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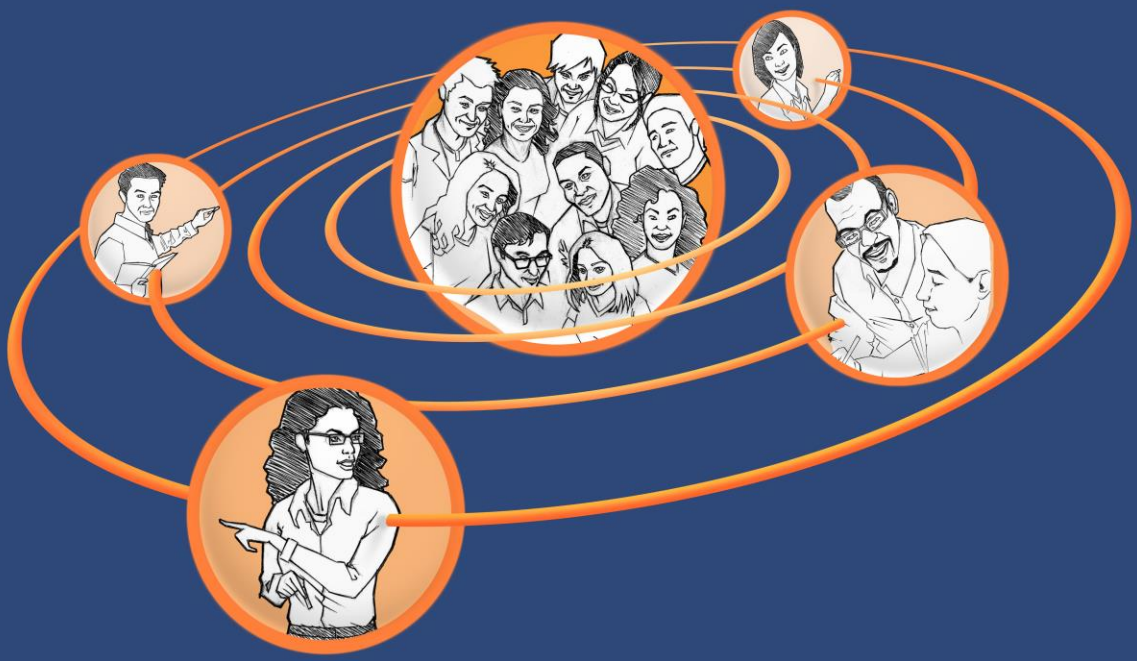
HOW WE TEACH NOW

The GSTA Guide to Student-Centered Teaching



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Introduction: Cultivating a Generation of Student-Centered Teachers of Psychology

Maureen O'Connor[1] and Patricia J. Brooks[2]

Palo Alto University[1] and College of Staten Island and The Graduate Center, CUNY[2]

College students today reflect unprecedented diversity (Kena et al., 2016). They are often the first members of their families to attend college and, at many schools, commute to classes while living at home (Pascarella, Pierson, Wolniak, & Terenzini, 2004). They range in age from traditional "college age" (17-23) to non-traditional "adult" students who may be entering or returning to college after years in the workforce or military service, often with families to support and full or part-time employment outside of school (Radford, 2011; Turner et al., 2007). Entering first-year students vary enormously in the extent to which their prior schooling has prepared them for college-level academic work, and many are required to complete remedial coursework while working towards a college degree (Camara, 2003). Since the passage of the Americans with Disabilities Act in 1990, colleges across American have accepted an increasing number of students with a wide range of disabilities with centers created to ensure that these students receive the accommodations necessary for them to succeed (Cortiella & Horowitz, 2014). Today's student body is made up of individuals from economically and ethnically diverse backgrounds, with students speaking many different languages at home in addition to English. Oftentimes students have experienced marginalization due to racial discrimination, sexual orientation, religious affiliation, immigration status, housing insecurity, food scarcity, and myriad other factors. Hence, for college instructors, it has become imperative to create inclusive classrooms that embrace the diverse experiences of the students and provide an education that is relevant to their everyday concerns (Banks & McGee Banks, 2016).

This volume grew out of collaborative efforts to provide support for graduate students in the Doctoral Program in Psychology at The Graduate Center, City University of New York (CUNY) who, after only a few semesters of graduate-level coursework, were assigned to teach undergraduate courses at various CUNY campuses as the Instructor of Record. CUNY is arguably the most diverse higher-education institution in the world, providing a world-class education to more than 270,000 degree-credit students at 13 senior colleges, seven community colleges, and four graduate schools scattered throughout the five boroughs of New York City. Here at CUNY, funding packages for doctoral students typically involve a minimum of three years of adjunct teaching, with only a minority of students hired as Teaching Assistants (TAs) rather than as Instructors. Rather than viewing this situation as dire, with hundreds of minimally qualified graduate students responsible for teaching collectively thousands of CUNY undergraduates, we saw an opportunity to make training in pedagogy a hallmark feature of our doctoral program. Upon graduation, our students would then be sought out as highly qualified instructors with a student-centered teaching philosophy, with the advantage of having gained one or more course preps under their belts.

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To achieve the goal of preparing graduate students to engage effectively with the undergraduates in their classes, O'Connor convened a Pedagogy taskforce, which consisted of interested CUNY graduate students and faculty in Psychology, including Brooks and Jillian Grose-Fifer. In 2010, the taskforce launched an annual Pedagogy Day conference with the theme "Practical Pedagogy" and created a course titled "Seminar and Practicum on the Teaching of Psychology" that would be team taught on an annual basis to capacity. In the years to follow, we invited fellow pedagogy enthusiasts to join us at Pedagogy Day as speakers and workshop leaders, with the annual conference emphasizing themes such as "Teaching Undergraduate Psychology in the Diverse City of New York Classroom," "Collaboration in Teaching and Learning," and "Student Engagement and Activism." We are especially grateful to Barney Beins (a Graduate Center alum), Bill Buskist, Regan Gurung, Amy Hunter, Susan Nolan, Aaron Richmond, and Janie Wilson for joining us as keynote speakers, and Janine Buckner, Paige Fisher, Jillian Grose-Fifer, Philip Kreniske, Rebecca Weiss, Eduardo Vianna, and numerous other faculty and graduate students for leading workshops. These individuals have played an enormous role in helping us shape our pedagogy program, and generously have shared their passion for teaching and learning in this volume.

In 2014, the Doctoral Program in Psychology at CUNY was selected by the Society for the Teaching of Psychology (STP) to serve as the host institution of the Graduate Student Teaching Association. This new collaboration with the STP gave impetus to our involving graduate students in the Scholarship of Teaching and Learning (SoTL) as part of their graduate training. Since 2014, our students have participated annually in the SoTL workshop, organized by Regan Gurung at the STP Annual Conference on Teaching, with several of their projects developing into published studies (e.g., Obeid & Hill, in press; Shane-Simpson, Che, & Brooks, 2016) and conference presentations (e.g., Sawyer et al., 2017; Schwartz, Richmond, & Brooks, 2015; Ober & Yannaco, 2016). Interest in SoTL has spread throughout the program, with many of our students finding the diverse classrooms at CUNY to be an ideal context for conducting research (e.g., Calcagno, 2015; Kreniske, in press). We are indebted to Svetlana Jović, Christina Shane-Simpson, Jeremy Sawyer, Rita Obeid, and Anna Schwartz for leading the GSTA through our first term as host institution. In addition to the GSTA chairs and co-chairs, student members Emily Dow, Philip Kreniske, Teresa Ober, Aliza Panjwani, Olga Parshina, Kasey Powers, Ethlyn Saltzman, Ralitsa Todorova, Francis Yannaco, and Ron Whiteman have worked tirelessly to expand the outreach of the GSTA, sharing their experiences and passion for teaching psychology with other graduate students through pedagogy workshops, blogging, and social media.

Collaborative Teaching and Learning

In preparing graduate students for college-level instruction, we have emphasized peer collaboration as a key strategy for juggling the demands of course preparation alongside doctoral coursework, research, internships, and fieldwork. At the College of Staten Island, we began crowd-sourcing the course prep for PSY100 (Introductory Psychology)—a course offered in "small" sections of 50 students taught by ~20 adjunct instructors each semester—by developing weekly lesson plans that included hands-on demonstrations (e.g., action potentials, habituation, classical conditioning), student presentations on psychopathology (5 slides in 5 minutes: Dow, Kukucka, Galazyn, Powers, & Brooks, 2013), low-stakes writing prompts, and online homework (using discussion boards and wikis) to foster more effective study habits (see Schwartz, Powers, Galazyn, & Brooks, this volume). The creation of a collaborative prep for PSY100 provided a mechanism for annual assessment and when the university implemented a hybrid initiative that shifted 30% of class hours online in some of the sections, we were well equipped to evaluate the impact of the policy directly in terms of student learning outcomes (Powers, Brooks,

Galazyn, & Donnelly, 2016). Moreover, the collaborative prep offered opportunities for more advanced graduate students to mentor new instructors in other courses, which ultimately resulted in new research projects within the SoTL field (see Sawyer & Obeid, this volume).

Similarly, in the Teaching of Psychology course, we arranged graduate students in small groups with the purpose of their developing detailed lesson plans embedded in complete syllabi for the undergraduate courses they are most likely to teach in the coming year. We engaged the graduate students in backward course design (Strashnaya and Dow, this volume; Wiggins & McTighe, 2005), asking them to identify specific learning objectives for their classes, using as a starting point the APA Guidelines for the Psychology Major (American Psychological Association, 2013). Having specific objectives that extended beyond content knowledge, we asked the graduate students to create (or locate from available sources) interactive lessons that would engage undergraduates in building the higher-order skills, such as critical thinking, perspective taking, and oral/written communication skills, that they aimed to teach. Each of their lessons was beta-tested in class, with graduate students playing the role of the undergraduates. With class feedback and supportive partnerships, the graduate students were able to fine-tune their lessons prior to using them on their own.

This volume is intended to provide a valuable text for Teaching of Psychology courses like our own by providing state-of-the-art methods for promoting active learning in the classroom. It includes numerous examples of student-centered lesson plans (e.g., Fisher, Hunter, Nolan, & Buckner, this volume; Grose-Fifer, this volume; Yuksel, this volume) as well as tips on how to develop a student-centered syllabus (Richmond, this volume; Whiteman & Ochakovskaya, this volume).

Embracing Student-Centered Teaching

Our approach to mentoring graduate students as new instructors reflects our own experiences and concerns as new faculty at CUNY. Almost 20 years ago, each of us faced the sink-or-swim challenge of teaching effectively without having had any coursework or formal training in pedagogy. One of us (Brooks) was lucky to be handed a syllabus for the Experimental Psychology course she was assigned to teach by a CUNY graduate student, who had covered the course for several semesters as an adjunct instructor. The course, as designed by the graduate student and her predecessors, had a significant laboratory component involving data collection, descriptive and inferential analyses of the data, summarization of key readings, preparation of lab reports, and oral presentations. Teaching a course with a built-in research component set the stage for her approach to teaching all courses in Psychology, where active learning, formulating and testing hypotheses, weekly writing assignments, and student presentations were viewed as core elements of course design. Research as a critical context for student development is a theme highlighted throughout this volume (e.g., Doychak, Krauss, Cardwell, & Beins, this volume; Grahe, this volume; Lewandowski, Ciarocco, & Strohmetz, this volume; Weiss & Seplowitz, this volume).

Since O'Connor was hired to teach an upper level, specialized seminar in her first semester, she quickly felt overwhelmed by inadequate student preparation in both writing and critical thinking skills. Fortunately, after an ineffective year or two of wearing out red pens in line-editing 20-page student papers, the University's Writing-Across-the-Curriculum program arrived. With the significant collaboration and support from colleagues in the English Department and through ongoing workshops, she learned that effective teaching is not something you are born to do, but rather something that requires active and ongoing professional development in evidence-based techniques. Combining the

scientific findings on how students learn most effectively with the tested techniques of skilled writing instructors completely transformed both the types of assignments given to students and the methods for assessing them.

Both of us came to embrace student-centered pedagogy through a combination of peer observations of effective classroom teaching, trial and error, and by taking to heart the feedback provided by our students to find ways of engaging them more effectively. In our view, "student centered" encompasses a number of key ideas that are well represented in the chapters of this volume. First, it is critical for instructors to get to know the students in their classes—starting out by learning their names and reflecting on how their diverse backgrounds can enrich the learning environment for all students in the class (Ober & Saltzman, this volume; Simon & Nolan, this volume). Knowing one's students and their goals and aspirations helps to build rapport and allows one to situate course materials in contexts that connect directly to students' lives (Buskist & Saville, 2001; Gurung, this volume; Wilson, this volume). Second, instructors must recognize that learning occurs in contexts of purposeful activity where students experience agency in their academic pursuits (Brown, Collins, & Duguid, 1989; Scribner & Cole, 1973; Vianna & Stetsenko, this volume). With this in mind, instructors should create assignments with careful thought to the learning objectives and engage in transparency in communicating the objectives to the students. Sharing what one hopes to achieve with a given assignment serves to motivate students as they can better align the coursework with their own personal objectives, and helps to secure buy-in for challenging assignments (Richmond, this volume; Schnieder, this volume).

Third, instructors must view student development as a learning objective—going beyond disciplinary content to include study habits, interpersonal skills, communication, planning, critical thinking, and mindset as instructional targets (Biggs, 1999; Chew, 2010; Yaeger & Dweck, 2012). Moving beyond an exclusive focus on content is especially important in general education courses such as Introductory Psychology, where only a small fraction of students plan to major in Psychology, and many may be at risk of dropping out (see Brooks, Che, Walters, & Shane-Simpson, this volume; Kreniske & Todorova, this volume; Podlucká, this volume). Fourth, instructors must provide instruction that is developmentally appropriate. Rather than focusing on deficiencies in the academic preparation of their students, instructors must recognize that they are charged to teach the students in their classes effectively, irrespective of their developmental level, and help them succeed in the face of challenge (Altman & Miller, this volume; Gillespie-Lynch et al., this volume). This does *not* mean that instructors should lower their expectations, but rather that they should engage in scaffolding difficult assignments so that students can make incremental progress, receiving feedback and additional support when needed (Brosowsky & Parshina, this volume; Davis & Miyake, 2004: Hogan & Pressley, 1997).

Fifth, as instructors of psychology, we must not turn a blind eye to decades of empirical research on learning and memory, which identifies the importance of spaced and interspersed exposure to topics, active learning via exploration and experimentation, practice and feedback in skills development, and frequent quizzes and tests, for example, in supporting learning and retention (Arner, Aldosari, & Morris, this volume; Brown, Roediger, & McDaniel, 2014; Hattie, 2014). It is unconscionable for psychology instructors to ignore research findings (Hunter & Lloyd, this volume), and persist in using less effective teaching methods rather than adopting evidence-based active teaching methods (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011; Freeman et al., 2014; Springer, Stanne, & Donovan, 1999). Finally, instructors need to be cognizant of their own development as teachers, seeking feedback from their students about what is (and is not) working for them, and making adjustments to hone their skills (Kirby,

Busler, & Buskist, this volume; Richmond, Boysen, & Gurung, 2016). Teaching effectively requires practice and a commitment to improve through professional development. For college instructors, engaging in professional development has become increasingly feasible via the Teaching and Learning Centers (TLC) that now exist on many college campuses and through participation in academic conferences and pre-conferences devoted to teaching and learning, such as the annual APS-STP Teaching Institute, the STP's Annual Conference on Teaching (ACT), and the National Institute on the Teaching of Psychology (NITOP).

We are delighted that so many of our esteemed colleagues and students have contributed to this volume, and we are grateful for the tremendous support these individuals have given to the GSTA at CUNY and for their efforts on behalf of the Society for the Teaching of Psychology. Through our engagement with the STP and the GSTA, we have deepened our commitment to ensuring that the next generation of Psychology instructors brings the best of the Psychological Science of Teaching and Learning to their classrooms (virtual or brick and mortar); that they do so in a spirit of collaboration and an ethical obligation to meet today's students where they are, not in some hypothetical space where those with privilege might want them to be; and, that we strive for an engaged pedagogy that propels psychologists and psychology students toward bringing their skills and knowledge of psychology to enhancing human welfare in these challenging times.

References

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology*, *103*(1), 1-18. doi:10.1037/a0021017

American Psychological Association. (2013). *APA guidelines for the undergraduate Psychology major,* Version 2.0. Washington, DC: Author. Retrieved from http://www.apa.org/ed/precollege/about/psymajor-guidelines.pdf

Banks, J. A., & McGee Banks, C. A. (Eds.) (2016). *Multicultural education: Issues and perspectives,* 9th Edition. Hoboken, NJ: John Wiley & Sons, Inc.

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development*, *18*(1), 57-75. doi:10.1080/0729436990180105

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*(1), 32-42. doi:10.3102/0013189X018001032

Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick*. Cambridge, MA: Harvard University Press.

Buskist, W., & Saville, B. K. (2001). Creating positive emotional contexts for enhancing teaching and learning. *APS Observer*, *19*, 12-13.

Calcagno, J. (2015). A current media approach to learning and teaching in Psychology of Women courses. *Psychology of Women Quarterly*, *39*(2), 268-271. doi:10.1177/0361684314566406

Camara, W. J. (2003). College persistence, graduation, and remediation. *Research Notes, RN-19.* New York: The College Entrance Examination Board.

Chew, S. L. (2010). Improving classroom performance by challenging student misconceptions about learning. *APS Observer*, *23*(4). Retrieved from http://www.psychologicalscience.org/observer/improving-classroom-performance-by-challenging-student-misconceptions-about-learning#.WH1q82QrLR0

Cortiella, C. & Horowitz, S. H. (2014). *The state of learning disabilities: Facts, trends, and emerging ideas, 3rd Edition.* New York: National Center for Learning Disabilities. Retrieved from http://www.ncld.org/wp-content/uploads/2014/11/2014-State-of-LD.pdf

Davis, E. A., & Miyake, N. (2004). Explorations of scaffolding in complex classroom systems. *The Journal of the Learning Sciences*, *13*(3), 265-272. doi:10.1207/s15327809jls1303_1

Dow, E., Kukucka, J., Galazyn, M., Powers, K. & Brooks, P. J. (2013, April). A five-slide model for pedagogy. Symposium presented at the *Farmingdale State College Teaching of Psychology Conference*, Tarrytown, NY.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410-8415.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Abington, UK: Routledge.

Hogan, K. E., & Pressley, M. E. (Eds.) (1997). *Scaffolding student learning: Instructional approaches and issues*. Cambridge, MA: Brookline Books.

Kena, G., Hussar W., McFarland J., de Brey C., Musu-Gillette, L., Wang, X., … & Dunlop Velez, E. (2016). *The condition of education 2016* (NCES 2016-144). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubs2016/2016144.pdf

Kreniske, P. (in press). Developing a culture of commenting in a first-year seminar. *Computers in Human Behavior.* doi:10.1016/j.chb.2016.09.060

Obeid, R., & Hill, D. B. (in press). An intervention designed to reduce plagiarism in a research methods classroom. *Teaching of Psychology.* doi:10.1177/0098628317692620

Pascarella, E. T., Pierson, C. T., Wolniak, G. C., & Terenzini, P. T. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *Journal of Higher Education, 75*(3), 249-284.

Powers, K. L., Brooks, P. J., Galazyn, M., & Donnelly, S. (2016). Testing the efficacy of MyPsychLab to replace traditional instruction in a hybrid course. *Psychology Learning and Teaching, 15*(1), 6-30. doi:10.1177/1475725716636514

Radford, A. W. (2011). *Military service members and veterans: A profile of those enrolled in undergraduate and graduate education in 2007-08. Stats in Brief.* (NCES 2011-163). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubs2011/2011163.pdf

Richmond, A. S., Boysen, G. A., & Gurung, R. A. R. (2016). *An evidence-based guide to college and university teaching: Developing the model teacher.* New York: Routledge.

Sawyer, J., Obeid, R., Bublitz, D., Schwartz, A., Shane-Simpson, C., DeNigris, D., … & Brooks, P. (2017, April). Which active learning methods are best? Comparing cooperative learning and writing-to-learn across modalities. Poster presented at the Developmental Science Teaching Institute at the biennial meeting of the *Society for Research in Child Development*, Austin, TX.

Schwartz, A., Richmond, A., & Brooks, P. J. (2015, May). Metacognition vs. memorization: What is an ideal study strategy in Introductory Psychology? Poster presented at the *APS-STP Teaching Institute at the 27th APS Annual Convention,* New York, NY.

Scribner, S., & Cole, M. (1973). Cognitive consequences of formal and informal education. *Science*, *182*(4112), 553-559.

Shane-Simpson, C., Che, E., & Brooks, P. J. (2016). Giving psychology away: Implementation of Wikipedia editing in an introductory human development course. *Psychology Learning and Teaching, 15*(3), 268-293. doi:10.1177/1475725716653081

Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research*, *69*(1), 21-51. doi:10.3102/00346543069001021

Turner, S. E., Breneman, D. W., Milam, J. H., Levin, J. S., Kohl, K., Gansneder, B. M., & Pusser, B. (2007). *Returning to learning: Adults' success in college is key to America's future.* Indianapolis, IN: Lumina Foundation for Education. Retrieved from https://www.luminafoundation.org/files/publications/ReturntolearningApril2007.pdf

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Yannaco, F. & Ober, T. (2016, October). From 'walking off' to 'logging on': Instructor self-efficacy and views on student use and misuse of technology. Poster presented at the *Society for the Teaching of Psychology 15th Annual Conference on Teaching*, Decatur, GA.

Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, *47*(4), 302-314. doi:10.1080/00461520.2012.722805

Chapter 1: Five Steps to Becoming a Student-Centered Teacher

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Abstract

In student-centered teaching, a teacher challenges students with learning to critically analyze, evaluate, and apply information that the teacher has either shared with them through lectures and readings or assigned them to gather and process on their own. This approach stands in stark contrast to instructor-centered teaching in which the teacher is primarily focused on the delivery of information to students without necessarily requiring students to think deeply about that information. We discuss five steps that new teachers can follow to become student-centered teachers: (a) developing rapport with students, (b) encouraging student autonomy, (c) sharing one's teaching philosophy with students, (d) engaging students in hands-on active learning activities in class, and (e) frequently reflecting over one's teaching with the aim of increasing its effectiveness in promoting student learning. We also discuss several impediments to becoming a student-centered teacher and suggest strategies for overcoming them.

Introduction

Shujie Chen and Camille Loflin are both second-year graduate students in the Social Psychology program at a large North American doctoral institution. They both aspire to become teacher-scholars, preferably at a small to medium-sized liberal arts institution that values both teaching excellence and scholarly productivity. Shujie and Camille are currently near the end of their second semester of teaching introductory psychology as instructors of record—they each have full responsibility for teaching a single section of 30 undergraduates. Everyone who teaches the course, including faculty, covers the same chapters from the same text in a predetermined order and must give three exams plus a comprehensive final exam on the same dates during the semester. All teachers of the course are also required to hold at least 4 office hours each week. Other than that, instructors of record and faculty are free to teach the course in any way that they wish.

Although Camille and Shujie have much in common—their love of social psychology, dedication to their graduate education, and aspirations to become teacher-scholars—they have very different approaches to teaching their respective sections of the course. Camille presents her material via PowerPoint lectures. She truly loves standing before her class and sharing her passion for psychology with her students. She arrives early to class and sets up her technology. If time permits, she will often chat with her students until class begins. Her lectures are well organized, clear, and coherent. Although she does not pose questions during her lectures, she is happy to answer questions when students ask them.

Like Camille, Shujie arrives early to class to set up her PowerPoint slideshow. Unlike Camile, though, Shujie uses fewer slides to cover the material, and devotes a substantial portion of class time to asking students to solve problems and engage in discussion. She regularly breaks up her lectures with brief one-page problem-based worksheets over material that students complete in small discussion groups. When students finish their small-group discussions, Shujie calls the class back together for a whole class

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discussion to review student answers and to solicit questions. Shujie also often poses questions in class as a means for reviewing what she has covered. After posing a question, she gives her students time to write out their answers in the margins of their notes, and then asks students to form pairs to compare and contrast their answers. Shujie then asks students to share their answers aloud with the class to encourage discussion of different perspectives on the question (this technique is called "think-pair-share"). She also asks her students to write three one-page reflection papers over what they are learning in the course. She provides written feedback on each paper. As a result of her frequent interaction with her students, Shujie has learned the names of all of her students, and is thus able to call on them by name during class or to greet them when she sees them elsewhere.

When the semester is over, Camille and Shujie compare their experiences with the course and their students. On average, Shujie's students scored a bit more than half a letter grade better than did Camille's students. On the end-of-the-semester course evaluation, Shujie's numerical data are about a full point higher than Camille's numbers, and Shujie's written comments are more than double the number that Camille received. Camille's students noted that she is a good teacher and they liked the course. In contrast, the majority of Shujie's students raved about how much they enjoyed the course, how much they appreciated her style of teaching, and the insights that class discussion and the group exercises gave them into psychology and their personal lives. Many of Shujie's students volunteered that the course had piqued their interest in psychology, and several students wrote that they decided to become psychology majors because of their experiences in her course. None of Camille's students volunteered similar views.

At the end of their conversation, Camille asked Shujie, "How did you do it—how is it that your students not only had more positive reactions to the course than my students did, but they also performed better than my students? What's your secret?"

What is a Student-Centered Teacher?

The answer to Camille's question is neither complicated nor a particularly well-guarded secret: Shujie simply spent time interacting with her students in ways that enhanced not only their learning, but also their enjoyment of the process. She kept her students on task in ways that were relevant to them through a combination of brief lectures and in-class activities. In other words, she got them *actively* involved with course material. After reviewing the key components of topics via lecture, Shujie's students practiced putting those concepts into action through problem-solving, writing, and discussion activities. Whereas Camille focused wholly on the delivery of content and students' recall of that information through examinations, Shujie focused on developing her students' speaking, writing, problem-solving, critical thinking, and teamwork skills. True, Shujie delivered brief lectures to her students, and her students took exams just like Camille's students did, but the fundamental educational experience for her students was radically different than for Camille's students.

The contrast between Camille and Shujie's approach to teaching highlights some of the key differences between instructor-centered teaching and student-centered teaching, or as it is sometimes called, learner-centered teaching (e.g., Bloomberg, 2008; Doyle, 2011; Weimer, 2013). In their extreme forms, these two approaches anchor opposite ends of the same continuum. In reality, many teachers combine these two approaches in various combinations to form an almost infinite variety of hybrid approaches to classroom instruction. To better understand what student-centered teaching is, let us first consider what it is not.

Instructor-Centered Teaching

The key characteristic of instructor-centered teaching is the delivery of content by an authority figure—someone who is purportedly an expert in the material. The overarching goal of instructor-centered teaching is simply the transmission of information: The teacher's job is to "cover" as much material as possible in 50- or 75-minute doses over the course of the semester. The teacher expects students to study the assigned readings, take and review their notes, and then periodically reproduce the information on quizzes and exams. Students perform better in the course relative to how well they can recall the information.

The primary platform of instructor-centered teaching is the pure lecture—teachers, like Camille, typically show PowerPoint slides elaborating on important points, providing examples of those points, and occasionally sharing funny anecdotes or personal stories related to the material. The lecture can be a powerful means of content delivery, and particularly effective lecturers can truly inspire their students to think deeply about or pique their interest in the information. Indeed, effective lecturers sometimes prompt students to alter their educational and professional trajectories by changing majors or developing new academic interests (Benjamin, 2002; Chaudhury, 2011; Daniel, 2012). However, such gifted lecturers are rare.

Many researchers have shown that the pure lecture is less effective than other platforms in enhancing student learning and student enjoyment of the subject matter. A variety of other platforms that focus on active learning such as problem-based learning, service learning, team-based teaching, and interteaching are demonstrably superior to the lecture in terms of enhancing student content knowledge and complex thinking skills (Buskist & Groccia, 2011). Such platforms form the heart of student-centered teaching.

Student-Centered Teaching

As we have hinted, student-centered teaching places student learning front and center in the teaching-learning process. As King (1993) aptly expressed it, in student-centered teaching the teacher is more of a "guide on the side" rather than a "sage on stage" as is the case with instructor-centered teaching (p. 30). In instructor-centered teaching, teachers task students with merely receiving and remembering information from lectures. In student-centered teaching, teachers like Shujie task students with learning how to critically analyze, evaluate, and apply information that the teacher has (a) shared with them through lectures and readings or (b) assigned them to gather and process on their own. The primary goal of student-centered teaching is to assist students with achieving their potential for becoming thoughtful and rational problem-solvers. Using student-centered teaching approaches increases the likelihood that students will learn how to make cognitive connections among seemingly disparate ideas and apply those insights to solving problems, and generate new ideas and strategies to advance their understanding of the world (Buskist & Groccia, 2011).

Because the lecture remains the most popular approach to college instruction, student-centered teaching may seem like a new and radical idea to many beginning college and university teachers. However, the idea of student-centered teaching is not new—it has been floating around the academy since the early 1950s (e.g., Bills, 1952; McKeachie, 1954). Over the past few decades, though, student-centered teaching has emerged squarely into the foreground of teaching as more and more college teachers have sought methods to enhance student learning. They discovered that learning is not a

passive process that results from merely exposing students to information; quite the contrary, the deepest and most meaningful learning results from students engaging with course content.

Among the most ardent of champions of student-centered teaching has been Maryellen Weimer, who has written extensively on the topic (e.g., 2013). In a 2012 blog, she outlined five characteristics of student-centered teaching:

- Engages students in the hard, messy work of learning—Teachers provide ample opportunities for students to actively practice what they are learning by, for example, asking them to raise and answer questions, create relevant examples, and solve problems.
- Includes explicit skill instruction—In addition to teaching students the nuts and bolts of content, teachers also show students how to use critical thinking skills to more deeply understand that content, including how to apply that information to novel situations.
- Encourages students to reflect on what and how they are learning—Weimer noted that "… teachers include assignment components in which students reflect, analyze, and critique what they are learning and how they are learning it. The goal is to make students aware of themselves as learners and to make learning skills something students want to develop."
- Motivates students by giving them some control over learning processes—Teachers invite students to share responsibility for thinking about how the class will be conducted. Student-centered teachers, for example, allow students to choose reading assignments, suggest topics for discussion and written assignments, and provide input for classroom management policies. The idea is to allow students to experience some degree of ownership of their education, thereby increasing students' intellectual and emotional investment in doing well in the course.
- Encourages collaboration—Teachers view the classroom as a community of learners that allows students and teachers to learn from one another through a variety of platforms including, among other things, group work, class discussions, and shared assignments.

Five Steps to Becoming a Student-Centered Teacher

Of course, Weimer's (2012) work leads to two obvious but critical questions: First, how does one become a student-centered teacher? For example, what might Camille do to transition from instructor-centered teaching to student-centered teaching? Second, how does one continue to develop or refine one's student-centered teaching? That is, how might Shujie improve her student-centered teaching to be better than it already is? Answers to these questions are neither simple nor particularly intuitive, especially considering the complex nature of teaching and learning. Perhaps the best way to think about these questions is to focus on concrete, observable pedagogical strategies and tactics that teacher-scholars have demonstrated to be effective in producing high levels of student learning. Teachers, especially new ones, who focus on well-established student-centered teaching activities replicate such practices in their own teaching, often with interesting and useful extensions and modifications. Below

we broadly outline five steps that teachers can follow to become an effective student-centered teacher or to enhance their already strong student-centered teaching.

Cultivate Rapport with Your Students

Relatively few teachers consider the importance of the classroom environment as they design and later teach their courses. However, teaching and learning take place within a social context. The classroom, as Lowman (1995) pointed out, is not neutral ground; rather, it is emotionally charged. Thus, it is key that teachers proactively create a positive and supportive atmosphere that promotes students' sense of intellectual and emotional safety. Only when students experience such support are they generally willing to become fully engaged in participating in all aspects of the course. In a study that we recently completed at Auburn University with a sample of 167 students, we found that students who have rapport with their teachers, compared to those who do not, are more likely, among other things, to attend class, pay attention during class, take notes, study for exams, attend office hours, enjoy their courses, and take a second course in the discipline.

Thus, establishing rapport with students—that is, demonstrating that one genuinely cares for and supports one's students—encourages several important pro-academic behaviors in students. There seems to be no shortage of ways to develop rapport with students, and most of these techniques require very little time and effort on the teacher's part. Here we provide a short list of tips for building rapport that we culled from the work of Benson, Cohen, and Buskist (2005) and Wilson and Ryan (2012; see also Wilson, this volume):

- Send students a welcoming e-mail a day or two before classes begin.
- Be upbeat and positive the first day of class—set a welcoming tone for the class.
- Learn student names.
- Treat all students respectfully.
- Learn a little bit about your students' interests in the course.
- Arrive to class early and engage in chit-chat with your students.
- Stay after class to entertain any student questions and comments leftover from class.
- When students visit during office hours, give them your complete attention.
- Answer student e-mails promptly and courteously.
- Avoid using gestures or language of power over students (i.e., threatening overtones).

Encourage Student Autonomy

A hallmark of student-centered teaching is giving students some degree of control over what they do in the course. In instructor-centered courses, teachers control all aspects of their course. In student-centered courses, teachers allow their students varying degrees of autonomy regarding the choice of readings, assignments, class activities, classroom policies, and even assessment procedures (Svinicki & McKeachie, 2014).

You are more likely to give students autonomy if you plan for it. Thus, as you write your syllabus prior to the beginning of a new semester, consider different possibilities for offering your students a bit of freedom. One way to accomplish this task is to bring a "first draft" of your syllabus to class and ask your students to help you write the final draft. Your students will likely be taken aback at your suggestion because the vast majority of them will expect your syllabus to tell them what do to, how to do it, and when to do it. Let them know that you would like their input and suggestions regarding several (but not necessarily all) aspects of the course. In our experience, students appreciate the opportunity to tailor courses to meet their needs and interests—and you can help students in this process without compromising the integrity or rigor of your course. We provide a few examples of some of the course elements over which your students can have some control:

- Flexible Deadlines—Within reason, offer students a time frame within which to take quizzes and exams or turn in assignments. Flexible deadlines are fast becoming the norm with online assessment and assignments.
- Choice of Assignments—Offer students the opportunity to complete a range of different assignments that accomplish the same educational goals. For example, assign students to write one or more reaction papers during the course, but allow them to have their preference of the chapter, article, or topic to complete the assignment.
- Testing—Allow students to select which test questions to which to respond. For example, rather than having students answer each of three short-answer essay exam questions, offer them the chance to answer three of five essay questions. Of course, you will need to make sure that all five questions are equally challenging.
- Classroom Etiquette—Ask students their advice regarding classroom management rules and the consequences for infractions. For example, you might outline your rules of etiquette in your first draft of the syllabus and then ask your students to discuss those rules in small groups and determine (a) whether those rules are applicable for this course, and (b) if they are applicable, which consequences might be appropriate when a student breaks a rule.

Of course, as an instructor, you have the right and the responsibility to develop your courses any way that you see fit as long as they comply with the guidelines established by your department and institution. However, you will find that as you seek student input into your syllabus, course assignments, and etiquette polices, you will learn much about students' perspectives on higher education, and as a result, you will likely become more insightful in how to develop your courses in a way that marries your high academic standards with your students' educational and personal goals. Keep in mind, too, that if you solicit student input on your syllabus, you are not obligated to include all of their suggestions into your final draft.

Share Your Teaching Philosophy and Assignment Rationale with Students

When teachers draft course syllabi, they generally have a solid rationale in mind for their course design, which includes, among other things, learning objectives, assigned readings, assignments, learning assessments, grading scale, course policies, and so forth. Unfortunately, this rationale is a well-kept secret from students. When they look over the syllabus, all they see is a series of tasks and hurdles to complete over the next few months—and most have no clue as to why the teacher wants them to do

those things. Many students take it on faith that these tasks will benefit them in some way—but they may not be sure exactly how. Other students may look over these tasks with some degree of resentment, feeling that the tasks are nothing but busy work. One way to dispel such ambiguity and angst is to share explicitly your reasoning for elements of the course with students. The procedure is simple:

- Devote a short paragraph or two near the beginning of your syllabus that describes the key elements of your teaching philosophy and how it applies to your course. For example, outline your general goals as a teacher and your expectations for your own and students' behavior toward achieving course goals.
- For each aspect of your course, provide a short rationale statement. For example, if you assign an APA-style research proposal or paper in your course, you might want to provide a rationale along the lines of, "One of our most important course goals is to have you engage in assignments that will aid your professional development as a young scholar. Enabling you to conceptualize a research question, research the topic, and design a study that contributes to the literature related to this question will help accomplish this goal."
- Create a short table near the end of your syllabus that links each assignment to specific skills that successfully completing that assignment is likely to cultivate in your students. For example, if you assign an APA-style proposal or paper in your course, you might describe the benefits of this assignment as, "Development of key writing and critical thinking skills, particularly those related to learning how to ask appropriate questions, distinguishing credible from non-credible sources of information, developing rational arguments, drawing inferences, and considering alternative explanations for psychological phenomena."

Implement Active Learning Activities with Feedback

There is no better way to engage students in your courses than to incorporate active learning activities (ALAs) into your teaching, and this point is true whether you meet your students face-to-face or in an online environment. Inside the classroom, technology allows students to visualize difficult concepts through a variety of media formats, and the use of clickers or similar technology provides the student-centered teacher with immediate feedback of student learning, thinking, and the processing of key ideas and concepts. Outside of the classroom, teachers can use interactive online assignments, quizzes, video lectures, and discussion boards to preserve class time for more problem-solving activities, discussions, debates, and presentations.

ALAs come in two varieties: "drop-ins" or "systems." Drop-ins are brief (usually 1-5 minutes) ALAs that teachers can easily insert into the beginning, middle, or end of a class session. An example would be the "think-pair-share" technique (for a fuller discussion of the think-pair-share technique, see Sawyer and Obeid in this volume). Systems are ALAs that form the central design of a course. Examples include team-based learning and service learning, (for a review of ALA systems, see Buskist & Groccia, 2011). Some ALAs, such as problem-based learning and case study teaching, are useful as either a drop-in or a system.

As we noted earlier, ALAs have abundant benefits in developing students' analytical thinking abilities and getting students involved in their courses. According to Richmond, Boysen, and Gurung (2016), teaching with ALAs is a regular practice of model teachers, suggesting that a key to the success of outstanding teachers is the use of active learning in their courses. Here are several suggestions for learning how to incorporate ALAs in your teaching:

- Scour the teaching and learning literature to learn more about the nature of ALAs and their many uses in college and university teaching.
- Talk to other teachers about the kinds of ALAs they have used in their courses and which worked well and which did not.
- Start slowly and be selective—not all ALAs are applicable to all content and some ALAs work better in some teaching situations than others. For example, you may find that a case study activity works very well when teaching about psychological disorders, but less well when teaching about the anatomy of the neuron.
- As you become more adept and comfortable using ALAs, introduce more of them into your teaching. Gradually replace more and more of your lectures with ALAs—the point at which one feels comfortable in striking a balance between lecturing and using ALAs will vary from teacher to teacher.
- Leave plenty of time for you to offer your students feedback on their contributions to the ALAs you've selected to use in class.
- Solicit feedback from your students. Do not hesitate to ask your students their reactions to the ALAs you are introducing them to in class. When you test them over the concepts on which you based these exercises you will get a good sense of whether students are learning from your ALAs. On the other side to that coin, you may also gain some insight into better ways of implementing ALAs in terms of procedure, time allotted to the task, and so on simply by talking to your students about their experience.

Engage in Frequent Reflection and Revision

Because teaching is a craft, it is all but impossible to perfect. Thus, the best teachers strive continually to improve their teaching by taking time to reflect on their instructional successes and failures and make the necessary modifications in the attempt to improve their teaching (Kite, 2012). Although most institutions mandate end-of-the-semester course evaluations, these may not include particularly informative questions. Furthermore, you should not wait until the end of the semester to solicit feedback from your students. Among the most important reasons for seeking earlier feedback is the fact that the feedback you receive from end-of-the-semester course evaluations is simply too late to improve your teaching for your current students. Here are our suggestions for ways that you might gather feedback from your students with respect to developing and enhancing your student-centered teaching:

- Two or three times during the semester, ask your students to provide you with their written comments regarding what is going well in the course and what might be improved. After the first exam, first ALA, or during midterm might be particularly helpful times to ask. This tactic will allow you to learn both what you are doing effectively and

what you might do to become even more effective. It will also create a strong impression in your students that you care about them and that you want them to do well. Be sure, though, to make a genuine attempt to act on any feedback you think might help you improve the learning experience you are providing for your students. Even if you do not change course structure based on their recommendations, address their concerns by explaining the rationale for your policies. Students will stop providing you feedback if they see that you ignore it.

- When students drop by your office hours, ask them how they are doing in the course and what you might do to help them become more successful learners. Again, when you engage students in a conversation about their experiences in your course, they will develop a sense that you care about them.
- Occasionally use classroom assessment techniques to assess the quality of your students' understanding of difficult concepts and ideas (Angelo & Cross, 1993). Classroom assessments such as the 1-minute paper—in which you simply ask students to take a minute to write down and turn in their descriptions of the most important thing they learned in class today or to summarize key points—will provide you abundant insight as to whether students are truly understanding the material.
- Shortly after class is over, take a few minutes to jot down notes as to your reaction to your teaching—What seemed to work? What seemed not to work? Any ideas for teaching the same topic next time? Over the course of the semester, such reflection will produce a small notebook of insights, ideas, and suggestions for revising the material next time you teach it.

Facing the Impediments to Becoming a Student-Centered Teacher

Because student-centered teaching is such an effective method for increasing student learning, you might think that all college and university teachers take a student-centered approach to their work. At the very least, you might think that they *should* adopt this approach. You could probably even argue—and from our vantage, you would be correct—that all teachers have an *ethical* responsibility to use the most effective tools possible in their teaching (Hill & Zinsmeister, 2012). Unfortunately, many teachers, perhaps the majority, are not student-centered teachers—just consider for a moment the number of undergraduate teachers you had who did not use student-centered teaching techniques.

Why is it that not all college and university teachers adopt the student-centered teaching approach? The answers to this question are varied and complex, but can be apportioned to two general categories—internal barriers, those that arise within the teacher, and external barriers, those that stem from the environment in which the teacher works.

Internal Barriers

There are three main types of internal barriers. Each of these barriers can be overcome with practice and patience.

Anxiety. The first and most common barrier among new teachers, especially those teaching for the first time, is personal uncertainty or lack of confidence. Teaching your first course can be an especially daunting and anxiety-provoking experience, especially if you have little or no departmental support or

supervision. After all, although you have had plenty of experience as a student, you likely have had no experience as a teacher—and uncertainty as to how to teach your content reigns the day. You will find it difficult enough merely preparing a lecture; even the thought of trying to build in ALAs to your lesson plan may be overwhelming. Thus, you can see why most new teachers tend to rely on their experiences as learners and adopt an approach to teaching like what they experienced as undergraduates: generally, the pure lecture.

An effective remedy for this internal barrier is to start slowly, and first become familiar with the content of your lectures to the point you are certain that you know it well. Pause occasionally during lecture and solicit student questions. The rule for asking good questions is to be specific (e.g., "What is the difference between positive reinforcement and negative reinforcement?") rather than general (e.g., "Does that make sense?"). Then, once you have some confidence interacting in class with your students, slowly introduce other student-centered teaching strategies into your pedagogical approach. Like Shujie, you do not have to convert your lecture-based course into a wholly student-centered teaching approach all at once.

Priority of content. A second common internal barrier is the urgency you may feel to cover all of the course content in detail during class. This sense of urgency will lead you to think that you do not have time for asking questions, generating class discussion, not to mention time-consuming ALAs, which in turn, will lead you to feel that you must exert total control of class time. Remember, though, that when teachers become slaves to content, they tend to cram information into the class period with seemingly total disregard to how well students are able to process it.

For many teachers, especially new ones, the prospect of yielding some control of class time to students through ALAs is uncomfortable and even anxiety-provoking. However, in our experience, we have found that students' intellectual contributions to class generally rewards those teachers who give students some control of class time. When teachers yield control to the class, students have the opportunity to develop and refine their skills as young scholars, which often lends confidence to those teachers who are new to student-centered teaching.

A helpful perspective to adopt in such situations is to ask yourself whether it is the delivery or *understanding* of content that is essential to student learning. What good is exposing students to content if they do not understand it or know how to apply it to solve problems? All effective teachers have struggled with this question, and have, in their own individual ways, struck a balance between how much of any class period is devoted to delivery of content versus asking students to engage with the content—by practicing the thinking skills necessary to evaluate and apply it.

Social reinforcement. A third internal barrier to becoming a student-centered teacher is the power of attention as a social reinforcer. In lecture, all student attention is focused on the teacher. For some teachers, like Camille, such attention is intoxicating—they enjoy, even revel in, being in the spotlight before a captive audience. Because of the personal satisfaction that teachers may accrue from lecturing, especially if they are successful lecturers, many teachers are reluctant to reduce lecture time, let alone give it up altogether, to engage students with ALAs.

To confront this barrier, it is again helpful to pause and ask yourself a question: Is my job as a teacher to serve students or to serve myself? A second question is also instructive here: Under what circumstances do students become the most successful learners—through instructor-centered teaching or student-

centered teaching? As we pointed out before, some lecturers—the minority—inspire students to achieve great things in their education, but all evidence points to the fact that student-centered teaching produces the most successful learners (e.g., Buskist & Groccia, 2011). Thus, embracing the notion that students often learn more through student-centered teaching than instructor-centered teaching is a solid step toward becoming a student-centered teacher.

External Barriers

At this point, you may be thinking that some of the impediments to your becoming a student-centered teacher are not for lack of wanting to—you simply feel you cannot because of variables that seem beyond your control. You may be correct. Three common external variables stand in the way of someone becoming a student-centered teacher: lack of time, negative student reactions to student-centered teaching, and an unfavorable departmental culture.

Lack of time. Time is the great enemy of all graduate students and professors. Our time is simply too sparse to accommodate all of the tasks that the academy sets before us. As a graduate student, you have a full complement of your own courses to take that involve more reading than you could have possibly ever imagined as an undergraduate. You have lab meetings to attend. You have papers to write; research to conduct; and a thesis or a dissertation to propose, run, write, or defend. On top of it all, the department has asked you to become an instructor of record—where are you going to find the time to take on this huge responsibility? You will be so busy just trying to master the content of the course and preparing lectures that you will have precious little time to prepare many, if any, ALAs.

Perhaps the best advice for dealing with time pressure is Boice's (2000) well-respected argument for *Nihil Nimus*—nothing in excess. That is, do not try to do too much at once. The most important first steps for new teachers is to learn the content and to learn how to explain it clearly to their students. Thus, even though you might wish to become a student-centered teacher from the get-go, be patient with yourself, and like we noted earlier, gradually introduce student-centered teaching into your classroom. As you gain more experience and confidence, you will gradually accumulate a growing arsenal of ALAs. A reasonable first approach to becoming a student-centered teacher is to build meaningful review questions into your lectures. You will want to provide interim summaries in your lectures anyway. Instead of you articulating the key points, ask your students to do it for themselves through brief question and answer sessions.

Student resistance. A second external barrier to student-centered teaching is student resistance to any teaching activity other than the lecture (Weimer, 2013). Passively listening to lectures comprises the typical student's learning history, and as Felder and Brent (1996) perceptively pointed out, students are used to a teacher telling them what they need to know. When they encounter a student-centered teacher, they often will resent the hard work that this teacher is asking them to do.

As student-centered teachers, we have found that an excellent way to address this issue is to explain our student-centered teaching philosophy to students in the syllabus and review that philosophy on the first day of class. Then, throughout the semester, we make the objective of each ALA we introduce in class crystal clear to students so that they can begin to see its benefits to their learning. We have also found that it helps to be enthusiastic throughout the semester about our ALAs and what students are learning from them. In other words, we like to have fun when interacting with our students—not the

kind of fun that is marked by “Ha-Has” and guffaws, but rather by how interesting and relevant course content becomes when you ask students to grapple with it hands-on.

Remember, too, that student-centered teaching focuses on meeting students’ educational needs, not catering to their whims. However, steamrolling over their resistance to student-centered teaching may likely further undermine their motivation for your course. When you sense that students are resistant to your student-centered teaching methods, directly but gently address what they are feeling. Ask for their feedback so they know that you want to listen to them. Let them know your rationale for why you have selected student-centered teaching for the course—and let them know how, within the structure of the course, you can accommodate any relevant criticisms of the course.

Unsupportive departmental culture. Perhaps the most powerful external barrier to becoming a student-centered teacher is an unsupportive departmental culture—one that is apathetic about fostering high quality student learning, or worse, one that actively minimizes the importance of undergraduate teaching. For example, we know of faculty who discourage their graduate students from becoming effective teachers by advising them to “invest as little time and effort as possible in your teaching” because it takes away from the time and effort they wish their students to invest in research. We also know faculty who take the issue a step further, and prevent their students from becoming involved at all in teaching, even though those students would like to pursue a teaching career.

If you find yourself in a department that devalues teaching or under the tutelage of a major professor who discourages you from pursuing your goal of becoming a teacher, you must be extremely careful in your reaction, else you could experience a very uncomfortable, even miserable, several years in graduate school. As we see it, under these circumstances you have three choices. First, you can leave your current school and apply to those schools that have more supportive attitudes regarding teaching (see, e.g., Beers, Hill, & Thompson, 2012). Second, you can do nothing—complete your degree and then move on in pursuing a teaching career the best you can. This option is not optimal because to land a teaching position, it is essential that you have some teaching experience. Third, you can gently push for change within the department and with your major professor by noting how your teaching experience can foster your professional development. Teaching as a graduate student can (a) make you more competitive in the college and university job market—after all, the vast majority of professorial positions involve at least some teaching—and (b) provide you valuable public speaking experience that will help prepare you for conference presentations and job talks as well as thesis/dissertation proposals and defenses.

Conclusion

We have outlined five actionable steps that graduate student instructors and other new teachers can take on their way to becoming student-centered teachers. Keep in mind though, that becoming a student-centered teacher requires considerable effort and persistence. In addition, several pesky internal and external barriers may stand in the way of anyone becoming a student-centered teacher. We have provided a short list of strategies that we have found useful in effectively addressing them. Despite the inherent challenges to becoming a student-centered teacher, the rewards for striving to become such a teacher are abundant and include deeper and more meaningful student learning, enhanced student problem-solving skills, increased student engagement, and, for teachers, the personal satisfaction that comes from seeing students succeed.

References

Angelo, T. A. & Cross, P. K. (1993). *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). San Francisco, CA: Jossey-Bass

Beers, M. J., Hill, J. C., & Thompson, C. A. (Eds.). (2012). *The STP guide to graduate training programs in the teaching of psychology* (2nd ed.). Retrieved from http://teachpsych.org/ebooks/gst2012/index.php

Benjamin, L. T. (2002). Lecturing. In S. F. Davis & W. Buskist (Eds.*), The teaching of psychology: Essays in honor of Wilbert J. McKeachie and Charles L. Brewer* (pp. 57-67). Mahwah, NJ: Erlbaum.

Benson, T. A., Cohen, A. L., & Buskist, W. (2005). Rapport: Its relation to student attitudes and behaviors toward teachers and classes*. Teaching of Psychology, 32*, 237-239.

Bills, R. E. (1952). An investigation of student-centered teaching. *The Journal of Educational Research, 46*, 313-319.

Bloomberg, P. (2008). Developing learner-centered teaching*: A practical guide for faculty*. San Francisco, CA: Jossey-Bass.

Boice, R. (2000). *Advice for new faculty members: Nihil Nimus.* Boston, MA: Allyn & Bacon.

Buskist, W., & Groccia, J. E. (Eds.). (2011). *Evidence-based teaching*. New Directions in Teaching and Learning, no. 128. San Francisco, CA: Jossey-Bass.

Chaudhury, R. S. (2011). The lecture. In .W Buskist & J. E. Groccia (Eds.). *Evidence-based teaching.* New Directions in Teaching and Learning, no. 128 (pp. 13-20). San Francisco, CA: Jossey-Bass.

Daniel, D. (2012). Learning-centered lecturing. In W. Buskist & V. A. Benassi (Eds*.). Effective college and university teaching: Strategies and tactics for the new professoriate* (pp. 91-98). Thousand Oaks, CA: Sage.

Doyle, T. (2011*). Learner-centered teaching: Putting the research on learning into practice*. Sterling, VA: Stylus.

Felder, R. M., & Brent, R. (1996). Navigating the bumpy road to student-centered instruction*. College Teaching, 44,* 43-47.

Hill, G. W., IV, & Zinsmeister, D. D. (2012). Becoming an ethical teacher. In W. Buskist & V. A. Benassi (Eds.). *Effective college and university teaching: Strategies and tactics for the new professoriate* (pp. 125-134). Thousand Oaks, CA: Sage.

King, A. (1993). From sage on the stage to guide on the side. *College Teaching, 41*, 30-35.

Kite, M. (Ed.). (2012). Effective evaluation of teaching: A guide for faculty and administrators. Retrieved from http://teachpsych.org/ebooks/evals2012/index.php

Lowman, J. (1995). *Mastering the techniques of teaching* (2nd ed.). San Francisco, CA: Jossey-Bass.

McKeachie, W. J. (1954). Student-centered versus instructor-centered instruction. *Journal of Educational Psychology, 45,* 143.

Richmond, A. S., Boysen, G. A., & Gurung, R. A. R. (2016). *An evidence-based guide to college and university teaching: Developing the model teacher*. New York, NY: Routledge.

Svinicki, M. D., & McKeachie, W. J. (2014). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (14th ed.). Belmont, CA: Wadsworth.

Weimer, M. (2012). *Five characteristics of learning-centered teaching*. Retrieved from http://www.facultyfocus.com/articles/effective-teaching-strategies/five-characteristics-of-learner-centered-teaching/

Weimer, M. (2013*). Learner-centered teaching: Five key changes to practice* (2nd ed.). San Francisco, CA: Jossey-Bass.

Wilson, J. H., & Ryan, R. G. (2012). Developing student-teacher rapport in the undergraduate classroom. In W. Buskist & V. A. Benassi (Eds.). *Effective college and university teaching: Strategies and tactics for the new professoriate* (pp. 81-89). Thousand Oaks, CA: Sage.

Chapter 2: A Graduate Student's Primer to Model Teaching:

A Focus on Learner-Centered Syllabi and Instructional Strategies

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Abstract

Recently, my colleagues and I developed evidence-based model teaching competencies for college and university teachers (Richmond, Boysen, & Gurung, 2016). In this chapter, I provide a definition of model teaching competencies, how to accomplish them, and why you should use them in designing your syllabus and instructional strategies. Additionally, I provide resources for further reading and learning about what it takes to become a model teacher. I end the chapter with directions on how to proceed in developing model teaching competencies.

Introduction

It is your first day of class and you are teaching introductory psychology. As a graduate student, this is the first time that you are listed as the "instructor of record." What have you done to prepare for this class? You know the material, but can you teach it effectively? What does your syllabus look like? Oh, my…all of these questions are about to make your head explode! But don't worry, these are questions and emotions that most new teachers experience and ask themselves, and what great teachers continually ask themselves. Fittingly, Scholarship of Teaching and Learning (SoTL) scholars have grappled with these questions, in part, to mitigate fears that may result in anxiety and overall uncertainty about entering the field of teaching psychology. For example, my colleagues (Guy Boysen and Regan Gurung) and I set out to develop a resource guide that was evidence-based and provided pedagogical methods that model teachers used. The result of this endeavor is the book *An Evidence-Based Guide to College and University Teaching: Developing the Model Teacher* (2016).

The model teaching competencies included training (e.g., your knowledge of your field and pedagogy), content (e.g., what content you should cover in your classes), assessment (e.g., how do you assess student learning), student evaluations of teaching, instructional strategies, and syllabus construction. For the purposes of this chapter, I chose to focus on the latter two competencies. Specifically, in an attempt to help you learn how to become a model teacher, one of my main goals for this chapter was to outline and provide concrete strategies on how model teachers teach and construct syllabi. I will first describe evidence-based model teaching competencies of syllabus construction and instructional

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Author Note: Much of what is described in this chapter, is based on Aaron S. Richmond, Guy A. Boysen, and Regan A. R. Gurung's book *An Evidence-Based Guide to College and University Teaching: Developing the Model Teacher* (2016). Thank you Guy and Regan for all of your hard work on this project. It is always a true joy to work with you two.

strategies. Then, I will provide evidence indicating why you should use these strategies, and I will end with a summary of resources for you to continue your learning on the model teaching criteria.

The Model Syllabus

Evidence-Based Practices in Syllabus Design

When you look at your syllabus, what do you see? A list of assignments and assessments? A calendar of due dates? Maybe a course description? Perhaps some class rules for behavior? Likely, *yes* is the answer to all of these questions, but the syllabus is more than that. Evidence-based practices suggest that your syllabus is a permanent record (Parkes & Harris, 2002), contract (Robinson Wolf, Czekanski, & Dillon, 2013), communication device (Sulik & Keys, 2014), learning tool, and cognitive map (Matejka & Kurke, 1994), and should be designed with learner-centered learning principles (Cullen & Harris, 2009; Richmond, Slattery, Morgan, Mitchell, & Becknell, 2016).

First, your syllabus serves as a permanent record. Yes, it lives on in perpetuity! Like it or not, your syllabus is a permanent record to be used by students transferring to other institutions, departmental chairs or deans for program assessment purposes, and a myriad of other reasons. Thus, it is extremely important to include permanent record elements of your syllabus (Richmond, Boysen, & Gurung, 2016). A good place to start for these elements is with what is known as the Regular Course Syllabus (RCS) or you can search the Society of Teaching of Psychology's Project Syllabus (http://teachpsych.org/otrp/syllabi/index.php) for examples of excellent syllabi. If you use the RCS, it is often located with the department chair and is the omnibus syllabus for the course. Both sources of syllabi will typically provide course information such as how many credit hours the course fulfills, an outline of course topics, suggested assignments, and the pre-and co-requisites for the course.

For both the RCS or a syllabus from Project Syllabus, there are several elements that you will need to include. For example, either source may include a list of Student Learning Objectives (SLOs). However, you will need to modify SLOs for your course, and even so, as a graduate student you must be careful doing so—it could get you in trouble with your chair or advisor. In either source of syllabi, there should be some basic evaluation procedures (e.g., assessments, quizzes, tests). As it is your class, you will have the opportunity to modify (in most cases) the evaluation procedures to fit your needs. Are you going to use formal and informal evaluations (e.g., graded or not graded)? Will you use summative (what students learn at the end of a chapter or lesson) and formative (an evaluation of whether your students are understanding your lesson) evaluations? By the way, the answer should be yes ☺.

Another permanent record element is a list of the course text(s) and materials. Be sure to list all of them, including appropriate hyperlinks. Write this part in APA style to model best writing practices for your students (Cullen & Harris, 2009). Let your students know if they can buy older editions of the textbook. Include optional reading assessments as well. The final permanent record element is to include a list of the content you will be covering. This information is typically outlined in the RCS, but is often located in the course calendar. Be sure to describe, on a weekly or bi-weekly basis, what topics will be covered and the associated reading(s) for those topics. In the end, by providing these permanent record elements, your syllabus will not only serve as a document for accountability, but more importantly, it will tell students what they need to know about a course (Smith & Razzouk, 1993).

Second, your syllabus serves as a contract. There is great debate about whether the syllabus is an actual legal contract or not, however, it is generally agreed upon that there are elements of your syllabus that

may serve as a contract to your student (Richmond, Boysen et al., 2016). Contractual syllabus elements mainly comprise policies on grading, the American Disability Act (ADA), late work, attendance, plagiarism/academic misconduct, revision or redoing assignments/assessments, and your course calendar (Cullen & Harris, 2009; Richmond, Boysen et al., 2016). For example, be sure to include a detailed class schedule that provides information on when assignments and assessments are due, the topic of each class, and always put a note at the bottom that says "Note. Dates are subject to change." to allow you and the class flexibility (Richmond, Boysen, et al., 2016). If you have an academic misconduct or cheating policy, how does it read? Be sure to include a standard statement from your university or college, but also personalize it, explain why it is necessary, and provide examples of the most common misconduct and cheating behaviors you have observed. With regards to contractual elements in the syllabus, it also important to communicate to your students your ethical obligations (see below). As such, I also include this modified statement from the American Psychological Association (APA) code of ethics:

> As stated in the American Psychological Association (APA) ethics code, I as the instructor and you as the student **will not** engage in any unfair discrimination based on age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation, socioeconomic status, or any basis proscribed by law. In the content of this course I will often address issues of gender, sexual orientation and culture. To promote a safe learning environment, I will expect you to strictly adhere to the above APA code.

Be sure to provide a succinct description of your late assignment policies. Is late work accepted? If so, is there a penalty? If so, what is it? (Mine is 3% per day, but my wife's is 10% per week). How late is too late? Be very descriptive in your policies on this. By incorporating these contractual elements into your syllabus, it is likely that you will save time and prevent any headaches you may have with students.

Third, the syllabus is a communication device (Richmond, Boysen et al., 2016). Going back to your reflection on the first day of class, what do you think your students thought about you based on reading the syllabus? Meaning, stop reading this chapter, pull out one of your syllabi, and look at it—does it mirror you as a teacher? If so, congrats and you are awesome-sauce. If, like many of us, it does not, maybe it is time to revise your syllabus. There are specific elements within the syllabus that may allow you to communicate yourself, your way of teaching (e.g., teaching philosophy), and modes for communication within and around the course. For example, how can students contact you? In your syllabus, list your office hours, location, office phone (or in many graduate student situations a cell phone), email address, etc. However, there may be more effective ways to communicate with your students. As many graduate students do not have an office, they use their personal cell phone number to communicate with students. This may create awkward personal boundaries with students. Therefore, Richmond (2016) suggests that you can text your students through anonymous texting service like Google Voice or Celly or by using Twitter as a communication device (Blessing, Blessing, & Fleck, 2012) in order to avoid such dilemmas yet maintain effective communication.

Another communication element is your teaching philosophy. What is your philosophy on teaching? If you don't have one, you need to develop one. If you do, is it described in your syllabus? Yet another communication element is student expectations. Specifically, what do you expect of your students? Should they be on time, prepared, ready to participate, and/or enthusiastic? If so, then list and describe your expectations. Additionally, include a corresponding list of expectations that students should have

of you (Richmond, Boysen et al., 2016). See Table 1 for examples of student and corresponding teacher behavioral expectations.

Table 1. *Corresponding Student and Teacher Classroom Behavioral Expectations*

Student Expectation	Teacher Expectations
• Come to class prepared.	• Come to class prepared.
• Turn in work on time.	• Return grading in a timely fashion.
• Be respectful of other students' beliefs and opinions.	• Respect the beliefs and opinions of students.
• Be open and flexible to changes in the course.	• Be open and flexible and communicate changes to the course.
• Be willing and comfortable to take risks in the course.	• Celebrate and encourage risk taking in the course.
• Be unbiased in writing and in your contributions to the course.	• Provide clear expectations of students and be equitable and unbiased in the course.
• Become a scholar.	• Nurture and develop you as a scholar.
• Have fun.	• Have fun.

Finally, your syllabus communicates a tone about you and your course (Slattery & Carlson, 2005). Research suggests that you should write in the first person and use personal pronouns in your syllabus (Richmond, Boysen et al., 2016; Richmond, Slattery et al., 2016) in order to establish rapport with your students. Parkes and Harris (2002) suggest that you should use inclusive language and avoid confrontational or condescending language. Harnish and Bridges (2011) also suggest using positive, warm, and rewarding language throughout the syllabus. For example, when describing learning resources for students, a cold syllabus would read "At some point in your life, you asked an expert for help with something. If you find yourself not understanding the assigned readings, lectures and assignment, please set up an appointment with me…" whereas a warm toned syllabus would read, "We've all needed help in something at some point in our lives. If you find yourself not understanding the assigned readings, lectures and assignments, please set up an appointment with me…" (p. 324). Remember, your syllabus is the first impression, thus make sure it communicates to your students what you want it to.

Fourth, the syllabus can be a learning tool and cognitive map (Richmond, Boysen et al., 2016). Moving beyond polices for grading, course calendars and elements of a permanent record, your syllabus should serve to communicate learning strategies and map out the prospective learning students will undergo (Matejka & Kurke, 1994; Richmond, Boysen et al., 2016). Typically, you should incorporate tips on how to succeed, common pitfalls for students, and campus resources in your syllabus to provide a cognitive map and learning tool. In your syllabus, write a section that explains how students can succeed. Include information on different reading strategies, learning strategies, and time-management strategies. As a

learning tool, you can also list out the common pitfalls (e.g., not communicating often, or studying by cramming, or not dedicating X amount of time per week to study for the course) or misconceptions (e.g., you can turn in anything anytime, or because you know the subject you will do good in the course). In addition, include campus resources such as the writing center, testing center, counseling center, career services, and Veterans Affairs. Finally, provide explanations of why you are asking students to complete specific elements of the class. For instance, why do they have a term paper? Or, why do you give comprehensive exams (my colleague Bethany Fleck and I call them *opportunities*—the opportunity for the student to demonstrate what they know)? Or, why do you grade participation? Another way to illustrate that your syllabus is a cognitive map is to tie your SLOs to assessments. For instance, quizzes or exams may be designed to assess a SLO for students to understand and comprehend basic experimental designs. Providing these syllabus elements will not only communicate to your students that you care about their success, they may actually directly aid in their success in the course (DiClementi & Handelsman, 2005; Richmond, Boysen et al., 2016).

Finally, when designing your syllabus, model teachers tend to use student- or learner-centered approaches (Boysen et al., 2015; Richmond, 2016; Richmond et al., 2014; Richmond, Boysen et al., 2016). A learner-centered approach focuses policies, pedagogy, and assessments on the needs of students rather than on the needs of the teacher (see also Kirby, Busler, & Buskist, this volume). In a syllabus, there are several ways to design it with this principle in mind. First, Richmond (2016) and Cullen and Harris (2009) suggest that you should allow students to redo written assignments to improve their writing (i.e., revise and resubmit). Typically, in my syllabus, I explain that students can revise and resubmit their written assignments for a 10% increase in their grade 1-week after they have received their grade. Cullen and Harris suggest that, to be learner-centered, your syllabus should convey your openness and availability to students (this harkens back to the syllabus as a communication device). For example, you should have multiple means of communication, office hours, and opportunities for students to have access to you. In your syllabus, you should also encourage or even require collaboration between and among students. For example, include group projects, or dyad presentations, or even collaborative learning activities (more on this in the instructional strategies section below). Another element of the learner-centered syllabus is the balance (or maybe conceptualize it as a dance) of power and control between you and the students. This is a difficult learner-centered element to adjust in your syllabus. Richmond (2016) suggests that one way to empower students is to have them responsible for course content. This may be accomplished by asking students to bring articles, blogs, or other popular media to class for discussion. DiClementi and Handelsman (2005) allowed students to choose classroom rules/behaviors and then incorporated the student choices into the syllabus. As will be discussed below, incorporating these learner-centered elements into your syllabus may not only benefit students' learning, but may also benefit how students perceive your teaching effectiveness.

As Richmond (2016) suggested, to improve your syllabus choose one or two of the elements described above, implement them into your syllabus, assess how students respond to these changes, adjust accordingly, and then implement some more changes and repeat the process. In the end, if you incorporate these model teaching elements into your syllabus, invariably you will be a more effective teacher.

What Does the Evidence Say? The Model Syllabus

Why go through all of this hard work just for a silly syllabus? Is it really that important? There has been a recent flurry of studies that attempt to investigate the effect of designing a learner-centered syllabus.

First, when evaluating syllabi from Project Syllabus (a repository of exemplary peer-reviewed psychology syllabi; http://teachpsych.org/otrp/syllabi/index.php), Richmond, Morgan, Slattery, Mitchell, and Cooper (2013) found that the majority of the syllabi were learner-centered. Additionally, when students were allowed some power and control over class policies and rules for behavior, DiClementi and Handelsman (2005) observed that they were more motivated in the course. When compared to a syllabus that was designed to be teacher-centered, a learner-centered syllabus caused students (who had never seen the instructor, just the syllabus) to perceive the instructor of the learner-centered syllabus to have significantly more rapport with students and possess more master teacher behaviors (Richmond, Slattery et al., 2016). Along the same lines, Saville, Zinn, Brown, and Marchuk (2010) found that a longer, detailed syllabus as opposed to a short, brief syllabus led students to rate the teacher of the longer, detailed syllabus as having more master teacher behaviors (e.g., respectful and patient). Building on Saville and colleagues' (2010) work, Harrington and Gabert-Quillen (2015) found that students preferred a longer syllabus (yes, I know, contrary to popular opinion) and had more positive impressions of teachers with longer syllabi. As evident by the research, designing a learner-centered model teacher syllabus will likely engage your students, empower them, and improve rapport and perceptions of master teacher behaviors.

Never Stop Learning—What to Read Next

Below you will find a list of two books and an open-source article centered on ways to improve your syllabus. Linda Nilson provides an interesting way of recreating your syllabus, or elements of your syllabus, using visual or graphic representations. O'Brien and colleagues provide a comprehensive read on how to build and construct a syllabus from scratch based on best-practices. If you are interested in a comprehensive look at building a learner-centered syllabus, check out my article in IDEA.

- Nilson, L. B. (2009). *The graphic syllabus and the outcomes map: Communicating your course*. San Francisco, CA: John Wiley & Sons.
- O'Brien, J. G., Millis, B. J., & Cohen, M. W. (2008). *The course syllabus: A learning-centered approach* (2nd ed.). San Francisco, CA: John Wiley & Sons.
- Richmond, A. S. (2016). A primer for constructing a learner-centered syllabus: One professor's journey. IDEA, #60, 1-14. Retrieved from http://www.ideaedu.org/Portals/0/Uploads/Documents/IDEA%20Papers/IDEA%20Papers/PaperIDEA_60.pdf

Model Instructional Strategies

Yes, the syllabus is the first thing your students see (typically) and it is one of the founding pillars of model teaching; however, now you need to practice-what-you preach in the syllabus and teach. What do you do? Research suggests that model teachers do two important things when it comes to instructional methods: (1) they use varied evidence-based instructional strategies, and (2) they have excellent model teaching skills (e.g., rapport, engagement, ethics, immediacy).

Evidence-Based Instructional Strategies

There are several instructional strategies and methods that model teachers use (Richmond, Boysen et al., 2016). First, model teachers use all types of different instructional methods (Richmond et al., 2016). Active learning instruction is by far the most popular and studied instructional method (Richmond & Kindelberger Hagan, 2011). For an outstanding resource on how to use active learning methods, check

out the journal *Active Learning in Higher Education*, or a review by Slavich and Zimbardo (2012). However, for this chapter I would like to discuss some lesser known, yet effective instructional strategies. First, a rather new evidence-based instructional method is interteaching (Saville et al., 2014). Interteaching is a behavioral approach to teaching that follows a fairly rigid sequence that involves students, teaching assistants, and instructors. See Figure 1 for what students and teachers are responsible for when using the interteaching instructional method.

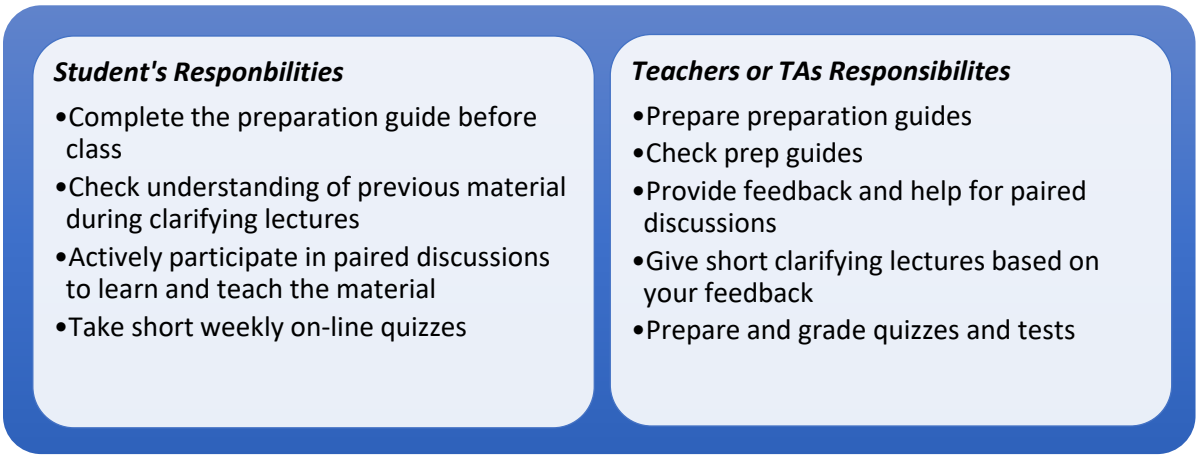

Figure 1. Student and Teacher Responsibilities in Interteaching

Another effective and relatively new instructional method is just-in-time-teaching (JiTT; Novak, 2011). JiTT is emerging as an effective instruction method for both face-to-face and hybrid or online instruction. Similar to interteaching, in JiTT students prepare for class by reading assigned material then completing an assignment designed as a feedback mechanism to aid the instructor in planning the next lesson. The instructor receives students' responses prior to class and adjusts instruction based on their responses, i.e., reinforcing what they understand and clarifying what they do not. The pre-class assignment is typically done online shortly before the class via instruction that occurs outside of the class room. JiTT is meant to provide feedback for the instructor to understand how students conceptualize class material in order to structure the next lesson to change their knowledge. To illustrate how JiTT may be used in your class, see Figure 2 for a classroom JiTT example. For another example of how to use JiTT in psychology statistics and research methods, check out Benedict and Anderton's (2004) article.

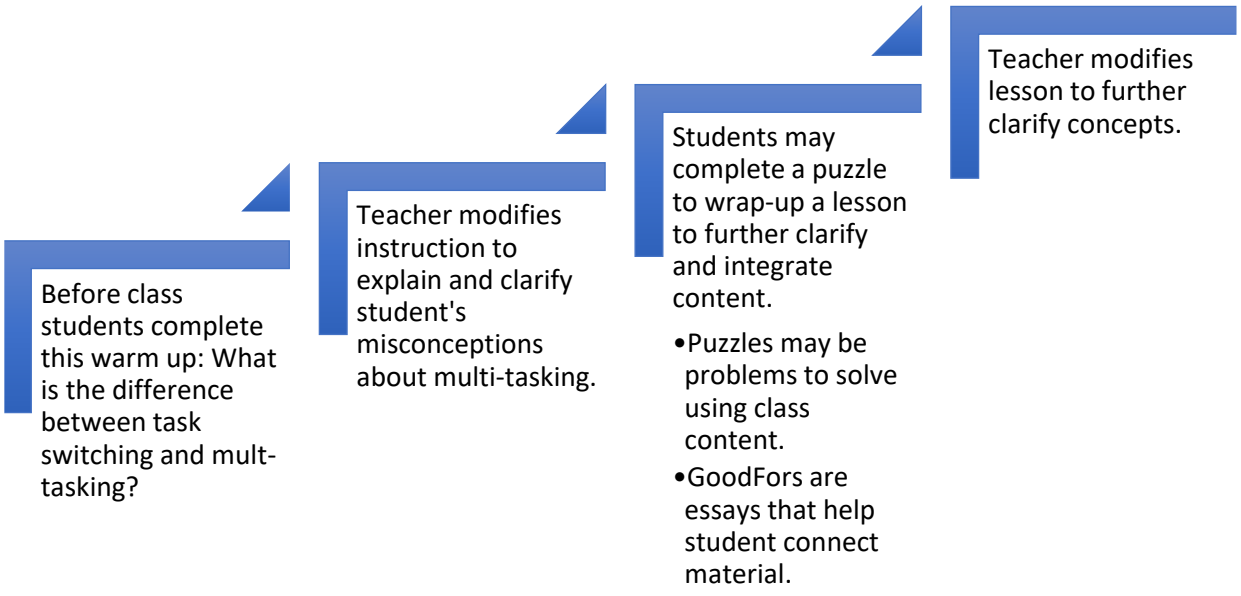

Figure 2. Classroom Example of JiTT Used to Teach the Concept of Task Switching

There are several other instructional strategies that you should use (e.g., Socratic, problem-based, and situated learning). See Table 2 for a list of instructional methods and where you can learn more about them. However, what the research suggests is that you should employ these instructional strategies in multiple ways even within one class and across your courses (Richmond, Boysen et al., 2016).

In addition to using multiple instructional strategies, model teachers use several different teaching skills and behaviors (Richmond, Boysen et al., 2016). These include master teaching skills and behaviors (Keeley et al., 2006), student-professor rapport (Wilson & Ryan, 2012), non-verbal immediacy (Meyers, 2009), ethical teaching (Landrum & McCarthy, 2012), student-engaging skills (Miller et al., 2011), and learning-alliance skills (Rogers, 2012). Essentially, master teacher behaviors, as measured by the Teacher Behavior Checklist (Keeley et al., 2006), are meant to demonstrate how teachers care and support students, how they are professional and competent, and how they communicate with their students (Buskist et al., 2002). Student-Professor rapport is the amount of trust and liking between and among students and their instructor (Richmond, Boysen et al., 2016). Non-verbal immediacy is a subset of rapport that strictly relates to how teachers can communicate, decrease, or increase rapport with their students by being physically immediate to them (Meyers, 2009). Ethical teaching centers on principles of respect and autonomy, nonmaleficence, beneficence, and caring between the teacher and students (Landrum & McCarthy, 2012). Learning-alliance is about establishing a working, professional, respectful, and meaningful relationship between teachers and students (Rogers, 2012). For examples of each of

these teaching skills, please refer to Table 3. If you would like to learn more, please check out Richmond, Boysen et al. (2016) for each respective example of these skills.

Table 2. *A List of Instructional Methods and Where to Find Them*

Instructional Method	Resource
Socratic Method	The Critical Thinking Community (http://www.criticalthinking.org/pages/socratic-teaching/606)
Problem-Based Learning	Cornell University of Center for Teaching Excellence (https://www.cte.cornell.edu/teaching-ideas/engaging-students/problem-based-learning.html)
Experiential Learning	The University of Texas at Austin Faculty Innovation Center (https://facultyinnovate.utexas.edu/teaching/strategies/overview/experiential-learning)
Team- or Group-Based Learning	Merlot Pedagogy (http://pedagogy.merlot.org/TeamBasedLearning.html)
Cooperative Learning	Merlot Pedagogy (http://pedagogy.merlot.org/CollaborativeCooperativeLearning.html)
Just-in-Time Teaching	Center for Teaching at Vanderbilt University (https://cft.vanderbilt.edu/guides-sub-pages/just-in-time-teaching-jitt/)
Interteaching	Noba Open Resource (http://nobaproject.com/blog/2015-08-11-using-interteaching-to-increase-student-engagement)

The description and explanation of instructional strategies and model teacher behaviors can go on and on. I encourage you to investigate which instructional strategies work best for you (e.g., I'm not great at the Socratic method, but do really well with collaborative methods) and experiment with different ways to increase your model teaching skills (e.g., focus on one skill and try to increase it).

What Does the Evidence Say? Model Instructional Strategies and Teaching Skills

There is an abundance of evidence that suggests students and teachers benefit from using model teaching instructional strategies (e.g., Kindelberger Hagan & Richmond, 2012; Richmond, Bacca, Becknell, & Coyle, in press; Richmond, Fleck, Heath, Broussard, & Skarda, 2015; Richmond & Kindelberger Hagan, 2011) and teaching skills (Pogue & AhYun, 2006; Richmond, Berglund et al., 2015; Rocca, 2004; Svanum & Bigatti, 2009). Specifically, Richmond and colleagues (2011; 2012, 2015; in press) and others have found that if you use active learning, or inquiry-based learning, or problem-based learning, or a combination of these instructional strategies, students will rate your instruction higher when compared to direct instruction, and students will not only do better on lower-level learning tasks (e.g., comprehension) but will do significantly better on higher-level learning tasks (e.g., application and synthesis). Additionally, if you employ model teaching strategies such as rapport, engagement, non-verbal immediacy, and ethical teaching, numerous studies suggest that several educational constructs

increase, such as students' academic performance, positive perceptions of your teaching, attendance, motivation, affective learning, student perceptions of instructor's responsiveness and assertiveness, and engagement (Pogue & AhYun, 2006; Richmond, Berglund et al., 2015; Rocca, 2004; Svanum & Bigatti, 2009). The moral of the story here is that by using model teaching skills, you will undoubtedly become a more effective teacher, and thus, your students will learn more in your classes.

Table 3. *Model Teaching Skills and Corresponding Classroom Practices*

Model Teaching Skill	Descriptors of Skill	Classroom Practice
Master Teacher Skills	• Authoritative • Prepared • Professional	• Establish clear course goals and behaviors • Do your homework. Be early to class and leave late. • Dress at least business casual.
Rapport Skills	• Perceptions of teacher • Student engagement	• Be kind and positive, avoid threatening students, be flexible, be conscientious • Vary instructional methods, use active learning, ask and encourage questions, present puzzling phenomenon
Non-Verbal Immediacy	• Body language • Vocal expressions • Eye contact	• Don't hide behind lectern, move around, don't constantly look at notes, gesture while talking • Laugh and do not use monotone voice • Make meaningful eye contact
Ethical Teaching	• Respect and autonomy • Fidelity • Nonmaleficience	• Distinguish between opinion and facts • Provide prompt feedback • Be patient with all students
Learning Alliance	• Collaborative bond • Teacher competency • Student investment	• Get to know your students • Demonstrate a passion for teaching and the course material • Make the class enjoyable and communicate why the course content is important

Note. Information in this table is from Richmond, Boysen et al., 2016; Rogers, 2012.

Never Stop Learning—What to Read Next

Below are three resources that could be very beneficial when choosing instructional strategies for your classroom. The first e-book by Miller et al. (2012) is a compendium of activities to engage your students. Each chapter focuses on a different domain within psychology (e.g., child, abnormal, methods). This truly is an amazing resource that graduate students should completely take advantage of. There are several of these resources on Society of Teaching of Psychology's website (www.teachpsych.org). The second book by Gurung et al. (2009) details several different instructional designs. The third book by Lucas and Bernstein is essentially a how-to-teach psychology guide that includes some valuable information on instructional methods.

- Miller, R. L., Balcetis, E., Burns, S. R., Daniel, D. B., Saville, B. K., & Woody, W. D. (2011). *Promoting student engagement (Vol 2): Activities exercises and demonstrations for psychology courses*. Retrieved from the Society for the Teaching of Psychology Web site: http://teachpsych.org/ebooks/pse2011/index.php
- Gurung, R. A., Chick, N. L., & Haynie, A. (2009). *Exploring signature pedagogies: Approaches to teaching disciplinary habits of mind*. Sterling, VA: Stylus Publishing.
- Lucas, S. G., & Bernstein, D. A. (2014). *Teaching psychology: A step-by-step guide*. New York, NY: Psychology Press.

Conclusion

There is so much to be learned about model teaching. In a way, it is truly overwhelming. However, you know where to start. This is the first step. You also know why you should go through all this effort (e.g., you will improve as a teacher and your students' learning will improve). I would like to leave you with two things: (1) a final list of must reads, and (2) some homework and directions on how proceed.

The final never stop learning—what to read next.

As this is just a chapter, bear in mind that there are other model teaching criteria that you should learn about. These include Assessment, Student Evaluations of Teaching, Content, and Training. Below is a list of readings for you related to each model teaching criteria.

- Assessment: Barkley, E. F., & Major, C. H. (2015). *Learning Assessment Techniques: A Handbook for College Faculty*. John Wiley & Sons.
- Student Evaluations of Teaching: Tucker, P. D., & Stronge, J. H. (2005). *Linking teacher evaluation and student learning*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Content: Lumina Foundation (2014). *The degree qualifications profile: A learning-centered framework for what college graduates should know and behavior to do to earn the associate, bachelor's or master's degree*. Retrieved from http://degreeprofile.org/press_four/wp-content/uploads/2014/09/DQP-web-download.pdf

- Training: Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. Cambridge, MA: Harvard University Press.

It's Now or Never: Jump-in and Start Swimming

Now comes the work. I suggest, in the immortal word of Bill Murray form the movie *What about Bob?*--take baby steps. Step 1, choose a teaching strategy, or skill, or syllabus to change or improve. Step 2, come up with a plan that is evidence-based. Step 3, implement the plan. Step 4, assess your implementation via a Scholarship of Teaching and Learning project. Step 5, reflect on your implementation and results of that implementation and change future instruction, skills, or syllabus. Step 6, never stop repeating steps 1 through 5.

References

Barkley, E. F., & Major, C. H. (2015). *Learning assessment techniques: A handbook for college faculty.* John Wiley & Sons.

Benedict, J. O., & Anderton, J. B. (2004). Applying the Just-in-Time teaching approach to teaching statistics, *Teaching of Psychology, 31*, 197-199.

Blessing, S. B., Blessing, J. S., & Fleck, B. K. (2012). Using Twitter to reinforce classroom concepts. *Teaching of Psychology, 39*, 268-271. doi:10.1177/0098628312461484

Boysen, G. A., Richmond, A. S., & Gurung, R. A. R. (2015). Model teaching criteria for psychology: Initial documentation of teachers' self-reported competency. S*cholarship of Teaching and Learning in Psychology, 1*, 48-59. doi:10.1037/stl0000023

Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning.* Cambridge, MA: Harvard University Press.

Buskist, W., Sikorski, J., Buckley, T., & Saville, B. K. (2002). Elements of master teaching. In S. F. Davis & W. Buskist (Eds.), *The teaching of psychology: Essays in honor of Wilbert J. McKeachie and Charles L. Brewer* (pp. 27–39). Mahwah, NJ: Lawrence Erlbaum.

Cullen, R., & Harris, M. (2009). Assessing learner-centredness through course syllabi. *Assessment & Evaluation in Higher Education, 34*, 115-125. doi:10.1080/02602930801956018

DiClementi, J. D., & Handelsman, M. M. (2005). Empowering students: Class-generated course rules. *Teaching of Psychology, 32*, 18-21. doi:10.1207/s15328023top3201_4

Gurung, R. A., Chick, N. L., & Haynie, A. (2009). *Exploring signature pedagogies: Approaches to teaching disciplinary habits of mind.* Sterling, VA: Stylus Publishing

Harnish, R. J., & Bridges, K. R. (2011). Effect of syllabus tone: Students' perceptions of instructor and course. *Social Psychology of Education, 14*, 319-330. doi:10.1007/s11218-011-9152-4

Harrington, C. M., & Gabert-Quillen, C. A. (2015). Syllabus length and use of images: An empirical investigation of student perceptions. *Scholarship of Teaching and Learning in Psychology, 1*, 235-243. doi:10.1037/stl0000040

Keeley, J., Smith, D., & Buskist, W. (2006). The Teacher Behavior Checklist: Factor analysis of its utility for evaluating teaching. *Teaching of Psychology, 33*, 84-91. doi:10.1207/s15328023top3302_1

Kindelberger Hagan, L., & Richmond, A. S. (2012). Teaching pre-service educators constructivism constrictively. What a novel idea! *The Researcher, 24*, 86-95. Retrieved from http://www.nrmera.org/PDF/Researcher/Researchv24n2Kindleberger.pdf

Landrum, R. E., & McCarthy, M. A. (Eds.). (2012). *Teaching ethically: Challenges and opportunities.* Washington, DC: American Psychological Association.

Lucas, S. G., & Bernstein, D. A. (2014). *Teaching psychology: A step-by-step guide*. New York, NY: Psychology Press.

Lumina Foundation (2014). *The degree qualifications profile: A learning-centered framework for what college graduates should know and behavior to do to earn the associate, bachelor's or master's degree*. Retrieved from http://degreeprofile.org/press_four/wp-content/uploads/2014/09/DQP-web-download.pdf

Matejka, K., & Kurke, L. B. (1994). Designing a great syllabus. *College Teaching, 42*(3), 115-117. doi:10.1080/87567555.1994.9926838

Meyers, S. A. (2009). Do your students care whether you care about them? *College Teaching, 57*(4), 205-210. doi:10.1080/87567550903218620

Miller, R. L., Balcetis, E., Burns, S. R., Daniel, D. B., Saville, B. K., & Woody, W. D. (2011). *Promoting student engagement (Vol 2): Activities exercises and demonstrations for psychology courses.* Retrieved from the Society for the Teaching of Psychology Web site: http://teachpsych.org/ebooks/pse2011/index.php

Nilson, L. B. (2009). *The graphic syllabus and the outcomes map: Communicating your course*. San Francisco, CA: John Wiley & Sons.

Novak, G. M. (2011). Just-in-time teaching. *New Directions for Teaching and Learning*, 2011(128), 63-73. doi:10.1002/tl.469

Parkes, J., & Harris, M. B. (2002). The purposes of a syllabus. *College Teaching, 50*(2), 55-61. doi:10.1080/87567550209595875

Pogue, L., & AhYun, K. (2006). The effect of teacher nonverbal immediacy and credibility on student motivation and affective learning. *Communication Education, 55,* 331-344. doi:10.1080/03634520600748623

Raymark, P. H., & Connor-Greene, P. A. (2002). The syllabus quiz. *Teaching of Psychology, 29*, 286-288. doi:10.1207/S15328023TOP2904_05

Richmond, A. S. (2016). A primer for constructing a learner-centered syllabus: One professor's journey. IDEA, #60, 1-14. Retrieved from http://www.ideaedu.org/Portals/0/Uploads/Documents/IDEA%20Papers/IDEA%20Papers/PaperIDEA_60.pdf

Richmond, A. S., Bacca, A. M., Becknell, J. S., & Coyle, R. P. (in press). Teaching metacognition experientially: A focus on higher versus lower level learning. *Teaching of Psychology*

Richmond, A. S., Berglund, M. B., Epelbaum, V. B., & Klein, E. M. (2015). a+(b1) Professor–student rapport+(b2) humor+(b3) student engagement=(Ŷ) Student ratings of instructors. *Teaching of Psychology, 42*, 119-124. doi:10.177/0098628315569924

Richmond, A. S., Boysen, G., & Gurung, R. A. R. (2016*). An evidence-based guide to college and university teaching: Developing the model teacher*. New York, NY: Routledge.

Richmond, A. S., Boysen, G. A., Gurung, R. A. R., Tazeau, Y. N., Meyers, S. A., & Sciutto, M. J. (2014). Aspirational model teaching criteria for psychology. *Teaching of Psychology, 41*, 281-295, doi:10.1177/0098628314549699

Richmond, A. S., Fleck, B., Heath, T., Broussard, J., & Skarda, B. D. (2015). Can inquiry-based instruction promote higher-level learning? *Scholarship of Teaching and Learning in Psychology, 1*, 208-218. doi:10.1037/stl0000032

Richmond, A. S., & Kindelberger Hagan, L. (2011). Promoting higher level thinking in psychology: Is active learning the answer? *Teaching of Psychology, 38*, 102-105. doi:10.1177/0098628311401581

Richmond, A. S., Slattery, J., Morgan, R. K., Mitchell, N., & Becknell, J. (2016). Can a learner-centered syllabus change student's perceptions of student-professor rapport and master teacher behaviors?. *Scholarship of Teaching and Learning in Psychology, 2*, 159-168. doi:10.1037/stl0000066

Robinson Wolf, Z., Czekanski, K. E., & Dillon, P. M. (2014). Course syllabi: Components and outcomes assessment. *Journal of Nursing Education and Practice, 4*, 100-107. doi:10.5430/jnep.v4n1p100

Rocca, K.A. (2004). College student attendance: Impact of instructor immediacy and verbal aggression. *Communication Education, 53*, 185-195. doi:10.1080/03634520410001682447

Rogers, D. T. (2012). The learning alliance inventory: Instrument development and initial validation. *International Journal for the Scholarship of Teaching and Learning, 6*(1), Article 9. doi:10.20429/ijsotl.2012.060109

Saville, B. K., Bureau, A., Eckenrode, C., Fullerton, A., Herbert, R., Maley, M. ... Zombakis, J. (2014). Interteaching and lecture: A comparison of long-term recognition memory. *Teaching of Psychology, 41*, 325-329. doi:10.1177/0098628314549704

Saville, B. K., Zinn, T. E., Brown, A. R., & Marchuk, K. A. (2010). Syllabus detail and students' perceptions of teacher effectiveness. *Teaching of Psychology, 37*, 186-189. doi:10.1080/00986283.2010.488523

Slattery, J. M., & Carlson, J. F. (2005). Preparing an effective syllabus: Current best practices. *College Teaching, 53*, 159-164. doi:10.3200/CTCH.53.4.159-164

Slavich, G. M., & Zimbardo, P. G. (2012). Transformational teaching: Theoretical underpinnings, basic principles, and core methods. *Educational Psychology Review, 24*, 569-608. doi:10.1007/s10648-012-9199-6

Smith, M. F., & Razzouk, N. Y. (1993). Improving classroom communication: The case of the course syllabus. *Journal of Education for Business, 68*(4), 215-221. doi:10.1080/08832323.1993.10117616

Sulik, G., & Keys, J. (2014). “Many students really do not yet know how to behave!” The syllabus as a tool for socialization. *Teaching Sociology, 42*, 151-160. doi:10.1177/0092055X13513243

Svanum, S., & Bigatti, S. M. (2009). Academic course engagement during one semester forecasts college success: Engaged students are more likely to earn a degree, do it faster, and do it better. *Journal of College Student Development, 50*(1), 120-132. doi:10.1353/csd.0.0055

Tucker, P. D., & Stronge, J. H. (2005). *Linking teacher evaluation and student learning*. Alexandria, VA: Association for Supervision and Curriculum Development.

Wilson, J. H., & Ryan, R. G. (2012). Developing student-teacher rapport in the undergraduate classroom. In W. Buskist & V. A. Benassi (Eds.) *Effective college and university teaching: Strategies and tactics for the new professoriate*. (pp. 81-90). Thousand Oaks, CA: Sage.

Chapter 3: Using a Mastery Goal Structure in the Classroom: Three Actionable Areas to Motivate your Students to Learn

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Abstract

As educators, we seek to motivate our students to learn, but we may not give sufficient attention to how we can create the most effective learning environment in the classroom. In this chapter, we highlight three "actionable areas" (developing the syllabus, creating assignments, and administering feedback) in which instructors can promote a mastery goal structure to motivate learning in their course. Within each area, we focus on three "themes" (emphasizing the process of learning, communicating an explanation of purpose, and shifting the locus of responsibility for learning into students' hands) that serve as a guide for practical suggestions. The aim is to direct instructors towards practical "DOs" for cultivating a learning environment, and away from alluring "DON'Ts" that may hinder mastery framing, and ultimately learning. Although developing a mastery goal structure can take considerable time and effort, we want to encourage instructors to use this chapter as a continual reference for the actions, themes, and theories it calls upon to develop a motivating learning environment.

Introduction

Whether we are novice or experienced instructors, our ultimate goal is to facilitate learning in the classroom by helping students master course material and develop skills. We spend time finding ways to incorporate activities and multimedia to promote a thorough understanding of course material. However, we may not be as aware that we can also cultivate a classroom environment that motivates students to learn. From how we set the stage for our course, to the ways in which we convey to students our definitions of success, and even to how we evaluate students and respond to them when they make mistakes, we may create an environment that can either foster or hinder learning. This chapter aims to encourage instructors to carefully consider their current classroom environment, and to provide a theoretical basis and practical ways to help instructors move more towards cultivating an environment that gears students for learning.

Researchers within the field of education and psychology have long stressed that in order to effectively promote learning it is crucial to consider aspects of the classroom environment that are imposed by instructors and institutions (Ames, 1992b; Maehr & Midgley, 1991). An environment that is theorized to facilitate learning is one where students are required to put in effort and where student success is characterized by their improvement (Ames & Archer, 1988). Achievement goal theorists describe this type of environment in the classroom as having a mastery goal structure (MGS). This is in contrast to an environment that gears students towards achieving high grades and outperforming their peers. More specifically, a MGS focuses on learning as a process that is effortful and meaningful, where students are directed towards developing knowledge and skills as opposed to developing a final product (Ames,

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1992b). In addition, students are given some control over their own learning, which may not be the case in more traditional academic environments (e.g., lecture-based teaching). Furthermore, progress is measured on an individual level, and students are recognized privately for their progress as opposed to publicly or in comparison to their peers. Research in the classroom highlights positive outcomes associated with a MGS (for a review see Anderman & Patrick, 2012). For example, when students perceive their classroom to have greater focus on a MGS they also report having greater intrinsic motivation (Murayama & Elliot, 2009), sense of belonging (Anderman & Patrick, 2012), end-of-semester interest (Barron & Harackiewicz, 2003), and persistence (Wolters, 2004). Consequently, a MGS is associated with benefits that encompass both academic and affective outcomes.

One notable system designed to cultivate a MGS, known as TARGET, was proposed by Ames (1992a) to encourage educators to be mindful of specific learning-relevant areas. Here, educators should create a variety of *tasks* that are meaningful, challenging, and interesting. Students should be given *authority* over their learning and provided with opportunities to take responsibility for their own learning. Instructors should *recognize* students for their individual effort, and they should place students into heterogeneous *groups* that promote collaboration. Lastly, students should be *evaluated* privately on their individual progress and should be given enough *time* to complete assignments. Surprisingly, there is little instruction in the literature on how to practically apply the various components of the TARGET System (for issues related to TARGET see Blumenfeld, 1992). In this chapter, we attempt to create steps to promote learning through a MGS, in part by relying upon some areas of the TARGET system.

Importantly, beyond achievement goal theory and TARGET, the conceptualization of a MGS overlaps with theories from social psychology and educational psychology. Urdan and Schoenfelder (2006) noted that the characteristics of a MGS dovetail nicely with critical aspects of self-determination theory and Bandura's notion of self-efficacy, while Blumenfeld (1992) noted similarities with constructivist theory. This volume also holds two chapters detailing a transformative activist stance (see Podlucka; Vianna & Stetsenko, this volume), and both of these chapters contain overlapping concerns with TARGET and a MGS, as described here. Briefly, self-determination theory stresses the need for individuals to attain autonomy, competence, and relatedness. Researchers propose that this can be accomplished when educators foster autonomy-supported learning environments where students are given ownership over learning and are provided with meaningful tasks and valuable feedback (Urdan & Schoenfelder, 2006). Researchers examining self-efficacy emphasize that educators need to help students realize that effort leads to success and that resources ought to be put in place to help students succeed (Margolis & McCabe, 2004; Urdan & Schoenfelder, 2006). Constructivist theory defines learning as the development of knowledge rather than acquisition of knowledge, and educators are encouraged to develop meaningful, authentic tasks where students can apply what they are learning (see Blumenfeld, 1992). Finally, a transformative activist stance (see Stetsenko, 2008) builds on Bandura's concepts of self-efficacy and agency to help students access, co-author and co-construct knowledge in the classroom. Both self-determination theory and self-efficacy are related to fulfilling the needs of the students, while constructivist theory and a transformative activist stance attempt to re-define learning, itself.

Based on the overlap of the TARGET system with the theories above, we have identified three "themes" that we will focus on throughout this chapter. The first theme focuses on the *process of learning* and encourages instructors to promote the usefulness of effort and the development of knowledge over time, rather than glorifying an end product without focusing on the means for arriving there. The second theme focuses on *explanation of purpose* and encourages instructors to explicitly provide reasons to

students as to why they are being asked to learn information and why they are being asked to complete an activity or assignment. The last theme focuses on *locus of responsibility* and encourages instructors to consider giving students authority and ownership over their own learning and to gear the course to be more student-centered (see Podlucka; Vianna & Stetsenko, this volume for more on this topic). Bolstered by empirical findings, these themes will be integrated into several proposed suggestions for action (i.e., "DOs" and "DON'Ts") within three key "actionable areas" that are critical for cultivating a MGS: development of the syllabus, creation of assignments, and provision of feedback.

Actionable Area 1: Developing and Reviewing the Syllabus from a Mastery Perspective

Instructors should consider implementing a MGS for their course even prior to commencement of the semester by adding some thoughtful and deliberate touches to their syllabus. It is common knowledge that the syllabus conveys the purpose of a course, its learning objectives, schedule and procedures, and criteria for student evaluation (i.e., what Parkes and Harris (2002) refer to as "contractual" and "permanent record" features of a syllabus; see also Richmond, this volume). In combination, these features are critical for setting students' expectations about course organization and flow (Homa et al., 2013). However, the syllabus should also be accentuated with content that sets expectations about what a MGS is and how this framing will be used to motivate student learning in the course.

Below, we outline some important DOs and DON'Ts for how to promote a MGS through the syllabus. These suggestions revolve around conveying to students up front that the course is intended to direct their focus explicitly on the *process of learning* and not simply on handing in assignments or achieving a suitable grade. Instructors are also encouraged to rely on the syllabus as a resource for offering an *explanation of purpose* that speaks to why taking the course is valuable and what students will gain. Finally, tips are offered on how to use the syllabus to begin *shifting the locus of responsibility* for learning into students' hands. Infusing these mastery-related themes overtly into the syllabus will help students begin to adopt a mastery mindset and start to recognize how these themes will recur across assignments (see Actionable Area 2) and through the feedback they will receive from their instructor (see Actionable Area 3). In this way, the syllabus, itself, sets the precedent for mastery, moving beyond a means of contractual and permanent record towards operating more as a "learning tool" (Parkes & Harris, 2002). Subsequently, students can then revisit the syllabus across the semester to remind themselves of the course's mastery focus and to renew their motivation for learning.

DOs

Develop the syllabus: Set the tone in writing. We suggest that instructors spend ample time developing their syllabus within the framework of a MGS, especially the learning objectives component. Instructors can use phrasing declaring that the mastery of new material relies on willingness to engage in the *process of learning*, where focus is placed on quality of involvement and improvement over objectification of an end product without paying attention to means for how one arrives there (Ames, 1992b; Pintrich & De Groot, 1990). Instructors can also declare that students are not intended to merely gain knowledge in the course, but also to develop skills that are meaningful, purposeful, and self-relevant. Instructors could perhaps consider providing examples of how mastering such skills may play out in the real world for students. In this way, instructors are setting a positive and practical mastery-oriented tone, the endorsement of which has been shown among students to relate to use of effective learning strategies and deeper processing of learning-related material (Ames & Archer, 1988).

Build in ample time for learning. Given a deliberate focus on the *process of learning* within a MGS, we suggest that instructors deliberately build in ample time for the teaching, discussion, and learning of course content. For example, instructors can construct their course calendar so that they have some flexibility in the schedule to decide to spend more (or less) time on some aspects of the course over others, depending on how the class responds to the challenge of learning within particular course modules.

Review the syllabus: Set the tone in person. Given the implementation of a MGS, it necessarily follows that instructors should take time to carefully review the syllabus directly with their students. Instructors can consider dedicating the first activity or assignment to help students think critically about the content of the syllabus. For example, instructors can discuss learning objectives and get input from students on what they hope to learn and what skills they would like to develop in the course. Given that the tone set by the instructor on the first day of class can have lasting influences on students' level of motivation and academic engagement (Wilson & Wilson, 2007), we urge instructors to set the tone in a positive manner and directly address the principles of a MGS with students.

Endow students with ownership over their learning. With respect to shifting the *locus of responsibility* to students, consider including information in the syllabus demonstrating how students will be given some authority over the learning process. For example, instructors could mention that they will assess interest by asking students to develop questions or select topics that they want to learn more about in relation to course content. Instructors can then more meaningfully frame course content and center lessons around students' questions and interests. In addition, since the use of student-centered activities is strongly encouraged, consider and discuss with students the ways in which they will be held accountable for their participation in a way that facilitates learning. Here, instructors may consider assigning attendance credit for participation when there is an activity.

DON'Ts

Do not ignore the dangers of using a prepackaged syllabus. We urge instructors to refrain from using a borrowed syllabus without first adapting it for their course, particularly with a mastery framing. Not assessing a prepackaged syllabus for the language it uses can leave students with a neutral framing in the course, or worse, a non-mastery framing. In the absence of a mastery framing, students may define success as meeting goals sufficiently with as little effort as possible, just for the sake of creating a product and receiving a grade. Here, learning can be undermined, as without a MGS, effort that does not lead to immediate success may be perceived as a threat, leading to disengagement from learning opportunities (Ames, 1992b; Dweck, 2008). However, with a MGS in place, effort that does not lead to immediate success may be perceived as a challenge, leading to increased engagement with learning opportunities.

Do not just give lip service to your use of a MGS. It is important that instructors are aware of the actions that accompany implementation of a MGS. Referencing mastery framing in the syllabus without proactively infusing this framing practically into pedagogy may leave students confused or feeling like instructors are not serious about promoting learning. We believe this action starts with careful syllabus review. Instructors should ignore the urge to speed past the syllabus, or to leave its review solely in the hands of the student, just for the sake of getting into the first lecture or assignment. Realize, again, that a syllabus is more than just about setting expectations and objectives about the course. It also serves as a learning tool for students (Parkes & Harris, 2002), whereby instructors can explicitly provide rationale

and instructions on how students can most adaptively engage with learning opportunities for the sake of mastering course material. For the most part, students are aware that the first meeting period typically involves syllabus review—so, do not waste this opportunity: you never get a second chance to make a first impression about MGS conceptualization and implementation!

Actionable Area 2: Creating Assignments Intended to Prime Mastery

The steps instructors take in establishing a MGS via the syllabus should subsequently translate into how they create opportunities for learning. We want to present our students with opportunities in which they can effectively demonstrate their understanding and practically apply what they are learning. Whether asking students to pose thoughtful questions in class, hand in homework, write up a manuscript, or develop a presentation, all work should invite students to engage deeply in *the process of learning* rather than focus merely on generation of a product for the sake of a grade. In addition, instructors should offer a *clear explanation of an assignment's purpose*, taking time to communicate the learning goal associated with it (see Schwartz, Powers, Galazyn & Brooks, this volume, for a longer discussion of learning objectives and backwards course design). Finally, assignments can be made more student-centered through the *shifting of responsibility into students' hands*, perhaps by endowing students with authority and ownership over the assignments administered (see Vianna & Stetsenko, this volume). We encourage instructors to consider these themes as we delve more deeply into some DOs and DON'Ts for selecting and implementing assignments to facilitate a MGS in the classroom.

DOs

Query student interest. Consider employing an exercise designed to assess which topics students want to learn more about or questions that they may have about the course topics that will be covered. Instructors can then partly repopulate their course curriculum with material that is related to students' interests. Importantly, interest is related to deeper processing of information (see Tobias, 1994), suggesting that students are more likely to learn when they are curious about the content (see Schraw, Flowerday, & Lehman, 2001).

Foster meaningfulness. The reasons for what we teach and how we teach should be communicated to students in order to make learning abundantly meaningful. It is therefore important that instructors are keenly aware of why they are tasking students with generating questions about textbook material, reading journal articles, writing research proposals, using statistical procedures, and so on. For example, we know that critiquing peer-reviewed research articles can help build critical thinking skills about the rationale for an argument or hypothesis, the rigors of scientific methodology, and the integrity of inferences or conclusions drawn from research study results (Anisfeld 1987). Conveying how assignments can be meaningful in this way affords students a greater sense of purpose as they move through the learning process. Students can then apply these skills and begin to make sense out of the complexities of research on their own. In addition, affording meaningfulness by asking students to relate what they are learning to their own lives has been found to increase interest and lead to better grades for students who do not necessarily expect to do well (Hulleman & Harackiewicz, 2009). Consequently, completion of assignments can become more about the knowledge and skills that students aim to develop for themselves, rather than a product that they superficially create for their instructor.

Provide choices. Flowerday and Schraw (2000) suggest that choices should be provided often and when students are knowledgeable about the topic being covered or the kind of task being assigned (e.g., written assignment, reading a journal article, making a presentation). Providing students with valuable

choices can especially promote learning when choices encompass students' interests (Katz & Assor, 2007). As an example of how choices can be provided, consider ungraded writing assignments, which can be used in almost any course. For instance, Drabick and colleagues (2007) employed ungraded writing assignments in a large Introduction to Psychology class and found that students who were asked to write for 5 minutes a week on a given topic performed better on exams in comparison to those who were only asked to think about the topic. In this vein, instructors can consider developing a few writing topics a week for students to choose from where students can incorporate and reflect on what was taught. If possible, try to align these topics to students' interests and to real world issues and concerns. Choices can also promote learning when students can develop their own explanations and answers to questions (Stefanou, Perencevich, DiCintio, & Turner, 2004).

Allow opportunities for improvement. Consider adding iterative due-dates for certain assignments, where students can recursively gain mastery over material by submitting updates of their work. With each attempt, instructors can provide feedback, encouraging students to make use of it for the next submission. Instructors can then evaluate not only the outcome of student's work, but their progress along the way. If providing feedback to each individual student becomes taxing, instructors can consider having shorter assignments (e.g., mini-presentations, short written responses), or breaking larger assignments into smaller ones. It is also useful to space these assignments out well enough so that useful and meaningful feedback can be provided and students will have ample time to process this information prior to completing the next assignment.

DON'Ts

Do not ignore the dangers of using a prepackaged assignment. Novice instructors may be tempted to use assignments previously packaged by others who have taught the course. Similar to the syllabus "DON'T" mentioned in Actionable Area 1, do not assume that these assignments foster a MGS. For each assignment, be sure to first examine the knowledge and skills that students are likely to develop as they complete it. This also serves to provide instructors with the information that they should communicate to students (e.g., the meaningfulness of the assignment) when introducing the assignment to the class.

Do not discount the difficulty level of assignments. Refrain from assigning tasks that may be too difficult for students to complete on their own. Instead, scaffold students' work by breaking down a complex assignment into smaller assignments. We recommend providing templates that students can modify, or even leaving out some aspects of the assignment for the time being. For example, a lengthy writing assignment can be parsed into multiple assignments, where students are only asked to complete a section or parts of a section at a time (see also Brooks, Che, & Shane-Simpson, this volume). More importantly, instructors may want to set course time aside to work on and address difficulties that students have with each part of the assignment. Instructors can assess the difficulty of an assignment by reviewing student work or asking students what difficulties they are experiencing. Giving students opportunities to voice their concerns can make them feel more supported (Assor, Kaplan, & Roth, 2002).

Do not assume expectations are clear. Finally, instructors should not assume that students know how to complete an assignment in the way the instructor intends. Students may not be aware what the expectations are if they are not provided with examples and specific guidelines or a rubric. It may be best to provide students with an opportunity to submit work on an assignment, give feedback on critical areas needing improvement, and then allow resubmissions to assess progress.

Actionable Area 3: Promoting Mastery by Administering Feedback

After students complete an assignment, it is important to offer feedback on how well they demonstrated what they learned. At the most rudimentary level, offering feedback entails evaluating students' performance (e.g., assigning a grade). However, only providing this kind of feedback may prompt students to prioritize earning a suitable grade over developing their knowledge and learning new skills. Although it may seem demanding to insist that instructors offer significantly more than a grade as feedback, it is critical to remember that instructors are the facilitators of the learning process. Thus, feedback should include information that seeks to motivate students towards further engagement with learning, particularly in areas where mastery was not demonstrated. In this way, feedback should help lessen the discrepancy between the understanding students currently display and the knowledge they still need to demonstrate (Sadler, 1989). Indeed, researchers find that providing descriptive feedback, as opposed to grades, leads to the most improvement—for instance, on later drafts of papers (e.g., Lipnevich & Smith, 2009a), and students report that receiving descriptive feedback is most effective for the goal at hand (Lipnevich & Smith, 2009b).

This conceptualization of feedback aligns with cultivating a MGS, where the *process of learning* is emphasized and students are encouraged to continue developing their knowledge with a focus on individual improvement. In line with the theme of *explanation of purpose*, it is then crucial to discuss with students why they are receiving descriptive feedback on any given assignment or task. With respect to fostering a student-centered focus in the classroom, instructors can *shift the locus of responsibility* for learning to the students by providing them with feedback that seeks to improve their self-regulation strategies. Hattie and Timperley (2007) stress that feedback needs to not only help students construct knowledge, but also enhance their self-regulation strategies, allowing them to evaluate their own progress and make updates on their own. These themes are integrated into the following DOs and DON'Ts in relation to descriptive feedback.

DOs

Offer descriptive feedback about updating the process of learning. First, instructors can simply offer feedback on *what* needs to be updated. For example, instructors can provide feedback on what information is missing or is inaccurate and why. Rooted in the beginnings of *explanation of purpose*, instructors are essentially forging an update to the foundational level of knowledge that students will rely upon as they begin developing means for updating their understanding. However, feedback is most effective in facilitating learning when it speaks to the student's level of understanding (Hattie & Timperley, 2007). Thus, it is important to offer something substantial about *how* students should be updating their knowledge. That is, beyond telling them at face value *what* needs to be updated, extend to them support for thinking about the process of updating their thinking and the *reasons why* this *process* is critical for learning. For example, instructors might offer feedback pertaining to how best to reframe support for a hypothesis, and why this process is important for the goal of persuading their readers or audience. As instructors offer process-oriented feedback, they are moving students into deeper understanding about the relationships between pieces of knowledge, the development of skills for the transference of information, and the construction of meaning (e.g., Purdie, Hattie, & Douglas, 1996).

Offer descriptive feedback that promotes self-regulation along the learning process. It is equally important to help students develop self-regulation skills and achieve autonomy, where they can come to assess

their own work, make any necessary updates, and rely less on instructor feedback (Hattie & Timperley, 2007). For example, along the learning process, instructors can ask students to briefly write about which task goals they have achieved and which still need to be worked on. Instructors can then provide feedback on students' assessments of their own work. Ultimately, it is important that students know that feedback about the learning process also involves helping them to think about how they are progressing towards their goal, what they specifically need to do next, and why it is important (Hattie & Timperley, 2007).

Keep in mind that feedback about self-regulation strategies is additionally intended to help students develop resilience and perseverance towards effortful attempts at learning, rather than a simple focus on whether or not they are able to accomplish the task at hand (Kluger & DeNisi, 1996). This may especially be useful for those students who are extremely sensitive to failure and become so self-critical over discrepancies in their understanding (e.g., brooding ruminators) that they find it difficult to continue working effectively on a task. Indeed, in one study, the tendency to passively brood over negative circumstances was linked with increased attention to errors and poorer academic performance, whereas the tendency to deliberately reflect on concrete means for dealing with challenges was linked with better academic performance and the increased ability to learn from one's mistakes (Whiteman & Mangels, 2016). Therefore, instructors may want to discuss self-regulation strategies that can help students stay focused on the task and avoid dwelling on negative evaluations directed toward the self.

Build in ample time to let students process and apply their feedback. Note that attending to and effectively digesting process-oriented feedback, let alone using it adaptively, may take time for students. Instructors should also be mindful that students may not often receive this kind of process-focused feedback, and thus may not have garnered much experience using corrective feedback to update their understanding. We suggest that instructors encourage students to re-submit the same assignment, or ask them to incorporate the feedback they receive into another assignment. Affording students ample time *and* several attempts at using this kind of feedback is key.

DON'Ts

Do not assign grades without offering any corrective feedback. It may be tempting for instructors to minimize feedback merely because of time constraints that limit their ability to put in the effort. However, a crucial aspect of deepening the mastery experience for students involves a shift of the *locus of responsibility* for learning into their own hands. By definition, after providing students with grades, the administration of corrective feedback is essentially synonymous with offering students control over means by which they can update their understanding for course material. According to Locke and Latham (1990), feedback intuitively offers a chance for students to continuously set their own goals and repeatedly evaluate the means necessary for achieving them.

Do not offer vague corrective feedback. Feedback might not be used in the most effective manner if it is unclear or if students do not see a need for it. Instructors should be reminded that the effective processing of feedback increases when this corrective information and any associated learning goals are made abundantly clear and are framed from a mastery perspective (see Kluger & DeNisi, 1996; Locke & Latham, 1990). By extension, instructors should resist the urge to offer feedback without assessing whether students are effectively processing it and using it to update their understanding. Here, instructors can consider examining whether students are able to apply the feedback they received in

subsequent submissions of the same assignment or in future assignments. Thus, it is critical to provide further opportunities that allow students to incorporate feedback.

Do not offer too much corrective feedback. Despite the value of issuing descriptive feedback that is clear and corrective in nature, it is important to avoid offering too much of it. Students who feel bombarded and overwhelmed with excessive feedback could be made to feel as though they are just being asked to "do more" for no apparent reason. Consequently, students might conflate important issues in the feedback they receive, attend only to certain pieces of it, or opt to disengage entirely from the relevant learning goal (Hattie & Timperley, 2007).

Conclusion

In this chapter, we provided instructors with suggestions on how to develop a syllabus, create assignments, and provide feedback to instill a MGS within their course. These suggestions were based on three themes that we selected to guide practices for each of these actionable areas. The *process of learning* was highlighted as an important point of focus for students over prioritizing the rote and disengaged creation of a final product. Reference to *explanation of purpose* was intended to prompt instructors to explicitly communicate the meaningfulness of assignments, feedback, and learning objectives in the course. A call for a student-centered *locus of responsibility* was chosen to gear instructors toward affording students authority and ownership over the learning process. Although we focus on just three actionable areas, these themes can also be applied to other aspects of instruction (e.g., designing lesson plans and learning activities).

As we draw to a close, we want to briefly highlight some important practical matters that instructors should bear in mind with respect to their usage of a MGS. Cultivating a MGS may not be as beneficial for students with poor learning habits who rely on ineffective study skills and maladaptive self-regulation strategies (Urdan & Schoenfelder, 2006). The reader is encouraged to seek out resources that may be beneficial for promoting good study habits among such students (see Chew, 2010). Additionally, in some academic settings it may be challenging to cultivate certain aspects of a MGS (Urdan & Schoenfelder, 2006). For example, in large lecture-based courses, it may be difficult, practically speaking, to focus extensively on the process of learning through the provision of individual feedback. In cases like this, consider whether attention can still be given to other mastery-oriented themes, such as offering explanations of purpose for assignments or promoting the meaningfulness of course material. Finally, we want to stress that a MGS is perceived when students *feel* that their teachers support them. Thus, interpersonal relationships between instructors and their students (rooted in emotional and instructional support) are essential for fostering a MGS (see Wilson, this volume; also see Buskist, this volume; Patrick, 2004; Patrick & Ryan, 2008; Turner et al., 2002). Furthermore, a MGS entails opportunities for peer collaboration, where instructors promote group work and foster cooperative student learning (Patrick, 2004; Patrick & Ryan, 2008; Turner et al., 2002). Consequently, it may not be possible to fully engender a MGS without developing positive relationships, i.e. rapport, with students and allowing them to learn proactively with their peers (Patrick, 2004).

References

Ames, C. (1992a). Achievement goals and the classroom motivational climate. In D. H. Schunk & J. L. Meece (Eds.), *Students' Perceptions in the Classroom* (pp. 327-348): Hillsdale, NJ: Erlbaum.

Ames, C. (1992b). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261-271. doi:10.1037/0022-0663.84.3.261

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*(3), 260-276. doi:10.1037/0022-0663.80.3.260

Anderman, E. M., & Patrick, H. (2012). Achievement goal theory, conceptualization of ability/intelligence, and classroom climate. In S. L. Christenson, A. L. Reschly & C. Wylie (Eds.), *Handbook of Research on Student Engagement* (pp. 173-191). New York, NY Location: Springer. doi:10.1007/978-1-4614-2018-7_8

Anisfeld, M. (1987). A course to develop competence in critical reading of empirical research in psychology. *Teaching of Psychology, 14*(4), 224-227. doi:10.1207/s15328023top1404_8

Assor, A., Kaplan, H., & Roth, G. (2002). Choice is good, but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviours predicting students' engagement in schoolwork. *British Journal of Educational Psychology, 72*(2), 261-278. doi:10.1348/000709902158883

Barron, K. E., & Harackiewicz, J. M. (2003). Revisiting the benefits of performance-approach goals in the college classroom: Exploring the role of goals in advanced college courses. *International Journal of Educational Research, 39*(4), 357-374. doi:10.1016/j.ijer.2004.06.004

Blumenfeld, P. C. (1992). Classroom learning and motivation: Clarifying and expanding goal theory. *Journal of Educational Psychology, 84*(3), 272-281. doi:10.1037/0022-0663.84.3.272

Chew, S. L. (2010). Improving classroom performance by challenging student misconceptions about learning. *APS Observer*, *23*(4).

Drabick, D. A. G., Weisberg, R., Paul, L., & Bubier, J. L. (2007). Keeping it short and sweet: Brief, ungraded writing assignments facilitate learning. *Teaching of Psychology, 34*(3), 172-176. doi:10.1080/00986280701498558

Dweck, C. S. (2008). *Mindset: The new psychology of success.* New York, NY: Random House Digital, Inc.

Flowerday, T., & Schraw, G. (2000). Teacher beliefs about instructional choice: A phenomenological study. *Journal of Educational Psychology, 92*(4), 634-645. doi:10.1037/0022-0663.92.4.634

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi:10.3102/003465430298487

Homa, N., Hackathorn, J., Brown, C. M., Garczynski, A., Solomon, E. D., Tennial, R., . . . Gurung, R. A. R. (2013). An analysis of learning objectives and content coverage in introductory psychology syllabi. *Teaching of Psychology, 40*(3), 169-174. doi:10.1177/0098628313487456

Hulleman, C. S., & Harackiewicz, J. M. (2009). Promoting interest and performance in high school science classes. *Science, 326*(5958), 1410-1412. doi:10.1126/science.1177067

Katz, I., & Assor, A. (2007). When choice motivates and when it does not. *Educational Psychology Review, 19*(4), 429-442. doi:10.1007/s10648-006-9027-y

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254-284. doi:10.1037/0033-2909.119.2.254

Lipnevich, A. A., & Smith, J. K. (2009a). Effects of differential feedback on students' examination performance. *Journal of Experimental Psychology: Applied, 15*(4), 319-333. doi:10.1037/a0017841

Lipnevich, A. A., & Smith, J. K. (2009b). "I really need feedback to learn:" students' perspectives on the effectiveness of the differential feedback messages. *Educational Assessment, Evaluation and Accountability, 21*(4), 347-367. doi:10.1007/s11092-009-9082-2

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*: Englewood Cliffs, NJ: Prentice-Hall, Inc.

Maehr, M. L., & Midgley, C. (1991). Enhancing student motivation: A schoolwide approach. *Educational Psychologist, 26*(3-4), 399-427. doi:10.1080/00461520.1991.9653140

Margolis, H., & McCabe, P. P. (2004). Self-efficacy: A key to improving the motivation of struggling learners. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 77*(6), 241-249. doi:10.3200/TCHS.77.6.241-249

Murayama, K., & Elliot, A. J. (2009). The joint influence of personal achievement goals and classroom goal structures on achievement-relevant outcomes. *Journal of Educational Psychology, 101*(2), 432-447. doi:10.1037/a0014221

Parkes, J., & Harris, M. B. (2002). The purposes of a syllabus. *College Teaching, 50*(2), 55-61. doi:10.1080/87567550209595875

Patrick, H. (2004). Re-examining classroom mastery goal structure. In P. R. Pintrich & M. L. Maehr (Eds.), *Advances in motivation* (Vol. 13, pp. 233-263). Amsterdam, The Netherlands: Elsevier JAI Press.

Patrick, H., & Ryan, A. M. (2008). What do students think about when evaluating their classroom's mastery goal structure? An examination of young adolescents' explanations. *The Journal of Experimental Education, 77*(2), 99-124. doi:10.3200/JEXE.77.2.99-124

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33-40. doi:10.1037/0022-0663.82.1.33

Purdie, N., Hattie, J., & Douglas, G. (1996). Student conceptions of learning and their use of self-regulated learning strategies: A cross-cultural comparison. *Journal of Educational Psychology, 88*(1), 87-100. doi:10.1037/0022-0663.88.1.87

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119-144. doi:10.1007/BF00117714

Schraw, G., Flowerday, T., & Lehman, S. (2001). Increasing situational interest in the classroom. *Educational Psychology Review, 13*(3), 211-224. doi:10.1023/A:1016619705184

Stefanou, C. R., Perencevich, K. C., DiCintio, M., & Turner, J. C. (2004). Supporting autonomy in the classroom: Ways teachers encourage student decision making and ownership. *Educational Psychologist, 39*(2), 97-110. doi:10.1207/s15326985ep3902_2

Stetsenko, A. (2008). From relational ontology to transformative activist stance on development and learning: expanding Vygotsky's (CHAT) project. *Cultural Studies of Science Education, 3*(2), 471-491. doi:10.1007/s11422-008-9111-3

Tobias, S. (1994). Interest, prior knowledge, and learning. *Review of Educational Research, 64*(1), 37-54. doi:10.3102/00346543064001037

Turner, J. C., Midgley, C., Meyer, D. K., Gheen, M., Anderman, E. M., Kang, Y., & Patrick, H. (2002). The classroom environment and students' reports of avoidance strategies in mathematics: A multimethod study. *Journal of Educational Psychology, 94*(1), 88. doi:10.1037/0022-0663.94.1.88

Urdan, T., & Schoenfelder, E. (2006). Classroom effects on student motivation: Goal structures, social relationships, and competence beliefs. *Journal of School Psychology, 44*(5), 331-349. doi:10.1016/j.jsp.2006.04.003

Whiteman, R. C., & Mangels, J. A. (2016). Rumination and rebound from failure as a function of gender and time on task. *Brain Sciences, 6*(1), 7. doi:10.3390/brainsci6010007

Wilson, J. H., & Wilson, S. B. (2007). The first day of class affects student motivation: An experimental study. *Teaching of Psychology, 34*(4), 226-230. doi:10.1080/00986280701700151

Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology, 96*(2), 236-250. doi:10.1037/0022-0663.96.2.236

Chapter 4: Key Aspects of Motivation in Learning

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Abstract

A variety of different cognitive and non-cognitive factors predict learning in higher education. One of the most important is motivation, a topic with a long history of research in psychology. In this chapter I briefly describe motivation and summarize major theories of motivation. I then overview what is known about learning, positioning this discussion using the framework of Socratic and Confucian teaching styles. Finally, I describe strategies to increase student motivation in the form of explicit tips and suggestions. It is clear that although motivation is based in the student, it can also be influenced by what instructors do, how they design their courses, and how the instructor and student interact. Modifying both how one teaches and how one designs a class may positively influence student motivation.

Introduction

How do you motivate students to study and learn? Not all students have a burning desire to master the material that faculty teach. Instructors, especially those new to the profession, often take a student's lack of interest personally and as a reflection of instructional shortcomings. It helps to be aware of the many other factors that play a role in learning and motivation (Credé & Kuncel, 2008). Some students do not want to go to college to learn, but go because they are either forced to by their families, or otherwise feel that they have to (Bain, 2012). Students who are getting less than satisfactory grades frequently say that they study hard and can often describe a variety of time-consuming study activities that are not working well for them (Gurung & McCann, 2012). These students then ask their instructors what they can do to improve their grades. Whereas instructors can share study techniques, the student must *want to* learn and be ready to put in the effort to do so. At least 50% of the variance in studies of student learning is accounted for by student factors (Hattie, 2015) and motivating students may be one of the most important first steps an instructor can take to enhance learning (Reeve, 2011).

What is motivation? What are the best ways to increase motivation? In this chapter, I will answer these questions and explore related areas of interest. I will first briefly describe motivation and summarize major theories of motivation. I will then overview what is known about learning—if we better understand how students learn, we can better develop ways to motivate them to learn. Finally, I shall describe strategies to increase student motivation in the form of explicit tips and suggestions. Specifically, I shall cover the following objectives:

- Identify contextual variables that may improve student motivation for learning
- Examine the context in which teaching and learning take place
- Review student data on motivation and learning
- Offer specific tips on how to increase student motivation

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- Stimulate thinking on how one might increase student motivation for learning

Motivation in Context

In the last few decades, researchers have strayed away from traditional predictors and demographic factors that are indicative of college success (e.g., high school GPA, ACT/SAT scores, socioeconomic status, race) and have started to focus more on the psychosocial predictors of academic achievement (Komarraju, Ramsey, & Rinella, 2013). Traditional and demographic predictors of academic achievement are not helpful targets for interventions since they offer little room for change (Robbins et al., 2004). Fortunately, the findings from research on psychosocial predictors associated with academic achievement allow for the possibility of improvement and thus, warrant further exploration of interventions that engender student growth and academic success (Komarraju & Nadler, 2013; Robbins et al., 2004).

The most well-known psychological factors indicative of academic achievement are motivational factors (e.g., self-efficacy, goal setting) and self-regulatory capacities such as organization and attention to study (i.e., organization of tasks, structuring of time, planning), effort regulation, and test-anxiety (Richardson et al., 2012; Krumrei-Mancusco et al., 2013). Self-efficacy is a context-specific construct and addresses student beliefs in their ability to master tasks, rather than generalized performance (Kitsantas, Winsler & Huie, 2008). Similar to the concept of mindset (i.e., that intelligence is either fixed or can change, discussed below) which also has significant implications for motivation and learning (Lin-Siegler, Dweck, & Cohen, 2016), there is strong evidence that self-efficacy is a key motivational belief that influences students' academic task choices (Pajares, 2008), use of effective self-regulatory learning strategies (Greene, Miller, Crowson, Duke, & Akey, 2004), and studying techniques (Bartoszewski & Gurung, 2015).

After reading this chapter, you should better understand the variables that determine student motivation to study and learn, and you should be able to incorporate this understanding into the design of classroom lessons that help motivate students to achieve academic success.

Why Motivation Is Important

There are three commonly used measures of motivation: choice, effort, and persistence (Svinicki & McKeachie, 2011). Students who are motivated to learn choose activities that enhance their learning, they then work hard, and continue to do so even when there are obstacles to learning. There are many psychological variables linked to motivation. Some students are driven by a high need for achievement; some students are said to be extrinsically motivated (those who study primarily for grades or approval of others), while other students are intrinsically motivated (those who study for the value of the learning in its own right). Students are generally focused on activities that they value and in which they expect to succeed (expectancy-value theory, Wigfield, Tonks, & Klauda, 2009). We can also say that motivation to complete a task is directed towards goals. Some students adopt mastery goals where the primary desire is to understand and master the material. Other students adopt performance goals where they focus on their learning outcomes in relation to the learning outcomes of others. Perhaps most well known is the work of Carol Dweck who showed that students who believe intelligence is fixed show different levels of motivation and effort than students who believe that intelligence is malleable (what is called a growth mindset). Changing a student's mindset is now considered a powerful intervention (Claro, Paunesku & Dweck, 2016; Paunesku et al., 2015). Each of these different variables relates to motivation and learning

(McKeachie & Hofer, 2001; Svinicki & McKeachie, 2011) and the five motivational theories that relate to educational success (with key points of each) are summarized below:

1. Autonomy and Self Determination
   - People have a need for control over their lives
   - Control helps people feel that they have choices
2. Intrinsic and Extrinsic Motivation
   - People are motivated by both internal (enjoyable and interesting) and external rewards (social recognition, professional development, money)
   - Teachers tap intrinsic motivation when they arouse student curiosity, provide appropriate challenges, and give students some control in the class
   - Teachers tap extrinsic motivation when they provide useful and constructive feedback
3. Expectancy-Value Theory
   - Students direct their energies toward activities they value and in which they believe they can be successful
   - Thus, teachers best promote learning when…
     - They show course content to have value to students
     - They foster student expectations of success in the course
4. Mastery /Performance Goal Theory
   - Mastery Orientation
     - Primary desire is to learn and master subject matter
   - Performance Goal Orientation
     - Primary desire is to achieve relative to others (i.e., compete)
   - Mastery is believed to promote deeper learning
     - Teachers foster mastery by having strong rapport with their students and encourage intellectual risk-taking
5. Social Goals/Motivation Theory
   - Students have social as well as academic goals
   - Students wish to be socially responsible and connected to other people
   - Teachers facilitate social accomplishment and student learning when they provide opportunities for peer discussion or group work

As seen above, there are many different theories of motivation in the psychological literature. To help consolidate the different ideas, Svinicki (2004) presented an Amalgamated Model of Motivation, which suggests that motivation is influenced by two major factors:

1. Value of the goal: There are many factors that influence how valuable a student will perceive a course or study topic to be. The main factors are:
    - The perceived need for the knowledge or information
    - Intrinsic quality of the goal (does the student value the goal itself?)
    - Utility of the goal (what use will achieving the goal have?)
    - Control and choice (how much control and choice does the student have?)
    - Influence of others (are the student's peers and/or family important factors?)
2. Student's expectation that the goal can be achieved:
    - Difficulty (is the topic, course, or subject very challenging?)
    - Prior experience (how much experience or knowledge does the student have on the topic?)
    - Match with the student's skills (is the level of the challenge suitable?)
    - Encouragement/Examples of others (what support or modeling is provided?)
    - Self-efficacy (does the student think they can achieve the goal?)
    - Attributions of success/failure (what does the student believe success or failure is caused by?)
    - Beliefs/attitudes about learning (what does the student see as the role of learning?)

One of the easiest things an instructor can do to motivate students is to help increase the value of a learning outcome for them. If instructors see that students lack motivation, assessing the extent to which the students value what they are trying to get them to learn is the first critical step to take.

It seems obvious that motivation is an important component of learning, but what exactly is the connection? There have been many different ideas on this topic and a summary of the literature (Svinicki, 2004) suggests that motivation:

- Directs the learners' attention to the task at hand and makes them less distractible. Accordingly, anything that focuses the student's attention helps learning;
- Changes what the student pays attention to;
- Helps the student persist when they encounter obstacles;

- Helps the student set goals which then serve as benchmarks that they can use to monitor their learning and recognize when they are making progress and when they have finished a task.

In case you are wondering how you can measure what your students' motivational levels are along the lines of the review above, consider administering the *Motivated Strategies for Learning Questionnaire (MSLQ)*. The MSLQ (Pintrich, Smith, Garcia, & Mckeachie, 1991) can assess college students' motivational orientations and their use of different learning strategies used in lectures. The MSLQ consists of 81-items divided into 15 subscales. Six subscales relate to motivation (the remaining seven relate to learning strategies).

The motivation section measures value, expectancy, and affect. The Value scale contains three subscales: Intrinsic Goal Orientation, Extrinsic Goal Orientation, and Task Value. Intrinsic Goal Orientation is concerned with the degree to which the student perceived oneself to be participating in a task for reasons related to challenge, curiosity, and mastery (e.g., "In a class like this, I prefer course material that really challenges me so I can learn new things). Extrinsic Goal Orientation is concerned with the degree to which the student perceives oneself to be participating in a task for reasons such as grades, rewards, performance, evaluation by others, and competition (e.g., "Getting a good grade in this class is the most satisfying thing for me right now). Task Value refers to the student's evaluation of how interesting, how important, and how useful the task is (e.g., "It is important for me to learn the course material in this class.").

The Expectancy scale contains two subscales: Control of Learning Beliefs and Self-Efficacy for Learning and Performance. Control of Learning beliefs refers to the student's beliefs that their efforts to learn will result in positive outcomes (e.g., If I study in appropriate ways, then I will be able to learn the material in this course). Self-Efficacy for Learning and Performance assesses expectancy for success (i.e., performance expectations and its relation to task performance; e.g., "I expect to do well in this class") and self-efficacy (i.e., a self-appraisal of one's ability to master a task and one's confidence in skills to perform that task; e.g., "I'm confident I can do an excellent job on the assignments and tests in this course).

The Affect scale contains one subscale, which measures Test Anxiety, incorporating two components: a worry or cognitive component and an emotion component. The worry component refers to students' negative thoughts that hinder performance (e.g., "When I take a test I think of the consequences of failing), whereas the emotion component refers to the affective and physiological arousal aspects of anxiety (e.g., I feel my heart beating fast when I take an exam").

It is also important to place motivation in the context of teaching and learning. Motivation comes from and is influenced by many different sources. The instructor is also a key player in determining student motivation. Lowman (1995) suggested two key dimensions are important in understanding the interplay between teaching, learning, and motivation:

Dimension 1: Intellectual Excitement

This factor can be influenced by the clarity of presentations (in particular, what is presented) and the emotional impact on the students (or the way material is presented).

Dimension 2: Interpersonal Rapport

> This factor hinges on the awareness of the interpersonal nature of the classroom and suggests a focus on communication skills that enhance motivation and enjoyment of learning and that foster independent learning.

Similarly, and perhaps more comprehensively, Groccia (2012) presented a model that focuses on seven variables that must be investigated to develop a full perspective of college and university teaching and learning. The main variables to keep in mind with a brief description of them are the:

Teacher: Understanding who individual teachers are and what they bring to the learning situation can affect the quality of that experience.

Learner: Students differ in the same ways that teachers differ. Students' backgrounds, preparation, and individual characteristics influence how, when, and why they learn.

Learning Process: Improved teaching should be grounded in an understanding of the research on the mechanics and transfer of learning.

Learning Context: Learning does not occur in a vacuum; where and when teaching takes place influences teaching and learning.

Course Content: Analysis of the accuracy, difficulty level, organization, and meaningfulness of what is taught can improve teaching.

Instructional Processes: The most obvious variable in this model describes what faculty as teachers and their students actually do in the instructional environment, which is what draws the most attention (often to the exclusion of other factors). This includes teaching strategies (competitive, cooperative, individual teaching techniques, computer-aided instruction, etc.), teacher behaviors (such as oral and written communication skills, enthusiasm, organization, time management) and student learning responses (note-taking, class participation, student engagement and interaction, etc.).

Learning Outcomes: The desired results of teaching, in terms of short- and long-term learning outcomes, should be identified during the course design process, before teaching, and assessed on a regular basis throughout the instructional process.

In summary, there are clearly a lot of technical aspects to the study of motivation. Similar to many concepts in life that seem commonsensical, psychological research reveals many components to motivation. Note that going beyond intrinsic and extrinsic forms of motivation, motivation involves goal setting and is related to concepts such as self-efficacy and mindset. Perhaps at its core, in learning, motivation is related to how much the student values the goal and related to the students' sense that the goal can be achieved. Instructors should take pains to impress upon students the importance of the subject matter and the relationship to students' lives. Given that psychology is about life, this task is easy, but instructors need to consciously make the utility of the material clear early on (the first day of class is perfect) to build motivation. I provide explicit ways to build motivation after I overview learning.

What Do We Know About How Students Learn?

Learning involves changing the long-term memory of learners by helping them form new connections with the content you are teaching them (Soderstrom & Bjork, 2015). Students must focus on the key aspects of new information in order to learn it and then encode that information into long-term

memory. Often a learner's prior knowledge or understanding hurts their motivation to learn, which occurs more frequently when that prior understanding is wrong or incomplete. Four conditions must be present for learners to abandon previously held wrong beliefs (Posner, Strike, Hewson, & Gertzog, 1982):

1. Learners have to be confronted with information that makes them dissatisfied with their previous beliefs,
2. Any new explanation being offered to replace the old beliefs must be easily understandable,
3. The alternative must be believable, and
4. The new ideas must be able to both predict new ideas as well as explain old ones.

Going beyond the motivational impediments brought on by incorrect prior learning, motivation to learn is often decreased by students not being able to accurately predict their own level of knowledge or understanding. Cognitive psychologists refer to this phenomenon as the illusion of comprehension (Druckman & Bjork, 1994). One problem is that students confuse being familiar with a concept with actually knowing the concept. If they recognize a term or theory, they often then go on to believe they know the concept. This problem sometimes take place when students are taught by skilled instructors who make a concept so clear in a lecture that the student then goes on to believe that they understand the material well, which is especially the case when physics or math problems are worked out in class. The professor may go through small steps towards solving the problem and the student understands it at that point but then has problems reproducing the steps when solving the problem individually. Professors exacerbate the problem by listing items on a test in the same order that the information was presented in class, wording test items in the same manner as the material was presented in class, and allowing the student to answer questions with overly vague answers that even remotely resemble the actual answer (Bereiter & Scardamalia, 1985).

To prevent the illusion of comprehension, faculty need to not make these mistakes, and faculty should also present students with numerous opportunities to test their own learning. The more that students are tested on the material, the better sense they will have about what they know and do not know. Students need to be made more aware of different ways to study, and made more aware of the natural ways humans assume they know more than they actually do. Svinicki (2004) suggested that students study using a GAMES model. In this model, students should use:

- Goal-oriented studying where they first plan their studying,
- Active studying where they do more than just read the book,
- Meaningful studying where they create their own examples and make connections between units,
- Explain the material to someone else, and
- Self-monitor where they pay close attention to their understanding and make corrections when they identify personal shortcomings.

Another factor to consider in relation to motivation, teaching, and learning is the concept of learning styles. There has been a considerable volume of research on the notion of learning styles and many instructors and even some introductory textbooks scramble to discuss learning styles. The term "learning styles" refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them (Pashler, McDaniel, Rohrer, & Bjork, 2008). Proponents of learning-style assessment contend that optimal instruction requires diagnosing individuals' learning style and tailoring instruction accordingly. Assessments of learning style typically ask people to evaluate what sort of information presentation they prefer (e.g., words versus pictures versus speech) and/or what kind of mental activity they find most engaging or congenial (e.g., analysis versus listening). Instructors often feel that if their teaching does not match the students' preferred learning style the students will not be motivated to learn. Learning styles are correspondingly presumed by many educators to be very important for student success. Investigators use learning style inventories to explore differences among students, explore educators' opinions of learning styles, and suggest connections between learning styles and other constructs. In one of the most comprehensive and recent reviews on the topic, Pashler and colleagues (2008) showed that there is little empirical evidence in support of the strongest learning style claims, such as that a person with a particular learning style is unable to learn in an "incompatible" teaching style. The bottom line is clear. Instructors need not worry about matching their teaching style to student learning styles, but instructors should use a variety of teaching styles in general (see also Hunter and Lloyd, this volume).

Beyond learning styles, there are broad differences in the ways that people want to learn (or in how they approach knowing). Tweed and Lehman (2002) organized a wide body of findings and compared the Socratic method of learning, exemplified by the questioning of one's own and others' beliefs, the evaluation of others' knowledge, having high esteem for self-generated knowledge, and focusing on error to evoke doubt, with the Confucian method of learning, exemplified by effortful, pragmatic, and respectful learning, behavioral reform, and the acquisition of essential knowledge. The Confucian and Socratic models can easily be conceptualized as representing two ends of the learning continuum within all individuals. The consideration of individual differences in ways of knowing, merging educational theory with this new cultural dichotomy in learning, makes for a more powerful heuristic tool for educational reform.

Most students engage in and feel pressure to memorize course material and illustrate an extremely pragmatic approach to learning (Bartoszewski, & Gurung, 2015). They are concerned with whether their coursework will help them get a good job, and are often turned off by courses (e.g., general education requirements) designed for the broadening of students' intellectual horizons. Student efforts to memorize material for the test and to be pragmatic are both major aspects of the Confucian style. Recent initiatives to make learning more active and the established need for instructors to modify their techniques to increase student engagement with the material testify to a need for more Socratic learning. Pedagogical writings urging educators to utilize multiple instructional styles suggest that more often than not, methods like the traditional lecture should be modified with other instructional styles that will engage different styles of learning and knowing (see Richmond, Boysen, & Gurung, 2016 for a review).

A substantial body of pedagogical writing on the ways that people learn and acquire knowledge bears on the Socratic-Confucian framework. For example, Bloom and colleagues (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956; see Anderson & Krathwohl, 2001 for a review) initiated the examination of learning by

proposing that optimal learning is achieved by having students analyze, evaluate, synthesize, and apply knowledge beyond just remembering and comprehending it. Perry (1970) discussed different types of students and distinguished "dualistic students" for whom knowledge is certain, and right or wrong is acquired from authority, from "uncertain students" who are uncertain (replacing the right or wrong dichotomy by separating knowledge into what is known versus unknown), and "relativistic students" who use relativistic thinking, for whom some knowledge claims are better than others, and for whom knowledge is validated by evidence relevant to context. If students' approach to learning, in general, is philosophically different from their instructor's philosophy of teaching, it is possible that motivation may suffer as students may feel a lack of connection and even frustration. There are a number of ways that motivation can be increased.

Tips for Increasing Motivation

The five theories of motivation previously reviewed lend themselves to the following techniques for improving student motivation (modified from McKeachie & Hofer, 2001):

1. Provide Opportunities for Student Choice

   – When assigning written assignments, give students the choice of topics and also the choice of due dates.

   – On tests allow students to choose which essay questions to answer (e.g., answer 3 of the following 5 questions). Also, allow students to justify and elaborate on missed questions.

   – If you use presentations, let students pick their own topics or provide a short list of topics for them to pick from.

   – Consider giving students the choice of exam format (either online or on paper).

2. Share Your Own Motivation for Your Subject Matter and Teaching

   – Show students why you fell in love with your subject matter. Share why you enjoy teaching. Discuss the different types of personal and social satisfaction you receive in your work. Explicitly mention the value your subject matter makes to the world. Reflect with students on the sorts of autonomy you enjoy in your work.

   – One good strategy is to spend ten minutes or more on the first day of class talking about your own research topic or what you are working on. Students appreciate hearing about work in progress and it is hard for us to not be excited about what we are working on. This can be extremely motivating to the student for whom research is an abstract concept.

3. Make Class Time Valuable

   – Prepare interesting and relevant material for class, taking pains to add timely material, preferably newspaper articles or social media posts, from within a few weeks of class.

- From time to time, vary class formats and activities, e.g., incorporate Problem-Based Learning, have students debate or role play, have students think-pair-share.
- Allow opportunities for student discussion and interaction.
- Provide moderate degrees of intellectual challenge. Be prepared to use challenging examples if students find some topics too easy. Alternately, be comfortable repeating material and generating new examples for topics that students have trouble with.
- Pose thoughtful and stimulating questions. You can use either classroom response systems or apps such as Poll Everywhere, which allow students to use their phones to send in responses to questions you raise.

4. Encourage Mastery by Offering Extended Opportunities for Papers and Tests
   - Allow students to revise papers before receiving a final grade on them.
   - Allow students to retake some quizzes/tests to improve their understanding and grades.
   - Offer students chances to learn from their mistakes.
5. Grade According to a Rubric or Clear Set of Outcomes (i.e., Criterion-Referenced Grading) Rather than Grading on a Curve (i.e., Normative Grading)
   - Make point value of assignments crystal clear.
   - Explain grading scale in detail so that students will know what they need to do to be successful.
   - Avoid grading students relative to each other.
   - These strategies help students perceive that they can control their destiny in their classes.
6. Provide Immediate and Helpful Feedback
   - Feedback should be constructive and informative.
   - You have to grade the material sometime so why not do it as soon as possible? I personally make it a rule to have any assignments or exams back to students within one week of the material being turned in. For classes that meet twice a week, I try to give back graded material by the next class period.
   - Use controlling language only if necessary.
     - "Might consider" rather than "must" or "should"

- Aim feedback at the problem and not the individual. Be careful when responding to emails or grading when you are tired or stressed as feedback may end up being more caustic than you want.

In addition to these tips, Svinick (2004) offered the following suggestions for how faculty can motivate their students:

- Be a good role model.
- Pick tasks with utility, challenge, and interest value.
- Encourage self-efficacy.
- Base evaluation on progress, mastery orientation.
- Provide choice and/control over goals/strategies.
- Communicate high expectations in line with students' capabilities.

Summary: A Classroom Example on Motivating Students

To get a good sense of what motivates students, Buskist (in Buskist & Keeley, 2015) asked 167 students what teachers could do to increase their motivation for learning. The top three responses (and some suggestions to do it) were:

1. Make Class Instruction Interesting

   - Provide relevant real-life examples and stories.
   - Exhibit enthusiasm for subject matter.
   - Don't always lecture—mix up class activities.
   - Allow for student-teacher interaction.
   - Allow student input in class via questions, etc.

2. Show Concern for Students (Social Context)

   - Be respectful toward students.
   - Show students you care if they pass or fail.
   - Let students know that you want them to do well in your class.
   - Look for opportunities to connect your subject matter with your students' lives.

3. Establish Class Contingencies/Policies

   - Require/take attendance.
   - Offer "pop" quizzes and/or frequent testing.
   - Occasionally offer extra credit.
   - Make sure test items correlate highly with material covered in class.

It is important to note that many of the above suggestions for motivation relate to the whole process of how you plan and run your class. How you create your syllabus, set your learning objectives, how you plan each class session, how you interact with your students, all have implications for student

motivational levels and consequently student learning. Be prepared to try different ways to increase motivation. Many of the suggestions mentioned above need to be modified slightly to fit different student cohorts, locations, school types (e.g., public vs. private), and may come easier the more you teach. It is not difficult to be overly focused on conveying content the first few times you teach. Especially when you are a graduate student or even a first year assistant professor, there is the sense that if you do not cover all the material, there will be major consequences. With such pressure, it is difficult to think about whether your students are motivated and what you can do about it.

In conclusion, the following points summarize the effective elements of teaching that influence motivation:

- Be an Interesting and Enthusiastic Teacher
- Establish Rules of Etiquette
- Establish Rapport with Your Students/Show Your Concern
- Use Active Learning Techniques to Provide Meaningful (Significant) Learning Experiences
- Establish Learning Contingencies and Tie Learning Objectives to Student Assessment
- Frequently Assess Student Learning with Feedback
- Assess Your Teaching Using a Variety of Different Methods

The last point is particularly important as the more you focus on assessing your own teaching, the more attention (automatically) you will pay to student learning, the perfect indicator of good teaching. When you build assessment (of your teaching, of course learning objectives) into your routine, I trust you will now also turn an eye towards student motivation levels as well. Consider measuring motivation using the scale described above.

Conclusion

In this chapter I reviewed a number of different theories on motivation and tips to increase motivation that corresponded to each theory. Like most human attitudes and behaviors, motivation is a complex phenomenon that is predicted by many different personality characteristics. Motivation, though based in the student, can also be determined by the actions of the instructor, the design of the course, and the interaction between the student and instructor.

References

Anderson, L. W. & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives.* Boston, MA: Allyn & Bacon.

Bain, K. (2012). *What the best college students do.* Cambridge, MA: The Belknap Press of Harvard University Press.

Bartoszewski, B. L., & Gurung, R. A. R. (2015). Comparing the relationship of learning techniques and exam score. *Scholarship of Teaching and Learning in Psychology, 1(3),* 219-228. doi:10.1037/stl0000036

Bereiter, C., & Scardamalia, M. (1985). Cognitive coping strategies and the problem of 'inert knowledge.' In S. Chapman, J. Segal, & R. Glaser (Eds.), *Thinking and learning skills* (Vol. 2, pp. 65-80). Hillsdale, NJ: Lawrence Erlbaum.

Bloom, B.S. (Ed.) Engelhart, M.D., Furst, E.J., Hill, W.H., Krathwohl, D.R. (1956). Taxonomy of educational objectives, handbook I*: The cognitive domain.* New York: David McKay Co Inc.

Buskist, W., & Keeley, J. W. (2015). Becoming an excellent teacher. In D. S. Dunn (Ed.), *The Oxford handbook of undergraduate psychology education* (pp. 99-111). New York, NY: Oxford University Press.

Claro, S., Paunesku, D., & Dweck, C. S. (2016). Growth mindset tempers the effects of poverty on academic achievement. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 113*(31), 8664-8668.

Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives On Psychological Science (Wiley Blackwell)*, *3*(6), 425-453. doi:10.1111/j.1745-6924.2008.00089.

Druckman, D., & Bjork, R. (1994). *Learning, remembering, believing: Enhancing human performance.* Washington, DC: National Academy Press.

Greene, B. A., Miller, R. B., Crowson, H. M., Duke, B. L., & Akey, K. L. (2004). Predicting high school students' cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology, 29,* 462-482. doi:10.1016/j.cedpsych.2004.01.006

Groccia, J. E. (2012). A model for understanding university teaching and learning. In J. E. Groccia, M. A. T. Alsudairi, & W. Buskist (Eds.), *Handbook of college and university teaching: A global perspective* (pp. 2-15). Los Angeles, CA: Sage.

Gurung, R. R., & McCann, L. I. (2012). How should students study?. In B. M. Schwartz, R. R. Gurung (Eds.), *Evidence-based teaching for higher education* (pp. 99-116). Washington, DC: American Psychological Association. doi:10.1037/13745-006

Hattie, J. (2015). The applicability of visible learning to higher education. *Scholarship of Teaching and Learning in Psychology, 1*(1), 79-91. doi:10.1037/stl0000021

Kitsantas, A., Winsler, A., & Huie, F. (2008). Self-regulation and ability predictors of academic success during college: A predictive validity study. *Journal of Advanced Academics, 20,* 42-68. doi:10.4219/jaa-2008-867

Komarraju, M., & Nadler, D. (2013). Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter? *Learning and Individual Differences*, *25,* 67-72. doi:10.1016/j.lindif.2013.01.005

Komarraju, M., Ramsey, A., & Rinella, V. (2013). Cognitive and non-cognitive predictors of college readiness and performance: Role of academic discipline. *Learning and Individual Differences*, *24,* 103-109. doi:10.1016/j.lindif.2012.12.

Krumrei-Mancuso, E. J., Newton, F. B., Kim, E., & Wilcox, D. (2013). Psychosocial factors predicting first-year college student success. *Journal of College Student Development, 54(3)*, 247-266. doi:10.1037/edu0000124

Lin-Siegler, X., Dweck, C. S., & Cohen, G. L. (2016). Instructional interventions that motivate classroom learning. *Journal of Educational Psychology, 108*(3), 295-299. doi:10.1037/edu0000124

Lowman, J. (1995). *Mastering the techniques of teaching.* San Francisco, CA: Jossey-Bass.

McKeachie, W., & Hofer, B. W. (2001). *Teaching tips: Strategies, theories, and research for college and university teachers* (11th ed.). Boston, MA: Houghton Mifflin.

Pajares, F. (2008). Motivational role of self-efficacy belief in self-regulated learning. In D.H. Schunk & B.J. Zimmerman (Eds.), *Motivational and self-regulated learning: Theory, research, and applications* (pp. 111-139). Mahwah, NJ: Lawrence Erlbaum Associates.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9, 105-119. doi:10.1111/j.1539-6053.2009.01038.x

Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science, 26*(6), 784-793. doi:10.1177/0956797615571017

Perry, W. (1970). *Forms of intellectual and ethical development in the college years: A scheme.* Troy, MI: Holt, Rinehart, and Winston.

Pintrich P. R., Smith D. A. F., Garcia T., & McKeachie W. J. (1991). *A manual for the use of the motivated strategies for learning questionnaire (MSLQ).* Ann Arbor: National Center for Research to Improve Postsecondary Teaching and Learning, The University of Michigan.

Posner, J. G., Strike, K., Hewson, P., & Gertzog, W. (1982). Accommodation of a scientific conception: Toward a theory of conceptual change. *Science Education, 66,* 211-227. doi:10.1002/sce.3730660207

Reeve, J. (2011). Teaching in ways that support students' autonomy. In D. Mashek, & E. Y. Hammer (Eds.), *Empirical research in teaching and learning: Contributions from social psychology* (pp. 90-103, Chapter xii). Hoboken, NJ: Wiley-Blackwell. doi:10.1002/9781444395341.ch5

Richardson, M., Bond, R., & Abraham, C. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin, 138(2),* 353-387. doi:10.1037/a0026838

Richmond, A., Boysen, G., & Gurung, R. A. R. (2016). *An evidence-based guide to college and university teaching: Model teaching competencies.* New York, NY: Routledge.

Robbins, S. B., Lauver, K., Le, H., Davis, D., Lang- ley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130,* 261–288. doi: 10.1037/0033-2909.130.2 .261

Soderstrom, N. C., & Bjork, R. A. (2015). Learning versus performance: An integrative review. *Perspectives on Psychological Science, 10*(2), 176-199. doi: 10.1177/1745691615569000

Svinicki, M. D. (2004). *Learning and motivation in the post-secondary classroom.* Bolton, MA: Anker Publishing.

Svinicki, M. D., & McKeachie, W. J. (2011). *McKeachie's Teaching tips: Strategies, research, and theory for college and university teachers* (13th ed.). San Francisco, CA: Wadsworth Cengage Learning.

Tweed, R. G., & Lehman, D. R. (2002). Learning considered within a cultural context. *American Psychologist*, *57*, 89-99. doi:10.1037/0003-066X.57.2.89

Wigfield, A., Tonks, S., & Klauda, S. L. (2009). Expectancy-value theory. In K. R. Wenzel, & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 55-75, Chapter xiii, 686 Pages). New York, NY: Routledge/Taylor & Francis Group.

Chapter 5: Crowdsourcing Course Preparation Strengthens Teaching through Collaboration

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Abstract

Teaching an undergraduate course for the first time requires considerable time and effort to develop effective course materials and lesson plans. This chapter describes our approach to supporting first-time graduate student instructors by collaborating in course preparation, sharing resources, crowdsourcing ideas, and mentoring one another. The benefits of collaborative course preparation extend to experienced instructors who benefit from the infusion of new ideas to enrich their teaching. Collaboration creates opportunities for multiple instructors to provide feedback on classroom activities and allows them to engage in the Scholarship of Teaching and Learning across multiple sections of the same course. We describe how crowdsourcing has helped our department to tackle challenges surrounding the vetting of instructional activities to improve curriculum in an Introductory Psychology course.

Introduction

Crowdsourcing course preparation is an effective way to improve one's teaching by sharing, swapping, and tweaking lesson plans as part of a collaborative group. The quality of the course materials can become infinitely richer when developed collaboratively, as each instructor's strengths can contribute to the group to shore up areas where others may not have particular expertise. For example, one instructor may have a flair for inventing activities that foster student participation, while another may have more experience in the application of digital resources to teaching contexts. The collaborative model enables instructors to work together to try out variations of an idea and evaluate which variation works best in promoting student learning and motivation. For each new teaching activity, the group has the feedback of multiple instructors who can offer ideas on how to fine-tune the execution of the activity for future use. Given the vast range of ideas that have emerged from the literature on teaching and learning, as exemplified in the chapters of this volume, new instructors may feel frankly overwhelmed in their efforts to absorb and apply these ideas to their teaching. With the help of a partner or group, implementation of effective learning activities becomes much more feasible.

We start this chapter by describing our efforts to establish a teaching community of Introductory Psychology instructors, made up of faculty, graduate students, and adjunct lecturers who share ideas and lesson plans in order to create better learning environments for their students. Next, we describe how working as a team transforms the classroom into a data-rich environment for engaging in the

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Scholarship of Teaching and Learning (SoTL) by allowing instructors to examine student learning across multiple sections of the same course. Throughout the chapter, we illustrate how we have embraced the concept of collaborative course prep by sharing ideas we have used along the way. We aim to help graduate students develop collaborative course preps suited to their needs, rather than replicating exactly what we have done with our course prep. To that end, the final section of the chapter provides suggestions on how to begin building your own collaborative working group.

Why did we begin teaching collaboratively?

We embarked on a collaborative course prep for Introductory Psychology about 10 years ago as part of a departmental effort to support new graduate student instructors and other adjunct faculty who were teaching the course for the first time. Over the years, new graduate student instructors have joined the team, while others have left at graduation. Despite variation in the staffing of the course from semester to semester, there has been a considerable degree of consistency in the course prep due to our archiving of teaching materials and lesson plans. This has allowed us to engage in course assessment on an ongoing basis as we evaluate the impact of course modifications that target specific learning objectives, such as fostering the development of effective study habits, communication skills, and ethical reasoning.

Our efforts to create a collaborative course preparation for the Introductory Psychology course emerged out of the needs of a department offering 25 to 35 course sections (ranging from 25 to 120 students) per semester. Our college, like many others (Green, 2007; Wyles, 1998), relies heavily on adjunct lecturers to cover general education courses, which results in graduate students with minimal or no prior training and instructors who are not teaching college as their primary job covering the majority of Introductory Psychology sections. Graduate students with narrow training in a specific subfield of psychology may be ill prepared to teach survey courses like Introductory Psychology because there are so many disparate topics to cover. Furthermore, graduate students may be unaware of their audience—the students—and how best to meet their needs. At our college, the overwhelming majority (~90%) of students taking Introductory Psychology do not intend to major in Psychology; instead, the course serves to fulfill a general education requirement for non-majors enrolled in either associates or baccalaureate degree programs. Furthermore, as a general education course, it is subject to periodic review by a college-wide general education committee and thus requires assessment. These conditions conspire to create a situation where instructors must take into account a large number of factors in course planning to satisfy both needs of their students and college requirements.

Selecting course materials and designing lesson plans for each topic covered in a survey course, or any course for that matter, can be a daunting task and potentially overwhelming for a new instructor juggling teaching responsibilities while developing a program of research (Busler, Beins, & Buskist, 2014; Lortie, 1966). Even though publishers typically provide PowerPoint slides and other multi-media materials for instructors to use in conjunction with an assigned textbook, it can be extremely time consuming for first-time instructors to sort through these materials to determine what is most useful and effective. Novice teachers, such as graduate students, may also lack the experience to accurately assess the quality of these publisher-provided materials (Fantilli & McDougall, 2009).

With these challenges in mind, our crowdsourced (or collaborative preparation) model was born. Graduate students and faculty worked together to create a common syllabus that covered topics (i.e., textbook chapters) in a specified order to allow for use of departmental exams. We then compiled

lesson plans, instructional activities, in-class demonstrations, discussion questions (including low-stakes writing prompts), and PowerPoint slides for each topic, sharing and co-editing course materials through the cloud storage service Dropbox.

Course design: Getting off to the right start!

In designing a course, instructors have to decide what learning goals they have for their students, what information they should include in the syllabus, what textbook chapters and other readings to assign, what content to cover in each class period and how to cover it (i.e., lesson plans), and how to assess learning (e.g., assignments, tests, and quizzes). Some of these decisions (e.g., course objectives, minimum requirements for the syllabus; textbook selection; scheduling of exams) may be set by the department, which leads to a new set of considerations in how to navigate departmental policies.

The starting points for developing our Introductory Psychology course were a set of general education learning goals (set by the department and college), a textbook (selected by a departmental committee), and a course description (from the college catalog). Given the necessity of scaffolding student development of general education skills, we recognized that it would not be possible to cover all of the chapters of the textbook in the time available. Consequently, we selected nine topics to be covered from a list provided in the course description, with our selected topics indicated in bold: "Included will be **research methodology**; at least three topics from **learning**, **cognition**, testing, **physiology**, and phenomenology; and at least three topics from **personality**, **psychopathology**, **emotion and motivation**, history and systems, **development**, and **social factors**." We then arranged the topics in a sequence that allowed us work backwards from our learning goals (see Strashnaya & Dow, this volume; Wiggins & McTighe, 2005), rather than following the order of topics created by the textbook authors.

Backwards course design helps instructors to make good decisions in course preparation by requiring them to consider their learning objectives first and foremost. For example, you might ask yourself: "If I had to choose one thing that my students would remember from my course, what would it be?" or "If there was one skill I wanted my students to develop in my course, what would it be?" In our Introductory Psychology course, taught as a general education requirement primarily for non-majors, we aimed for our students to leave with improved academic skills, such as writing and study habits, and professional skills, such as teamwork and public speaking (National Association of Colleges and Employers, 2014). We also wanted our students to leave the course better able to evaluate popular claims about psychology in the media by thinking critically about information sources (Fisher, Hunter, Nolan, & Buckner, this volume; Halpern, 1998) and to think ethically about psychological research and practice. As we worked on the collaborative preparation, we incorporated ideas and methods from the SoTL field to evaluate whether our lessons were effective in meeting our goals (Schwartz & Gurung, 2012).

Using assessment to guide curriculum development

In sections to follow, we will describe our efforts to crowd-source activities and assignments to foster development of students' academic and professional skills, with an emphasis on active learning to facilitate student engagement with the material. As a collaborative group, we aimed to reduce dependence on lecturing while taking advantage of digital technologies to connect with students between class periods. We started with course objectives that went beyond content to skill development, and made efforts to create a classroom space for students to practice academic and professional skills, rather than viewing it only as a context for transmission of content to students

(Tishman, Jay & Perkins, 1993). Hence, the content began to serve the goal of teaching skills rather than serving as an end in itself, and led us to select lesson topics that would help students to understand the skills we were trying to help them develop, such as using research on metacognition and memory to encourage better study habits and deeper learning, as will be described next.

As part of our assessment activities, we administered a homework survey to students in several class sections (n=160) asking them how much time they spent on a variety of strategies when studying for class exams. In line with what others have observed (e.g., Gurung, 2005; Gurung, Weidert, & Jeske, 2010), our students approached studying in a variety of ways that tended to rely on repetition, e.g., by highlighting and/or re-reading textbook chapters, re-reading or re-writing their notes, or even speaking aloud to themselves (Schwartz, Richmond, & Brooks, 2015). Although a great deal of SoTL research indicates that repetition is less likely to result in deep learning in comparison to elaborative study habits, such as generating questions about the material, creating concept maps, or explaining/teaching concepts to other students (Berry & Chew, 2008; Dunlosky, 2013; Pressley et al., 1992; Roediger 2013; Rohrer & Pashler, 2010), our students tended not to employ elaboration or engage in metacognition about their own learning.

Moreover, their success on the departmental exams was tied to the use of repetitive strategies: We observed significant correlations between students' final exam grades (multiple-choice format) and self-reported time spent memorizing terms, reading the textbook for the first time, highlighting the textbook, re-reading the textbook, taking notes, re-writing notes, and using a study guide (Schwartz et al., 2015). Furthermore, when we examined the study habits of students in an honors section, we found heightened use of repetitive strategies in comparison to students in regular sections, with exam grades in the honors section trending upwards over time (better performance on successive exams), while the opposite was true of the non-honors section (worsening performance over time). These findings suggested to us that honors students were more adept at navigating "the system" to secure high grades than non-honors students, and that the format of the departmental exams was encouraging use of repetitive study strategies (Scouller, 1998). Students desire self-efficacy, such that their actions control their outcomes (Bandura, 1977), and they will adjust how they study to achieve the desired grade. A successful student who intensively uses a repetitive strategy may intentionally select it as optimal for a multiple-choice exam; hence, different forms of assessment are necessary if one wants students to grasp the benefits of elaborative processing over repetition.

These data led us to ask how we, as instructors, could encourage students to think about learning in a broader context than preparing for multiple-choice tests (which, unfortunately, are not going away in the foreseeable future). We thought that one way to increase usage of elaborative study strategies would be to develop lessons around key concepts such as metacognition and memory. Using activities and a video series developed by Professor Stephen Chew (available for download at https://www.samford.edu/departments/academic-success-center/how-to-study), we introduced students to the concept of metacognition on the first day of class, while demonstrating (1) the fallibility of rote memory and the need for effective retrieval cues and (2) the pitfalls of multi-tasking while studying. We then assigned students to watch segments of the video series *How to get the most out of studying* (Chew, 2011) and answer questions about the kinds of beliefs that sabotage their learning, how basic research on memory can be applied to school work, the benefits of deep processing over shallow processing of information, and how to achieve deeper processing while studying, etc. Over the course of

the semester, and especially prior to each exam, we returned to the concept of metacognition and deeper processing in relation to making learning stick.

Using digital tools to support learning

To further support the development of their study habits, we require students to collaboratively edit study guides that we implement using the Wiki feature of Blackboard, our institution's online course management system; see Powers, Brooks, McCloskey, Sekerina, and Cohen (2013) for further description of this method. Students have access to the study guides throughout the semester and are graded on their participation in filling in answers to questions (i.e., with Blackboard homework counting as 20% of the final grade). How the study guides are introduced has varied somewhat by instructor and semester—for example, students in some sections are asked to generate topics, key words, and phrases that they think might be on the exam, which are shared via the Wiki, with students instructed to fill in details about each topic mentioned. Other instructors create a series of questions to go along with the textbook chapters, with relevant page numbers to consult along with links to supplemental videos and other resources to use in answering the questions. Students are instructed to edit each other's contributions and to double-check information using the textbook, their notes, and other course materials. (Note that this activity can also be done using publicly available tools such as Google Docs, if you do not have access to an online course management system with a Wiki feature.)

In addition to the online study guides, we use the asynchronous discussion forum on Blackboard to engage students in low-stakes writing (Elbow, 1997), practice critical thinking (Dunn, Halonen & Smith, 2008; Halpern, 1998), and process course material more deeply. As an example of a recent discussion forum, students read about H.M. in *The New York Times Magazine* (Dittrich, 2016), available at https://www.nytimes.com/2016/08/07/magazine/the-brain-that-couldnt-remember.html, and were instructed to answer the following questions on Blackboard:

1. Who is H.M? In your response please address what surgery H.M. underwent, why H.M. underwent this surgery, and what part of the brain was removed. Your response should be ~ 25-40 words.

2. What were the main consequences of that surgery? Describe what type of amnesia he had by listing the symptoms. Your response should be ~ 50 words.

3. What kind of experiment led to the conclusion that there are at least two different memory systems in the brain? Describe the different types of long-term memory and indicate which type is impaired in amnesic patients like H.M.? Use your textbook to help you with this question. Your response should be ~75-100 words.

4. What happened to the original data collected on H. M.? Your response should be ~10 words.

In our efforts to provide thought-provoking questions around course topics, we have adopted a number of different strategies. We have incorporated questions from test banks or past Advanced Placement high school exams (https://apstudent.collegeboard.org/apcourse/ap-psychology/exam-practice), and have created discussions around current news events (accompanied by a news article or video) or other supplemental readings; see Yuksel, this volume, for a similar approach using TED talks. Alternatively, you could encourage students to submit articles for use in the discussion forum, which could easily be introduced as an extra credit assignment. In implementing online work in introductory courses, we

cannot overemphasize the importance of communication to ensure that students know how to navigate the online course management system to locate the assignments and know the particulars of what is expected of them including due dates, length of desired posts, whether they should post comments to their classmates' posts, etc. Use of a rubric is especially helpful in communicating your expectations; see Table 1 for a sample rubric we have used.

Table 1. *Sample rubric for grading an online discussion forum on Blackboard*

Grading Rubric for Blackboard Discussion Questions	**Possible points**	**Received**
On time	1	
Used complete sentences including correct grammar, spelling, capitalization, punctuation, etc.	1	
Response is on topic and answers the questions(s) asked	1	
Information is correct	1	
Response refers to textbook and when relevant includes personal experiences or examples.	1	
TOTAL	**5**	

Creating a classroom environment conducive to learning

In developing our lesson plans, we have set the goal of drastically reducing the use of text-heavy PowerPoint slides in favor of images, graphs, and interactive activities. While text-heavy slides are provided with many textbooks and may be a comfort to novice instructors and to students as a guide for studying, they create an environment that does not encourage good studying habits (Winn, 2003). Students today have busy lives and they prefer to download lecture slides and review them for key points rather than read lengthy textbook chapters. Apart from dis-incentivizing the use of the textbook, text-heavy slides also discourage students from writing notes by hand, especially when instructors upload their slides for student use. Writing notes by hand requires students to make decisions about what to write down for later review. The very act of decision-making involves cognitive processing of content and the motor effort of handwriting deepens processing of the material (Mueller & Oppenheimer, 2014). In our experience, even when instructors do not upload their slides for student use, students will use their cell phones to take pictures of the slides as a substitute for taking their own notes or reading the textbook. Moreover, having ready access to an instructor's slides may give students a false sense of security, allowing them to let their attention wander during class as they become distracted by their mobile devices and side conversations. If students believe that all of the critical content needed to do well in the class is on the slides, they will devote their energy to repetitive study of slide content, rather than engaging deeply in learning.

As a substitute for text-heavy PowerPoint lectures, we use demonstrations and interactive activities that have the added bonus of increasing elaborative processing (McCarthy & Anderson, 2000); such active teaching methods are proven to be more effective in supporting student learning than lecturing (Freeman et al., 2014). In what follows, we describe one of the activities we have used in shift the emphasis from delivering content to creating spaces for students to experience concepts, interact with them, and actively engage in applying them.

In a course unit on Learning, we use PowerPoint slides to classically condition students to salivate when they see the word *Pavlov* (adapted from Cogan & Cogan, 1984; see also Powers, 2014). We start by explaining who Ivan Pavlov was and the purpose of his experiments. We hand students a Dixie cup with a tablespoon of dry lemonade powder, and then we play a timed Power Point that alternately flashes the word *Pavlov* on the screen and a cue for students to put lemonade powder on their tongue. After several trials, students start to experience salivation after seeing *Pavlov* flash, even if the cue does not appear and they are instructed NOT to put lemonade powder on their tongue. This brief demonstration allows students to experience classical conditioning in an interactive way that becomes a personal memory for them, and not simply a set of facts to memorize. We give them a self-scored quiz on the components of conditioning, asking them to identify the unconditioned stimulus, conditioned stimulus, unconditioned response and conditioned response in the preceding demonstration. We go over the answers and, to leave a good flavor in their mouths, show a two-minute video of a stand-up comedian (Eddie Izzard) explaining how Pavlov's results might have been different if he had used ornery cats instead of obliging dogs (Izzard, 2007).

By incorporating teaching ideas from conferences, books, and conversations with colleagues into our course planning, we have accumulated multiple interactive activities for each course topic (i.e., textbook chapter). Our success in restructuring what was initially a lecture-based class into active student-centered format was entirely dependent on our sharing ideas and communicating openly with one another. As new instructors, having access to engaging lesson plans is what we have come to value the most, and it is the aspect of our teaching that is most likely to earn us positive student evaluations. Although all of the interactive activities require a bit of planning and some require a small investment in materials, they create memorable moments for student engagement and repay dividends on the initial investments.

Scaffolding the development of professional skills

With more and more jobs today requiring teamwork and the ability to evaluate, condense, and succinctly present information in an appealing, engaging, and convincing way (National Association of Colleges and Employers, 2014; Schwitzer, Gonzalez, & Curl, 2001), we have sought ways of developing professional skills in our Introductory Psychology students. One method we have used capitalizes on the fact that Introductory Psychology students often demonstrate great interest in learning about psychological disorders and other clinical topics. Building on their intrinsic interests, we assign students to work in teams to research one of the psychological disorders described in their textbook and teach their classmates about the disorder through a brief PowerPoint presentation. This assignment provides us with an opportunity to scaffold multiple skills including how to collaborate with peers, how to identify reputable sources, summarize and paraphrase information, how to create a PowerPoint presentation, speak clearly in front of an audience (the class), and answer questions. Notably, these skills are directly relevant to the APA guidelines for the undergraduate psychology major, which encompass goals for

developing students' knowledge base in psychology, scientific inquiry and critical thinking, ethical and social responsibility in a diverse world, communication, and professional development (APA, 2013).

Using a pedagogical technique we call the five-slide model (Dow et al., 2013), we give students a template to follow in organizing information for their presentations, see Figure 1. Structured formats are common in professional environments; for example, psychologists (and psychology majors) must follow the more elaborate, but equally structured, format of APA style in writing research reports. Acclimating students to the use of templates is useful preparation for coursework where assigned papers must follow specified guidelines.

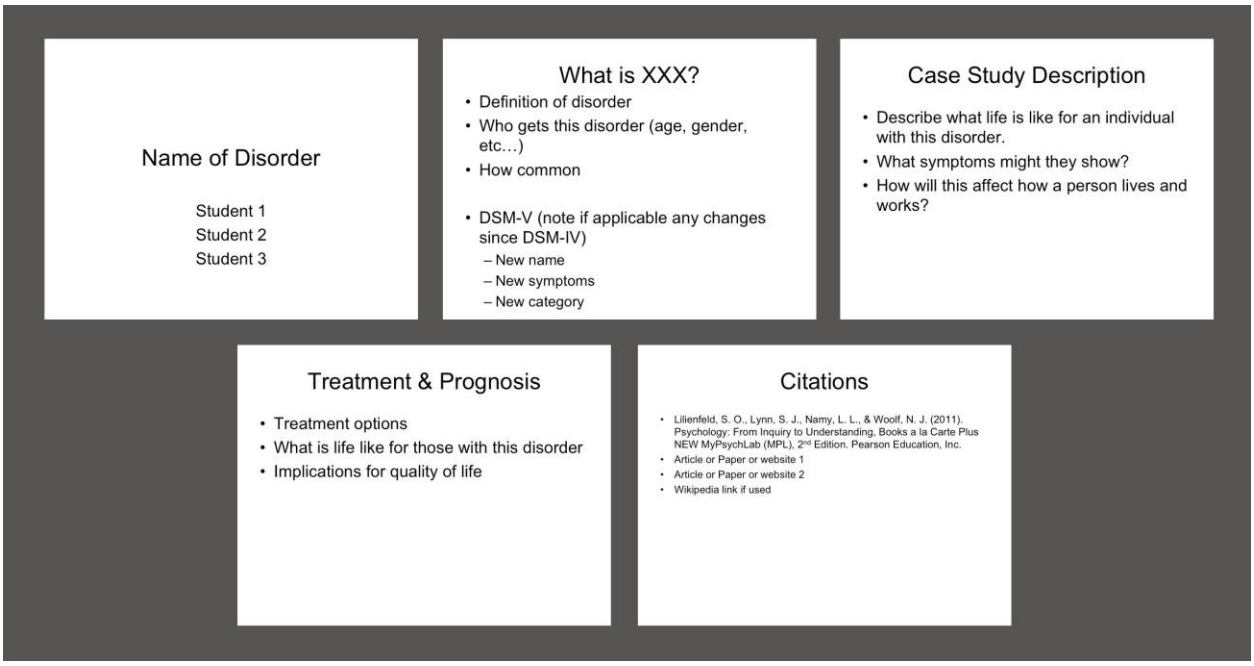

Figure 1. Five-slide model presentation template

Students are arranged in groups of 2 to 3 students (or more in larger classes), assigned a specific disorder from the textbook, and tasked with preparing a 6-minute oral presentation using the template. They are instructed to start with the information provided in the textbook, and use three additional reputable sources, such as websites of professional organizations and primary source materials (accessed via PsycINFO, PubMed, or Google Scholar), to provide diagnostic information, description of a case study, treatment options, and prognosis. When inserting information into the template, students are told they can change the theme, colors, and fonts, but not add or delete slides. Students are required to upload their presentations to Blackboard prior to class, with the order of their presentations dictated by the ordering of the topics in the textbook. Presentations typically span multiple class periods, during weeks 4 and 5 of a 15-week semester.

Table 2. *Sample rubric for grading student presentations on psychological disorders*

	Possible Points	**Received**
PUBLIC SPEAKING		
Each member introduces self	1	
Presentation 6 minutes	1	
Made eye contact / faced class	1	
Did not read slides	1	
Presented additional material not on slides	1	
Speak loud and clear	1	
Able to answer a question	1	
PRESENTATION SLIDES		
Emailed in on time	1	
Template followed (no slides added or deleted)	1	
Title & group member names	1	
Correct Definition/Description	1	
Describe a person with the disorder (what are the symptoms / every person will not have every possible symptom)	1	
Give correct treatment and prognosis	1	
Citations: Included textbook + 2 more	1	
Aesthetic: slides are easy to read, not too much information, no busy backgrounds	1	
Instructor TOTAL	**15**	

Student presentations are evaluated using multiple methods: First, for instructor grades, we use a rubric to evaluate public speaking skills and quality of information on the slides, see Table 2. Note that students are given the rubric in advance to ensure awareness of the grading criteria. Second, we ask students to use the same criteria to compute scores (ranging from 1=poor to 5=excellent) for each group presentation, with space on the evaluation form for justification of scores. Finally, we ask students to score themselves and their partners for their contributions to the group work (ranging from 1=poor to

5=excellent) and to provide comments to justify scores. Overall grades for student presentations are based on the instructor's grade (60%), class scores (20%), self-evaluation (10%), and partner evaluations of contributions (10%). Having implemented this assignment over multiple course sections for several years now, we can attest to the excitement (and fear) that students experience in teaching their peers about psychological disorders, and their motivation and effort to create high quality work.

Using the collaborative course preparation to conduct SoTL research

Collecting data on learning outcomes in relation to specific assignments or topics helps instructors to think about how students learn and how to teach them more effectively. In recent years it has become a key aspect of our collaborative course prep. The practice of collecting course data arose naturally from a desire to evaluate what lessons were effective, and what students liked (and disliked) about the course. Note that getting feedback from students can be as simple as adding a short survey to the bottom of an exam; see Table 3 for an example adapted from Richmond, Boysen, & Gurung (2016).

Table 3. *Sample feedback survey*

Feedback for Your Instructor
Please use this space to reflect on your experience in the course thus far. The purpose of this feedback is to help me (your instructor) make improvements and for you to consider how you are preparing for this course.
1. What is the instructor doing that is helping you to learn?
2. What is the instructor doing that is NOT helping you to learn?
3. What are you, as a student, doing that is helping you to learn?
4. What are you, as a student, doing that is NOT helping you to learn?

Whenever lessons are modified, instructors may disagree about whether the changes are beneficial, and this is where assessment data are especially useful. Intuition is not always the best source of evidence about what works in the classroom, which is why we advocate for evidence-based teaching strategies. As an example, consider our first SoTL project: the "hybrid" study (Powers, Brooks, Galazyn & Donnelly, 2016). This project aimed to measure potential costs versus benefits of teaching Introductory Psychology in a hybrid format, with one-third of class time replaced with online learning modules from a publisher-provided course-pack (MyPsychLab, http://www.pearsonmylabandmastering.com/northamerica/mypsychlab/). Hybrid teaching arose as a response to an enrollment bubble that overtaxed available classroom space. Over three years, our department offered 3-4 sections of Introductory Psychology each semester in hybrid format, almost all of which were taught by graduate students with no prior experience in online teaching. The assessment project was crucial in determining if the hybrid format should be continued in the face of instructor concerns that hybrid teaching was more time-consuming and challenging than traditional teaching and less effective. Pooling data across multiple course sections, we found evidence that many hybrid students failed to complete a substantial amount of their assigned online homework and fared more poorly than traditional students on exams as the semester progressed. These data led the department to abandon the hybrid format once course enrollments had returned to normal levels.

Coincidently, as part of the hybrid initiative, we began developing low-stakes writing assignments on the Blackboard course management system as a means of increasing student participation and fostering deeper processing of course materials (see section above on "Using digital tools to support learning"). Use of the online discussion forum was soon extended beyond the hybrid sections, as it served as a fruitful environment for examining students' critical thinking about a broad range of topics, including their own study habits (Schwartz et al., 2015).

More recently, the graduate students on our team have worked in collaboration with faculty members to assess learning outcomes in other courses, such as Research Methods (Obeid & Hill, in press) and Developmental Psychology (Sawyer et al., 2017). Each of these projects, involving data collection across multiple classrooms and instructors, is made possible only through collaborative course preparation where instructors share lesson plans and then evaluate their impact on student learning outcomes.

How to get started with your own collaborative preparation

In this final section, we offer a couple of suggestions for engaging in collaborative course planning with your colleagues. First, set aside time to brainstorm and build lesson plans with other instructors. As a graduate student or new faculty member, it may be difficult to schedule time to create teaching materials given your other obligations. We have overcome this obstacle by scheduling periodic workshops where we invite friends and colleagues to develop teaching materials with us. In our most recent workshop, we chose the topic of digital technologies and spent two hours working in groups to create materials for our courses. One group used Google Forms to develop a tool for a mate preference survey (adapted from Buss, 2013); this tool allowed students to input their own mate preference data and get immediate feedback on how other students responded to the survey. Another group used Blackboard to create a fully online version of the Tuskegee Syphilis Study role-play activity (see Grose-Fifer, this volume), which several instructors used when a scheduled class meeting coincided with the date of a conference they were attending.

Second, we encourage you to approach collaborate course preparation like a lab meeting, where you bring ideas that are (at least) moderately developed to the group for feedback and engage in discussions about recent research papers to add evidence-based methods to your teaching toolkit. The lab model is especially conducive to developing course assessment or SoTL projects. Note that collaborative planning can extend beyond the confines of the academy; see Weiss and Seplowitz, this volume, for examples of how to collaborate with K-12 instructors in creating experiential learning opportunities for students.

Conclusion

In developing a collaborative course preparation for Introductory Psychology, we have learned a great deal about student-centered pedagogy, such as how to pique students' interests and sustain their engagement with course materials. As a collaborative team, we could divvy up the work of developing learning activities that related more directly to the general education goals of the Introductory Psychology course than PowerPoint lectures focusing exclusively on textbook content. As a result of interactive feedback provided by students and colleagues, we were able to shift instruction away from a lecture-based model to foster critical thinking, communication, and professional development through interactive learning activities. As the Introductory Psychology course continues to evolve to meet our students' needs, we have mechanisms in place to evaluate the outcomes of curricular decisions on student learning and motivation. Collaborating with other instructors using the same basic syllabus and lesson plans has allowed us to conduct valuable SoTL research by pooling data across instructors and

course sections. We hope that our experiences have convinced you to seek out partners to work with in designing your own courses, and to consider the merits of crowdsourcing for teaching and learning.

References

American Psychological Association. (2013). *APA Guidelines for the undergraduate psychology major.* Retrieved from http://www.apa.org/ed/precollege/about/undergraduate-major.aspx

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191

Berry, J. W., & Chew, S. L. (2008). Improving learning through interventions of student-generated questions and concept maps. *Teaching of Psychology, 35*(4), 305-312. doi: 10.1080/00986280802373841

Busler, J. N., Beins, B. C. & Buskist, W. (Eds.) (2014). *Preparing the New Psychology Professoriate: Helping Graduate Students Become Competent Teachers,* 2nd edition. Retrieved from http://teachpsych.org/page-1862898/

Buss, D. (2013). Mate preferences questionnaires. Retrieved from labs.la.utexas.edu/buss/files/2013/02/Mate-Preferences-Questionnaires.doc

Chew, S. [Samford University]. (2011, Aug 16). *How to get the most out of studying.* [Video series]. Retrieved from https://www.samford.edu/departments/academic-success-center/how-to-study

Cogan, D., & Cogan, R. (1984). Classical salivary conditioning: An easy demonstration. *Teaching of Psychology, 11*, 170–171.

Dittrich, L. (2016, August 3). The brain that couldn't remember: The untold story of the fight over the legacy of "H.M."—the patient who revolutionized the science of memory. *The New York Times Magazine.* Retrieved from https://www.nytimes.com/2016/08/07/magazine/the-brain-that-couldnt-remember.html

Dow, E.A.A., Kukucka, J., Galazyn, M., Powers, K. L., & Brooks, P. J. (2013, April). A five-slide model for pedagogy. Symposium presented at the Farmingdale State College 27th Annual Conference on the Undergraduate Teaching of Psychology, Tarrytown, NY.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, 14*(1), 4-58. doi:10.1177/1529100612453266

Dunn, D. S., Halonen, J. S., & Smith, R. A. (Eds.). (2008). *Teaching critical thinking in psychology: A handbook of best practices*. Sussex, UK: John Wiley & Sons.

Elbow, P. (1997). High stakes and low stakes in assigning and responding to writing. *New Directions for Teaching and Learning, 1997*(69), 5-13. doi:10.1002/tl.6901

Fantilli, R. D., & McDougall, D. E. (2009). A study of novice teachers: Challenges and supports in the first years. *Teaching and Teacher Education*, *25*(6), 814-825. doi: 10.1016/j.tate.2009.02.021

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410-8415. doi:10.1073/pnas.1319030111

Green, D. W. (2007). Adjunct faculty and the continuing quest for quality. *New Directions for Community Colleges*, *2007*(140), 29-39. doi:10.1002/cc.302

Gurung, R. A. (2005). How do students really study (and does it matter)? *Teaching of Psychology, 32*(4), 238-240.

Gurung, R. A., Weidert, J., & Jeske, A. (2010). Focusing on how students study. *Journal of the Scholarship of Teaching and Learning, 10*(1), 28-35.

Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist, 53*(4), 449-455. doi: 10.1037/0003-066X.53.4.449

Izzard, E. [azhat]. (2007, Dec 3). Eddie Izzard – Pavlov's cat [Video file]. Retrieved from https://www.youtube.com/watch?v=whwiMrBNWCA

Lortie, D. C. (1966). *Teacher socialization: The Robinson Crusoe model*. In D. Darland & R. Edelfelt (Eds.), *The real world of the beginning teacher* (pp. 54-66). Washington, DC: National Commission on Teacher Education and Professional Standards (ERIC Document Reproduction Service No. ED 030 616)

McCarthy, J. P., & Anderson, L. (2000). Active learning techniques versus traditional teaching styles: Two experiments from history and political science. *Innovative Higher Education, 24*(4), 279-294. doi:10.1023/B:IHIE.0000047415.48495.05

Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard advantages of longhand over laptop note taking. *Psychological Science*, *25*(6), 1159-1168. doi: 10.1177/0956797614524581

National Association of Colleges and Employers (NACE). (2014). The skills/qualities employers want in new college graduate hires. http://www.naceweb.org/about-us/press/class-2015-skills-qualities-employers-want.aspx

Obeid, R., & Hill, D. B. (in press). An intervention designed to reduce plagiarism in a research methods classroom. *Teaching of Psychology.* doi:10.1177/0098628317692620

Pressley, M., Wood, E., Woloshyn, V. E., Martin, V., King, A., & Menke, D. (1992). Encouraging mindful use of prior knowledge: Attempting to construct explanatory answers facilitates learning. *Educational Psychologist, 27*(1), 91-109. doi: 10.1207/s15326985ep2701_7

Powers, K. L. (2014). Learning. In R. A. R. Gurung (Ed.) *Discover Psychology: Instructor's Manual* (digital edition). Champaign, IL: DEF Publishers. Available at: www.nobaproject.com

Powers, K. L., Brooks, P. J., Galazyn, M., & Donnelly, S. (2016). Testing the efficacy of MyPsychLab to replace traditional instruction in a hybrid course. *Psychology, Learning, & Teaching*. doi:10.1177/1475725716636514

Powers, K., Brooks, P. J., McCloskey, D., Sekerina, I. A. & Cohen, F. (2013). Hybrid teaching of psychology. In M. Hamada (Ed.) *E-Learning: New Technology, Applications and Future Trends* (pp. 147-166). Hauppauge, NY: NOVA Science Publishers.

Richmond, A. S., Boysen, G., & Gurung, R. A. R. (2016). *An evidence-based guide to college and university teaching: Developing the model teacher.* New York, NY: Routledge.

Roediger, H. L. (2013). Applying cognitive psychology to education translational educational science. *Psychological Science in the Public Interest, 14*(1), 1-3. doi:10.1177/1529100612454415

Rohrer, D., & Pashler, H. (2010). Recent research on human learning challenges conventional instructional habits. *Educational Researcher, 39*(5), 406-412. doi:10.3102/0013189X10374770

Sawyer, J., Obeid, R., Bublitz, D., Schwartz, A., Shane-Simpson, C., DeNigris, D., … & Brooks, P. (2017, April). Which active learning methods are best? Comparing cooperative learning and writing-to-learn across modalities. Poster presented at the Developmental Science Teaching Institute at the biennial meeting of the *Society for Research in Child Development*, Austin, TX.

Schwartz, A.M., Richmond, A.S., Brooks, P.J. (2015, May). Metacognition vs. memorization: What is an ideal study strategy in Introductory Psychology? Poster presented at the *APS-STP Teaching Institute at the 27th APS Annual Convention*, New York, NY.

Schwartz, B. M., & Gurung, R.A. (Eds.). (2012). *Evidence-based teaching for higher education*. Washington, DC: American Psychological Association. doi: 10.1037/13745-000

Scouller, K. (1998). The influence of assessment method on students' learning approaches: Multiple choice question examination versus assignment essay. *Higher Education, 35*(4), 453-472. doi:10.1023/A:1003196224280

Schwitzer, A. M., Gonzalez, T., & Curl, J. (2001). Preparing students for professional roles by simulating work settings in counselor education courses. *Counselor Education and Supervision, 40*(4), 308-319.

Tishman, S., Jay, E., & Perkins, D. N. (1993). Teaching thinking dispositions: From transmission to enculturation. *Theory into Practice, 32*(3), 147-153. doi: 10.1080/00405849309543590

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Winn, J. (2003). Avoiding death by PowerPoint. *Journal of Professional Issues in Engineering Education and Practice, 129*(3), 115-118. http://dx.doi.org/10.1061/(ASCE)1052-3928(2003)129:3(115)

Wyles, B. A. (1998). Adjunct faculty in the community college: Realities and challenges. *New Directions for Higher Education*, *1998*(104), 89-93. doi:10.1002/he.10409

Chapter 6: Purposeful Pedagogy through Backward Course Design

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Abstract

At some point during your career as an instructor, you may be given the opportunity to develop a new course on your own. It might be a dream course in your area of expertise or it might be a course with less familiar content. In either scenario, you might be unsure about the best way to start planning your course or what to include. Should you first pick a textbook? Should you first develop assessments, such as exams, homework assignments, and papers? Should you first think of a creative course title? In this chapter we recommend that you use backwards course design as a means of purposefully planning your course—first identifying the course objectives and working backwards to design lesson plans that engage students in activities necessary for meeting the objectives.

Introduction

"An understanding of fundamental principles and ideas appears to be the main road to adequate transfer of training. To understand something as a specific instance of a more general case—which is what understanding a more fundamental structure means—is to have learned not only a specific thing but also a model for understanding other things like it that one may encounter" (Bruner, 1960, p. 31).

Teaching should be an intentional, purposeful act. Most instructors have limited time to spend with their students, and they should use the time they have effectively. In this chapter, we encourage you to organizing your teaching efforts by first asking: "What do I want students to take away from this lesson/ activity/class session/course?" Backwards course design forces the instructor to identify the most important goals they have for student learning. It urges instructors to ask themselves, "If my students only remember one thing about this class in ten years, what do I want that to be?" This type of thoughtful questioning leads to sharper, more purposeful planning, which is the goal of the backwards course design perspective (Wiggins, 1998). The backwards course design approach encourages instructors to focus on the "enduring understandings" or "big ideas" that they want students to take away and retain over time, ideally years, after they leave the classroom. According to McTighe and Wiggins (1999), these "enduring understandings provide a larger purpose for learning the targeted content," and ultimately better justify to students the value of studying a particular topic (McTighe & Wiggins, 1999, p. 70). This larger purpose may also help the instructor to focus more on encouraging students' active learning experiences rather than on delivery of content through a passive lecture format.

A primary tenant of backwards course design is to determine course objectives first. In doing this, the role of the instructor shifts from a traditional conveyor of information to a coordinator that engages students. Backward course design also improves assessment through a more directed, thoughtful, and purposeful approach that considers measures of learning in relation to course objectives.

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The Instructor's Role

A backwards course design approach requires instructors to embrace their role as a facilitator in search of knowledge and collaborative understanding. This approach challenges the notion that information is simply transferred from instructor to student. An instructor's role is not so much about "instructing" students through endless content-driven PowerPoint slides, but is instead about responding to and building upon students' interests, abilities, experiences, and quest for knowledge. Instructors that employ backwards course design go beyond the desire to emphasize important terms and facts that students should know (i.e., a focus on memorization and proper use of terms). Instead, instructors encourage "enduring understandings" which embody new insights. Childre and colleagues (2009) provide this example: "A student may know that the tilt of the earth's axis causes the earth's seasons because he memorized this fact. However, he may have no idea how the tilt actually causes the season; if asked to explain his answer, he would be unable to articulate an explanation" (Childre et al., 2009, p. 7). The implementation of a backwards course design approach helps the instructor to support the development of students' critical thinking skills. It encourages instructors to actively promote inquiry-based learning, which has been shown to be more effective than traditional teaching methods that focus on information transfer and transmission (Abdal-Haqq, 1998).

Engaging Students

Not only does backwards course design help instructors to effectively design a course, but backwards course design can also improve student engagement. This approach helps instructors to clearly communicate to students why they were assigned certain tasks and the purpose and value of attending the course. Thinking through the following questions (adapted from Davidovitch, 2013) allows instructors to design a course in a way that shows students what they can expect to learn:

1. What will students know and be able to do by the end of this course?
2. What will serve as evidence of these abilities and understandings?
3. Which materials and methods will support and accomplish these goals?

As an educator passionate about his/her field, we may consider the course topic exciting and worthy of investigation because it is fun and interesting. However, effectively engaging students often takes some careful planning, which means organizing lessons to promote curiosity and deeper engagement with essential topics. If students are only interested in learning simple answers to basic questions, they could simply turn to technology. In the words of many of my students, they could just "Google it" with ease and speed, and quite often they may do so via their mobile devices from the same desk that they are occupying in the classroom. As such, a model that prioritizes the transfer of knowledge no longer seems to work for our students, and yet, our teaching methods still focus on an instructor's ability to transmit knowledge to students in a neatly wrapped package (Cross, 2000; Eberly, Newton, & Wiggins, 2001).

Upon analyzing 145 undergraduate syllabi, Wiggins and McTighe (2001) found that course goals from these syllabi largely involved transfer of information. Course goals that developed critical skills and those that aimed to help students to develop attitudes necessary for coping with changing life circumstances received little-to-no attention. A backwards course design, on the other hand, was shown to be effective in improving students' abilities to identify information and contribute to the development of metacognitive abilities (Thompson & Licklider, 2011). When instructors are designing a course based on

learning outcomes, or course goals, they are planning a learning-centered course versus a more traditional content-centered course.

Student Engagement and Student Diversity

Today, more than ever before, students come from various backgrounds with diverse experiences and skill sets. How can instructors structure courses to make learning relevant to students' varied interests? How can they create coursework that expands students' worldviews? What can instructors do to better integrate course material with students' daily lives? How can they structure learning experiences to build skills that students can use beyond the classroom? How can instructors get students to think critically about what knowledge is and how it is produced?

Of course, there is no one-size-fits-all answer to accomplish these overarching goals. Instructors may want to focus on the value of evidence (especially in an intensive writing course) and facilitate activities that allow students to discover information on their own. For example, instead of lecturing about stereotypes that exist in the media, instructors may ask students to collect a few advertisements from different media sources and hold a dialogue about the similarities (and differences) that exist in popular culture about how certain types of people are portrayed or viewed.

For students to grow, instructors often want to encourage and provide plenty of opportunities for students to develop confidence as learners and critical thinkers (see Fisher, Hunter, Nolan, & Buckner, this volume). To do this successfully, instructors must create opportunities that build upon and integrate students' views about and their experiences in the world by "connect[ing] their prior knowledge and experiences with new information through their own thought processes and through interactions with others and the environment" (Childre, Sands, & Pope, 2009). Simply stated, for learning to be meaningful, it needs to be relevant, and it must allow room for learners to actively construct and acquire knowledge (Rogoff, 1994).

Organizing the day-by-day course lessons is an important part of backwards course design and student engagement. For example, one topic often found in a Psychology of Gender class is gender in the workplace. Instructors may begin a student-focused discussion using brief news coverage and commentary about the recent presidential election, which can encourage student dialogue. Opening up a course topic in this way serves several purposes. First, it provides insight about a student's basic understanding of various elements of gender theory in a political context. Second, it provides students with the opportunity to engage with the course content through material that is familiar to them. Third, it provides the opportunity for the instructor to use information gathered from the discussion and then apply various concepts related to the topic or course. This kind of student engagement encourages students to think critically in a low-stakes fashion. Moreover, instructors are helping students develop "enduring understandings" that they can take with them beyond a specific course (e.g., think critically about news coverage, recognizing social inequalities).

Another way to engage students and retain their interest is by posing questions that pique their interests, recognize their reality, consider their developmental level, and guide their inquiry. These should be "big" questions—questions that are open-ended and cannot be answered in a single meeting, if at all. A good question will serve as a thread that ties multiple lesson topics together. It will guide inquiry and exploration of different topics and content across diverse learning tasks. For instance, instructors can ask students to decide on a controversial social justice issue by choosing a side and

supporting their choice with a theoretical perspective or evidence from scholarly articles or a textbook. Instructors and students should be sure to revisit these questions and reflect on the fact that there are often two sides to every story. A follow-up lesson may include an exercise that stretches students' perspective taking abilities by asking them to take the opposing view and then support their argument. This type of assignment can not only strengthen students' understanding and ability to apply what they learn, but it can also support the development of a critical and thoughtful worldview.

Evidence of Attained Understanding: Assessments

It is important to reiterate that a primary tenant of backwards course design is intentionality or, perhaps more appropriately, 'purposeful pedagogy.' Intentionality in identifying course objectives should directly lead to intentionality in identifying ways to measure obtainment of those objectives. What type of assessments should an instructor use to evaluate learning and "enduring understandings?"

Once learning objectives for a course have been established, it is important to consider the type of assessments that will demonstrate various levels of understanding that instructors intend for students to have by the end of the term. For example, one general course objective might be for students to understand that there are at least two positions (each supported with evidence) for any given issue. How can an instructor measure this? Perhaps this could be assessed through a 50-question, definition-driven multiple-choice-test? Or perhaps it could be assessed through a short writing assignment in the form of a newspaper editorial?

Bloom's Taxonomy is a well-known tool in education that helps instructors formulate objectives and subsequently identify assessments that match those objectives (Bloom, 1956; Krathwohl, 2002). The taxonomy focuses on the cognitive domain with six ordered categories: Remember, Understand, Apply, Analyze, Evaluate, and Create. Bloom later expanded on the cognitive domain and further developed categories in the affective domain and the psychomotor domain (Anderson, Krathwohl, & Bloom, 2001; Krathwohl, 2002). Each category is associated with broad verbs that can, and should be used to develop learning objectives. For example, an objective for a child development course might state: Students will apply the theories of Jean Piaget and Lev Vygotsky to explain developmental processes. Or, an objective for a research methods course might state: Students will design a research project and apply statistical concepts to analyze data and evaluate hypotheses. Using verbs from Bloom's taxonomy will help instructors develop objectives that are measurable.

We understand that making the link between objectives and assessment might be challenging. Assessments can be broken down into two different types of assessment: *formative* and *summative*. Formative assessments inform instructors about the progress that students are making in meeting a specific objective. Formative assessments should be low-stakes for students and are often used as an opportunity for instructors to reflect not only on a student's progress, but also on the effectiveness of an instructor's teaching strategy. Summative assessments, on the other hand, are often used to assess if a student has met a specific objective. Each assessment for a course should be designed with a clear intent and purpose. To achieve this, instructors should use a mix of both formative and summative assessments when developing a course.

Beyond formative and summative assessments, an instructor should consider the specific type of assessment that would best match their course learning objectives. Multiple-choice exams might be a good tool for measuring the first two categories of Blooms taxonomy, Knowledge (Remember) and

Comprehension (Understand). However, a multiple-choice exam might be less appropriate for demonstrating that a student has advanced their analytical skills or that a student can synthesize information. Alternative assessment tools better suited to measure analytical skills might include inviting students to generate solutions for an ill-defined, complex problem or critically evaluate a set of conclusions made by other students in response to an ambiguous situation. We encourage instructors to think outside the box and consider a variety of assessments that maximize opportunities for students to demonstrate that they have met a specific course objective.

It is important that instructors are creative in their assessments and consider using multiple forms of assessment to ascertain understanding and to provide multiple opportunities for growth. It is also important to recognize that some objectives may not fall on a continuum. For example, an objective of a course may be to simply expose students to new forms of technology.

A *single* assessment, no matter how appropriate it is, is unlikely to produce evidence of true understanding. To do this, instructors may want to use a mix of writing assignments (i.e., long and short, formal and informal, low-stakes and high-stakes), formal exams and quizzes (e.g., multiple choice questions, definitions, short-answer), and in- and out-of-class activities (i.e., group and individual). For example, instructors can ask students to identify and apply course concepts to their lives and then have them share some examples in the form of an informal writing assignment explaining how the concept fits. Not only will this type of assignment foster critical thinking in the individual student, but it also allows for collaboration, dialogue, and new discoveries with peers in the classroom. This type of exercise also promotes "on your own learning" that is supported by a backwards course design. Students construct knowledge by making connections between the material and their own life experiences, and in doing so, they develop their own perspectives on issues rather than relying on the instructor's perspective.

For the reasons cited above, course assignments must serve a bigger purpose; they must be designed in such a way that they serve as evidence of emerging and enduring abilities and understandings. Reflecting on course assessments about overarching course goals is an important part of engaging students with course material and making sure that the key messages or practices become long-term take-aways beyond the walls of the classroom. Even with specific instructions or a clear vision in mind, instructors want to provide students with options so students can connect assignments with their unique interests and lives. For example, if an instructor assigns a writing task that requires students to argue both sides of a timely issue (e.g., immigration reform, incarceration, surveillance), it is also important to provide students with a range of topics and be open to accepting suggested topics of interest too. Having options and actively selecting a topic encourages students to invest more in their work and to take ownership of their ideas. Carefully selecting activities for the course based on the course objectives fosters engagement and an active stance toward learning, both of which build confidence and make it more likely that students will learn to think critically on their own.

An Example in Statistics

Backwards course design can be used for a variety of courses, but might be particularly useful for courses that students are more likely to struggle with. For instance, statistics is often a hurdle for psychology students. It is our experience that many students begin the course with a reticence for the content, with some students carrying the trauma they experienced from previous math-related courses. However, statistics is an important and necessary tool for psychological research. A statistics course that

is designed from the course objectives first (as opposed to simply moving through the material) has the potential to improve student outcomes, not only for the course, but also for a student's understanding of psychology as a field.

A first time instructor of statistics might be overwhelmed about where to start in teaching an undergraduate statistics course. That first-time instructor might similarly have memories of a class that was challenging and complicated for them. When teaching a new course, it seems natural to reflect on how the material was taught to you. However, it is important to consider the new developments in the field related to that course. For example, statistical computer programs were not easily or universally accessible to undergraduate students ten years ago. Ergo, this limitation likely limited an instructor's ability to teach statistics using the assistance of computer programs for data analysis and modeling. However, statistical programming such as SPSS or SAS are becoming more common in statistics classes due to changes in access to such programs and the demand for psychology graduates who can successfully navigate these programs.

In addition to changes in the field, it is also important to consider the ever-changing demographics of undergraduate students when identifying course objectives. Traditional college-aged students may have a different purpose for taking a specific course than non-traditional students who are seeking additional credentials, e.g., after spending time in the workforce, military, or raising a family. Hence, it is important for instructors to create course objectives that meet the diverse needs of their students and build on their prior knowledge and experience.

So, what is the purpose of teaching statistics to psychology majors? It is our thought that a primary course objective for psychological statistics is to understand how statistics can be used in psychological research (see also Wilson, this volume). Statistics is a tool for researchers. Once this primary objective is identified, it becomes clear that memorizing equations or working through non-concrete examples might not be the best use of time. Instead, class time might be better spent on helping students to gain a conceptual understanding of why a researcher might use a chi-square analysis to compare an observed value to an expected value. Or time might be spent discussing the difference between the concepts of standard deviation and standard error. Both of these examples focus on common equations found in statistics, and both of these examples can help students understand how statistics may be used in psychological research beyond the classroom environment.

Let's tease out one of these examples a bit further. As a reminder, the broad objective of a hypothetical undergraduate statistics course is to understand how statistics can be used in psychological research. One commonly used statistics test is the chi-square goodness of fit test which is used to find out whether there is a significant difference between the observed and expected frequencies of events. A variety of examples could be used to illustrate the purpose of the chi-square test, with the most common being the coin toss. If we flipped a fair coin 100 times, we would expect that 50 of those flips would end with the heads side up. In our classroom, we could easily conduct a demonstration where we flip a coin 100 times and count the number of observations in which the coin landed heads-side up. For the sake of this example, let's say that we did this demonstration and we observed 55 heads. Theoretically, if it were a fair coin, the number of observations should be near equal to the expected value. So, how do we test to see if it was a fair coin? We use a chi-square goodness of fit test.

Having demonstrated the basic statistic, we can extend the application of the chi-square test to a psychology-related example. In 2009, a research study by Berger replicated the well-known Milgram

obedience study (1963, 1965; Perry, 2013). Berger sought to find out if people today (~50 years after the original research) were more or less likely to be as obedient as they were in the 1960's. In the original obedience study, 82.5% of participants went beyond the 150-volt dial to inflict pain on another person. In the replication study, 70% of participants went beyond the 150-volt dial. To address the research question, "Are people today are as obedient as they were in the 1960's?" one needs to find out whether the two percentages (82.5% and 70%) are significantly different. Having illustrated the chi-square goodness of fit test with the coin-toss example, we can show how the same test would be useful in this context. And, in fact, it was a chi-square analysis that Berger used in the replication study! As a further extension of this example, we can lead students to discuss the social psychological theory of obedience in relation to contemporary issues, such as the use of excessive force in interrogation.

Using research as a context for making sense of statistics shifts the focus away from memorization of equations and tedious calculations. Instead, we emphasize examples in which statistics can be used to answer questions pertaining to psychological phenomena in real life. In accordance with the course objective to understand how statistics can be used in psychological research, we focus on the value and utility of statistical tests to answer questions that appeal to students' interests.

Just as we have provided an example of how to use backwards course design to shift course content, backwards course design can also be used to appropriately identify assessment tools. Again, this is with an understanding that the primary objective of a statistics course in psychology is to understand how statistics can be used in psychological research. The next question is, "How do we measure this understanding?" We can run through the catalog of assessments such as multiple-choice exams, problem-solving questions, short answer questions, and essays, and perhaps pick ones that may or may not be directly related to the course objectives. We may pick an assessment that comes with the textbook, or an assessment that students are more familiar with, or an assessment that is easy to grade. However, picking an assessment that is not directly related to the course objectives is doing a great disservice to our students. Choosing an assessment should be a thoughtful process and should reflect the intentions of the course and the previously identified learning goals.

How can students demonstrate an "understanding" of a topic or phenomenon? According to Bloom's taxonomy (1956), this understanding rests upon knowledge or our ability to remember. Therefore, it might be appropriate first to use assessments that access a student's ability to remember different terms found in psychological statistics. This type of assessment can be low-stakes. For example, at the beginning of a class the instructor might ask students to write down what they remember from the previous class or what they remember from the assignment that was due that day. Understanding or comprehension is found in the second level of Bloom's taxonomy. Measuring a student's understanding of statistics (as it relates to psychology) should include opportunities for students to explain an answer or summarize their process of arriving at a specific answer.

Conclusions

Backwards course design can be used for a variety of courses and for developing curriculum for academic programs or majors. Academic institutions can also scale up this approach for general education coursework that all students are expected to complete. In fact, the state of Maryland has used this approach to design an alternative pathway in mathematics under a grant titled, "First in the World." The First in the World grant is a statewide initiative, coordinated by the University System of Maryland, to develop an objective-based mathematics foundation course that provides an alternative

mathematics pathway to the traditional algebra-calculus sequence in post-secondary education. Using an outcomes-based course design that focuses on quantitative relationships, patterning, algebraic reasoning, functional reasoning, and probabilistic and statistical reasoning (Governor's P-20 Leadership Council, 2016), 23 institutions in Maryland will offer a mathematics course that meets these learning objectives.

Using backwards course design to scale up courses in a department, an institution, or statewide has many advantages. First, instructors have the flexibility to teach in a way that maximizes their strengths as an instructor. Second, instructors gain the flexibility to teach to student successes. Because backwards course design is objective-based, the day-to-day details of a class can be modified to more closely align with the needs of the students. Backwards course design opens up opportunities to move content into a different format, such as flipped classrooms (see Arner, Aldosari, & Morris, this volume). Furthermore, course equivalencies can be more accurately determined for students who wish to transfer between majors, schools, or institutions. For example, two courses with the same title could potentially have similar or vastly different objectives, which can only be compared if clearly stated objectives are listed in course syllabi.

We hope that new instructors walk away from this chapter with an energy to purposefully plan a course by first considering the course objectives, and then in parallel, developing the appropriate student assessments. This purposeful planning changes the role of the instructor and has the potential to improve student learning outcomes.

References

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York, NY: Longman.

Abdal-Haqq, I. (1998). Constructivism in teacher education: Considerations for those who would link practice to theory. ERIC Digest. Retrieved from: http://ericae.net/edo/ed426986.htm on February 25, 2017.

Bloom, B. S. (1956). *Taxonomy of educational objectives. Vol. 1: Cognitive domain.* New York, NY: McKay.

Bruner, J. S. (1960). *The process of education.* New York, NY: Vintage Books.

Burger, J. M. (2009). Replicating Milgram: Would people still obey today? *American Psychologist, 64,* 1-11.

Childre, A., Sands, J. R., & Pope, S. T. (2009). Backward design: Targeting depth of understanding for all learners. *Teaching Exceptional Children*, *41*(5), 6-14.

Cross, K. P. (2000). Cross paper #4: Collaborative learning 101. Mission Viejo, CA: League for Innovation in the Community College. Retrieved from: https://diva.sfsu.edu/bundles/217623/83604/download on February 25, 2017.

Davidovitch, N. (2013). Learning-centered teaching and backward course design-from transferring knowledge to teaching skills. *Journal of International Education Research*, *9*(4), 329-338.

Eberly, M. B., Newton, S. E., & Wiggins, R. A. (2001). The syllabus as a tool for student-centered learning. *The Journal of General Education*, *50*, 56-74.

Governor's P-20 Leadership Council. (2016). Progress on implementing college and career readiness and college completion strategies in Maryland. Retrieved from http://dlslibrary.state.md.us/publications/exec/p-20/ed24-801(m)_2016.pdf on February 25, 2017.

Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. *Theory into practice*, *41*(4), 212-218.

McTighe, J., & Wiggins, G. P. (1999). *Understanding by design handbook*. Alexandria, VA: Association for Supervision and Curriculum Development.

Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology, 67,* 371-378.

Milgram, S. (1965). Some conditions of obedience and disobedience to authority. *Human Relations, 18,* 57-76.

Perry, G. (2013). *Behind the shock machine: The untold story of the notorious Milgram psychology experiments*. New York, NY: The New Press.

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, culture, and activity*, *1*(4), 209-229.

Thompson, J. R., & Licklider, B. L. (2011). Visualizing urban forestry: Using concept maps to assess student performance in a learning-centered classroom. *Journal of Forestry*, *109*(7), 402-408.

Wiggins, G. P. (1998). *Educative assessment: Designing assessments to inform and improve student performance.* San Francisco, CA: Jossey-Bass.

Wiggins, G., & McTighe, J. (2001). What is backward design? In *Understanding by design* (pp. 7-19). Upper Saddle River, NJ: Merrill Prentice Hall.

Chapter 7: Teaching Students Using Evidence-based Learning Strategies through Flipped Classrooms

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Abstract

The traditional classroom paradigm has remained static for decades with the roles of the educator and student firmly established: students in the more passive "receiver" role and professors as the providers of initial instruction. The flipped classroom alters this tradition by inverting the activities that typically occur within the classroom and the activities usually completed outside of the classroom. Flipping the classroom presents a unique opportunity for instructors to incorporate evidence-based practices that can improve student learning outcomes. This chapter introduces the foundations of the flipped classroom, discusses evidence-based practices (feedback, spaced practice, self-explanation, collaborative learning, and practice-testing) that are generalizable across content areas in both formal and informal learning environments, and provides examples of how to implement these practices in the flipped classroom. The strategies included in this chapter have been used to improve learning outcomes within classroom settings, but can be used by students in any learning situation.

Introduction

Traditional university classroom practices follow a consistent model in which content is delivered in the classroom, typically through instructor lectures, and practice takes place outside of the classroom (e.g., homework). Although widely used, this model creates passive learning situations that are associated with lower levels of learning than active learning contexts (Freeman et al., 2014). Recently, this paradigm has been reimagined by "flipping" the traditional model. In a flipped classroom, the learning activities that previously took place in the classroom (e.g., lectures) occur outside of class and the usual 'homework' activities happen in the classroom. The premise of the flipped model is that instructors can add more value by facilitating learning in activities, projects, and discussions rather than in simply delivering content, which can be viewed outside of class (e.g., via online lectures). This change creates active learning situations in which students collaborate, get support, and think deeply about the content while the instructor facilitates the learning process.

The flipped classroom, originally coined by high school chemistry teachers Jonathan Bergmann and Aaron Sams, inverts the traditional lecture and homework (Tucker, 2012). In the traditional classroom model, students receive initial direct instruction in the classroom, listening to a lecturer and taking notes on what they interpret to be both correct and important content. Students then engage in activities outside of the classroom to extend this knowledge often by practicing key skills (e.g., calculating means). The flipped model involves students preparing at home with instructor provided content and then returning to class ready to interact with peers in collaborative learning groups. The value of this model is that the use of instructor provided materials allows for annotation or signaling of salient concepts in the lecture ensuring that students focus on the key learning objectives during initial instruction. The time

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invested in developing content for students to view at home is repaid with the amount of time teachers spend in the classroom advancing difficult concepts, clearing up misconceptions, and interacting with individual students who are rewarded with improved learning outcomes and deep understanding of concepts.

The flipped model briefly described above has several key features that simplify integration of the evidence-based practices described below. The first, mentioned above, is that initial instruction now occurs outside of the classroom. Learning content can be text or multimedia and may be created by the instructor or curated through content developed by experts in the field (Berrett, 2012). University faculty provide content on iTunes U™ or YouTube™ channels such as Khan Academy™ that can be organized for students' out of class learning (Schmidt & Ralph, 2016). Given the ubiquitous nature of technology, the use of curated multimedia content may streamline the flipping process, but regardless of the delivery method, initial learning occurs outside the classroom. Technology-based content can be engaging and can provide measures of accountability in ways that textbooks can not when used in the flipped classroom. For example, interactive videos can provide feedback to students as well as data to instructors on which students have watched the complete video, when they watched it, and how well they answered embedded questions (Abeysekera & Dawson, 2014; Schmidt & Ralph, 2016).

Second, there is some element of required student interaction with the content. This may be free-form notes, guided notes or even the use of an interactive video with embedded questions that provides immediate feedback for students and guides the teacher's instructional focus during the following class period. When selecting activities for students to complete at home, it is important to consider the learning objective and how the students can best interact with the activity (Schmidt & Ralph, 2016; Strayer, 2012). Students return to class the next day with a summary, self-explanation of the concept, or a discussion question that they will share with the class or discuss with their collaborative learning group. The instructor is able to review students' understanding of the concept during discussions to determine where misconceptions lie and additional instruction is needed. Successfully flipped classrooms make use of effective, evidence-based practices that promote learning through strategies that students can use in any learning situation, formal or informal (Abeysekera & Dawson, 2014; Schmidt & Ralph, 2016; Strayer, 2012).

The flipped classroom model described in this chapter involves more than just recording yourself lecturing and then sharing the video with students without guidance or direction. The consideration of how to create high-quality instructional materials that will promote student learning is essential in the implementation of the flipped classroom (Strayer, 2012). Educators now have more tools to facilitate learning in a flipped environment than ever before. Technology has evolved since its introduction to the classroom; it is less expensive, easier to use, and more readily available for students and teachers. The use of such technologies for learning also has a strong research base from which to draw the most effective strategies for design and implementation. Mayer (2008) suggests that educators must consider both the science of learning and the science of instruction.

The direct instruction materials that students view at home are frequently multimedia products, where students learn from both images and spoken words. While multimedia content is not a required element, it can increase engagement and facilitate some of the evidence-based practices discussed below. Multimedia content provides some unique affordances that are not possible through traditional instruction or plain text. Video-based lectures facilitate the incorporation of images and sounds in

addition to the instructor's speech. These additional features serve to highlight salient concepts and to aid in development of visual representations of the concept (Clark & Mayer, 2011). Multimedia lectures can be further enhanced with embedded questions and pauses for self-explanation and reflection as a means to refresh students' attentional focus, aid in learning, and assess understanding.

There are three primary considerations for effective multimedia instruction (Mayer, 2008). First, create materials that allow students to process both visual and verbal content simultaneously. For example, include a labeled picture of the brain with the general title, brain. This strategy helps students develop a visual representation connecting the title to the complex structure of the whole brain. Second, students have limited capacity for both verbal and visual materials so keep the amount of simultaneously presented material to a minimum as working memory is limited in both capacity and duration (Mayer 2008; Wong, Leahy, Marcus & Sweller, 2012). Using the example above, don't present the image and titles of multiple brain structures at the same time as a narrative description. While combined word and image are effective for developing visual representations, too many simultaneous structures will overwhelm the working memory of the learner. Third, active processing is required for deep learning (Clark & Mayer, 2011; Mayer, 2008). For example, students who passively read a statement will retain less than students who create a self-explanation or explain the concept to their peers. Therefore, it is beneficial to include an activity in the instruction that requires students to engage with what they have been presented to facilitate knowledge construction (Mayer, 2008). One example would be to have students describe the functions attributed to the first region of the brain being reviewed (Clark & Mayer, 2011; Mayer, 2008).

Mayer (2008) suggests five evidence-based principles in the science of instruction: coherence, signaling, the redundancy principle, spatial contiguity, and temporal contiguity. These principles can increase the effectiveness of multimedia instruction while minimizing extraneous processing demands. The first of these is coherence, which involves reducing the amount of extraneous material presented. Extraneous material can reduce the already limited capacity of either channel (i.e., visual or verbal) and make it difficult for students to grasp the main point of a lesson. As in the previous example, an instructor should make sure that the only information presented at one time is related to the brain structure being learned. Additionally, instructors should avoid adding non-essential text or images that may draw focus away from the important material. Second, signal essential content. This is easily done with current technology through text or graphic annotation or other simple methods such as a reflection pause. Instructors should use a clear indicator, such as an arrow, to point out which areas of the brain are responsible for memory. Third, the redundancy principle addresses the simultaneous use of on-screen images or video, written, and oral content. This principle suggests that presented content should consist of image and narration or image and written text, but should not have image, narration, and written text. It becomes overwhelming for students to read a lot of text while also viewing content with motion and sound (narration). Students are only able to process one stimulus in each of the visual and verbal channels, so students reading text, listening to narration, and watching an image or animation can overwhelm the verbal channel (Clark & Mayer, 2011; Mayer, 2008). For example, present students with an image of a dog salivating over a prospective treat with a buzzer and a short text description of classical conditioning. Alternatively, one might narrate Pavlov's theory while students have images of the subject and stimulus used in the experiments demonstrating the theory. Finally, the last two principles concern contiguity. Spatial contiguity refers to the placing of printed words next to the corresponding graphic or image. Temporal contiguity refers to presenting narration at the same time as

corresponding image or animation when the animation does not have its own soundtrack. For example, the label and symbol for mean should be displayed at the same time as the procedure itself so that students can identify each element in the operation. It becomes taxing for students to maintain the formula while searching for the descriptive text or waiting to hear it described at a later time. Additionally, including narration describing the steps of a mathematical procedure, such as calculating a mean exam score at the same time as the procedure is demonstrated on screen has a large, positive effect on learning (Mayer, 2008). Instructors taking these principles into account when designing instructional content are likely to see more effective student learning.

Next, we will discuss five evidence-based practices that can augment learning in the flipped classroom: feedback, spaced practice, self-explanation, collaborative learning groups, and practice testing (see Table 1 at the end of this chapter for a summary). Each practice will include a description of the practice, evidence supporting its use and a description of how it can be implemented in the flipped classroom.

Implementing Flipped Classrooms with Evidence-based Practices

Feedback.

Feedback is one of the easiest evidence-based practices to implement in the flipped classroom and can be one of the most effective; however, it is also one of the most underutilized (Hattie, 2009). Feedback is information about a person's performance or their understanding provided by some agent such as a teacher, peer, self, or content such as an interactive video (Hattie & Timperley, 2007). The purpose of feedback is to decrease the gap between student performance and the learning goal. In order for feedback to be effective, it should answer one of three questions: 1) Where am I going? (the goal); 2) How am I doing? (progress); 3) Where to next? (move on or remediate; Hattie & Timperley, 2007). Additionally, each of these guiding feedback questions can be evaluated at four different levels. The task level identifies how well a task was performed or understood. The process level addresses the understanding of the processes necessary to complete the task. The self-regulation level includes self-monitoring and regulation activities such as directing attention to the goal and detecting errors in the task or process. Finally, feedback can be addressed at the self-level. This is feedback directed at the learner themselves, such as comments on attitude or behavior. Caution should be exercised in the type and content of feedback at the self-level as it can negatively impact the self-efficacy of the learner and it is less effective than feedback at the task, process, and self-regulation levels (Hattie, 2009).

Feedback generated through the use of technology can be particularly effective for a number of reasons. First, technology can provide the instructor data from student responses when using tools like online formative assessments, instructional simulations, and interactive videos. The data will reflect the most common mistakes students made, allowing the teacher to pinpoint misconceptions and re-teach concepts during the next class period. Additionally, some technologies can provide the learner with immediate feedback on whether or not they used the correct strategy or procedure or understood key concepts. The student directed feedback may be at the task level (correct or incorrect response), process level (steps of a procedure) or self-regulation level (time on task), all of which can benefit student learning (Hattie, 2009).

Commonly used technologies in the flipped classroom that provide feedback to teacher and student include instructional simulation, interactive video, and audio/video-based direct instruction. Simulations used for instruction are computer-based applications that replicate real-world situations or procedures. These simulations for instruction provide immediate feedback while allowing students to manipulate

pre-determined variables in a safe and sustainable environment without risk of harm and with a freedom to fail repeatedly. Instructional simulations have been found to be most effective when the simulations provide immediate task-related feedback (Rutten, van Joolingen & van der Veen, 2012), when students are provided feedback through instructional support such as worked examples (Yaman, Nerdel, & Bayrhuber, 2008), and when students are agents of their own learning (Smetana & Bell, 2012). In Hattie's (2009) review of nine meta-analyses on simulations in the classroom, feedback showed a moderate effect size of *d* = 0.33, with studies included in these meta-analyses finding benefits of feedback in simulations on achievement, retention, and attitude (Hattie, 2009).

Interactive video refers to videos that have been edited to include annotated signals of salient content (e.g., pop-ups), prompts for self-explanation, or question-response opportunities used to check for understanding and provide feedback for the student and data for the teacher. A review of six meta-analyses for a total of 441 studies showed that the use of interactive video is a highly effective tool for learning with an effect size of *d* = 0.52 (Hattie, 2009). This evidence suggests that multimedia learning materials following Mayer's (2008) principles of design are more effective for student learning than a simple video recording of a teacher-centered lecture. Nevertheless, Hattie (2009) found that audio/video teacher-led instruction (lecture) that did not include learner interaction or specific feedback had an effect of d = 0.22. While less effective than the other computer-based learning opportunities that do provide feedback, well-designed recorded lectures can have a positive effect on learning and may be the simplest introduction to flipping the classroom.

Hattie (2009) also notes that while the research on feedback points to its effectiveness in helping students to engage with content, develop appropriate strategies, and understand concepts, it is more effective for teachers to provide elaborative feedback for novel declarative concepts rather than correct/incorrect feedback. Additionally, Fyfe and Rittle-Johnson (2016) found varying effects of feedback for learners with moderate to high prior knowledge. Students who had no prior knowledge in mathematical equivalence strategies benefitted from immediate confirmatory/disconfirmatory feedback regarding their strategy choice. However, students with at least moderate prior knowledge of equivalence problem-solving strategies had a negative effect from feedback whether it was immediately following each trial or at the end of the trial. Finally, timing is an important factor in feedback. Feedback in the traditional classroom model is often a "red check" indicating that a homework response is incorrect, sometimes long after the concept has been completed. Feedback is more effective when provided soon after the task is completed (Hattie, 2009). These results suggest that when feedback is correctly matched with concept and learner knowledge level, it can be very valuable for student learning. In addition to improving student learning outcomes, it is also one of the easiest strategies to implement in the flipped classroom.

Feedback in the flipped classroom. The quickest way to flip the classroom—moving initial instruction to home and interactive learning activities to the classroom—is to videotape yourself lecturing. Recording your lecture can be done with something as simple as a phone camera or laptop webcam. Lectures can also be captured with relatively inexpensive digital cameras mounted on a tripod. Students can access the lecture through a learning management system (Blackboard™, Moodle™) website (Google Sites™ Weebly™), or cloud sharing service (Google Drive™, Dropbox™), but this does not mean that feedback has to be excluded. Feedback can still be an effective part of this technique with planning and the use of additional tools like Google Forms™, Survey Monkey™, or similar quiz generation tools. These tools serve as a template for teachers to create content-specific questions for students to answer as part of

the at-home activity. Students get immediate feedback and teachers get the data on students' correct and incorrect responses. Additionally, teachers provide feedback during the interactions that occur in the next class period. Students' summaries, questions, and discussion should be reviewed and analyzed for process, strategy use, and transfer as part of the teacher-to-student interaction. Students also receive feedback during peer interactions in collaborative learning groups.

Instructors do not have to use content they have created themselves; they may choose to adapt instructional content created by others to gain feedback. For example, teachers can find and use instructional simulations or videos that were created by other educators or experts in the field. One source of simulations for statistics is the University of Colorado at Boulder, the home of PhET simulations (https://phet.colorado.edu/). Simbrain (http://www.simbrain.net) is another example of an instructional simulation where students can design and analyze neural networks. The student-paced, trial and error nature of the simulations provides immediate feedback for each interaction. Introducing interactive video into the flipped classroom can be easily accomplished with one's own video or with video shared publicly by others. Teachers can upload the video they choose to tools like EdPuzzle™ or PlayPosit™. These applications allow the addition of questions, pauses for self-explanations, and annotations to cue significant content. These examples demonstrate some options to combine an educator's recorded lecture and technology to maximize the effectiveness of good instruction, feedback, and signaling, leading to higher-quality collaborative learning during the next class period.

Spaced Practice. Practice is repeated engagement or rehearsal related to a learning goal (Dunlosky et al., 2013). Interestingly, not all kinds of practice are equally beneficial. Spaced practice is when learning events are distributed across time and massed practice is when learning events are presented to participants in immediate succession (Vlach & Sandhofer, 2012). In general, long-term memory for previously learned information is enhanced on a spaced learning schedule, compared to a massed schedule (Vlach & Sandhofer, 2012). For instance, in one study, subjects were taught random trivia facts, either in a massed schedule or with varying degrees of time between each presentation (spaced schedule). For example, one question was, ''What European nation consumes the most spicy Mexican food?'' (Answer: ''Norway''). After a delay, subjects were asked to answer the trivia questions. Results showed that the subjects' performance was higher for items that were presented on a spaced schedule than for items that were presented on a massed schedule, suggesting that memory was strengthened when learning events were spaced in time (Cepeda, Vul, Rohrer, Wixted, & Pashler, 2008).

In addition, spaced practice facilitates generalization, which is the ability to apply the knowledge of a concept or a situation to a new context (Vlach & Sandhofer, 2012). In a study by Kornell and Bjork (2008), participants were presented with different paintings by relatively obscure artists on either a massed (immediate succession) or spaced (18 seconds between presentations) schedule. After a 15-second delay, participants were exposed to unfamiliar paintings by the same artists and asked to generalize an artist's style with the unfamiliar paintings. Participants who were presented with paintings on a spaced schedule proved to be more accurate in generalizing a painter's style than participants who were presented with paintings on a massed schedule, showing that spaced presentations facilitated generalization more than massed presentations. Also, Vlach & Sandhofer (2012) found that spaced practice enhances the acquisition and generalization of educational concepts. In this study, children between the ages of five and seven were presented with science lessons related to the food chain and were randomly assigned to one of three learning schedules: massed, clumped, or spaced. Children in the spaced schedule group were given one science lesson per day for four successive days. Children in the

massed schedule group were given four science lessons in immediate succession on the same day. In the clumped schedule group, two science lessons were presented to the children in immediate succession, on day one, and two lessons in immediate succession, on day two. A pretest was given to all of the children before the experiment and a posttest was given a week after the last lesson. The results indicated that children's performance in generalizing both simple and complex concepts was higher in the spaced schedule group than all of the other groups.

These results indicate that not only does spaced practice promote memory for specific items, but spaced practice also supports generalization for both simple and complex concepts. When generalizing information from one situation to another by using spaced practice, the learner is required to find common features across the learning events, such as visual characteristics of a painter's style (Kornell & Bjork, 2008). Moreover, in spaced practice, there is a time gap between learning presentations, allowing learners to disremember unrelated information. Because related features are likely to be present across learning presentations then reactivated in memory, they are more likely to be remembered. In contrast, perceptual characteristics for specific learning events are more likely to be forgotten with repeated practice, while the abstract features (i.e., those occurring across events) are likely to be recalled. The repeated reactivation of relevant features promotes generalization. In massed practice, relevant and irrelevant features are reactivated at the same rates, reducing the likelihood of extracting salient, abstract properties (Vlach & Sandhofer, 2012).

Spaced Practice in the flipped classroom. A key feature of the flipped classroom model discussed in this chapter includes initial interaction with new material at home and then a return to the classroom to again, interact with the material alongside peers. The retrieval and discussion of content introduced the night before is considered spaced practice. Evidence suggests that the key to effective spaced practice is that the learner has the opportunity to forget the irrelevant details between retrieval opportunities (Vlach & Sandhofer, 2012). For example, students who study one subject, then another, and then return to the first subject have spaced their practice. However, instructors are in the unique position to facilitate retrieval of prior concepts over a period of days using in-class discussion and activities. For example, the instructor may have students watch the Khan Academy™ video of Bandura's observational learning experiment using the Bobo doll and children as the initial instruction taking place at home. The following class period, the instructor may have the collaborative learning groups (discussed below) explain what observational learning is and how it applies to, the previously taught, social learning theory. The students are then retrieving what they saw in the video about observational learning and retrieving a prior lesson on learning theory. Spacing the retrieval of these concepts strengthens the pathways so that subsequent retrieval is faster and schema are developed between the concepts.

Self-explanation. Self-explanation takes place when students explain some part of their cognitive processing during learning to themselves, such as the concept, the procedure, and the solution that supports new information being linked to prior knowledge (Dunlosky et al., 2013). Self-explanation activities aid learning through the generation effect in which learners generate their *own* explanations rather than simply using an existing explanation (Lee & Anderson, 2013). In a study, students were prompted to solve physics problems on an intelligent tutoring system. Students alternated between solving problems and studying examples for three problem cycles. While the students were studying the examples, they were prompted to either self-explain or paraphrase. The results revealed that students who were prompted to generate their explanations for examples showed greater learning gains than those who were prompted to paraphrase provided explanations (Hausmann & Van Lehn, 2007).

Self-explanation is effective for elementary, middle, high school, and college students and across a range of tasks and content domains, as it helps to promote both near- and far-transfer (Dunlosky et al., 2013). Self-explanation has also been shown to improve learning in non-simulated educational contexts. In one study, students in a teacher-education program studied how to develop example problems to use in their classrooms by learning examples of both well designed (problem formulation + solution steps + final solution) and poorly designed (missing one or more elements) example problems in a computer program (Schworm & Renkl, 2006). During each trial, students in the self-explanation group were asked to explain why one of two examples was more effective than the other. Meanwhile, students in the control group were not asked to self-explain. After an immediate test, in which students selected and developed example problems, the self-explanation group outperformed the control group in the creation of well-designed example problems including the problem formulation, solution steps, and final solution.

Self-explanation in the flipped classroom. One key feature in the flipped classroom model is that it requires students to interact with the new content in some way, providing a perfect opportunity to integrate self-explanation. Teachers should include specific prompts in the instructional materials where students will process the content and then write an explanation. Self-explanations should be required for the concepts that students frequently struggle with due to their complexity or common misconceptions. Students can write a self-explanation and submit it through email, cloud-based document sharing (e.g., Google Drive™, Dropbox™, Box™), or an online learning management system (e.g., Blackboard™, Moodle™). A required submission is an accountability measure, but more importantly, it facilitates students' processing of the new content and tying it to prior knowledge. The teacher reviews the explanations, looking for clarity and accuracy, indicating whether the student understands the content. The students' self-explanations provide opportunities for feedback and should guide the teacher's instruction to address errors and misconceptions in the next class period.

Collaborative Learning. Collaborative learning is when students work together in a small group in order to solve a problem or complete a task (Prince, 2004). Students interact with their peers in such a way that both peers provide explanations of their individual understandings of the same topic. During collaboration, students discuss, ask, and answer each other's questions, build and elaborate on each other's contributions, and argue and critique each other on the same point or topic while the instructor assumes the role of facilitator. The instructor guides the discourse to lead students to a deeper understanding of the content and its implications by asking questions, giving hints, or starting steps. The instructor may also clear up any misconceptions and provide other corrective feedback to the students (Chi, 2009). This kind of activity is constructive, because the learners are generating knowledge that goes beyond the information given by the learning materials and activates deeper knowledge concerning the implications and applications of the information provided (Chi, 2009).

Peer contributions to the collaborative learning group can be a form of new information, corrective feedback, a hint, and/or scaffolding (Abeysekera & Dawson, 2014). These contributions can yield various benefits to each individual student: they can enrich a learner's knowledge, advise the learner to pursue a new line of reasoning, explore other perspectives, challenge the learner with a deeper question, and remind the learner of previously considered ideas. These examples illustrate the various ways in which interactions with peers can contribute to learning (Chi, 2009).

Additionally, Chi (2009) found that interactive learning activities were better than passive, active, and constructive learning activities for achieving deeper understanding. Several studies on collaborative learning reveal more learning advantages when these methods are compared with individual learning. One study compared reading fluency, comprehension strategies, and content test scores between two groups; one group of learners who participated in reciprocal peer tutoring (interactive activity) and another group of learners who participated in filling out guided notes, consisting of fill-in-the-blank, matching, vocabulary, and short-answer items (active activity) during a lecture. The results indicated that the interactive peer tutoring group performed better than the group filling in guided notes on content-area assessments (Mastropieri, Scruggs, Spencer, & Fontana, 2003). A second study compared how students learned from explaining to a peer versus explaining to no one after studying a text passage about the eye. Students in the first group were asked to explain information to their peer group beyond what was stated in the text passage, to answer their peers' questions, and to help their peers to understand the concepts (interactive activity). Students in the second group were asked to present a lesson that would be recorded and shown to another student later to help the other student learn from the participant's explanations of the text passage (constructive activity). The students who explained the content to a peer outperformed the students who did not explain the content to peers (Roscoe & Chi, 2007). As evidenced in these examples, interactive activities in collaborative groups, in which peers are giving and providing feedback and reciprocal instruction, are more effective than constructive and active activities.

Collaborative learning in the flipped classroom. Many flipped models incorporate some type of collaborative learning whether it is whole class discussion or peer-tutoring in pairs or small groups. The model discussed in this chapter specifically identifies the use of small groups of three to four students who will work together to solve problems or clarify concepts. Traditional homework models include problems that were simply repeated practice of the exact concept or procedure demonstrated in class. The flipped model allows the instructor to introduce concepts in class that require deeper thinking. The tasks that teachers select for collaborative groups should be based on the trends identified in the students' self-explanations. For example, if students frequently misidentified the difference between behaviorist and constructivist theories, then the teacher should include scenarios where the students have to identify which learning theory is depicted and why. The actual structure of student interactions can vary. One method is to give each student a different scenario in which they find the solution and teach their peers. Another method is to give each group one scenario to discuss, which they will subsequently teach to the class. The important factor for the success of the interaction is that both roles (instructor and learner) are experienced by every student and the interaction is authentic. It is less effective for learning if students observe the group or interact without a partner (Chi, 2009).

Practice testing. Students are more likely to view testing as an undesirable requirement of education, preferring to take as few tests as possible. Practice testing, engaging the process of remembering material (retrieval from memory), has been shown to enhance long-term retention of that material. So, when students are tested on material in an actual test and successfully recall it, they will retrieve the material better in the future than if students had not been previously tested. Thus, the act of retrieval in and of itself is a powerful way to improve learning (Karpicke, 2012).

Tests that enhance learning are either low-stakes retrieval practice, no-stakes practice, or any type of practice testing which students can engage in on their own. Practice testing activities could be free-recall, paper or virtual flashcards, or practice tests from supplemental curriculum materials (Dunlosky et

al., 2013). Students should approach the practice test with the same start-to-finish method as a for-stakes exam; however, the no-stakes nature of the retrieval has significant benefit to subsequent retrievals. The positive effects of this kind of testing have been shown across an impressive range of practice-test formats, kinds of material, different learner ages, outcome measures, and retention intervals (Dunlosky et al., 2013). Practice testing enhances learning and retention. In a recent study, undergraduate students were asked to read two prose passages and then recall the passage under one of three conditions: studying the passages three times and completing one free recall test without feedback, studying the passages one time and then taking a free recall test three times without feedback, or restudying the passage four times for five minutes each (Roediger & Karpicke, 2006). Students were tested after two minutes, five minutes, or one week later to see how much information they could remember in the long term. The results revealed that restudying improved recall of the material compared to repeated testing when the final test was given after five minutes. Results on the delayed tests suggest that the more times the students practiced retrieving, the more material they retained in the long term.

Additionally, studies have shown the effects of practice testing on summative course assessments that take place within real educational contexts. In one study, undergraduate students enrolled in an online course could earn extra course points every week by completing an online practice activity up to four times (McDaniel, Wildman, & Anderson, 2012). During these activities, students were quizzed on core target concepts under one of three conditions: practice testing with feedback condition (short answer/multiple choice quiz question), reading the target fact condition, and no additional exposure to the target fact condition. Students responded to the short-answer questions by typing in their answer. Students selected one of four possible answers on multiple choice questions. Feedback about the correct answer became available immediately following the first submission of a quiz. For the fact-reading condition, students responded to each item by clicking, "I have read the above statement." Later exams involved new questions, along with questions that had been presented during the practice tests. The results indicated that grades on exams were superior for information that had been practice tested than for restudied information or unpracticed information.

One concern that instructors may argue about using testing as a teaching and learning strategy is that it may promote rote learning, however, practice testing improves rote learning *and* meaningful, long-term learning. In a study that investigated the effect of retrieval practice on students' learning of undergraduate-level science concepts, students were asked to study a science text and were then divided into one of four conditions: a study once condition, a repeated study condition (students studied the text four additional times), concept mapping condition (students produced a map of the concepts in the text), and retrieval practice condition (free recall of the text). One week later, students were tested on short answer questions that could be answered verbatim from the text or required inferences from the text. Results showed that students in the retrieval practice condition produced better performance on both types of questions than students in the other groups (Karpicke & Blunt, 2011). In sum, evidence shows that practice testing is an effective strategy that enhances meaningful learning and retention in a laboratory and in real educational contexts.

Practice testing in the flipped classroom. Practice testing in the flipped classroom can be student-centered or teacher-centered, digital or analog, and in or out of the classroom. In student-centered practice testing, students are given opportunities to test themselves using tools like flashcards, repeating practice until none are missed, or practice-tests provided by the teacher. In teacher-centered

practice testing, quizzing is initiated by the teacher, typically in class. There are three important considerations when planning practice testing opportunities (Dunlosky et al., 2013). First, the practice test should be authentic, designed, and approached like an actual, for-stakes test. Second, students should be retrieving the same content that they will need on a for-stakes test. Finally, practice tests should be low- or no-stakes to benefit from retrieval practice while eliminating or at least minimizing any possible test anxiety. Tests that have stakes are not practice. Returning to our previous examples, teachers may choose to create a 25-question summative practice exam that takes the entire class period and covers all the learning theories that have been covered in the last four weeks. During the next class period after the practice exam, the teacher should review all of the problems and focus on addressing misconceptions that are revealed. Teachers may also choose to use a formative "knowledge check" each week that only asks questions that were covered during the last week. This style is shorter and more focused but still gives students the opportunity to retrieve content and provides data to the teacher on student understanding.

Whether teachers choose digital or analog test, delivery is less important than meeting the criteria of a practice testing situation. However, teachers may want to use technology for rapid feedback, availability of data, and increased efficiency. Some examples of technologies that teachers can use to create a summative style practice test are Google Forms™, Survey Monkey™, or assessment tools in a learning management system. Socrative™ and Formative™ are applications that work well for a formative-style practice test taken on student mobile devices. Quizizz™ and Kahoot™ are game-based practice testing applications with similar features to those mentioned above, but add an element of fun and competition while students strengthen knowledge retrieval pathways. Teachers can prepare any of these assessments ahead of time and reuse them over and over with slight modifications based on the needs of their current student population.

Conclusion

The flipped classroom provides an opportunity to create engaging, active learning contexts. Effective student learning in the flipped classroom model can be supported by these evidence-based practices that have been evaluated across multiple disciplines and from primary to post-secondary education. The evidence base clearly indicates the value of these learning strategies, yet students rarely utilize them without specific incorporation into classroom practice by the instructor. Indeed, students frequently use strategies that are less effective for learning such as re-reading and cramming the night before a test, even when they doubt their effectiveness (Dunlosky et al., 2013). Introducing students to new learning strategies in the flipped classroom and their personal evidence of success can lead students to generalize these strategies throughout their educational career. Although students can implement all of the learning strategies reviewed here independently, they will need to practice them in order to clearly identify the benefits of their use. The ubiquitous nature of technology and the increase in technology-based tools further simplifies independent strategy use once students have experienced personal success with their use.

Table 1. *Activities and Practices included in the flipped classroom*

Activity or Practice	Description	Tool or Source
Content curation	The accumulation of instructional content used for initial instruction.	Khan Academy™ iTunes U™ YouTube™
Lecture creation	Recording yourself or colleague providing direct instruction	Smartphone camera Computer web cam Digital SLR camera Camtasia™ Screencast-o-matic™ EdPuzzle™
Content sharing	Location where students can access instructional content or submit evidence of content engagement	Learning Management System-Blackboard™, Moodle™, Google-Sites™, Drive™, Classroom™ Dropbox™, Box™ Email
Feedback	Information about one's performance from some agent; instructor, peer, content, or self	Instructor response Peer interaction Interactive video
Spaced practice	Repeated engagement or rehearsal of a learning goal spaced in time	Home instruction/class interaction Repeated retrieval in multiple class periods
Self-explanation	Written or verbal elaboration of a concept to oneself	Guided notes Interactive video Quizlet™
Collaborative learning	Reciprocal instructor student interaction between peers	Classroom learning groups, peer-tutoring
Practice testing	Low- or no- stakes tests requiring content retrieval	Socrative™ Formative™ Quizizz™ Google Forms™ Survey Monkey™ Paper exam

References

Abeysekera, L., & Dawson, P. (2014). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development, 34*(1), 1-14. doi:10.1080/07294360.2014.934336

Berrett, D. (2012, February 19). How 'flipping' the classroom can improve the traditional lecture. Retrieved from http://www.chronicle.com/article/How-Flipping-the-Classroom/130857

Cepeda, N. J., Vul, E., Rohrer, D., Wixted, J. T., & Pashler, H. (2008). Spacing effects in learning: A temporal ridgeline of optimal retention. *Psychological Science, 19*(11), 1095-1102. doi:10.1111/j.1467-9280.2008.02209.x

Chi, M. T. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science, 1*(1), 73-105. doi:10.1111/j.1756-8765.2008.01005.x

Clark, R. C., & Mayer, R. E. (2011). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (3rd ed.). San Francisco, CA: Pfeiffer.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, 14*(1), 4-58. doi:10.1177/1529100612453266

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410-8415.

Fyfe, E. R., & Rittle-Johnson, B. (2016). Feedback both helps and hinders learning: The causal role of prior knowledge. *Journal of Educational Psychology, 108*(1), 82. doi: 10.1037/edu0000053

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81-112. doi:10.3102/003465430298487

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement.* London: Routledge.

Hausmann, R. G., & Vanlehn, K. (2007). Explaining self-explaining: A contrast between content and generation. *Frontiers in Artificial Intelligence and Applications, 158*, 417.

Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning than elaborative studying with concept mapping. *Science, 331*(6018), 772-775. doi:10.1126/science.1199327

Kornell, N., & Bjork, R. A. (2008). Learning concepts and categories is spacing the “enemy of induction”? *Psychological Science, 19*(6), 585-592. doi:10.1111/j.1467-9280.2008.02127.x

Lee, H. S., & Anderson, J. R. (2013). Student learning: What has instruction got to do with it?. *Annual review of psychology, 64*, 445-469. doi:10.1146/annurev-psych-113011-143833

Mastropieri, M. A., Scruggs, T. E., Spencer, V., & Fontana, J. (2003). Promoting success in high school world history: Peer tutoring versus guided notes. *Learning Disabilities Research and Practice, 18*(1), 52-65. doi:10.1111/1540-5826.00057

Mayer, R. E. (2008). Applying the science of learning: Evidence-based principles for the design of multimedia instruction. *American Psychologist, 63*(8), 760-769. doi:10.1037/0003-066x.63.8.760

McDaniel, M. A., Wildman, K. M., & Anderson, J. L. (2012). Using quizzes to enhance summative-assessment performance in a web-based class: An experimental study. *Journal of Applied Research in Memory and Cognition, 1(*1), 18-26. doi: 10.1016/j.jarmac.2011.10.001

PhET: Free online physics, chemistry, biology, earth science and math simulations. (n.d.). Retrieved from https://phet.colorado.edu/

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*(3), 223-231. doi:10.1002/j.2168-9830.2004.tb00809.x

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science, 17*(3), 249-255. doi: 10.1111/j.1467-9280.2006.01693.x

Roscoe, R. D., & Chi, M. T. (2008). Tutor learning: The role of explaining and responding to questions. *Instructional Science, 36*(4), 321-350. doi:10.1007/s11251-007-9034-5

Rutten, N., van Joolingen, W. R., & van der Veen, J. T. (2012). The learning effects of computer simulations in science education. *Computers & Education, 58*(1), 136-153. doi:10.1016/j.compedu.2011.07.017

Schmidt, S. M. P., & Ralph, D. L. (2015). The flipped classroom: A twist on teaching. *Contemporary Issues in Education Research, 9*(200348548), 1–6.

Schworm, S., & Renkl, A. (2006). Computer-supported example-based learning: When instructional explanations reduce self-explanations. *Computers & Education, 46*(4), 426-445. doi:10.1016/j.compedu.2004.08.011

Simbrain. (n.d.). Retrieved from http://www.simbrain.net/

Smetana, L. K., & Bell, R. L. (2012). Computer Simulations to Support Science Instruction and Learning: A critical review of the literature. *International Journal of Science Education, 34*(9), 1337-1370. doi:10.1080/09500693.2011.605182

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*(2), 171–193. doi:10.1007/s10984-012-9108-4

Tucker, B. (2012). The Flipped Classroom. *Education Next, 12*(1), 82-83. Retrieved November 15, 2016.

Vlach, H. A., & Sandhofer, C. M. (2012). Distributing Learning Over Time: The Spacing Effect in Children's Acquisition and Generalization of Science Concepts. *Child Development, 83*(4), 1137-1144. doi:10.1111/j.1467-8624.2012.01781.x

Wong, A., Leahy, W., Marcus, N., & Sweller, J. (2012). Cognitive load theory, the transient information effect and e-learning. *Learning and Instruction, 22*(6), 449-457. doi:10.1016/j.learninstruc.2012.05.004

Yaman, M., Nerdel, C., & Bayrhuber, H. (2008). The effects of instructional support and learner interests when learning using computer simulations. *Computers and Education, 51*(4), 1784-1794. doi:10.1016/j.compedu.2008.05.009

Chapter 8: Achieving Total Student Participation in Today's Diverse College Classes

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Abstract

This chapter aims to provide an overview of practical methods for achieving total participation in today's college-level psychology classroom. In preparing instruction for students of diverse backgrounds, abilities, and interests, we recommend that instructors frequently incorporate participation activities, such as those described in this chapter. These engaging activities may facilitate better learning outcomes for students by creating lessons that are dynamic and responsive to students' learning needs. Fostering student participation can also help support the personal and professional development of students, such as building skills for communication and teamwork, and thus aligns instruction with the learning goals of the undergraduate psychology major. The use of classroom participation techniques, therefore, is not only practical, but even necessary for effective teaching and learning.

Introduction

In this chapter, we discuss instructional methods designed to achieve total student participation that make the most of the diversity of students' experiences, strengths, and ideas. We will describe how total participation methods can help build students' critical thinking skills, provide opportunities to continuously assess students' formative knowledge, and allow instructors to flexibly adapt to the needs of students in the classroom. The classroom, in essence, becomes a laboratory where students formulate and test their own theories by way of discussion and interaction, and subsequently modify those theories as needed in light of new perspectives and insights. Similarly, instructors can continually test and adjust their pedagogical methods. In such an environment, each member of the class assumes ownership of the learning that takes place. Therefore, total participation techniques can be a method for promoting and optimizing learning in a diverse classroom.

Why is Total Participation Important?

To meet the needs of a diverse student body, it is necessary that instructors consider the different experiences, skills, and interests of their students. On the first day, students naturally enter the classroom possessing different experiences and background knowledge, which may impact learning outcomes (Thompson & Zamboanga, 2003). Though it may seem challenging for instructors to meet diverse learning needs, studies have indicated that students' experiences with peers of diverse backgrounds during their first year of college often have positive effects on them, enhancing students' intellectual engagement and development of academic skills (Gurin, Dey, Hurtado, & Gurin, 2002). In light of these differences in students' background experiences or requisite skills, participation techniques can help create a forum that supports communication through the mutual discovery of new knowledge and furthers the cognitive development of all learners.

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The total participation techniques discussed in this chapter are aimed at facilitating more active and student-centered instruction. Student-centered instruction refers to a wide variety of learning experiences, instructional approaches, and support strategies that are designed to address distinct learning needs, backgrounds, interests, and aspirations of individual students (Landrum, 1999). According to Lea, Stephenson and Troy (2003), student-centered instruction includes the reliance on active rather than passive learning, an emphasis on deep learning and understanding, increased responsibility and accountability on the part of the student, an increased sense of autonomy in the learner, an interdependence and mutual respect between teacher and learner, and a reflective approach to the teaching and learning process. Student-centered approaches are generally based on constructivist educational philosophies and shift the emphasis from the transmission of information to active construction of knowledge (Greene, 2015). In a student-centered environment, the primary role of the instructor therefore is not to convey information, but to support students' learning by providing meaningful experiences, monitoring students' learning, and providing appropriate support to make learning more accessible.

Through active participation strategies, students are provided opportunities to reflect on what has been presented and to engage in higher-order thinking processes such as the analysis or evaluation of information that are essential for meaningful learning (Bloom, 1956; Lea, et al., 2003). In addition, participation methods that encourage students to actively organize information in a manner that is self-referential appear to be highly effective for long-term memory retention (Klein & Kihlstrom, 1986). In contrast, evidence suggests that approaches to learning that focus primarily on passive learning activities result in a surface understanding of the material. Activities that rely on rote memorization, such as copying notes or highlighting text, are typically considered passive learning activities, as they do not cognitively engage students in the rigorous process of integrating new information into an existing knowledge structure (Craik & Lockhart, 1972; Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). Instead, when instructors use an approach that is focused on deep-level processing, students are more likely to comprehend information, retain it, and apply it in the future (Cherney, 2008; Hovelynck, 2003; Nilson, 2010).

Active student participation is also associated with increases in students' motivation to learn and engage with the material (Skinner & Belmont, 1993). Participatory activities provide opportunities for students to work collaboratively, helping each other to foster co-regulatory learning processes that improve comprehension monitoring and the transformation of one another's knowledge (Underwood & Wald, 1995). Through participatory activities, students work with peers, pursue their own interests, and contribute to classroom learning, thus satisfying the internal needs of relatedness, autonomy, and competence, leading students to become more motivated, engaged, and confident in their process of learning (Ryan & Deci, 2000).

Instructional methods that promote student participation are also invaluable as opportunities for formative assessment. Formative assessments include a range of formal and informal assessments that may be conducted by instructors concurrently with learning, and can be used to modify teaching and learning for the benefit of students. Such assessment procedures allow instructors to modify teaching and learning activities to achieve improved learning outcomes (Hattie & Timperley, 2007). In a diverse classroom, formative assessments can serve as a tool for helping students to become better self-regulated learners, which can help to close the discrepancy between what students know and what students are expected to know (Nicol & Macfarlane-Dick, 2006; Zimmerman, 1989). Such assessment

procedures can easily be integrated into instruction by using low-stakes writing prompts, posing questions, facilitating discussion forums, creating assignments that allow students to display their work, and generally acknowledging students' ideas and providing constructive feedback without fear of critique or a bad grade.

Total participation techniques are an important instructional tool for educators who wish to create a more inclusive and student-centered learning environment. Such techniques help instructors to achieve multiple aims by encouraging a deeper level of cognitive engagement with the material, motivating students to learn, and providing a means to quickly assess students' knowledge and flexibly adapt instruction to meet learning objectives. Incorporating total participation techniques into instruction makes it possible for all learners to have opportunities to master course content. In the sections that follow, we discuss and provide recommendations for using different total participation techniques.

Strategies for Total Participation

Instructional practices aimed at increasing student participation and engagement generally involve a variety of techniques that are self-paced or cooperative. Such strategies include the use of critical or creative thinking exercises, guided discussions, reflective writing exercises, and simulations and role-plays. In this next section, we briefly describe aspects of instructional strategies for total student participation, provide examples, and explain how these strategies can improve the quality of teaching and learning in a diverse classroom.

Strategies for Building Rapport with Students

A fundamental, yet potentially overlooked, method for increasing student participation involves working to establish positive and respectful relationships with students. Research using student evaluations has indicated that instructors' rapport with students and students' level of engagement are two important factors that predict high ratings of instructors (Filak & Sheldon, 2003; Richmond, Berglund, Epelbaum, & Klein, 2015). Research also indicates that instructors who demonstrate behaviors that support students' autonomy tend to be rated more positively by students and produce greater gains in learning outcomes. Instructors with such an autonomy-supportive style of teaching tend to exhibit a distinctive and effective motivational style in their teaching, which includes positive conversational behaviors, respectful interpersonal conduct, and attempts to support students as they become more intrinsically motivated to learn content (Reeve, Bolt, & Cai, 1999). In addition to impacting students' attitudes about learning, instructors' own attitudes towards pedagogy appear to significantly influence students' learning outcomes. Some research indicates that teachers with more constructivist and student-centered views of pedagogy tended to produce greater gains in learning outcomes for students (Kunter et al., 2013). These and other findings suggest that the simplest and most effective way to increase student participation by making a more engaging and inclusive classroom begins with adjusting one's attitudes about teaching, while focusing on behaviors that build good rapport with students.

The think-aloud procedure, which is sometimes used in qualitative research to gauge a participant's reasoning about a topic or task (Koro-Ljungberg, Douglas, McNeill, Therriault, & Malcolm, 2012), can also be used as an effective demonstrative technique for teaching. Since an important part of teaching involves figuring out how students make sense of certain topics, encouraging students to become conscious of their own learning process may be an important first step towards resolving any potential misconceptions about a topic, particularly when it involves some form of problem-solving (Meyer, 1993). Instructors can demonstrate a think-aloud procedure by verbally expressing responses to

prompts such as, '*What am I thinking now?', 'How am I going to proceed from here?', and 'What am I deciding at this point based on evidence?*' to demonstrate effective patterns of reasoning to students.

Remembering and using students' names is another way to build rapport with students and create an environment that is more supportive of communication (Benjamin, 1991; Gleason, 1986). A simple method for using students' names regardless of class size involves having students write their names on index cards that they keep in front of them during each class session. During the session, students can write questions or comments that they might not have been comfortable making in the class. At the beginning of each class session, the students pick up the index cards, and at the end of each session, instructors collect the cards. This way the cards can also serve as a communication device, as well as a method of keeping attendance. The index cards can alternatively be held by the instructor and used to randomly select a student to answer a question and to keep track of which students have already participated, helping to ensure that discussions are not dominated by only a few students.

Instructors have considerable control over the amount and quality of student participation that occurs during instructional time. They can set the stage for participation by modifying their behaviors to include more frequent eye-contact, use appropriate self-disclosure in the form of think-alouds, respond to students' questions promptly and respectfully, provide positive feedback, attempt to know students' names and build rapport, and engage in a positive manner with students (Cornelius-White, 2007).

Facilitating Whole-Class Discussion

While many instructors recognize the value of student participation in class discussions, instructors may find that the same few students continue to regularly participate, while most of the class remains silent (Karp & Yoels, 1976). To increase student participation in whole-class discussions, it is necessary to find methods of reducing students' natural resistance to speaking in front of the class.

One valuable strategy for facilitating classroom discussion and increasing the frequency of student participation is the use of extended wait time (Rowe, 1986; Tobin, 1987). Studies with classrooms ranging from elementary to college have found that, on average, teachers wait only one second for students to respond after asking a question and follow up with their response or the next question after one second or less. By extending wait-time to 3 seconds, research suggests that students are more likely to provide an answer, to elaborate on their answer, and to support their inferences with logical arguments. Students are also more likely to listen to one another as evidenced by more interactions between students and greater coherence in the discussion (Rowe, 1986). Research findings, however, suggest that this relationship between wait time and achievement is complex, with some findings indicating that extended wait-times beyond 6 seconds can actually reduce achievement (Duell, 1994). It is also important to consider how wait time is structured, as students may respond better to higher-order thinking questions when instructed to write down their answers or discuss the question with a peer (Larson & Lovelace, 2013).

In addition to extending wait time, the frequency and type of questions that instructors ask, as well as how they respond to students' questions and comments, has been shown to influence the extent and quality of student participation in class discussions (Duell, 1994; Larson & Lovelace, 2013; Nunn, 1996). In an observational study of twenty college classrooms, Nunn (1996) found that participation varied significantly between classes and was highly dependent on the instructor's behavior and teaching practice. When instructors asked more questions and praised students or encouraged them to

elaborate, more students participated and the amount of time spent on active participation was greater. Another study examining the types of questions asked in college classes found that the questions asked were mainly low-level questions (Larson & Lovelace, 2013). Though some instructors may be reluctant to use more difficult or higher-order questions as they may fear fewer responses, the study found that when instructors asked higher-level questions, students were just as likely to respond. Based on these findings, instructors may be able to promote more active participation and critical thinking by asking a small number of carefully constructed higher-order questions and making sure students have sufficient time to think through the questions. Facilitating whole class discussion may be a challenging undertaking, but with these few simple practices it is possible to increase the level and quality of student participation in whole class discussions.

Comprehension Checks

The implementation of total participation activities can vary depending on the objective of a lesson. During some portions of instructional time, it may be most practical to use a traditional lesson format, such as when an instructor introduces a new topic or conveys factual information. Even so, a traditional lesson format can be infused with opportunities for student participation. For example, incorporating topic review questions into the lesson can be used by instructors to quickly check students' comprehension of the content, while providing students with an opportunity to also apply their knowledge and self-assess it.

Review questions may be especially useful for topics where a substantial amount of factual information has been learned. Some studies suggest that the inclusion of review questions is more effective for rehearsing knowledge for factual questions as opposed to application questions (Gurman, Holliman, & Camperell, 1988). Factual questions often assume the form of verbal fill-in-the-blank or questions about identifying or defining words and concepts. Application questions involve more higher-order thinking and tend to address more abstract concerns such as causal relationships within a system. For application-type questions, the use of the four-question technique may be especially useful. According to this technique, students are introduced to new content and then are given a set of prompts to successively analyze, reflect, relate, and question the material (Dietz-Uhler & Lanter, 2009). Using this technique, the first question is designed to facilitate students' analysis of the material itself (e.g., *Identify one important concept, research finding, theory, or idea in psychology that you learned while completing this activity*). The second question then encourages students to reflect on the activity itself (e.g., *Why do you believe that this concept, research finding, theory, or idea in psychology is important?*). The third question encourages students to meaningfully relate the material to their own experiences (e.g., *Apply what you have learned from this activity to some aspect of your life*). Finally, the fourth question instructs students to continue to question the knowledge gained from the activity (e.g., *What question(s) has the activity raised for you? or What are you still wondering about?*). The use of this technique has been linked with gains in students' understanding and memory of the material (Dietz-Uhler & Lanter, 2009) and is a simple technique for facilitating learning through participation.

Other techniques for integrating comprehension questions into instruction include the use of materials such as index cards. Index cards can be used in a variety of ways to increase participation, including allowing students to quickly jot down responses to review prompts given to them during class and exchanging with nearby classmates to share their responses. Colored index cards can also be used by students to silently vote on viable responses to true/false questions presented during class. For example, students who raise a green index card when completing this task are indicating that they

believe a statement to be true, whereas students who raise a red index card are indicating that they believe a statement to be false. Unlike hand-raising, the visibility of the index cards encourages all students to vote simultaneously, without experiencing the apparent anxiety or peer pressure that sometimes results in the reluctant slow-hand raise or a non-response. This can also serve as a quick and effective way for instructors to gauge students' understanding of a topic without diverting from the topic of discussion.

Questions that are more inferential in nature may require some form of application, and brief opportunities for discussion with nearby classmates provide such opportunities to engage and critically contemplate an issue. The "think-pair-share" technique can fulfill this objective. Using this method, instructors provide students a review question or prompt that elicits critical thinking. Students are then given a moment to consider the question and start formulating a response to it. After a brief period of time (1-2 minutes at most), students then turn to a nearby classmate and discuss their thoughts on the issue. The extended time to deliberate on a topic, discuss it one-on-one, and consider it in light of their peers' considerations is brief and efficient, allowing each member of the class a chance to participate. This technique can be used to promote cooperative learning, which has been shown to not only foster an understanding of the topic, but also support students as they develop good skills for listening and argumentation (Butler, Phillmann, & Smart, 2001; Jakoubek, 1995; King, 1993; 1995). By promoting cooperative learning, instructors can ensure that each student has an opportunity to participate and learn from peers. For more on participation techniques, see Panjwani & Cipollina, this volume.

Opportunities for Low-Stakes Writing and Problem Solving

In-class writing can be used not only as a means of assessing student' knowledge, but also as a way of transforming it. Approaches that focus more specifically on student participation and learning through writing include the use of low-stakes practice questions and reflective writing exercises that require students to use critical and creative thinking (Wade, 1995). Such activities are often referred to as "low-stakes" because they have no direct bearing on students' summative progress or grades in the course. When students learn to feel more comfortable in fluidly conveying their knowledge of a topic, they may also become more consciously aware of misconceptions or logical fallacies that they implicitly hold. Participation in low-stakes writing activities provides opportunities for students to self-reflect and expand upon their own knowledge.

The benefits of such writing-to-learn activities have been noted in numerous research studies. In a study designed to examine the effects of low-stakes writing on students' performance on written exams, researchers found that students performed better on writing assessments that were on topics which they had previously written about in the form of a low-stakes writing prompt (Drabick, Weisberg, Paul, & Bubier, 2007). In this particular study, students in a psychology course were either instructed to write freely on a topic for 5 minutes or to think about the topic for the same length of time. The topics that students were instructed to either write or think about focused on expressing opinions about controversies in the field, applying content to everyday experiences, or identifying and selecting a position following a presentation of competing viewpoints. The results indicated that students who had been given instruction to write about the topic generally performed better on tests of their knowledge than students who had been given instruction just to think about it. In another study, similar results were found even when the type of writing assignment changed. Students were instructed to write according to a specific type of assignment (e.g., reflective or generic writing) and topic (e.g., student selected from specified list or were assigned topics from list). The results of the study indicated that

students generally perform better when retested on topics that they had previously selected to write reflectively about (Nevid, Pastva, & McClelland, 2012). These findings suggest that if writing is to be used as a summative assessment tool, then more frequent, ungraded writing assignments should be given with constructive feedback provided to students, giving them more experience in writing about a certain topic.

Another form of low-stakes writing that can be highly effective is the use of the "exit ticket." Within the last few minutes of a class session, students are given a writing prompt that is directly relevant to something discussed in class. Before leaving, students turn in their exit ticket response, which may be returned to them at the beginning of the following class with notes or feedback (Francis, 2012). Alternatively, the instructor can choose exemplary responses to read aloud, serving both as a review of the previous class and a way of meaningfully transitioning to a new topic. In addition to these forms of low-stakes, independent writing, findings from research suggest that incorporating writing into activities such as collaborative writing and peer-led review can also prove beneficial for students' learning by promoting students' appreciation for the creation, presentation, and reception of different ideas (Dunn, 1996). These findings underscore the importance of allowing students to engage actively in the process of learning by participating and communicating through multiple mediums.

Cooperative Learning Methods

While using the methods previously described can increase participation, structured cooperative learning methods can further ensure that all students actively participate in classroom discussions and provide additional opportunities for critical thinking (Benjamin, 1991; Cooper, 1995; Johnson & Johnson, 2009). The following section will discuss how to use two methods of cooperative learning: jigsaw (Aronson, 2002; The Jigsaw Classroom, 2017) and reciprocal peer questioning (King, 1990). While the jigsaw method helps to structure students' roles in discussion so all students' participation is necessary and valued, reciprocal peer questioning is a method of structuring students' questioning that promotes elaboration on newly learned concepts and encourages every student to participate and actively construct meaning.

The jigsaw method is based on the idea of group interdependence. The name of the method is derived from the fact that each member of the group has a unique piece of knowledge and must rely upon other group members in order to complete the bigger picture (Aronson, 2002). In the jigsaw method, students are first divided into groups with each member of the group given a different section of the material to learn. After having a chance to review the material, the students then join an experts group where they prepare a presentation on the material they studied. Students subsequently return to their original groups and present the information back to their group members. Fellow group members are encouraged to ask questions and gain clarification. Generally, a group leader is chosen to keep the group on task while the teacher circulates between groups. Afterwards, students then take a quiz on all of the information to further test their knowledge.

The jigsaw method, as a cooperative learning technique, has been successfully used in undergraduate psychology classes. Crone and Portillo (2013) adapted the jigsaw method for use in a cognitive psychology classroom. They found that this method increased students' belief in themselves as scholars, as well as their own communication skills and ability to teach others. An adaptation of the jigsaw method can also be used for the preparation of group projects. Carroll (1986) used a modification of the jigsaw method to have students work together in preparing and executing projects in a psychological

research methods class. The students were each given four separate tasks for designing a sample experiment, and students would then execute the experiment and write up the report as a team. After completing the sample experiment, each student individually had to design a research project. The results indicated that the jigsaw method significantly increased the percentage of students who successfully passed the class.

A variation on the jigsaw technique called the "reverse jigsaw" has also been successfully applied to the undergraduate psychology classroom (Hedeen, 2003). In the reverse jigsaw method, the primary goal is to help students appreciate various interpretations and perspectives rather than merely understand the material as presented by the instructor. The method is reversed in that the expert groups meet only after presentations have been made. In the reverse jigsaw method, each student individually prepares their presentation and presents their assigned topic to their group members who provide feedback. The groups are then rearranged into the expert groups where students share the opinions and reactions that they received from their original group members. Finally, one student from each expert group is chosen to report to the entire class on the discussion. Zhan and Georgia (2011) conducted a study of the reverse jigsaw method in a developmental psychology course and found that students were not only more active, but also found the activity more interesting than traditional lesson formats.

Reciprocal peer questioning is another method of empirically validated cooperative learning for college students (Gillies, 2003; King 1990). This technique gives students question stems or generic questions to be used to generate two or three thought-provoking questions on the topic. Question stems included such statements as, "*Explain why...", "What do you think would happen if...?" and "What is the difference between ... and …?*". Students are then divided into groups to take turns asking and answering the questions. To evaluate this instructional method, King (1990) conducted two studies incorporating the teaching method into university education courses. The first study compared the use of such guided question prompts to an unguided peer discussion condition, in which students were simply told to discuss the material in pairs. In the second study, the researcher compared guided and unguided peer questioning. Unlike the guided condition, where students were instructed to question each other using a set of prompts, students in the unguided condition were not provided the question stems, but were simply given instructions to ask one another questions. These studies found that providing students with guidance through the use of question stems resulted in more critical thinking questions, more elaboration in students' responses, and better comprehension of course material than the no guidance conditions. Cooperative learning methods can be a beneficial tool in undergraduate psychology classes, as they improve students' interest in the topic and provide opportunities for students to build communication and interpersonal skills.

Role Play

Role play is yet another valuable tool that instructors can use to fully engage all members of the class. In role play activities, students engage with their peers by taking on different character identities and perspectives. This challenges students to take on a perspective that may be different than their own, pushing students to reflect on their thought process, which is often considered a necessary requisite for conceptual change. For an example of how to use role play to promote understanding of research ethics, see Grose-Fifer, this volume. This lesson is effective because it compels students to consider controversial issues by building students' ethical reasoning and understanding rather than simply listing and recalling ethical standards for research. As an activity, it can be structured for total participation in either small or large classes and involves students in both cooperative group work and whole class

discussion. Alternatively, role play can address issues of research ethics by having students play members of an ethical review board (Herzog, 1990).

DeNeve and Heppner (1997) used role play as a regular feature of an industrial psychology course. Each week students were given the role of one of the members of the board of directors of a company. The instructor assumed the role of the industrial psychologist. Each week the board discussed a different issue depending on the content covered in class that week. They followed up with an evaluation from students who almost universally found the activity interesting and recommended the use of role play in other courses. Students were also given an open-ended question to test their recall of information covered in a class and in the role play each week. The results indicated that students recalled a significantly greater amount of information learned during the role play than during the class alone. These findings suggest that the use of role play can meaningfully promote student participation, provide opportunities for critical thinking, and improve student learning outcomes.

Suggestions for Participatory Demonstrations

One activity that incorporates a number of the participation strategies discussed in this chapter is the "Smarties and Dum-Dums" activity (Lewandowski, 2003). The lesson begins by handing students a piece of candy that is either a "Smarties" candy roll or "Dum-Dums" lollipop. The students are then asked to use red and green index cards to answer a series of trick questions that they are told will test their intelligence. The number of correct answers for students who have been handed a "Smarties" roll or a "Dum-Dums" lollipop are then compared, with false conclusions drawn about a causal relationship between receiving a type of candy and supposed scores on this made-up assessment of intelligence. This activity can be used as a starting point for a discussion about intelligence as a construct, including what constitutes a valid measure of a construct, and what makes a good experiment for evaluating a construct. The activity is an engaging method for exploring issues of internal validity, but can also serve as a springboard for discussions about how a psychological construct as complex as intelligence is not unidimensional. Further, the activity allows students to reflect on their understanding of intelligence. This is important as studies have shown that students who believe that intelligence is fixed and unchangeable may become fearful of failure when engaging in a challenging academic task, but when students believe that their intelligence can grow and change, they are more likely to remain motivated even in the face of failures and set-backs (Dweck, 2000). Therefore, this activity provides an opportunity to teach concepts pertaining to mindset that potentially transform students' thinking about their own academic trajectories. For a deeper discussion on the essential role of motivation in the learning process and techniques for enhancing student motivation through learning environment modifications, see Whiteman and Ochakovskaya, this volume, and Gurung, this volume.

Another activity designed to help students build critical thinking and scientific reasoning skills is the "Dr. Kohlberg Goes to Washington" activity (Richmond, Fleck, Heath, Broussard, & Skarda, 2015; Shapiro, 1995). The activity, as designed by Shapiro (1995), presents students with arguments from a congressional debate on a controversial issue. The instructors present students with a set of arguments from the debate containing two arguments that exemplify the reasoning at each stage of moral development according to Kohlberg's theory (1963). Students in small groups are then instructed to identify the level of moral reasoning in each argument and to justify their answer. Richmond and colleagues (2015) further developed this activity, structuring it as a cooperative learning inquiry activity. The activity can also be used with the jigsaw method, where each student in a group is asked to present on a different comment, or can be done as a think-pair-share with students comparing their answers

with a peer. These activities require students to actively engage with the material while encouraging them to evaluate the ethical reasoning of others, thus supporting students as they develop their own reasoning skills.

Use of Technology to Increase Participation

The use of educational technologies, such as digital games and online or mobile apps that create a more active and participatory classroom, can also improve student learning outcomes (Diliberto-Macaluso & Hughes, 2016). Some research suggests that many of the same factors that make participation activities effective as tools for in-person instruction, can be effective in online learning contexts as well. Ke and Kwak (2013) studied learner satisfaction in online courses and found that five essential constructs related to student-centered instruction were consistently strong predictors of students' self-reported satisfaction with the online course. These five constructs include learner relevance, active learning, authentic learning, learner autonomy, and computer technology competence (Ke & Kwak, 2013).

When the option is available to students and instructors, the use of clickers can be an effective way to increase student participation. Comparing the benefits of clickers to index cards (a technique mentioned earlier in this chapter), researchers found that both approaches had similar benefits on learning gains. One study found that there were no noted differences in outcomes between the two conditions in regards to test performance and self-report feelings of anxiety; students in the study unanimously reported a preference for clickers over index cards, possibly because it allowed them to submit responses anonymously (Fallon & Forrest, 2011). Other forms of technology that can easily be integrated into classes include the use of online and mobile student response systems that support instant polling and low-stakes quizzes (Pemberton, Borrego, & Cohen, 2006). You might also consider incorporating online and web-enhanced instruction beyond the classroom by using online discussion forums on course websites or content management systems. Incorporating technology in regular instruction, while certainly not a requisite for quality teaching (Christopherson, 2011), is increasingly viewed as a norm of instruction in today's college classroom and has the potential to promote learning when the importance of interactions and participation between members of the class is emphasized (Newlin & Wang, 2002).

Additional Considerations: Rearranging the Classroom

In addition to choosing strategies to increase student participation, instructors may find that other factors, such as the physical arrangement of the classroom, can be changed to optimize student engagement. Studies have shown that students are conscious of the classroom layout and how it affects their behaviors, and that it can indeed influence student achievement (Holliman & Anderson, 1986). Several dimensions of a classroom layout appear to influence students' engagement and learning. Among these are the shape and size of the classroom, the seating arrangement (either close or far from the instructor) and furniture arrangement (either fixed or movable), as well as the technology available in the classroom (Lei, 2010). Since the physical lay-out can be a potential hindrance or advantage to student participation, it may be helpful to either rearrange the room or modify the activity in light of a fixed classroom set-up. For example, if a classroom naturally invites seating in small groups, it should be feasible to have frequent small-group discussions. If the classroom seating is U-shaped, however, it may be more realistic to invite whole-class questions or discussions, or have shorter activities where students turn to a neighbor and discuss a prompt. Regardless of how a classroom is arranged before instruction

begins, instructors should be aware that they can make modifications to encourage participation and better address the lesson goals and learning needs of students.

Conclusions

In this chapter, we discussed the use of participation techniques to enhance cognitive engagement and learning, emphasizing that instructional strategies which provide frequent opportunities for student participation are effective for teaching all students, regardless of their background, knowledge, skills, and interests. With careful lesson planning and the selection of clear learning objectives that incorporate frequent participation activities, instructors can design course materials that are flexible and responsive to students' learning needs. Varied instructional approaches that offer frequent opportunities for participation can help facilitate communication with peers, support a more rigorous understanding of the topic, provide opportunities for the development of critical thinking and scientific reasoning, and foster a continued interest in studying psychology.

In addition to facilitating an active learning process, regular student participation provides information to instructors about the learning needs of students. Appreciating and evaluating students' knowledge and abilities on an individual basis may better help instructors to support students' development as independent thinkers who have potential to make contributions to the field. Since we believe that teaching and learning should be viewed as active and generative processes, we encourage readers to consider the participation strategies and activities described in this chapter, and to contemplate ways to make these and other activities even more relevant and engaging for students.

References

Aronson, E. (2002). Building empathy, compassion, and achievement in the jigsaw classroom. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors on education* (pp. 209-225). San Diego, CA: Academic Press.

Benjamin, L. T. (1991). Personalization and active learning in the large introductory psychology class. *Teaching of Psychology*, *18*(2), 68-74. doi:10.1207/s15328023top1802_1

Bloom, B. S. (1956). *Taxonomy of educational objectives, handbook I: The cognitive domain.* New York, NY: McKay, 20-24.

Butler, A., Phillmann, K. B., & Smart, L. (2001). Active learning within a lecture: Assessing the impact of short, in-class writing exercises. *Teaching of Psychology*, *28*(4), 257-259. doi:10.1207/S15328023TOP2804_04

Carroll, D. W. (1986). Use of the jigsaw technique in laboratory and discussion classes. *Teaching of Psychology*, *13*(4), 208-210.

Cherney, I. D. (2008). The effects of active learning on students' memories for course content. *Active Learning in Higher Education*, *9*(2), 152-171. doi:10.1177/1469787408090841

Christopherson, K. M. (2011). Hardware or wetware: What are the possible interactions of pedagogy and technology in the classroom? *Teaching of Psychology*, *38*(4), 288-292. doi:10.1177/0098628311421332

Cooper, J. L. (1995). Cooperative learning and critical thinking. *Teaching of Psychology*, *22*(1), 7-9. doi:10.1207/s15328023top2201_2

Cornelius-White, J. (2007). Learner-centered teacher-student relationships are effective: A meta-analysis. *Review of Educational Research*, *77*(1), 113-143. doi:10.3102/003465430298563

Craik, F. I., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior*, *11*(6), 671-684. doi:10.1016/S0022-5371(72)80001-X

Crone, T. S., & Portillo, M. C. (2013). Jigsaw variations and attitudes about learning and the self in cognitive psychology. *Teaching of Psychology*, *40*(3), 246-251. doi:10.1177/0098628313487451

DeNeve, K. M., & Heppner, M. J. (1997). Role play simulations: The assessment of an active learning technique and comparisons with traditional lectures. *Innovative Higher Education*, *21*(3), 231-246. doi:10.1007/BF01243718

Dietz-Uhler, B., & Lanter, J. R. (2009). Using the four-questions technique to enhance learning. *Teaching of Psychology*, *36*(1), 38-41.

Diliberto-Macaluso, K., & Hughes, A. (2016). The use of mobile apps to enhance student learning in introduction to psychology. *Teaching of Psychology*, *43*(1), 48-52. doi:10.1177/0098628315620880

Drabick, D. A., Weisberg, R., Paul, L., & Bubier, J. L. (2007). Keeping it short and sweet: Brief, ungraded writing assignments facilitate learning. *Teaching of Psychology*, *34*(3), 172-176. doi:10.1080/00986280701498558

Duell, O. K. (1994). Extended wait time and university student achievement. *American Educational Research Journal*, *31*(2), 397-414. doi:10.3102/00028312031002397

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, *14*(1), 4-58. doi:10.1177/1529100612453266

Dunn, D. S. (1996). Collaborative writing in a statistics and research methods course. *Teaching of Psycholog*y, *23*(1), 38-40. doi: 10.1207/s15328023top2301_8

Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Chicago, IL: Psychology Press.

Fallon, M., & Forrest, S. L. (2011). High-tech versus low-tech instructional strategies: A comparison of clickers and handheld response cards. *Teaching of Psychology*, *38*(3), 194-198. doi:10.1177/0098628311411896

Filak, V. F., & Sheldon, K. M. (2003). Student psychological need satisfaction and college teacher-course evaluations. *Educational Psychology*, *23*(3), 235-247. doi:10.1080/0144341032000060084

Francis, R. W. F. (2012). Engaged: Making large classes feel small through blended learning instructional strategies that promote increased student performance. *Journal of College Teaching & Learning*, *9*(2), 147-152.

Gillies, R. M. (2003). Structuring cooperative group work in classrooms. *International Journal of Educational Research*, *39*(1), 35-49. doi:10.1016/S0883-0355(03)00072-7

Gleason, M. (1986). Better communication in large courses. *College Teaching*, *34*(1), 20-24. doi:10.1080/87567555.1986.10532325

Greene, B. A. (2015). Measuring cognitive engagement with self-report scales: Reflections from over 20 years of research. *Educational Psychologist*, *50*(1), 14-30. doi:10.1080/00461520.2014.989230

Gurin, P., Dey, E. L., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review*, *72*(3), 330-366. doi:10.17763/haer.72.3.01151786u134n051

Gurman, E. B., Holliman, W. B., & Camperell, K. (1988). Oral application questions as a teaching strategy. *Teaching of Psychology*, *15*(3), 149-151. doi:10.1207/s15328023top1503_13

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81-112. doi:10.3102/003465430298487

Hedeen, T. (2003). The reverse jigsaw: A process of cooperative learning and discussion. *Teaching Sociology*, *31*(3), 325-332.

Herzog, H. A. (1990). Discussing animal rights and animal research in the classroom. *Teaching of Psychology*, *17*(2), 90-94. doi:10.1207/s15328023top1702_3

Holliman, W. B., & Anderson, H. N. (1986). Proximity and student density as ecological variables in a college classroom. *Teaching of Psychology*, *13*(4), 200-203. doi:10.1207/s15328023top1304_7

Hovelynck, J. (2003). Moving active learning forward: Keynote presentation to the 30th annual AEE conference. *Journal of Experiential Education*, *26*(1), 1-7.

Jakoubek, J. (1995). Developing critical-thinking skills in Psychology content courses. *Teaching of Psychology*, *22*(1), 57-59. doi:10.1207/s15328023top2201_17

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, *38*(5), 365-379. doi:10.3102/0013189X09339057

Karp, D. A., & Yoels, W. C. (1976). The college classroom: Some observations on the meanings of student participation. *Sociology & Social Research*, *60*(4), 421-439.

Ke, F., & Kwak, D. (2013). Online learning across ethnicity and age: A study on learning interaction participation, perception, and learning satisfaction. *Computers & Education*, *61*, 43-51.

Klein, S. B., & Kihlstrom, J. F. (1986). Elaboration, organization, and the self-reference effect in memory. J*ournal of Experimental Psychology: General*, *115*(1), 26-38. doi:10.1037/0096-3445.115.1.26

King, A. (1990). Enhancing peer interaction and learning in the classroom through reciprocal questioning. *American Educational Research Journal*, *27*(4), 664-687. doi:10.3102/00028312027004664

King, A. (1993). From sage on the stage to guide on the side. *College Teaching*, *41*(1), 30-35. doi:10.1080/87567555.1993.9926781

King, A. (1995). Designing the instructional process to enhance critical thinking across the curriculum. *Teaching of Psychology*, *22*(1), 13-17. doi:10.1207/s15328023top2201_5

Kohlberg, L. (1963). The development of children's orientations toward a moral order. *Human Development*, *6*(1-2), 11-33. doi:10.1159/000269667

Koro-Ljungberg, M., Douglas, E., McNeill, N., Therriault, D., & Malcolm, Z. (2012). Re-conceptualizing and de-centering think-aloud methodology in qualitative research. *Qualitative Research*, *13*(6), 735-753. doi: 10.1177/1468794112455040

Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: Effects on instructional quality and student development. *Journal of Educational Psychology*, *105*(3), 805-820. doi:10.1037/a0032583

Landrum, R. E. (1999). Fifty-plus years as a student-centered teacher: An interview with Wilbert J. McKeachie. *Teaching of Psychology*, *26*(2), 142-146. doi: 10.1207/s15328023top2602_17

Larson, L. R., & Lovelace, M. D. (2013). Evaluating the efficacy of questioning strategies in lecture-based classroom environments: Are we asking the right questions? *Journal on Excellence in College Teaching*, *24*(1), 105-122.

Lea, S. J., Stephenson, D., & Troy, J. (2003). Higher education students' attitudes to student-centered learning. *Studies in Higher Education*, *28*(3), 321-334. doi:10.1080/03075070309293

Lei, S. A. (2010). Classroom physical design influencing student learning and evaluations of college instructors: A review of literature. *Education*, *131*(1), 128-134.

Lewandowski, G. W., Jr. (2003, March). *Classroom demonstration for teaching threats to internal validity.* Poster presented at 17th Annual Meeting on Undergraduate Teaching of Psychology Ideas and Innovations, Ellenville, NY. [Online] Retrieved from http://www.teachpsychscience.org/files/pdf/56201061709AM_1.pdf.

Meyer, D. K. (1993). Recognizing and changing students' misconceptions: An instructional perspective. *College Teaching*, *41*(3), 104-108. doi:10.1080/87567555.1993.9926789

Nevid, J. S., Pastva, A., & McClelland, N. (2012). Writing-to-learn assignments in introductory psychology: Is there a learning benefit? *Teaching of Psychology*, *39*(4), 272-275. doi:10.1177/0098628312456622

Newlin, M. H., & Wang, A. Y. (2002). Integrating technology and pedagogy: Web instruction and seven principles of undergraduate education. *Teaching of Psychology*, *29*(4), 325-330. doi:10.1207/S15328023TOP2904_15

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199-218. doi:10.1080/03075070600572090

Nilson, L. B. (2010). *Teaching at its best: A research-based resource for college instructors*. New York, NY: John Wiley & Sons.

Nunn, C. E. (1996). Discussion in the college classroom: Triangulating observational and survey results. *The Journal of Higher Education*, *67*(3), 243-266.

Pemberton, J. R., Borrego, J., & Cohen, L. M. (2006). Using interactive computer technology to enhance learning. *Teaching of Psychology*, *33*(2), 145-147. doi:10.1207/s15328023top3302_9

Reeve, J., Bolt, E., & Cai, Y. (1999). Autonomy-supportive teachers: How they teach and motivate students. *Journal of Educational Psychology*, *91*(3), 537-548. doi:10.1037/0022-0663.91.3.537

Richmond, A. S., Berglund, M. B., Epelbaum, V. B., & Klein, E. M. (2015). a+(b1) Professor–Student Rapport+(b2) Humor+(b3) Student Engagement=(Ŷ) Student Ratings of Instructors. *Teaching of Psychology*, *42*(2), 119-125. doi:10.1177/0098628315569924

Richmond, A. S., Fleck, B., Heath, T., Broussard, K. A., & Skarda, B. (2015). Can inquiry-based instruction promote higher-level learning? *Scholarship of Teaching and Learning in Psychology*, *1*(3), 208-218. doi:10.1037/stl0000032

Rowe, M. B. (1986). Wait time: Slowing down may be a way of speeding up! *Journal of Teacher Education*, *37*(1), 43-50. doi:10.1177/002248718603700110

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78-78. doi:10.1037/0003-066X.55.1.68

Shapiro, J. K. (1995). Dr. Kohlberg goes to Washington: Using congressional debates to teach moral development. *Teaching of Psychology*, *22*(4), 245–247. doi:10.1207/s15328023top2204_9

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*(4), 571-581. doi:10.1037/0022-0663.85.4.571

The Jigsaw Classroom. (2017, January 5). [Online] Retrieved from https://www.jigsaw.org/

Thompson, R. A., & Zamboanga, B. L. (2003). Prior knowledge and its relevance to student achievement in introduction to psychology. *Teaching of Psychology*, *30*(2), 96-101. doi:10.1207/S15328023TOP3002_02

Tobin, K. (1987). The role of wait time in higher cognitive level learning. *Review of Educational Research*, *57*(1), 69-95. doi:10.3102/00346543057001069

Underwood, M. K., & Wald, R. L. (1995). Conference-style learning: A method for fostering critical thinking with heart. *Teaching of Psychology*, *22*(1), 17-21. doi:10.1207/s15328023top2201_6

Wade, C. (1995). Using writing to develop and assess critical thinking. *Teaching of Psychology*, *22*(1), 24-28. doi:10.1207/s15328023top2201_8

Zhan, G. Q., & Georgia, K. (2011). A modified jigsaw learning activity. *The Journal of Learning in Higher Education*, *7*(1), 1-5.

Zimmerman, B. J. (1989). Models of self-regulated learning and academic achievement. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement* (pp. 1-25). New York, NY: Springer.

Chapter 9: The Elephant in the Room: Fostering Participation in Large Classes

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Abstract

Participation, a component of engagement, is known to increase students' performance, motivation, interest, and understanding of course material. In large classes, however, numerous barriers prevent the student from participating and the instructor from creating opportunities for participation. This chapter highlights the benefits of participation and puts forth instructor behaviors, tools, and methods that can generate student participation and enhance the quality of the large lecture classroom environment. We discuss the utility of electronic student response systems in increasing large-class attendance and participation as well as peer-to-peer and teacher-student engagement. The role of learning management systems (e.g., Blackboard) in fostering participation and sense of community both in- and outside the classroom is also discussed. We suggest that a shift from solely didactic, lecture-based content delivery towards an active-learning approach via participation *is* possible, even within a large classroom.

Introduction

To learn, read; to understand, participate.

– *Debasish Mridha*

Skinner and Pitzer (2012) described class engagement as: "constructive, enthusiastic, willing, emotionally positive and cognitively focused participation with learning activities in the classroom" (pp. 22). While there are myriad ways of fostering classroom engagement, participation is certainly one essential component. Participation can refer to a range of activities that occur before, during, and after class, both in- and outside the classroom (Normore, & Blaylock, 2011). Types of participation have been classified in different ways. Dancer and Kamvounias (2005), for example, describe five categories of participation: 1) preparation (extent of reading, analyzing, understanding material), 2) attendance, 3) contribution to discussions (extent of volunteering answers, asking relevant questions, analyzing others' contributions), 4) group skills (extent of allowing others to contribute, providing positive feedback, and demonstrating tolerance and respect); and 5) communication skills (quality of expression, clarity, appropriate language, confidence). Regardless of how individual instructors define participation, there is consensus that participation can take several forms, and is beneficial for student engagement and learning (Rocca, 2010). We differentiate participating from simply attending a lecture. For the purposes of this chapter, participation is conceptualized as non-passive action (e.g., commenting, asking

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questions, contributing to discussions, participating in activities) occurring both in and outside of class through a variety of appropriate channels (e.g., Blackboard).

Research has demonstrated that participation promotes students' understanding of course material above and beyond [solely] didactic lectures (see Rocca, 2010, for a review). Class participation increases students' attendance and motivation (Kay & LeSage, 2009), improves critical and higher-order thinking (Webb, Franke, Turrou, & Ing, 2015), strengthens learning and communication skills (Weaver & Qi, 2005), and correlates with higher final course grades (Massingham & Herrington, 2006). Students often recognize the value of participation (Fassinger, 1995) and many readily admit that they wanted to or should have participated more in their courses (Wade, 1994). However, a major reason for lack of student participation is class size (Wulff, Nyquist, & Abbott, 1987). Diverse strategies may be required to foster participation in different gradations of class size (e.g., 45 vs. 75 vs. 100 or more), as what is considered to be a "large" class tends to vary (Howard, Short, & Clark, 1996; Fassinger, 1995).

What is clear is that large classes are here to stay. From 2000 to 2010, the number of enrolled college students in the United States increased from approximately 15 million to 21 million (Snyder & Dillow, 2010). In the next 10 years, enrollment of students in post-secondary institutions is projected to increase by another 2,800,000 (National Center for Education Statistics, 2016), which will contribute to *a continued shift* towards large lecture-based classes, a trend already occurring in institutions around the country (e.g., Saiz, 2014). In addition to an increase in college enrollments, class sizes are also increasing as a result of budgetary cuts at public institutions, due in part to economic downturns and the inability to keep up with admission demands (U.S. Department of Treasury, 2012; Geiger, 2015). In light of these developments, it is important for educators to understand the challenges of participation and increase active engagement in large classes.

The Challenges of Large Classes

Compared to small classes (e.g., $\leq$ than 30 students), large classes provide fewer chances for students to participate and students often report greater anxiety and lower willingness to participate (Myers et al., 2009). One reason behind the anxiety may be a lack of confidence; students may think that they do not measure up to peers or feel intimidated by professors (Hyde & Ruth, 2002; Wade, 1994), an effect that is compounded in larger classes. There is also increased anonymity in large classes (Mulryan-Kyne, 2010), which results in fewer students (and many of the same students) participating in each class, a phenomenon known as *consolidation of responsibility* (Karp & Yoels, 1976). One study found that a small number of students contributed the majority of comments/questions in class discussions (Howard & Henney, 1998); approximately one-third of these students were regular participators while a sizable number of students did not participate at all.

Students are also less likely to participate when they perceive that the instructor does not welcome questions/comments or if they view the instructor's demeanor as discouraging (Fritschner, 2000). Conversely, instructors may be torn between covering the basic course material and actively engaging students, as they have to manage time constraints. As a result, and despite best intentions, instructors may rely more on lecturing as the method of instruction in larger classes, resulting in fewer opportunities for students to participate (Weaver & Qi, 2005). The frequency of instructor-student interaction and feedback may also suffer given the teacher to student ratio (Cuseo, 2007). Indeed, a lack of participation becomes akin to the "elephant in the room", something the instructor is aware of

and yet may feel powerless to address. In this chapter, we propose strategies, tools, and approaches that are applicable to varying class sizes.

Benefits of Participation

Though there are barriers to facilitating an active learning atmosphere, college students attend lectures when they perceive value in attending and feel engaged in the learning process (Fitzpatrick, Cronin, & Byrne, 2011). Engaging students via participation becomes even more relevant when a course is designed to encourage critical and analytical thinking, problem-solving, and self-efficacy (e.g., Iran-Nejad, McKeachie, & Berliner, 1990). In fact, students learn more when engaged in class interactions with peers and their instructor (Johnson, Johnson, & Smith, 1991). A recent meta-analysis provides further evidence that solely relying on lecturing has adverse effects on student learning and performance (Freeman et al., 2014). Consequently, educators must find ways to encourage participation despite the challenges described above. First and foremost, we elaborate on key instructor behaviors that help generate a climate conducive to participation even in large classes (see Table 1 for a summary).

Instructor Behaviors

Active Listening, Using Open-Ended Questions, and Increasing Wait-Time.

One of the most important factors in increasing communication between two parties is active listening (Rogers & Farson, 1979). There are several ways to convey active listening such as smiling or nodding. Eye contact, for example, expresses warmth, regulates interpersonal interactions, and facilitates communication of goals (Kleinke, 1986). One study found that college students participated more in a seminar when they were able to make eye contact with the instructor (Caproni, Levine, O'Neal, McDonald. & Garwood, 1977). Instructor eye contact also has a positive association with college students' grades and class appreciation (Pedersen, 1977). In the same vein, it is important for instructors to maintain a non-judgmental stance towards students' responses, use inclusive language, and utilize reflections to ensure that students feel "heard" (Mottet, Martin, & Myers, 2004). Previous research suggests that observing supportive and warm student-instructor exchanges is likely to incentivize other students to participate as well (Abdullah, Bakar, & Mahbob, 2012). Moreover, encouraging students to respond to a peer's comment or question can also generate a collaborative, cooperative atmosphere (Tinto, 1997).

Open-ended questions posed by an instructor are an excellent tool to begin a lesson, they help generate student interest, and keep students motivated in discussion (Dallimore, Hertenstein & Platt, 2010). Rather than just asking yes/no questions or questions of fact, researchers recommend asking broad, opinion-based questions. This practice not only enriches the discussion, but also encourages crosstalk among the students (Gravett, 1985). For example, on the first day of the course, one of the authors (Panjwani) asks students to share what they think the field of health psychology is about before offering formal definitions of the discipline. A deliberate pause after a question like this allows students time to think. Instructors tend to wait less than two seconds before choosing a student to answer a question (Rowe, 1986). However, waiting for even ten seconds gives all students time to think through the question rather than giving only those students who are "fastest out of the gate" a chance to answer (Faust & Paulson, 1998, pp. 8). To prevent calling out of answers, the instructor can inform students that students are intentionally being provided "thinking time" and that instructors will ask students to speak after 10 seconds have passed. Understandably, hearing from all or the majority of students in large

classes is not feasible, but it is possible to allow for a few minutes of discussion at the beginning of each class period, and to pepper the lesson with a few minutes of discussion at intermittent points.

Reducing "Distance" between Instructor and Student.

Compared to smaller classes, students perceive larger classes to be less intimate and more impersonal (Wulff, et al., 1987). The physical as well as psychological distance between the instructor and the students may be greater in larger classes, leading to perceptions of instructor inaccessibility, wherein the professor is the all-knowing scholar and the student is the passive recipient of information (Auster & MacRone, 1994; Biggs, 1999). To decrease this distance, and to increase teacher-student rapport (see Wilson, this volume for more on rapport), a number of strategies can be used. First, instructors can employ appropriate self-disclosure. Appropriate self-disclosure not only reduces the instructor-student power differential, but also positively impacts student participation (Goldstein & Benassi, 1994). For example, in a clinical psychology course, an instructor might share their experience of treating a client for the first time. Second, instructors can walk about the classroom while lecturing in order to involve students sitting in the periphery of large classrooms. Third, in small classes, instructors often engage in an introductory activity with their students (e.g., provide your name, year, major, and a random fact about yourself). Such an activity becomes difficult to do in-class with a large number of students, but can be readily implemented online through a learning management system, such as Blackboard (see Appendix A or Schnieder, this volume, for examples of introductory activities or "ice breakers"). Fourth, learning the names of even a few students can reduce the anonymity often felt by students in larger classes, making them feel valued (Hayes, 1997). One way to help connect names to faces is to ask students to provide a picture of themselves with their name on it; see Middendorf and Osborne (2002) for additional strategies to learn student names.

Increasing Instructor-Student Interactions.

There are many evidence-based ways to increase interactions with students in large classrooms. For example, an instructor might arrive to class five to ten minutes early and engage with students. An instructor can invite students to introduce themselves and ask questions or share comments on the previous lecture. Alternatively, the instructor can initiate casual discourse with the students or pose a conversational/opinion-based question related to the class material (Lang, 2016). Communicating with students via Blackboard announcements, email, chat functions, and keeping virtual office hours, are also strategies to keep class size from interfering with teacher-student interactions. This type of interactivity increases student participation, enriches the classroom experience, and enhances motivation to learn (Gurung, this volume; Steinert & Snell, 1999; Whiteman & Ochakovskaya, this volume).

Making Participation Worthwhile and Cold-Calling.

One way to encourage participation in large classes is to include participation as part of the student's overall grade. This strategy results in greater motivation to participate (Frymier & Houser, 2016) and clearly communicates the instructor's expectations to the students. In addition to making participation worth grade points, instructors can utilize the practice of cold-calling (involuntary participation), which refers to calling on a student who has not raised their hand. Though many instructors report that this practice feels uncomfortable and cruel, evidence suggests that when done in a non-punitive, supportive manner, cold-calling is related to an increase in voluntary participation and overall comfort with participation over time (Dallimore, Hertenstein, & Platt, 2013).

A number of techniques can help facilitate cold-calling and ease students' comfort with the practice. The instructor might consider a variation on the think-pair-share activity (Kaddoura, 2013), which traditionally involves two students working together; instead of a pair, groups of four can engage in discussions prior to the instructor calling on students to share their thoughts (see Ober & Saltzman, this volume). Alternatively, a minute paper, which involves writing down thoughts on a piece of paper in response to a question posed by the instructor (Angelo & Cross, 1993; Sawyer & Obeid, this volume), can help students brainstorm ideas and increase their willingness to participate when the instructors calls on them.

Table 1. *Instructor Behaviors that Facilitate Participation*

Behavior	Strategies
Actively Listen and be Supportive	• Make eye contact • Convey encouragement by smiling and nodding • Reflect part of student's comment back to the class • Invite peers to comment on a student's response • Use language (e.g., "we" rather than "you") encouraging cooperation and respect
Ask Open-Ended Questions	• Avoid asking questions likely to generate yes or no answers • Utilize open-ended question to generate interest in lecture topic (Limit responses to 2-3 students if class size is large)
Increase "Wait" Time	• Wait 5 to 10 seconds after asking a question to give students time to think; this strategy also allows students who are not "regular" contributors to participate and keeps instructors from [reflexively] calling on the first student to raise their hand
Reduce "Distance" between Instructor and Student	• Engage in appropriate self-disclosure • Learn a few names • Introductory activity via Blackboard or Survey Tool (see Appendix for example) that provides general information about students in class and personalized responses to open-ended questions • Do not stand in one spot/lecture behind podium; move about the classroom
Increase Instructor-Student Interactions	• Utilize virtual methods outside of class to interact with students in the form of Blackboard announcements, emails, chat functions, virtual office hours • Arrive to class 10-15 mins early; encourage students to ask questions, share comments on previous lecture, or simply introduce themselves to you (there won't be a horde of students lining up, we promise!)
Make Participation Worth the Students' While	• Include participation as part of syllabus; make it part of the overall grade • Emphasize expectations around participation regularly in-class and via announcements
Cold-Calling	• Inform students that cold calling is a possibility • Results in students coming to class prepared and gains voluntary participation over time

Using Student Response Systems to Encourage Participation in the Classroom

A major barrier to generating participation in large classes is the increased anonymity, which can also result in irregular or inconsistent attendance (Kuh, Schuh, & Whitt 1991); however, roll-calling or utilizing a sign-in sheet is generally not feasible. Additional challenges include decreased attention, higher boredom, and greater confusion. To address this problem, instructors use traditional approaches such as "raise-your-hand-if" or colored notecards (e.g., green = true; red = false) to poll students on interesting questions or to assess comprehension (see Ober & Saltzman, this volume). By using such methods, instructors engage students in their own learning; students, in turn, have a way to stay involved and participate. In large classes, these traditional methods of positing questions can result in students hitchhiking on others' responses or failing to participate completely (Stowell & Nelson, 2007). Other considerations include visibility of students and time constraints (e.g., the time it would take to count hands in the raise-your-hand-method). To overcome these challenges, we present information on student response systems (SRS; also known as electronic response systems, classroom response systems and audience response systems) and their utility in large classes.

How Do SRS Work?

SRS consist of online platforms that pool student responses through infrared technology or wireless Internet. Especially helpful for large classes, SRS can be used to quickly take attendance, administer quizzes, grant extra credit, and poll students on their understanding of content. While these are some common utilities of SRS, instructors can be creative in using the response systems to fit their needs. Typically, before a lecture, instructors will add questions to their SRS. These questions (often in multiple choice format) are made active during class and projected on the classroom's screen. Once the question is activated, students respond using their hand-held devices. Depending on the SRS provider, devices can be students' phones, laptops, tablets, or clickers. As students start responding, the instructor receives live-feed data to their computer. The data is displayed as a histogram and can be projected for the class to view or for the instructor's view alone. If student responses are displayed, histogram response bars move up and down according to the frequency of student responses in live-feed, causing anticipation in the class around rival answers. Live-feed responses bond students in a large class with the common goal of 'getting the right answer', which can foster a sense of community.

Common Instructor Concerns Regarding SRS.

Financial burden. Instructors may avoid the use of new or different technology in the classroom because of potential financial burden on students and teachers. SRS can cost from $0 to $40 per student; platforms that require clicker devices are at the higher end of this distribution, but there are also cheaper options. Software and the required devices for electronic student response systems often do not have a cost to the instructor and may even provide cloud based-storage for lectures and other course materials. For an overview of cost and features of the three leading SRS, see Table 2 below (for a larger discussion on leading SRS, see Barber & Njus, 2007). Furthermore, with SRS costing a fraction of textbooks used in many classes, students are often accepting of the adaptation of this technology. In a sample of 398 students at the University of Rhode Island, only 3% of students reported that clickers were hard for them to attain financially (Boatright-Horowitz, 2009). While financial burden may be higher at some college institutions, instructors can often work out alternatives for the few students that have difficulty affording these technologies.

Table 2. *Leading Providers of Student Response Technology: Breakdown of Requirements and Abilities by Student Response Platform*

	TopHat	**Reef Pooling**	**Iclicker**
Technology	Web-based/App	Web-based/App	Clicker based/App
Device and cost for student	Accessed through any device. Can use browser or SMS; $24 for semester subscription	Downloadable IOS/Android compatible app for cell or web-browser; $10 for semester subscription	Need iclicker handheld response device; $20-40 student device; no subscription needed
Device for instructor	Software download (free)	Software download (free)	Software download & response receiver (free to instructors)
Connectivity	Internet based, WIFI helpful but not needed.	Reliable WIFI needed	No WIFI, clicker station necessary
Text/SMS	Both. When no WIFI, offline/SMS responses saved & submitted to gradebook at a later time (responses are time-stamped)	Text with WIFI only	N/A
Attendance	Text-in randomly generated daily code	Text-in	Click-in with device
LMS platform compatibility	Yes	Yes	Yes
Game/tournament interface	Yes, if toggled on	No	No
Student-student Interaction	Discussion board where students can help peers with unanswered questions	No	No
Student-teacher interaction	Discussion board can be used to ask instructor questions during class.	No	No

Implementation time. Adapting new technology into a course takes time and may require the instructor to change lesson plans, create questions, and think of discussion topics. Naturally, adding questions and discussion into lectures can reduce the amount of course content that is covered in a class, and may require flexibility on the part of the instructor to think about course topics in new ways. Yet instructors report that this extra preparation is worth the time-investment as SRS created an interactive learning experience for their students (Winstone & Millward, 2012).

Teaching Benefits of SRS in Large Classes.

As student responses are paired with their name or ID number on the response system platforms, collecting attendance or awarding participation points becomes a much more feasible and streamlined process. Using grade incentives as small as an extra two percent toward students' final grades improves attendance among SRS users (Dunham, 2009). As many students in large classes are reluctant to ask questions when they are uncertain of course content (Graham, et al., 2007), SRS "quizzes", or questions, provide a way for instructors to check-in on students' comprehension of covered topics. This type of instructor-student feedback can direct the instructor to parts of the lesson on which students require further clarification. Alternatively, asking the class about which concept was hardest can help instructors plan ahead for a review at the beginning of the next class.

Using SRS in classrooms has been shown to increase student grades in psychology classes (Mayer et al., 2009). These performance benefits of SRS in large classes can be attributed to increased engagement and interest in course questions. Research suggests that once a student picks an answer, they become invested in the problem and pay attention so as to understand the *correct* choice (Beatty, 2004). In fact, even students report that the use of response systems have a positive effect on their learning abilities, participation, and interest (Gauci, Dantas, Williams, & Kemm, 2009). SRS also tackle issues of student conformity and shyness in large classes. One study found a discrepancy of 24% in responses using SRS compared to the traditional method of hand-raising; SRS methods received almost 100% participation (Stowell & Nelson, 2007), suggesting that SRS can transform reluctant or shy students into active participants. Interestingly, students often provide different answers than their peers when SRS are used, resulting in decreased conformity in classroom responses (Stowell, Oldham, & Bennett, 2010). When students are no longer evaluating their responses on the basis of other students' responses, it is possible that they take extra time to reflect on the question, improving their relationship with the course and building self-efficacy. In sum, when clickers are connected with points toward the final grade, class attendance, participation, and engagement increases (Dunham, 2009; Kay & LeSage, 2009), improving upon the usual learning environment in large lectures.

Using Learning Management Systems to Foster Participation Outside the Classroom

Learning management systems (LMS; e.g., Blackboard, Canvas, Moodle) are eLearning software commonly used in higher education to post course content, announcements, assignments, and grades, but their utility in large classrooms goes far beyond these uses. While student response systems can promote engagement, time constraints remain a significant barrier and can limit discussions in large lectures. LMS can help instructors shift from content-based to process-based learning (Vogel & Klassen, 2001) as well as promote peer-to-peer and instructor-student interactions (Lonn & Teasley, 2009). For example, the synchronous chat-based features allow students to pose questions to peers to clarify course content; whereas, the asynchronous discussion board or forum allows students to post opinions

or responses to questions posed by the instructor. Despite the utility of the LMS in facilitating an active learning environment, many instructors use them primarily as tools to send out emails/announcements or distribute course material (Becker & Jokivirta, 2007). Thus, in the next section, we elaborate on ways in which LMS can be utilized to foster participation and community via the use of blogs, discussion boards, and online group work.

Discussion Boards, Blogs, and Community Building

The blog and discussion board functions on LMS provide students with additional channels for participation where they can reflect on course content, express opinions, connect with other students, and engage in peer-study or debate (Levine, 2007; Schwartz, Powers, Galazyn & Brooks, this volume). In a comparative study of face-to-face vs. online discussions, students felt that posting online gave them time to reflect on course material and allowed them to form more insightful responses (Meyer, 2003). There are several ways that the blogs and discussion boards can be utilized. For instance, the instructor can post content on a discussion board and pose questions for the students, providing opportunities for them to engage with material related to the course. Alternatively, students can write in their own blog as a way to facilitate journaling and the instructor could elect to have the blogs shared with the rest of the class to promote peer-to-peer interactivity. A simple, yet effective way to utilize a blog is to have students read an assigned reading and ask them to describe *the most important point* as well as *the muddiest point* (least understood point) of the reading (Rovai, 2007). To encourage peer interactivity, the instructor can encourage students to provide answers/responses to their peers' "muddiest" points.

While some students might feel that contributing to an activity, such as the one described above, is not worth the effort or that they do not have valuable contributions to offer (Williams & Jacobs, 2004), there are a number of strategies that can alleviate such concerns. To motivate students, the instructor can make discussion board contributions worth points or count towards the final. Additionally, the instructor can provide a how-to tutorial for the discussion board/blogging features where different types of posts (e.g., reflective, judgment based, inquisitive) are encouraged (see Kreniske and Todorova, this volume, for further tips on classroom blogging). Instructors can also sporadically add comments, pose questions, or mention interesting posts in-class. In fact, acknowledging student contributions may foster a sense of pride and even encourage others to participate. Taking these actions will help students gain confidence, give them ideas on what to post, increase the amount of participation in online discussions, and foster classroom community (Sim & Hew, 2010).

In her course, for example, the first author (Panjwani) has a discussion board on which students post links to articles, videos, books, and movies that are relevant to health psychology topics. Students gain participation points by briefly summarizing the content of their postings, sharing why they think their postings are relevant to the class, and commenting on peers' postings throughout the semester. Students will often start a post with "I really wanted to share this with the class…" which can serve to engage classmates. To further foster peer connectivity and engagement, towards the end of the semester, students are required to select a classmate's discussion board post that they found interesting. Subsequently, students are required to write a blog or low stakes writing assignment such as a discussion forum (viewable to the class) answering the following questions (for another example, see Schwartz, Powers, Galazyn & Brooks, this volume):

1) Why did you select this posting? What about it made an impression?

2) How does the posting relate to what we have learned in class? Utilize

(and cite) specific course material in your answer.

LMS can help instructors adopt these kinds of activities and, by doing so, help students familiarize themselves with one another. It can also create a sense of community that may be otherwise absent in larger classes. (Mulryan-Kyne, 2010). When used creatively, LMS can also serve to facilitate group work online (see Schnieder, this volume, for more ideas on how to encourage group work).

Online Group Work

Though it is well-established that participation in small-group activities promotes engagement and active learning among students (Springer, Stanne, & Donovan, 1999), barriers like time constraints and space can interfere. Furthermore, perceptions of anonymity in large classes may reduce the responsibility students feel to participate in interactive activities (Ward & Jenkins, 1992). LMS, like Blackboard, can offer a number of helpful solutions to create groups and "take" group work online. For example, there are options to create groups manually (where the instructor enrolls students in a group); self-enroll (students enroll themselves in a group); or random enroll (the LMS randomly enrolls students in different groups). The latter option works particularly well in large classrooms, saving time and ensuring that students do not form groups solely with friends. While instructors can use their discretion and take into consideration the type of group work, optimal group size is said to be between three to six students (e.g., Cuseo, 2007).

After groups have been created, the instructor can upload group work or assignments and enable the use of various in-group tools (e.g., file exchange, discussion board, blog, email). Though this may vary by goal of the group activity and class size, and exceptions may apply (e.g., group conflict), we suggest creating groups rather than allowing students to self-select. In addition, we recommend providing students with ample opportunity to familiarize with group members throughout the semester (see Schnieder, this volume, for tips on how to foster teamwork). Familiarity with peers is likely to enhance participation and build the perception of a smaller community within the larger classroom (Rovai, 2002). In service of these goals, a few group work activities that can be completed online are provided below (for further discussion on implementing group work in large classes, see Cooper & Robinson, 2000).

One example of an online group activity is to have students work on a *significant problem or case* embedded within the context of the discipline or field of study (Michaelsen & Sweet, 2008). For example, in a health psychology class, this could involve working on a health behavior change in groups of four or five, where students collectively decide on a change to enact (e.g., exercising three times a week). They could then contribute to a group blog, sharing their unique experience of enacting the health behavior change and connecting it back to health behavior change theories. Instead of discussing conceptual distinctions between the numerous theories in an abstract way, they would now be able to draw on their own- and group members' concrete experiences to remember, consolidate, and distinguish between theories; they would also be participating via the LMS and engaging with peers and course content outside of the classroom.

Utilizing the *jigsaw* technique is another way to facilitate understanding of a comprehensive topic or lesson as it actively involves the students in the learning process (Aronson, 1978; See Ober & Saltzman, this volume for a discussion about the *jigsaw* technique). Though the jigsaw is often used in-class (e.g., Doymus, 2008; Perkins & Saris, 2001), space and time may be potential roadblocks in the

implementation of this exercise in large classes; fortunately, the jigsaw can easily be adapted for online group work. After creating groups on the LMS, the instructor can assign each group member a different part of a theory, article, or concept on which to focus and generate examples. Each group member then contributes to their group's discussion board, teaching other members the "task" or "concept" for which s/he was responsible and providing examples. For instance, to increase students' knowledge of different coping strategies, each student may be assigned a particular strategy (i.e., positive reframing, denial or suppression, behavioral disengagement, seeking social support) to research and understand. Utilizing the discussion board, students would then share with their group members a description of their coping strategy, when people might use it, and then provide a real-life (or made-up) example. While these are just a few examples, various participation activities can be moved online with the help of LMS, circumventing the usual challenges of fostering participation in large classrooms.

Conclusions

Given that large classes are here to stay (Geiger, 2015), the challenge currently facing instructors is how to teach these classes, while actively involving the students in the learning process. In this chapter, we presented an overview of the challenges (Mulryan-Kyne, 2010), benefits of participation (Rocca, 2010), and strategies, tools, and activities to help instructors create a constructive, engaging, and interactive classroom environment. In large lectures, promoting participation may indeed require the use of technology (Kay & LeSage, 2009) and thoughtful course planning (Roehl, Reddy, & Shannon, 2013). However, the challenges are well worth the effort. We believe that encouraging students to communicate questions, contribute ideas, and think critically, as individuals and in groups, is integral to a quality college education.

References

Abdullah, M. Y., Bakar, N. R. A., & Mahbob, M. H. (2012). Student's participation in classroom: What motivates them to speak up? *Procedia-Social and Behavioral Sciences, 51*, 516-522. doi:10.1016/j.sbspro.2012.08.199

Angelo, T. A., & Cross, K. P. (1993). Minute paper. *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). San Francisco: Jossey-Bass.

Aronson, E. (1978). *The jigsaw classroom*. Beverly Hills, CA: Sage.

Auster, C. J. & MacRone, M. (1994). The classroom as a negotiated social setting: An empirical study of the effects of faculty members' behavior on the students' participation. *Teaching Sociology*, *22*(4), 289-300.

Barber, M. & Njus, D. (2007). Clicker evolution: Seeking intelligent Design. *Life Sciences Education, 6*, 1-20. doi:10.1187/cbe.06-12-0206

Beatty, I. (2004). Transforming student learning with classroom communications systems. *EDCAR Research Bulletin, 2004,* (3), 1-13.

Becker, R., & Jokivirta, L. (2007). *Online learning in universities: Selected data from the 2006 Observatory survey—November 2007*. The Observatory on Borderless Higher Education (OBHE) [Electronic Version]. Retrieved from http://www.obhe.ac.uk

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development, 18*, 57-75. doi:10.1080/0729436990180105

Boatright-Horowitz, S. L. (2009). Useful pedagogies or financial hardships? Interactive response technology (clickers) in the large college classroom. *International Journal of Teaching and Learning in Higher Education, 21*(3), 295-298.

Caproni, V., Levine, D., O'Neal, E., McDonald, P., & Garwood, G. (1977). Seating position, instructor's eye contact availability, and student participation in a small seminar. *The Journal of Social Psychology, 103*(2), 315-316. doi:10.1080/00224545.1977.9713335

Cooper, J. L., & Robinson, P. (2000). The argument for making large classes seem small. *New Directions for Teaching and Learning, 2000*(81), 5-16. doi:10.1002/tl.8101

Cuseo, J. (2007). The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students. *The Journal of Faculty Development, 21*, 5-21.

Dallimore, E. J., Hertenstein, J. H., & Platt, M. B. (2010). Class participation in accounting courses: Factors that affect student comfort and learning. *Issues in Accounting Education, 25*(4), 613-629. doi: 10.2308/iace.2010.25.4.613

Dallimore, E. J., Hertenstein, J. H., & Platt, M. B. (2013). Impact of cold-calling on student voluntary participation. *Journal of Management Education*, *37*(3), 305-341. doi:10.1177/1052562912446067

Dancer, D., & Kamvounias, P. (2005). Student involvement in assessment: A project designed to assess class participation fairly and reliably. *Assessment & Evaluation in Higher Education, 30*(4), 445-454. doi:10.1080/02602930500099235

Doymus, K. (2008). Teaching chemical equilibrium with the jigsaw technique. *Research in Science Education, 38*(2), 249-260. doi:10.1007/s11165-007-9047-8

Dunham, B. (2009). *Statistics clicks: Using clickers in introductory statistics courses*. Retrieved from http://www.cwsei.ubc.ca/SEI_research/ les/Stat/ BDunham _ClickersInStat.pdf

Fassinger, P. A. (1995). Professors' and students' perceptions of why students participate in class. *Teaching Sociology, 24*, 25-33.

Faust, J. L., & Paulson, D. R. (1998). Active learning in the college classroom. *Journal on Excellence in College Teaching, 9*(2), 3-24.

Fitzpatrick, J., Cronin, K., & Byrne, E. (2011). Is attending lectures still relevant in engineering education? *European Journal of Engineering, 36*(3), 301-312. doi:10.1080/03043797.2011.585226

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410-8415. doi:10.1073/pnas.1319030111

Fritschner, L. (2000). Inside the undergraduate college classroom: Faculty and students differ on the meaning of student participation. *The Journal of Higher Education, 71*(3), 342-362.

Frymier, A. B., & Houser, M. L. (2016). The role of oral participation in student engagement. *Communication Education, 65*, 83-104. doi:10.1080/03634523.2015.1066019

Gauci, S. A., Dantas, A. M., Williams, D. A., & Kemm, R. E. (2009). Promoting student-

centered active learning in lectures with a personal response system. *Advanced Physiology Education, 33*, 60-71. doi:10.1152/advan.00109.2007

Geiger, R. (2015). Impact of the financial crisis on higher education in the United States. *International Higher Education, 59*, 9-11. doi:10.6017/ihe.2010.59.8486

Goldstein, G. S., & Benassi, V. A. (1994). The relation between teacher self-disclosure and student classroom participation. *Teaching of Psychology, 21*(4), 212-217. doi:10.1207/s15328023top2104_2

Graham, C. R., Tripp, T. R., Seawright, L., & Joeckel, G. (2007). Empowering or compelling reluctant participators using audience response systems. *Active Learning in Higher Education, 8*(3), 233-258. doi:10.1177/1469787407081885

Gravett, D. J. (1985). Asking the right questions, a key to good class discussions. *Teaching English in the Two-Year College, 12*(4), 300-302.

Hayes, D. (1997). Helping teachers to cope with large classes. *ELT journal, 51*(2), 106-116.Howard, J. R., Short, L. B., & Clark, S. M. (1996). Students' participation in the mixed-age college classroom. *Teaching Sociology, 24*, 8-24. doi:10.1093/elt/51.2.106

Howard, J. R., & Henney, A. L. (1998). Student participation and instructor gender in the mixed-age college classroom. *The Journal of Higher Education, 69*(4), 384-405.

Howard, J. R., Short, L. B., & Clark, S. M. (1996). Students' participation in the mixed-age college classroom. *Teaching Sociology*, *24*, 8-24.

Hyde, C. A., & Ruth, B. J. (2002). Multicultural content and class participation: Do students self-censor? *Journal of Social Work Education, 38*(2), 241-256.

Iran-Nejad, A., McKeachie, W. J., & Berliner, D. C. (1990). The multisource nature of learning: An introduction. *Review of Educational Research, 60*(4), 509-515.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). *Active learning: Cooperation in the college classroom*. Edina, MN: Interaction Book Company.

Kaddoura, M. (2013). Think pair share: A teaching learning strategy to enhance students' critical thinking. *Educational Research Quarterly, 36*(4), 3-24.

Karp, D. A., & Yoels, W. C. (1976). The college classroom: Some observations on the meanings of student participation. *Sociology and Social Research, 60*(4), 421-439.

Kay, R. H., & LeSage, A. (2009). Examining the benefits and challenges of using audience response systems: A review of the literature. *Computers & Education*, *53*(3), 819-827. doi: 10.1016/j.compedu.2009.05.001

Kleinke, C. L. (1986). Gaze and eye contact: A research review. *Psychological Bulletin*, *100*, 78-100. doi: 10.1037/0033-2909.100.1.78

Kuh, G. D, Schuh, J. H., & Whitt, E. J. (1991). Involving colleges: Successful approaches to fostering student learning and development outside the classroom. San Francisco, CA: Jossey-Bass.

Lang J. M. (2016, January 11). Small changes in teaching: The first 5 minutes of class. Retrieved from http://www.chronicle.com/article/Small-Changes-in-Teaching-The/234869/

Levine, S. J. (2007). The online discussion board. *New Directions for Adult and Continuing Education, 113*, 67-74. doi:10.1002/ace.248

Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of learning management systems. *Computers & Education, 53*(3), 686–694. doi:10.1016/j.compedu.2009.04.008

Massingham, P., & Herrington, T. (2006). Does attendance matter? An examination of student attitudes, participation, performance and attendance. *Journal of University Teaching and Learning Practice*, *3*(2), 82-103.

Mayer, R. E., Stull, A., DeLeeuw, K., Almeroth, K., Bimber, B., Chun, D., ... & Zhang, H. (2009). Clickers in college classrooms: Fostering learning with questioning methods in large lecture classes. *Contemporary Educational Psychology*, *34*, 51-57. doi:10.1016/j.cedpsych.2008.04.002

Meyer, K. A. (2003). Face-to-face vs. threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks*, *7*(3), 55-65.

Michaelsen & Sweet, (2008). Fundamental principles and practices of team-based learning. In L. K. Michaelsen, D. X. Parmelee, K. K. McMahon, & R. E. Levine (Eds.). *Team- based learning for health professions education: A guide to using small groups for improving learning* (pp. 9-34). Sterling, VA: Stylus Publishing.

Middendorf, J., & Osborn E. (2002, July). *Learning student names*. Retrieved from http://citl.indiana.edu/files/pdf/Lecture_Learning_Names.pdf

Mottet, T. P., Martin, M. M., & Myers, S. A. (2004). Relationships among perceived instructor verbal approach and avoidance relational strategies and students' motives for communicating with their instructors. *Communication Education, 53*, 116-122. doi:10.1080/0363452032000135814

Mulryan-Kyne, C. (2010). Teaching large classes at college and university level: Challenges and opportunities. *Teaching in Higher Education, 15*(2), 175-185.

Myers, S. A., Horan, S. M., Kennedy-Lightsey, C. D., Madlock, P. E., Sidelinger, R. J., Byrnes, K. Frisby, B., & Mansson, D. H. (2009). The relationship between college students' self-reports of class participation and perceived instructor impressions. *Communication Research Reports, 26*(2), 123-133. doi:10.1080/08824090902861580

National Center for Education Statistics. (2016). *Digest of Education Statistics, 2015* (NCES 2016-014), Chapter 3. Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=98

Normore, L. F., & Blaylock, B. N. (2011). Effects of communication medium on class participation: Comparing face-to-face and discussion board communication rates. *Journal of Education for Library and Information Science*, 198-211.

Pedersen, D. M. (1977). Relationship of rating of classroom performance and enjoyment with seat selection. *Perceptual & Motor Skills, 45*(2). 601-602.

Perkins, D. V., & Saris, R. N. (2001). A "jigsaw classroom" technique for undergraduate statistics courses. *Teaching of Psychology, 28*(2), 111-113.

Rocca, K. A. (2010). Student participation in the college classroom: An extended multidisciplinary literature review. *Communication Education, 59*(2), 185-213. doi:10.1080/03634520903505936

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning. *Journal of Family and Consumer Sciences, 105*(2), 44-49.

Rogers, C.R. & Farson, R.E. (1979). Active listening. In Kolb, D.A., Rubin, I.M. & McIntyre J.M. (Eds.) *Organisational Psychology* (3rd ed., pp. 168–180). New Jersey: Prentice Hall.

Rovai, A. P. (2002). Building sense of community at a distance. *The International Review of Research in Open and Distributed Learning, 3*, 1-16. doi:10.19173/irrodl.v3i1.79

Rovai, A. P. (2007). Facilitating online discussions effectively. *Internet and Higher Education 10*, 77–88. doi:10.1016/j.iheduc.2006.10.001

Rowe, M. B. (1986). Wait time: Slowing down may be a way of speeding up! *Journal of Teacher Education, 37*, 43-50.

Saiz, M. (2014). Economies of scale and large classes. *Thought and Action*, *30*, 149–59.

Sim, J. W. S., & Hew, K. F. (2010). The use of weblogs in higher education settings: A review of empirical research. *Educational Research Review*, *5*, 151-163. doi:10.1016/j.edurev.2010.01.001

Skinner, E. A., & Pitzer, J. (2012). Developmental dynamics of engagement, coping, and everyday resilience. In S. L. Christenson, A.L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21-44). New York: Springer Science.

Snyder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011*. National Center for Education Statistics.

Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research, 69*, 21-51.

Steinert, Y., & Snell, L. S. (1999). Interactive lecturing: Strategies for increasing participation in large group presentations. *Medical Teacher, 21*, 37-42. doi:10.1080/01421599980011

Stowell, J. R., & Nelson, J. M. (2007). Benefits of electronic audience response systems on student participation, learning, and emotion. *Teaching of Psychology*, *34*(4) 253-258. doi:10.1080/00986280701700391

Stowell, J. R., Oldham, T., & Bennett, D. (2010). Using student response systems ("clickers") to combat conformity and shyness. *Teaching of Psychology, 37*(2), 135-140.

Tinto, V. (1997). Enhancing learning via community. *Thought & Action, 13*, 53-58.

U.S. Department of Treasury. (2012). *The economics of higher education.* Retrieved from https://www.treasury.gov/connect/blog/Documents/20121212_Economics%20of%20Higher%20Ed_vFINAL.pdf

Vogel, D. & Klassen, J. (2001). Technology-supported learning: Status, issues and trends. *Journal of Computer Assisted Learning, 17*(2) 104–114. doi:10.1111/j.1365-2729.2001.00163.x

Wade, R. C. (1994). Teacher education students' views on class discussion: Implications for fostering critical reflection. *Teaching and Teacher Education, 10*(2), 231-243. doi:10.1016/0742-051X(94)90015-9

Ward, A. & Jenkins, A. (1992) The problems of learning and teaching in large classes, in: G. Gibbs & A. Jenkins (Eds.). *Teaching large classes in higher education* (pp. 23-36). London: Kegan Paul.

Weaver, R. R., & Qi, J. (2005). Classroom organization and participation: College students' perceptions. *Journal of Higher Education, 76*(5), 570-601.

Webb, N. M., Franke, M. L., Turrou, A. C., & Ing, M. (2015). Exploration of teacher practices in relation to profiles of small-group dialogue. In C. S. Asterhan, S. N. Clarke, & L. B. Resnick (Eds.), *Socializing intelligence through academic talk and dialogue*. Washington, DC: American Educational Research Association

Williams, J. B., & Jacobs, J. (2004). Exploring the use of blogs as learning spaces in the higher education sector. *Australasian Journal of Educational Technology*, *20*(2), 232-247.

Winstone, N., & Millward, L. (2012). Reframing perceptions of the lecture from challenges to opportunities: Embedding active learning and formative assessment into the teaching of large classes. *Psychology Teaching Review, 18*(2), 31-41.

Wulff, D. H., Nyquist, J. D., & Abbott, R. D. (1987). Students' perceptions of large classes. *New Directions for Teaching and Learning, 32*, 17-30. doi:10.1002/tl.37219873204

Appendix A

Introductory Activity

This is a three-part introductory activity (Part I – select an answer; Part II – opinion questions; Part III – picture with your name on it) designed to help me learn a little more about you. Given the number of students, doing the activity in class is not feasible. We will do it online instead. There are no right or wrong choices. All I am looking for is honesty. Your answers do not influence your standing in the course in any way. The activity takes 10 to 12 minutes to complete. Please complete the activity by [insert date] so that I have time to read students' responses. Early submissions are welcome.

Part I: Select an Answer

1) Are you a

Freshman
Sophomore
Junior
Senior

2) Do you identify as

Male
Female
Other

3) Is English your Native Language?

Yes
No

4) Is your intended major Psychology?

Yes
No
I am undecided

5) Have you taken Psychology Statistics?

I have taken it
I have not taken it yet
I am taking it currently

6) Have you taken Experimental Methods?

I have taken it
I have not taken it yet
I am taking it currently

7) Do you have experience reading scientific articles from previous courses?

I don't have any experience in reading scientific articles
I have a little bit of experience in reading scientific articles
I have a moderate amount of experience in reading scientific articles
I have quite a bit of experience in reading scientific articles
I have a lot of experience in reading scientific articles (I could practically write one).

8) How much do you know about the field of health psychology?

I have no knowledge about this field of psychology.
I have a little bit of knowledge about this field of psychology.
I have a moderate amount of knowledge about this field of psychology.
I have quite a bit of knowledge about this field of psychology.
I have a lot of knowledge about this field of psychology (I could practically teach the course).

9) How relevant do you feel the field of health psychology is to you?

Not at all relevant
A little relevant
Moderately relevant
Very relevant
Completely (and I mean 100%) relevant

10) Are you excited about this course?

Not at all excited
A little excited
Moderately excited
Very excited
Completely (and I mean 100%) excited

11) Why are you taking this course? Please be honest. You can select more than one response

I am really interested in the subject
The time the class is offered works for me
Friends or student peers recommended this course to me
Heard about it from undergraduate academic advisors
I am pre-med
I am thinking of becoming a health provider (e.g., nurse, physical therapist, etc.)
I need a 200-level course for my major
I heard the professor was fabulous ☺

12) What grade do you aim to work for in this course? (Keep in mind this question is different than one that might ask, "What grade do you want in the course?")

A+ or A
A-
B+ or B
B-
C+ or C
D
F

Part II: Short Answer:

1) What do you think the field of health psychology is all about?

This is an opinion question based on the knowledge that you have right now. If you don't know what health psychology is, that's perfectly ok. Just tell me what you think it is about. Be honest (no wikipedia-ing)! Keep it brief: 5 sentences or less.

2) Why are you taking this course and what do you hope to gain from it? *Please answer in 5 sentences or less.*

3) Please answer **one** of the following **two** questions - I don't have a preference as long you only complete only one. This allows me to know a little bit about you as an individual and helps me remember students in our jumbo class (i.e., connect faces to names).

Tell me a random fact about yourself **OR** if you could have dinner with any person (living or dead), who would it be and why? *Answer in 5 sentences or less.*

Part III: Upload Picture with Your Name on It

As you will come to know, our course involves discussion both virtually (on BB) and in-class. Though we are a bigger class, we will be sharing ideas and thoughts. For this reason and for the fact that I would like you to be more than just a student ID, I try my best to learn my students' names/recognize who they are. Unfortunately, it is extremely difficult because student ID pictures are often fuzzy, dark, or outdated. I hope that most of you will take pity on me and fulfill the request below:

In "my day", two of my professors did this with Polaroids and put students' names on the bottom. It turns out that Polaroid cameras are not cheap and our class is much too big (it would take forever to do); and so, that idea is a no-go.

However, I am confident we can surpass this hurdle given all the mobile apps and tech savvy students out there, *so if you feel comfortable*, please upload an **appropriate** picture of you (one that is hopefully more recent, less far away, and clearer than the one on your student ID). The catch is your **full first name** and just the **initial of your last name** have to be somewhere **on the picture**, otherwise the point is moot!

Chapter 10: When Learning Styles Interfere with Learning and What to Do Instead

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Abstract

Although appealing, little empirical evidence has supported the utility of matching student learning styles to method of instruction. In this chapter, we describe the current state of the learning styles concept as well as provide suggestions for techniques in and out of the classroom that have been empirically demonstrated to be beneficial to students. Some of these techniques require students to be able to reflect on their current understanding, while others are of universal benefit no matter the state of one's present knowledge. By shifting from a focus on "style" to "cognitive principles," students will have better outcomes and greater control of learning.

Introduction

The concept of "learning styles" has received a great deal of attention in recent years, with many educators, parents, and the general public endorsing the idea that student learning is maximized when the method of teaching is consistent with a student's individual style of learning (aka the *meshing hypothesis*; Pashler, McDaniel, Rohrer, & Bjork, 2008). For example, a student who is a "visual learner" will benefit the most from instruction in a visual modality, while a "kinesthetic learner" will receive the greatest benefit from hands-on learning experiences. A variety of learning styles have been proposed, including but not limited to visual, auditory, and kinesthetic (Dunn, Dunn, & Price, 1984); assimilating, diverging, converging, and accommodating (Kolb, 1985); activist, pragmatist, and reflective (Honey & Mumford, 1992); and active-reflective, sensory-intuitive, visual-auditory, inductive-deductive (which was removed from later versions of the model), and sequential-global (Felder & Silverman, 1988).

Although the concept of learning styles is intuitively attractive, there are two primary ways in which the literature is not supportive of this construct. First, learning styles are considered to be a trait, and therefore, should be consistent across time and different situations. However, even learning styles experts acknowledge the lack of reliability of the instruments designed to assess learning styles (Peterson, Rayner, & Armstrong, 2009).

Second, despite repeated experimental attempts, the literature does not support the existence of individual variability in superiority for retention of information when it is presented via a particular modality. Specifically, there is no empirical evidence that information presented via a student's preferred learning style results in better outcomes such as greater comprehension or memory for the material. In an influential article, Pashler and colleagues (2008) outlined the methodology necessary to test this idea and described the pattern of results that would provide support for the hypothesis. Specifically, a study must first assess learning style (regardless of how that may be operationalized) and categorize participants into groups based on these styles. Next, participants need to be randomly

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assigned to different methods of learning, with some participants receiving instruction in a modality that is consistent with their preferred learning style and others receiving instruction that is inconsistent. After the learning manipulation, all participants must receive the same test of comprehension/retention. As depicted in the graph below, the results of such a study should show an interaction between learning style and method of instruction, demonstrating not only superior performance in the matched condition, but also impaired performance in the mismatched condition (see Figure 1).

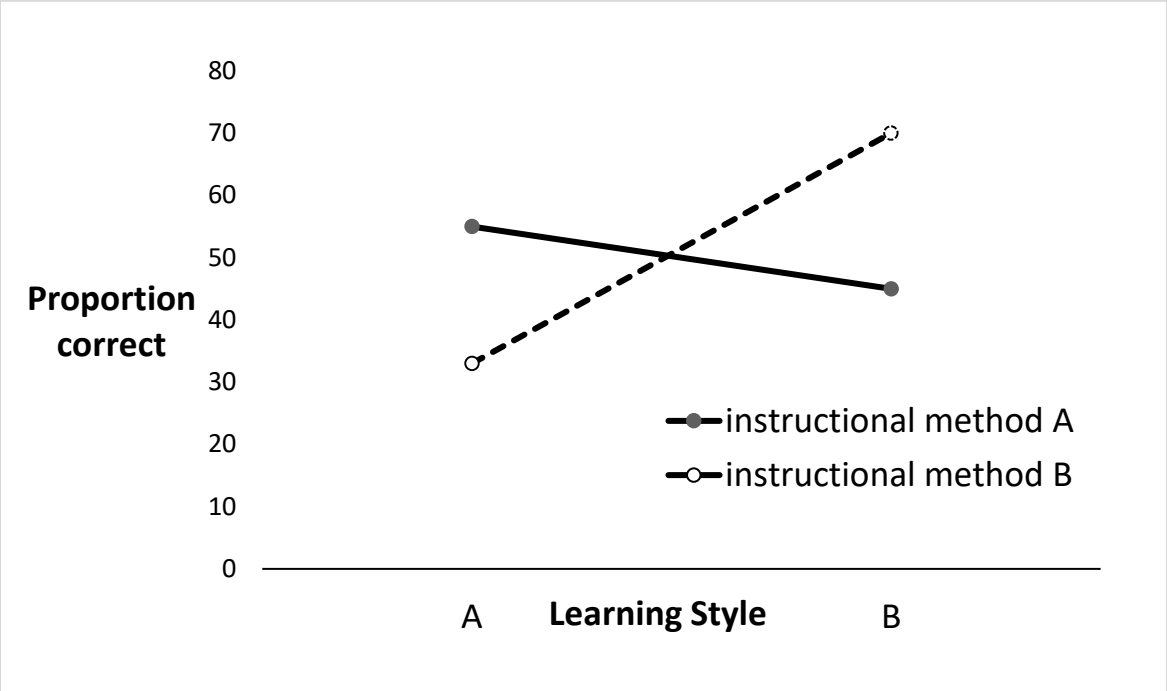

Figure 1. *Hypothetical Data that would Support the Meshing Hypothesis. Performance should be best when learning style is matched to instructional method and impaired when mismatched.*

As outlined by Pashler and colleagues (2008), much of the research in this area suffers from flaws in experimental design, which makes interpretation of results challenging. However, the few studies that have been appropriately designed do not provide support for the meshing hypothesis that information presented via a student's preferred learning style results in better outcomes. We review two of these as examples of the typical findings that fail to support the meshing hypothesis.

The first of these experiments investigated the commonly referenced learning styles of "verbalizer" and "visualizer." Massa and Mayer (2006) provided participants with an online lesson in electronics that included help screens providing either definitions or illustrations of key terms. After participants indicated that they had studied the lesson sufficiently, they were given a retention test. After the test, participants completed a variety of measures to assess whether their preferred learning style was categorized as a "verbalizer" or "visualizer." The researchers predicted that the verbalizers would show better performance when provided with text help via definitions, while the visualizers would perform better with help provided via illustrations.

Learning style was assessed with two self-report and one performance-based measure (the frequency with which participants chose visual or verbal help in a separate, computer-based assessment). In multiple experiments with participants of varying demographics, those who received help via illustrations consistently outperformed those who received help with definitions. Most problematic for the meshing hypothesis is that there was no interaction between learning style and performance on the retention test; that is, performance was not improved when learning style was matched with manner of presentation. These findings were consistent regardless of the instrument used to operationally define learning style. It is important to note that the authors did find that participants self-reported different learning styles (verbalizer or visualizer) and that those learning styles predicted the type of help participants selected, when (in a separate experiment) they were given the opportunity to choose. That is, participants who self-reported as verbalizers were more likely to choose help in the form of definitions, while those who self-reported as visualizers were more likely to choose help with illustrations. However, there was no difference in *performance* based on learning style.

Using the framework suggested by Pashler and colleagues (2008), others have attempted to provide empirical support for the meshing hypothesis. For example, Rogowski, Calhoun, and Tallal (2014) examined the relationship between self-reported learning style and learning aptitude, with the latter assessed by means of objective measures of comprehension of information presented via an auditory recording (listening aptitude) or computer screen (reading aptitude), with the goal of determining whether learning style influenced retention of the information presented through the different modalities. Participants completed a commonly used learning styles assessment to determine whether their primary learning style was auditory or visual. Then they completed a listening aptitude test and a reading aptitude test. The results revealed that participants with a visual learning style had higher comprehension scores on both the listening and reading aptitude tests when compared to participants with an auditory learning style. In addition, all participants had higher comprehension scores on the listening aptitude test when compared with the reading aptitude test, which may be indicative of a difference in test difficulty. Importantly, there was no interaction between learning style and instructional modality; that is, there was no increase in comprehension when instructional modality was matched to learning style, as would be predicted by the meshing hypothesis.

Rogowski and colleagues (2014) also conducted a multiple regression analysis to determine the extent to which learning style scores predicted listening and reading comprehension. Auditory learning style scores accounted for a significant portion of the variance in listening comprehension. However, counter to the meshing hypothesis, there was a negative relationship between the two variables; that is, listening comprehension increased as strength of the auditory learning style decreased. Visual learning style preference did not predict reading comprehension scores, but auditory learning style did, and again there was a negative relationship such that having a stronger auditory learning style was associated with lower reading comprehension. Taken together, these results indicate that there is no relationship between learning style and instructional method (listening vs. reading) that would improve student performance.

To address the possibility of retention differences based on learning style, Rogowski and colleagues (2014) asked a subset of the initial participants to listen to a section of an audiobook or read the same text with an e-reader. All participants were then tested for comprehension. Once again, participants with a visual learning style outperformed those with an auditory learning style on comprehension of both the written and audio versions of the text. Modality of presentation had no effect on

comprehension scores and there was no interaction between the two variables; that is, there was no improvement in comprehension when modality of presentation was matched to learning style. Comprehension was assessed again after a two-week delay, and the same pattern of results was observed with visual learning style participants outperforming those with an auditory learning style regardless of the modality of presentation. Subsequent multiple regression analyses demonstrated that the only variable which significantly predicted either audiobook or e-text comprehension was initial listening aptitude scores. Overall, the results of this study fail to support the meshing hypothesis: presenting information in a manner concordant with a person's learning style does not improve their performance, nor does presenting information in a manner that is discordant with their learning style impair performance.

Taken together, these studies (Massa and Mayer, 2006; Rogowski et al., 2014) provide no support for the meshing hypothesis – there is no performance benefit when the method of instruction is matched to an individual's preferred learning style. In addition, learning style is not related to aptitude (as measured by scores on a comprehension test). However, one important implication of these findings, and those from other studies, is that there *are* individual differences in self-reported learning style, and those differences may predict behavior (e.g. visualizers reliably choose illustrated help links as opposed to definitions, as shown in Massa and Mayer, 2006).

Given the emphasis on learning styles that many students have been exposed to in their academic careers, it is unlikely that we can convince them to forget everything they have learned about different learning styles, particularly when the concept has such intuitive appeal. However, perhaps we can convince them that although differences in *preference* for how information is presented are "real," there is no evidence that tailoring instruction to that preference will help people learn or remember information. In fact, the easier it is for someone to understand something, the more likely they are to be fooled into believing that they remember it when they really don't (e.g., Benjamin, Bjork, & Schwartz, 1998; Koriat & Bjork, 2006). For example, if students are learning foreign language definitions by studying Spanish–English word pairs such as *gato*–cat, they will likely give high ratings of probability to later remembering cat when presented with *gato*–_____. However, they are also likely to report that they will answer correctly when the order is reversed and the goal is to report *gato* when presented with cat–_____, even if they only studied *gato*–_____. Although *gato* prompts cat readily, cat does not prompt *gato*. Because the pairing *gato–cat* is easy to process, this can lead to an inflated sense of understanding that leads to improper test preparation. Another practical translation of this effect occurs in statistics classes. When teaching students how to calculate a standard deviation, an instructor may provide a step-by-step approach that is easy for students to follow in class. However, during quizzes and tests, students need to be able to perform the steps from the data and perhaps the formulas on their own. In this case, the ease of following along in lecture is not the same as knowing how to complete the problem at the time of the test.

Another important finding from studies testing the meshing hypothesis is that visual learners outperform auditory learners on written tests regardless of the modality in which information is presented (Rogowsky et al., 2014). Therefore, if we want to utilize learning styles to inform our teaching, instead of attempting to match learning style to a particular method of instruction, we should try to help auditory learners improve their performance. Written tests are an unavoidable part of education, but effective test-taking skills can be taught (e.g., Holzer, Madaus, Bray, & Kehle, 2009).

Why, then, does the learning styles concept persist despite a growing body of contradictory data? One reason may relate to a seemingly universal interest in psychological assessments that presumably help us understand others and ourselves. This has been shown across different domains within the field of psychology, with one example being the enduring popularity of the Myers-Briggs Type Indicator despite its lack of objective support (e.g., Hunsley, Lee, Wood, & Taylor, 2015; Pittenger, 2005). Another reason is that the idea of learning styles is one for which, like horoscopes, it is relatively easy to find confirmatory data. For example, the second author once took a styles quiz in college that categorized her as an "auditory learner." She subsequently noticed that she seemed to learn more while listening to lectures than when reading in the dorm room, thereby reinforcing her perception of her supposed strength in learning via auditory presentation of material. However, there were a number of alternative explanations for this outcome, other than her preferred auditory learning style. First, she would read before class when the material was novel, and the novelty of the information likely reduced its retention. Second, she was often reading while socializing, so her attention was not optimal. In contrast, during lectures, she sat and took diligent notes. Thus, it is likely that cognitive factors, including attention and semantic knowledge, were the reasons for differential memory outcomes, which had nothing to do with the modality of instruction.

Another possible reason for the continued appeal of learning styles is a failure to make the distinction between style and ability (Willingham, Hughes, & Dobolyi, 2015). As explained by Willingham and colleagues, "styles refer to how one does things, [while] abilities concern *how well* one does them" (p. 267). There are well-documented differences in individuals' cognitive abilities (for a review, see Carroll & Maxwell, 1979; Gruszka, Matthews, & Szymura, 2010), and many may be unaware of this seemingly minor, but important, distinction. The results of some studies have provided support for the meshing hypothesis when ability, not preferred learning style, is combined with specific types of instruction. Specifically, there is some evidence that students with high ability perform better in a less structured learning environment, while lower ability students perform better in more highly structured learning environments. In one study (Cramer, Post, & Behr, 1989), elementary school students with high and low ability in picking out information from a large display were assigned to math lessons with either a high or low degree of structure. The high structure condition was mainly lecture, while the low structure condition consisted of a brief overview before students worked through problems on their own. The results revealed a treatment by ability interaction: high ability students performed better in the low structure environment, while low ability students performed better in the high structure environment. Importantly, the low ability students in the high structure environment outperformed the high ability students in the same environment, demonstrating the importance of matching treatment to ability to optimize student performance. It is important to note, however, that not all studies have observed treatment by ability interactions, and their occurrence seems to depend on how variables are operationalized.

Another possible reason for the popularity of learning styles relates to the current educational emphasis on the individuality of students; if each student is unique, a logical conclusion is that a one-size-fits-all approach to teaching and learning is not the most effective way to reach students. Although a thorough discussion of this topic is beyond the scope of this chapter, there are three extra-student factors that have been shown to predict performance: aptitude, prior knowledge, and cultural assumptions (Pashler et al., 2008). If individualization of instruction is an important goal, these empirically validated factors provide a good starting point. The emphasis on individuality also implies that student success is heavily

dependent on factors controlled by the school or professor, such as instructional method, and less dependent on factors related to an individual student, such as studying methods or previous knowledge. In reality, more important factors include the material itself and the student's mastery of it, not the supporting cast of the way it was presented.

Aside from understanding why learning styles continue to be popular despite a lack of evidence, it is also important to acknowledge that this belief has the potential to harm performance. For example, students may believe a mismatch between their learning style and the organization of a particular course will hamper their performance (see Whiteman and Ochakovskaya, this volume, on mindset). This can result in a self-fulfilling prophecy (Merton, 1948): students believe that they are not being taught in a manner that will facilitate their success and anticipate a negative outcome before the first evaluative assessment is even administered. It may also encourage behaviors that are not helpful, such as skipping a lecture-based class if one believes the lecture is not visual enough or the lecture lacks a hands-on approach that a student may deem necessary for success. Although combatting these well-ingrained perceptions is likely an uphill battle and a pursuit worthy of its own research, one approach may be to make students aware of the data showing no benefit of matching teaching to learning preference, such as that which is described earlier in this chapter (Massa & Mayer, 2006; Rogowski et al., 2014).

Despite the limited utility of learning styles, alternative techniques have been shown to increase performance. These techniques share the appeal of a learning styles approach in that they can be adjusted to the learner and are rooted in the empirical literature of cognitive psychology, with a wealth of research on learning and memory. A commonality across many of these cognitive techniques is that they require the learner to have a strong understanding about one's current state of knowledge and understanding. This is an admittedly difficult first step as there are ample data to show that students who perform poorly on exams (and who are perhaps of greatest concern to professors) are also most likely to overestimate their knowledge at the time of testing (e.g., Hacker, Bol, Horgan, & Rakow, 2000). There are many techniques that professors can employ to help students have a better sense of where one's current state of understanding is located. Some of these techniques include:

1. Give space for everyone to think after a question. Taking a break from lecture to ask a question is an excellent technique to break up class time, ensure attention, and let students reflect. However, there are often a few students whose hands shoot up before finishing the inflection on the question mark. Rather than calling on these students, pause for a minute and ask everyone to think of the answer. Ideally, have students write down the answer and the explanation. Then call on someone, either randomly or through volunteering. When the answer is provided right away, students who had not yet formulated a response will likely experience a feeling of hindsight bias (e.g., Roese & Vohs, 2012) or an illusion of competency (e.g., Koriat & Bjork, 2005) that can make it seem as if they would have given the correct answer on their own. This technique can also create a space to work through wrong answers and recognize why a previous explanation given in class may have been unclear.

2. Engage in frequent quizzing. Students need a chance to practice the sort of retrieval process that exams require and need feedback on their current level of knowledge. Although research on the most beneficial format of such quizzes is ongoing, there is some consensus that fill in the blank quizzes are more beneficial than multiple choice

quizzes for improving later retention (e.g., Roediger & Marsh, 2005). Although this may seem impractical for large lecture courses, clickers and related systems can provide a fast measure of how well the class understands a concept. These also have the advantage of requiring each student to answer instead of only one representative from the class.

3. Create opportunities for the college classroom's equivalent of guided play. In preschool education models, there is often tension between play-based and curriculum-based approaches. Recent research by Weisberg and colleagues (2016) offers a compromised option of guided play, in which children are playing with some structure or scaffolding to assist in learning. In the classroom, this can mean giving everyone an example to dissect using targeted questions (e.g., *Which of the theories we have discussed is best exemplified in this case study? Why?*), as opposed to simply asking students for their opinions. Instructors should encourage students to apply concepts directly, instead of waiting for them to do so intuitively.

4. Use different approaches to explain material. This works not because it changes modalities, but because a rich, elaborative memory leads to variable encoding, which results in better performance as compared to repetitive or rote memory (e.g., Huff & Bodner, 2014). For example, a lecture-based explanation may provide a necessary first step in fostering understanding of a complex concept, such as the action potential, but it is unlikely to result in a strong memory. Following an explanation with an opportunity for students to pair up and explain the process to each other allows them a different approach by "teaching" the material to each other and often reveals questions they didn't realize they had during the initial presentation of the material.

Once students have a sense of their current level of understanding, they are ready to use other empirically-validated techniques to move forward in improving learning (for a deeper discussion, see Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). In our experience, these are NOT the techniques students already use or prefer to employ. It is valuable for instructors to spend time in class explaining why changes in study habits will be beneficial and explain that learning needs to happen predominantly outside of the classroom.

1. Find desirable difficulty: Bjork and colleagues (e.g., Bjork & Bjork, 2014) have noted that people make the best gains in understanding when working with material that poses an appropriate level of difficulty. When a topic is novel, students need to first construct the concepts. When a concept is familiar, more advanced thinking is possible. Again, students cannot benefit from this desirable difficulty if they believe that they fully understand the material when they do not and when they prepare for class in an inefficient manner.

2. Take advantage of testing effects: In general, testing one's memory is better for retention and later retrieval than simply reviewing material (for a review see Roediger & Karpicke, 2006). Although it is uncomfortable to face what one does not know, quizzing allows students to recognize and correct their errors in a low-stakes environment prior to taking an exam. This notion has been gaining attention in recent years as illustrated in

an article in the New York Times about the role of errors in learning (http://www.nytimes.com/2014/09/07/magazine/why-flunking-exams-is-actually-a-good-thing.html?_r=0).

3. Take advantage of the spacing effect: Memory retrieval is more effective when repetitions occur across time (e.g., Greene, 1989). That is, it is more effective to study for a course over the stretch of a few days rather than trying to study for six hours straight. To illustrate this concept for students, the second author of this chapter spends time on the first day of the semester reviewing a half marathon training plan in order to encourage her students to use it as a basis for approaching the semester. Yes, there is time to rest, but there is also consistent work. Cramming all of your training into a single long run the week before a race is not an effective training strategy. Shorter, more frequent runs are essential, and the rest periods between runs are necessary for gains in training.

4. Use different approaches during study time: What works well in the classroom (e.g., using different approaches to explain material, as previously described) also works well when preparing outside of class. Going back to the running analogy, most training plans incorporate different kinds of runs (hills, tempo, easy), which is similar to engaging in multiple behaviors to learn material. One should spend time reading, making flashcards, quizzing, and generating questions about the material for office hours and not simply rereading notes (see item #6 below for more discussion of this). Again, variable encoding is better for later memory performance (e.g., Huff & Bodner, 2014).

5. Engage in full attention: When encoding new information, it is best to do so under full, as opposed to divided, attention (for a review, see Mulligan, 2008). An exception is for extremely easy to learn material, which is hopefully not the case in college classes! Students should be encouraged to turn off web browsers, cell phones, and chatty friends when trying to work.

6. Stop rereading notes: This habit has the unfortunate consequence of increasing familiarity for the material, which leads to positive feelings without increasing actual understanding. Thus, students often go into an exam with a false sense of mastery but find that although they recognize the terms, they cannot discriminate between correct answers and well-crafted distractor items (the constant refrain of "I had it down to two choices but picked the wrong one!"), nor can they integrate across concepts in an essay (for fuller discussion, see Dunlosky et al., 2013).

Conclusion

A robust body of literature has made it clear that although there are differences in learning style preferences, there is no benefit to matching learning style to method of teaching. As educators, the key is to inform students about what the empirical studies on learning styles have shown, create classrooms where students can *accurately* assess their own understanding, and give students tools that have been empirically validated for effective use. Furthermore, students should be encouraged to focus not solely on their particular learning preferences, but they should instead balance their preferences and the type

of behavior that is appropriate for the task of learning. Although mind over matter may help one get motivated to work, matter over mind should dictate the way one engages with the material.

References

Benedict, C. (2014, September 4). Why flunking exams is actually a good thing. *The New York Times.* Retrieved from https://www.nytimes.com/2014/09/07/magazine/why-flunking-exams-is-actually-a-good-thing.html?_r=2

Benjamin, A. S., Bjork, R. A., & Schwartz, B. L. (1998). The mismeasure of memory: When retrieval fluency is misleading as a metamnemonic index. *Journal of Experimental Psychology: General, 127*, 55-68. doi: 10.1037/0096-3445.127.1.55

Bjork, E. L. & Bjork, R. A. (2014). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In M. A. Gernsbacher and J. Pomerantz (Eds.), *Psychology and the real world: Essays illustrating fundamental contributions to society* (2nd edition). New York, NY: Worth.

Carroll, J. B. & Maxwell, S. E. (1979). Individual differences in cognitive abilities. *Annual Review of Psychology*, *30*, 603-640. doi: 10.1146/annurev.ps.30.020179.003131

Cramer, K., Post, T., & Behr, M. (1989). Cognitive restructuring ability, teacher guidance and perceptual distracter tasks: An aptitude treatment interaction study. *Journal for Research in Mathematics Education, 20*(1), 103-110. Retrieved from http://www.cehd.umn.edu/ci/rationalnumberproject/89_2.html

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in The Public Interest*, *14*(1), 4-58. doi:10.1177/1529100612453266

Dunn, R., Dunn, K., & Price, G. E. (1984). *Learning style inventory*. Lawrence, KS: Price Systems.

Felder, R. M. & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering Education, 78*(7), 647-681.

Greene, R. L. (1989). Spacing effects in memory: Evidence for a two-process account. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 15*, 371-377. doi:10.1037/0278-7393.15.3.371

Gruszka, A., Matthews, G., & Szymura, B. (2010). *Handbook of individual differences in cognition: Attention, memory, and executive control*. New York, NY, US: Springer Science + Business Media. doi: 10.1007/978-1-4419-1210-7

Hacker, D. J., Bol, L., Horgan, D. D., & Rakow, E. A. (2000). Test prediction and performance in a classroom context. *Journal of Educational Psychology, 92*(1), 160-70. doi:10.1037//0022-0663.92.1.160

Holzer, M. L., Madaus, J. W., Bray, M. A., & Kehle, T. J. (2009). The test taking strategy intervention for college students with learning disabilities. *Learning Disabilities Research and Practice, 24*(1), 44-56. doi:10.1111/j.1540-5826.2008.01276.x

Honey, P. & Mumford, A. (1992). *The manual of learning styles*. Maidenhead, England: Peter Honey Publications.

Huff, M. J. & Bodner, G. E. (2014). All varieties of encoding variability are not created equal: Separating variable processing from variable tasks. *Journal of Memory and Language*, *73,* 43-58. doi:10.1016/j.jml.2014.02.004

Hunsley, J., Lee, C. M., Wood, J. M., & Taylor, W. (2015). Controversial and questionable assessment techniques. In S.O. Lilienfeld, S.J. Lynn, & J.M. Lohr (Eds.), *Science and pseudoscience in clinical psychology* (pp. 42-82). New York, NY: Guilford Press.

Koriat, A. & Bjork, R. A. (2005). Illusions of competence in monitoring one's knowledge during study. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 31,* 187-194. doi:10.1037/0278-7393.31.2.187

Koriat, A. & Bjork, R. A. (2006). Mending metacognitive illusions: A comparison of mnemonic-based and theory-based procedures. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 32*, 1133-1145. doi:10.1037/0278-7393.32.5.1133

Kolb, D. (1985). *Learning style inventory*. Boston, MA: McBer.

Massa, L. J. & Mayer, R. E. (2006). Testing the ATI hypothesis: Should multimedia instruction accommodate verbalizer-visualizer cognitive style? *Learning and Individual Differences, 16*, 321-336. doi: 10.1016/j.lindif.2006.10.001

Merton, R.K. (1948). The self-fulfilling prophecy. *Antioch Review, 8*(2), 193-210. doi: 10.2307/4609267

Mulligan, N. W. (2008). Attention and Memory. In H. L. Roediger (Ed.), *Learning and memory: A comprehensive reference* (pp. 7-22). Oxford: Elsevier.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest, 9*(3), 106-119. doi:10.1111/j.1539-6053.2009.01038.x

Peterson, E. R., Rayner, S. G., & Armstrong, S. J. (2009). Researching the psychology of cognitive style and learning style: Is there really a future? *Learning and Individual Differences, 19*, 518-523. doi:10.1016/j.lindif.2009.06.003

Pittenger, D. J. (2005). Cautionary comments regarding the Myers-Briggs Type Indicator. *Consulting Psychology Journal: Practice and Research, 57*(3) 210-221. doi:10.1037/1065-9293.57.3.210

Roediger, H. L. & Karpicke, J. D. (2006). The power of testing memory: Basic research and implications for educational practice. *Perspectives on Psychological Science 1*(3), 181-210. doi:10.1111/j.1745-6916.2006.00012.x

Roediger, H. L., & Marsh, E. J. (2005). The positive and negative consequences of multiple-choice testing. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *31*(5), 1155-1159. doi: 10.1037/0278-7393.31.5.1155

Rogowski, B. A., Calhoun, B. M., & Tallal, B. (2014). Matching learning style to instructional method: Effects on comprehension. *Journal of Educational Psychology, 107*(1), 64-78. doi:10.1037/a0037478

Roese, N. J. & Vohs, K. D. (2012). Hindsight bias. *Perspectives on Psychological Science, 7,* 411-426. doi:10.1177/1745691612454303

Weisberg, D. S., Hirsh-Pasek, K., Golinkoff, R. M., Kittredge, A. K., & Klahr, D. (2016). Guided play: Principles and practices. *Current Directions in Psychological Science, 25*(3), 177-82.

Willingham, D. T., Hughes, E. M., & Dobolyi, D. G. (2015). The scientific status of learning styles theories. *Teaching of Psychology, 42*(3), 266-71. doi:10.1177/0098628315589505

Chapter 11: What to Do When Students Bomb the Exam

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Abstract

Unfortunately, not all of our students will succeed when taking examinations. In this chapter, we discuss what to do when students do poorly on tests. We offer strategies for giving students options, including some techniques that can be built into our syllabi and others for use on an as-needed basis, preventing test problems by providing access to good test preparation techniques, modifying your teaching to improve students' test performance, and counseling at-risk students. We draw our strategies from the scholarship of teaching and learning, as well as from the contributions of master teachers in psychology. In addition, we provide references and contact information for the contributors, so that interested instructors can extend their understanding by going into greater depth.

Introduction

A challenge we all face as teachers is that our students are not always going to perform well on every test, quiz, or assignment that we set for them. How we handle their failures is of tremendous importance to their learning, self-concepts, and willingness to persevere in our courses. As Wilbert McKeachie (1994, p. 87) reminds us, "The most important function of testing is *not* to provide a basis for grading. Rather tests are an important educational tool."

With McKeachie's dictum in mind, there are many approaches to consider in response to poor assessment performance. McKeachie (1994) and Zlokovich (2004) both suggest allowing students to retest after a failed test. Other instructors and researchers have different, but equally well-thought-out approaches. However, we also need to be aware of the possibility of going too far to help our students. For example, we should avoid entering into a form of co-dependent relationship in which we make things easier and easier so that students will do better without learning much, even though that may result in all of us feeling wonderful about each other and ourselves (Daniel, 2007).

In trying to determine some appropriate approaches, we sought advice from colleagues at many different institutions. Each had their own well-developed, pedagogically sound strategy, and while many of these strategies differ in important ways, they all share the same goal. To help students learn from their errors, and to help them remain motivated about learning psychology. Because most of these strategies came in as email messages, we've edited them a bit to make the style of this chapter more coherent. However, the information they provided was left unchanged. We encourage you to evaluate all of these strategies, and find those closest to your own teaching philosophy. We provide the contact information for each of our contributors, for readers who might want to explore a particular technique in greater depth. The remainder of this chapter is organized into four sections:

1. Second-chance strategies for students who bomb the test. These include techniques that can be built into the syllabus as well as things to do when students' unexpectedly fail the test;

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2. Providing students with access to good test preparation techniques;

3. Ways to modify your teaching to improve students' test performance; and

4. Counseling the at-risk student.

Second Chance Strategies for Students Who Bomb the Test

One set of strategies that seemed prevalent among the instructors was to allow students to retake a test, or to provide corrections to the test they had just failed. There are several approaches to this strategy, which are described below.

Allowing Students to Retake the Test as Individuals

From Bill Altman (SUNY Broome Community College): I give my students the chance to correct their mistakes on tests. After a test has been returned to the students, they have until the next class meeting to hand the tests back in with their corrections. In addition to providing the correct responses for each missed item, they need to provide page references for their answers from the textbook or dates from their class notes, and students must explain the reasons why they made each error. Items on these exams are worth two points each, so I return one point for each item that has been corrected properly.

However, any items that students didn't correct, or any that were changed to new wrong responses, lose one more point, because I reward everything appropriately—including errors. My students really appreciate this approach, even the ones who lose points. They see it as fair, and as one student put it, "only a complete fool would screw up an item again with a chance like this." They also know that it's part of my overall course design to help them learn from possible failures.

In fact, my course is designed to permit students to fail one exam and one paper, and still earn an A or B if they work hard on the rest of the material. The goal in the case of test corrections is to give them a chance to relearn material they'll need to understand in subsequent lessons. And although the corrections are optional, nearly all of my students participate. As a side note, being transparent and up-front about how failure can help and how the students can ameliorate their failures has also had a nice impact on my student evaluations.

From Jennifer Brielmaier (George Mason University): Once scores are computed in my online Physiological Psychology course, I give students the opportunity to complete exam corrections. They can earn up to half credit back (e.g., 2 points if it was originally a 4-point question) if they provide the following:

1. the original question, word-for-word;

2. their original answer and an explanation of why it was incorrect; and

3. the correct answer and an explanation of why it is correct.

I generally give students one week to complete these corrections. I add the points earned back to students' original exam scores.

One potential drawback to this strategy is that students don't get individualized feedback on their original exams. I simply mark a question as correct or incorrect. But I think the exercise of going back to the notes/textbook and figuring out where they went wrong allows for much more learning than if I

were to just tell them what the correct answer is. Students have repeatedly expressed gratitude for being given this opportunity, and I find that those who do corrections for interim exams perform better on the cumulative final exam.

Allowing Students to Retake the Test in Pairs or Groups

From Jennifer Cooper (Wesleyan University): I give students the opportunity to earn back points the next day in class, before they have received feedback on individual test items. They do this in small groups (these groups are used for other in-class activities throughout the class), they have a subset (5-10) of the most missed questions (or ones with moderate miss rates that are very important), and this policy applies whether grades on the test are very low or not. We go over this question subset and other key items from the test right after they turn this sheet in, and they are still really engaged and wanting to know if they got the answers right. Because most of my questions are applied, they're not things that students can just look up in the book. What I like about this is that the groups get really engaged in talking about the topics and right answers with each other as each group turns in a single paper.

From Jennifer Oliver (Rockhurst University): A strategy that I used in one class was that during the next class period, I didn't hand back the graded exams. I just gave each student a slip of paper with his or her grade on it (this was before we had an electronic system, such as WebCT or Blackboard). Then, I paired students up and had them retake the exam. I strategically paired up those who had performed exceptionally poorly with those who did very well, which generally left those in the B range partnered together. Students were allowed to use notes, and text and talk to each other (in fact, they had to talk to each other). In addition to the correct response, students also had to give the page number or the notes heading for any information not in text (I give structured outlines) for where they found the correct information. I averaged the scores on both exams to get the score that I counted toward the course grade. It took up another class period for testing, but students responded favorably to it, even those who had performed well the first time around. And not everyone got 100% on the re-test (as I recall only 2 groups out of 14 did).

From Iva Katzarska-Miller (Transylvania University): What I do in situations when students bomb an exam is to give them the opportunity to retake it as a group. I create the groups (usually 4 students in each) such that there is a representative of each grade. For example, one person would have gotten an A, another a B, another a D, and another an F. I give them exactly the same exam, and they have to work as a group to complete it, in one whole class period. Then I average the grade from the original exam and the group one. My impression is that students welcome the opportunity, and it leads to great discussions, allowing them to learn some of the things they missed prior to the exam.

Providing Students with Access to Good Test Preparation Techniques

Strategies to Use Before Students Bomb the Exam

There are several strategies that can be implemented before students fail an exam to address the problem of low scores on the first exam of the semester. In their syllabus, many instructors indicate that students may drop their lowest score. In some cases, the lowest score is replaced by an extra exam or the scores on the better exams are averaged and provided in place of the lowest score. Another strategy is to make the first exam in the course worth less than subsequent exams.

From Jordan Troisi (Sewanee: The University of the South): It's not a major thing, but one thing I often do—especially for the introductory course—is to make the first examination cover less content and be

worth fewer points than the other tests. This gives students “a taste” of what exams will be like in my class, without it being as “high-stakes” as other examinations will be. I make the point values clear to them, and I hope this mitigates concerns about what may be their first college exam. This only addresses strategies about the first exam, but that’s often the one that will go the worst for students.

These strategies have both advantages and disadvantages. One advantage of dropping the lowest score is that it reduces the need for make-up exams. Another advantage is that it provides students a way to bomb one exam and still do well in the course. On the other hand, a disadvantage is that the material from the dropped exam is lost and the student has no need to learn what they didn’t know.

Providing students with a replacement test holds students responsible for learning the full range of course content, but has the disadvantage of having the instructor make a new test. Implementing a weighting system has the advantage of providing the students with the opportunity to learn how the instructor tests before going on to subsequent tests with higher point values. In this way, the first exam can provide a wake-up call. In adopting one of these strategies it is important that we keep in mind that our ultimate goal is to promote student learning (Weimer, 2014).

Give Students Test-Taking Tips along with your Syllabus.

Provide students with a handout that contains test-taking tips. For example, on their blog, Jeremy Hyman and Lynn Jacobs (2010) describe 13 tips for prepping for a test. They include descriptions of how to engage in distributed study, what to focus on, the need to understand the format the professor uses for questions, the importance of obtaining any materials that you don’t have (e.g., missing lecture notes), the need to figure out what needs to be memorized and what concepts require deeper understanding, and the suggestion that the learner self-test over the material. They also provide metacognitive tips that can help students monitor their own thinking and learning processes. These are available at http://www.usnews.com/education/blogs/professors-guide/2010/02/03/13-tips-for-prepping-for-your-next-test.

From Rick Miller (Texas A&M University-Kingsville): I have found that the following strategies have helped students improve test scores and prepare more effectively for exams:

1. Don’t wait until the day before the test to begin studying. Going over one’s notes to make them clear and readable right after class or at least later in that day will make them more useful when reviewing them prior to the test.
2. Schedule time to study as firmly as you schedule time for work and class. Make it a regular part of your day.
3. Pay attention to pick up clues the teacher might provide about possible test questions. If a lecture includes three major concepts to explain a topic, that is an easy topic to turn into a multiple-choice question.
4. If the instructor holds test review sessions, attend and be sure to ask questions about any of the material you don’t clearly understand.
5. Outline the main topics and concepts that will be covered during an exam, and use this sheet to study. This will help you focus on key concepts on which you are likely to be tested.

6. On the day of the test, show up to class early in order to ask any last-minute questions and to be on hand in case the instructor provides any additional tips about how to do well on the test.

7. Review lecture notes, reading assignments, and other materials several days before the test to prepare for the test and to discover areas that you might need to clarify.

How to be a Successful Learner and Exam Taker

To better prepare students to take the first exam, or how to do better on subsequent exams, Stephen Chew (2017) of Samford University created a set of videos that represent both the latest in cognitive research on how people learn and his many years of experience teaching undergraduates. These videos are designed to help students identify effective and ineffective strategies in preparing for the test. The full set of videos is available at: http://www.samford.edu/departments/academic-success-center/how-to-study. Individual topics (linked below) include:

- *Developing a Mindset for Successful Learning* which provides 10 principles of effective studying.
- *Beliefs That Make You Fail . . . Or Succeed*, which describes students' mistaken beliefs that often interfere with learning.
- *What Students Should Understand About How People Learn*, which provides a powerful theory of memory.
- *Cognitive Principles for Optimizing Learning*, describes four principles students can use to study effectively.
- *Putting the Principles for Optimizing Learning into Practice* discusses effective note taking and highlighting.
- "*I Blew the Exam, Now What?*" tells a student what to do when they have bombed an exam. His suggestions include staying calm, not denying the problem, honestly examining your exam preparation strategies, reviewing the exam to analyze your mistakes, talking with the professor, examining your study habits for effectiveness, and developing plans for better strategies in studying and classroom work.

Study Guides and Group Work

From Joan Warmbold (Oakton Community College): My ideas focus on two issues. First, I cannot over-emphasize the importance of instructors providing their students with study guides BEFORE tests to clarify what are and are not important concepts in the readings. This is not spoon-feeding, but is simply a crucial aid in providing students with clarification about what they need to focus on when preparing for tests. An unintentional, but very important, side benefit for instructors who develop study guides is that we learn which topics weren't explained well, have not been provided sufficient context, or are superfluous and can be eliminated from our lectures. I think too many instructors make the unfounded assumption that their textbooks do an adequate job covering/explaining most of the important concepts, whereas I have discovered that this is frequently not the case.

The important benefit of study guides, with regard to how they can be used to assist students who perform poorly, is that by completing the study guide questions, students can determine which topics

they do and do not comprehend, a meta-cognitive ability sorely lacking among less-skilled students. Therefore, if the students make a genuine effort, they can meet with the instructor to discuss the specific topics they don't understand. Otherwise, many simply don't know what they don't know.

However, I don't experience an abundance of students who have trouble with the study guide IF my study questions are clear and straightforward. What I do experience frequently are students who perform poorly because they did not properly prepare for the test. Students generally won't admit their lack of preparation, and come up with all sorts of rationalizations, the prime one being, "I'm simply not a very good test taker." Certainly, there are students who do not possess effective study skills. But, to my dismay, I often discover that the main reason my students perform poorly is that they weren't willing to put in the necessary time and effort. As I've already stated, obviously this isn't an admission students will make without clear evidence. But that's another advantage to providing study questions. When a student comes to me for assistance and I review their study guide answers, I usually discover that they didn't complete most of the study questions or they rushed through them resulting in incomplete or incomprehensible answers. Remarkably often, the students' stark realizations that not doing a good job completing the study guide led to their poor performance, and this often results in a significant improvement in their test scores when they modify their study behaviors.

Therefore, I suspect that many students who perform poorly on tests in college classes are simply not putting in the necessary time to prepare, regardless of their claims to the contrary. I don't mean to be a super cynic here, but I do think students play us for dupes at times. However, clearly there are also students who are not aware or do not apply effective study strategies. Instead, many feel that simply re-reading over and over will do the trick. Therefore, students who perform poorly not only need to understand that good performance requires time and effort (surprise, surprise), but also requires using effective study strategies.

This implies that one way to deal with poor performing students is to provide direct instruction on good study skills, especially the use of active elaboration such as mapping, developing examples of concepts, discussing topics with other students, etc. And if instructors are using multiple-choice tests, they should provide specific strategies that aid performance on that test format. This is exactly what is done in courses students take to help them perform better on ACT/SAT tests, by the way. The more skilled students already have such "test wiseness" strategies, and so have a built-in advantage over those students who don't. If we want to give multiple-choice tests, we need to create a level playing field.

In addition, I think that all students would benefit from being provided class time to work in groups with other students' in order to:

1. review text content;
2. discuss/debate what the most important topics are; and
3. develop examples of these topics and how they relate to their own lives and experiences.

Modify Your Teaching and Testing to Improve Students' Test Performance

Construct Your Course to Maximize the Testing Effect

In 1992, Carrier and Pashler demonstrated that practice that involves testing produces superior test results than other forms of studying. In their study, learners who tested their knowledge remembered more information than those who spent the same amount of time studying the material. The reason as to why testing works better than re-reading course material has been explained by Mark McDaniel: it produces stronger connections between items (McDaniel & Fisher, 1991). Henry Roediger further suggests that it is the process of trying to recall material that makes testing better than re-reading (Roediger & Karpicke, 2006). To take advantage of the testing effect, teachers can construct their courses to include frequent quizzes or other assessment techniques that require students to answer questions rather than review materials.

Partnering for the Test

From Jennifer Oliver (Rockhurst University): In some classes, I give students the option to partner-test. Names for partners are drawn from slips of paper in a bucket. The two members of the partner team earn the same test score. Not surprisingly, most students who really prepared for exams opt not to partner.

I provide the option for partner-testing for the remaining exams after the first test. And I don't tell students ahead of time before the second exam that this would be an option. They do ask before the third exam whether it would be an option and I tell them that I have to think about it, not wanting them to expect that option going into the exam. This is to prevent some of them from intentionally not studying, and hoping to get partnered with someone who did.

Alternate Testing Strategies

From Elizabeth Shobe (Stockton University): I think most of us already know that major exams, covering a third or half of the course content, are not great indicators of the learning experience for many students. Tests are imperfect instruments (e.g., having typos, unintended bias in wording, unevenly emphasized content), different test formats elicit more or less of what has been learned, and students rapidly forget the material they studied for a test; for these reasons, tests have limited validity as a learning measure. Alas, we have to measure something for grades, and tests seem like the most objective method among a litany of possible subjective methods. Furthermore, time constraints on faculty and the length of the semester make the use of two or three tests highly appealing.

In Introductory Psychology (*n*=100), I offer seven multiple-choice quizzes, testing two chapters per quiz, and using 35–45 questions per quiz. I drop the lowest quiz grade from the final grade calculation, and do not allow make-ups. Students can then bomb a quiz, for whatever reason, and it doesn't add too much worry or personal doubt because each quiz covers such different material that it's ok for the student not to love or click into all of the material covered in the course. The second reason I drop the lowest grade is to reward the students for doing well. If students are satisfied with their grades after Quiz 6, they don't have to take Quiz 7. That 0 becomes their lowest grade, and is dropped. This frees those students to focus more on their other courses during the final week of the semester. About 60% of my students opt out of Quiz 7, and about 30–40% of students earn A grades.

So, my strategy is more of compensating for a poor grade rather than trying to do mid-semester back-pedaling and rectification. On occasion, I have allowed students to make up one quiz of their choice

after the last quiz. I don't like to do this because the vast majority bomb it, again. So, unless I spend inordinate amounts of time tailoring to individual misunderstandings, reoffering the same or similar quizzes is a waste of time.

In addition, each quiz has several associated extra credit options worth anywhere from 10–20 points (combined) added to their quiz score. These are written applications of the chapter material, and are intended to combat the issue that multiple-choice tests are not great for everyone. Thus, they enable student to show what they've learned in a different format. About 90% of the students do at least one of the options per quiz.

Could this strategy work in every course? Probably not. I think it will work best in survey courses (e.g., introductory, cognitive, abnormal), where it's not that important if students miss a chapter here and there. It could work in statistics if the students are motivated enough to back-pedal on their own so that they don't bomb every quiz thereafter. I haven't tried it in my statistics course, so I don't actually know how motivated the students are to do that.

In my neuroscience course, I just try to insert as many homework and other assignments as possible to prepare students for tests, but I have the luxury (n=35) of including only two tests, one each for sections 1 & 2, and then avoid tests/quizzes for the remaining four sections. If the students bomb their tests, I just give them points on their final portfolio grade if they've corrected the answers.

Counseling the At-Risk Student:

Providing Advice to Students to Ease the Shock of Failing the First Exam

When a student fails an exam they can feel defeated and humiliated. What can you say to the student who bombed the exam? In general, it is important to deal with the situation without criticizing or rebuking them. Try to encourage the student to learn from their failure and to rise above their setback. Some things you might say include:

1. Tell the student to not stress out, or at least to avoid debilitating stress. Let them know what they can do once the initial panic passes.

2. Re-focus their attention. The first step in improving performance is for the student to accept that what they did is what caused the outcome. However, as F. Scott Fitzgerald (n.d.) once said, "never confuse a single defeat with a final defeat." Re-direct their internal attributions from "I am just not smart in this way" to "I just need to study smarter to do well."

3. Assist the student in identifying problem areas. Did they mostly miss questions from the textbook, the readings, or the in-class lecture/discussions? Depending on the pattern, the solution should be readily self-evident to the student.

4. Encourage students to study with classmates in order to build on each other's strengths and compensate for weaknesses. Also, scheduling study sessions with others tends to encourage responsibility and may lead students to engage in actual studying.

5. If you plan to offer extra credit opportunities, the best time to mention it is after the first exam rather than at the end of the semester.

6. If there are external factors that have contributed to the student's poor performance (and what failing student doesn't have one of these), talk with the student about what they plan to do to reduce the effects of those external factors. Being sympathetic is great, but it may not really solve the problem.

7. Provide students with some of the resources, (e.g., study tips) described earlier in this chapter.

Conclusion

In the end, it may be that the most important thing we can say to our students when they bomb one of our exams is that this is not the end of the world, nor the end of their academic careers. Failure is not the enemy. Overcoming obstacles is how we build up our problem-solving skills, expertise, and intelligence. Bombing an exam is an opportunity for students to learn about themselves and to become smarter, more resilient, and better at learning, testing, and proving themselves.

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References

Carrier, M., & Pashler, H. (1992). The influence of retrieval on retention. *Memory & Cognition, 20,* 632–642. doi: 10.3758/BF03202713

Chew, S. (2017, February 14). *How to get the most out of studying*. Retrieved from http://www.samford.edu/departments/academic-success-center/how-to-study

Daniel, D. (2007, January). *Teaching as codependence: A teacher's bill of rights.* Symposium conducted at the National Institute on the Teaching of Psychology, St. Petersburg Beach, FL.

Fitzgerald, F. S. (n.d.). *BrainyQuote.com*. Retrieved from https://www.brainyquote.com/quotes/quotes/f/fscottfit161657.html

Hyman, J. S. & Jacobs, L. F. (2010). *13 tips for prepping for your next test.* Retrieved from http://www.usnews.com/education/blogs/professors-guide/2010/02/03/13-tips-for-prepping-for-your-next-test

McDaniel, M. A., & Fisher, R. P. (1991). Tests and test feedback as learning sources. *Contemporary Educational Psychology, 16,* 192–201. doi: 10.1016/0361-476X(91)90037-L

McKeachie, W. J. (1994). *Teaching tips: Strategies, research, and theory for college and university teachers*. Lexington, MA: D. C. Heath.

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science, 17*, 249–255. doi: 10.1111/j.1467-9280.2006.01693.x

Weimer, M. (2014, March). Calculating final course grades: What about dropping scores or offering a replacement? *The Teaching Professor, 28*(3), 6.

Zlokovich, M. S. (2004). Grading for optimal student learning. In B. Perlman, L. I. McCann, & S. H. McFadden (Eds.), *Lessons learned: Practical advice for the teaching of psychology, Volume 2.* Washington, DC: American Psychological Society.

Chapter 12: Cooperative and Collaborative Learning: Getting the Best of Both Words

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Abstract

Learning in small groups plays an increasing role in modern pedagogy. There is strong evidence that students working in small groups outperform students working individually in several key areas, including knowledge development, critical thinking skills, social skills, and course satisfaction. This chapter compares the theory behind cooperative and collaborative learning techniques, and demonstrates both approaches in practice. Such active, student-centered pedagogical approaches have been popular in K-12 schools for years, but have only recently come to be valued in higher education. We describe how we have applied these two approaches in teaching undergraduate developmental psychology, using examples of collaborative student oral presentations, cooperative use of the CRAAP test to build information literacy, and combining cooperative learning with multimedia to teach psychological concepts. We also provide an illustration of our methods for assessing student motivation and learning outcomes. Benefits of cooperative, collaborative, and hybrid approaches are discussed.

Introduction

Learning in small groups plays an increasing role in modern pedagogy, from K-12 to higher education. There is strong evidence that students working in small groups outperform students working individually in several key areas, including knowledge development, thinking skills, social skills, and course satisfaction (Barkley, Major, and Cross, 2014; Johnson & Johnson, 1994; Stroebel & Van Barneveld, 2009). A myriad of terms have been used to describe such learning in the past four decades, but most commonly these group-based processes are called cooperative or collaborative learning. These approaches are built on developmental and educational theory, suggesting that learning is fundamentally a cooperative, collaborative process of socially constructing knowledge (Bruffee, 1986; Driver, Asoko, Leach, Scott, & Mortimer, 1994; Slavich & Zimbardo, 2012). While cooperative and collaborative approaches share a great deal in common, this chapter will help to clarify and disentangle the unique features of each. We will then share ways that we have implemented hybrids of cooperative-collaborative methods in teaching an undergraduate developmental psychology course.

Both cooperative and collaborative learning have roots in social constructivism, and the cognitive developmental theories of Vygotsky (1934/1986; 1978) and Piaget (1951). These developmental theorists suggest that when students work together, socio-cognitive conflict promotes deeper reasoning. Vygotsky further argued that all learning and development is socially constructed, arising on

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the social level before the individual level. Both Piaget and Vygotsky see the learner as an active agent, but Vygotskian theory emphasizes that learning is not an individual construction, but rather social *co-construction* of knowledge, taking place within ever-changing historical and cultural contexts. The etymological roots of "cooperate" are in the Latin verb *cooperari* (*co-* "together" + *operari* "to work"), meaning to work together or operate in conjunction with others ("Cooperate," 2017; Davidson & Major, 2014). Similarly, the origin of "collaborate" is the Latin verb *collaborare* (*col-* "together" + "laborare "to work") which entered into English via modern French in the 19th century, meaning to work in conjunction with others ("Collaborate," 2017). Cooperative and collaborative learning are both active methods, in contrast to individualized, "transmission" or "banking" models of education (Freire, 1970), in which students passively absorb and reproduce an inert body of knowledge.

While both approaches share a great deal in common, there are important and discernible differences. Although there are no completely agreed upon definitions of either term, in practice, cooperative learning generally focuses on working in an interdependent fashion, where each member of the group is often responsible for a "piece" of the final product (Johnson & Johnson, 2009). The division of labor is typically more systematically structured in cooperative learning, with clear, accountable roles assigned to each member of the group. By contrast, collaborative learning tends to feature more fluid, shifting roles, with group members crossing boundaries between different areas of work, or co-deciding the best ways to collaborate on their joint project (Dillenbourg, 1999; Bereiter & Scardamalia, 2006). Goals and tasks may be more open-ended, and collaborative groups are generally more "self-managed" in terms of setting goals and establishing styles of interaction. In cooperative learning, instructors may also play a greater role in scaffolding activities by creating intentional groupings of students, or randomly assigning students to groups. Further scaffolds may also be necessary to ensure successful cooperation between group members, such as directly teaching group interaction skills and reflection on those skills. This intentional grouping reflects the influence of the civil rights movement on cooperative learning, and the desire to integrate racially diverse groups of students working toward common goals, thus reducing prejudice (Aronson & Bridgeman, 1979). The "jigsaw" technique is a prototypical cooperative learning activity developed in the wake of the civil rights movement, with the goal of transforming individual competitive tendencies into cooperative ones (https://www.jigsaw.org/). Jigsaw involves creating groups of 5-6 students in which every student is assigned to become an "expert" by studying a portion of the overall topic (e.g., Piaget's four cognitive stages, plus a biography of Piaget). Experts temporarily form groups with other experts in the class who have been given the same portion of the topic (e.g., Piaget's formal operations stage), to exchange ideas and deepen their expertise. Students then rejoin their original group, where they present their piece of the intellectual "puzzle." By comparison, instructors often take a more "hands off" approach in collaborative learning, allowing students to form groups based on friendships or common interests (Davidson & Major, 2014).

Research in different subject areas and with students of various ages has demonstrated positive effects of cooperative learning on academic achievement and the development of higher-order thinking skills (Davidson & Major, 2014). At the postsecondary level, a meta-analysis by Springer and colleagues (1999) found that college students participating in cooperative learning in science, technology, engineering, and math (STEM) courses demonstrated greater achievement, persistence, and more positive academic attitudes than peers in non-cooperative approaches. Cooperative techniques have also been found to facilitate learning of psychological concepts (e.g., Perkins & Saris, 2001; Tomcho, Wolfe, & Foels, 2006). It has been proposed that these beneficial effects of cooperative learning are due to the socio-cognitive

conflict that arises when engaging with a partner's ideas and perspectives, which in turn promotes deeper reasoning (Piaget, 1951; Vygotsky, 1978). Interactions often take the form of joint dialogues that build upon and respond to the partner's contributions of relevant information and challenging questions, thereby increasing the conceptual understanding of the cooperating individuals (Chi, 2009).

Meanwhile, the literature on collaborative learning has reported success in allowing small groups of students to pursue shared goals and develop solutions to complex, open-ended problems (Bruffee, 1995; Hmelo-Silver, 2004). Collaborative learning heavily emphasizes students' interpretations of texts and critical thinking, drawing upon multidisciplinary skills. Thus, collaborative learning is thought to be ideally suited for scientific inquiry and research applications (Brown & Campione, 1994). Through collaboration with peers and instructor facilitation, students can engage in inquiry-driven problem solving and become part of a community of learners and thinkers within the classroom (Brown & Campione, 2002; Rogoff, 1994).

One such collaborative method is problem-based learning (PBL), in which students attempt to solve a complex problem that does not have a single correct answer (Hmelo-Silver, 2004). Students work in collaborative groups to first identify what new information they need to learn to solve the problem. Students then engage in self-directed learning, applying their new knowledge to the problem and reflecting on what they learned and the effectiveness of their strategies. The teacher only acts to facilitate students' self-directed processes, or to model certain reasoning processes, rather than to directly provide knowledge or information. The goals of PBL are to help students develop flexible knowledge, effective problem-solving skills, self-directed learning skills, collaboration skills, and intrinsic motivation. In both cooperative and collaborative approaches, working together in small groups provides opportunities for students to develop social and communication skills (Johnson & Johnson, 2009; Shimazoe & Aldrich, 2010), and often has the added benefit of being more motivating and enjoyable for students than independent work (Slavin, Hurley, & Chamberlain, 2003).

For Vygotsky and later cultural-historical activity (CHAT) theorists, collective activity creates a zone of proximal development (ZPD) for individual learning and social transformation. This means that instructors can facilitate cooperative activities and collaborative projects among peers of various skill levels, engaging students' proximal, "ripening" abilities, which they could not develop effectively in isolation. In this spirit, we will share cooperative and collaborative learning activities that we have incorporated into our mid- to large-size undergraduate classes at a diverse, urban public university. These group activities were often a hybrid of cooperative and collaborative approaches, as we sought to combine the best aspects of each method. Efforts to assess learning and motivational outcomes generated by these techniques will also be discussed. These case examples also align with the APA guidelines for undergraduate psychology coursework (APA 2013; Dunn et al., 2007). It is our hope that providing detailed examples of these active, group-based forms of instruction will be useful to inform the pedagogy of new and seasoned instructors alike.

Collaborative Learning through Oral Presentations

Public speaking and communication of ideas to a live audience are important skills in a variety of professional and academic settings. Oral presentations have a long and venerable history in education, and can provide an optimal collaborative learning experience for small groups of students. Both authors have facilitated collaborative group research projects in their developmental psychology classes over a period of several weeks, with these projects culminating in oral presentations to the class. The goal was

to have groups of four students (give or take one student) deliver 10 to 20-minute presentations, followed by a five-minute question-and-answer period, on developmental topics of interest to them. Prior to forming groups, instructors discussed the importance of developing public speaking and presentation skills, highlighting how practicing collaboration will enhance their ability to be “team players” in future professional endeavors. Instructors then apprised students that the objective for each group was to present a scientific debate in developmental psychology, and to present different theories or points of view within that debate. Students were encouraged to formulate their research topics as unanswered questions that we would like to answer. For instance, if the question were formulated as, "How do Humans Acquire Language?" the group could present the behaviorist, nativist, and social constructivist theories of language acquisition, along with the evidence supporting each view. If the topic were, "What is the best method of child discipline?" the group might present arguments for and against spanking, as well as cognitive, behaviorist, or cognitive-behavioral approaches to child discipline. Students were given the following further instructions about the project:

We are presenting a "debate" between different scientific points of view. Each viewpoint should be presented with supporting evidence from psychological research to make a convincing case for that point of view. This scientific controversy should make the topic exciting and memorable, and we will learn about ongoing investigation of unanswered questions in human development.

This activity was predominantly collaborative in form, and students were expected to benefit from several collaborative elements of the project. First, group members were encouraged to communicate with each other to establish what roles they would play, as specific group roles were not assigned. This meant that students were free to “cross boundaries” between roles and tasks, and to decide the best ways for their groups to collaborate. The instructor merely provided guidelines for the final presentation that required groups to present multiple viewpoints on their question, a brief history of how psychological research into this question developed, and an accompanying multimedia (e.g., PowerPoint, short video) presentation. Otherwise, however, the format of the presentation and the process of developing it were relatively open-ended. Some groups embraced this challenge by presenting their debates as “presidential debates” with opening statements, rebuttals, and moderators. Others staged them as mock “boxing matches” where fighters for each theory exchanged scientific jabs, supporting their arguments with empirical research. While many groups enacted fluid and shifting roles, other groups established clear divisions of labor from the beginning. This sometimes took the form of two students presenting opposing viewpoints, one student giving the topic’s history, and one student responsible for the multimedia presentation. The instructor “checked in” with each group to answer questions and facilitate interactions, but specific social skills were not modeled, and group interactions were not directly scaffolded. That is, groups were relatively “self-managed” in terms of their timetables and styles of interaction. Allowing group processes to emerge in this way seemed to promote forms of critical thinking that are necessary to conduct research on the evidence behind different theories, and to critically evaluate their merits.

Another collaborative aspect of these projects was that students were permitted to form groups based on common interests. Early in the semester, students were asked to begin brainstorming and to be on the lookout for topics on development that interested them. About a month later, students shared the ideas they had generated with their classmates, and the instructor compiled a live document listing the potential topics. Students were then given a week or two to perform cursory searches of popular or academic sources to determine which topics were both interesting and had sufficient research to form a

presentation. Students generated their top three to four choices for topics, and in the next class the instructor facilitated the formation of groups based on common interests. If there was a topic in which only one or two people were interested, these students joined other groups, typically with topics that were still among their top choices. During certain semesters, one of us (Sawyer) has implemented a variation on this process by providing students with a list of possible topics ahead of time (but still allowing freedom to choose a topic not listed), and this has also worked well. There tended to be a wider, more creative range of topics when students generated them on their own, though sometimes these topics required some shaping to connect them more directly with developmental psychology. Student-generated questions for these projects have included how we develop our gender identity and sexual orientation, how racial bias may develop in children, the effect of pets and animal therapy on human development, how friendship contributes to development, and how social deprivation impacts development. All of these topics made for highly interesting and effective presentations.

Before the research process got underway, the instructor employed an element from cooperative learning by scaffolding student skills in searching for psychology articles in online media, and pointing students to popular psychology blogs and scientific websites. The instructor also provided tutorials on using Google Scholar and university databases (e.g., EBSCO) to search for relevant articles and book chapters. As for presentations, students were advised that PowerPoint slides should be light on text (e.g., using bullet points), incorporating substantial use of pictures and images to help communicate the message. Additional tips on speaking slowly, maintaining eye contact with the audience, and rehearsing presentations to make them smoother were also shared. Subsequently, students with diverse skill levels in research tutored each other in their respective areas of strength, which benefitted the student teaching the skill as well as the one learning it. As a practical matter, many students at our campuses work and commute long distances to campus, and thus have difficulty finding time to meet up with classmates for group work. Thus, students were given time to work together in class during at least three different weeks. This especially helped with refining topics, researching the topic, and making plans for a division of labor, which could be carried out at home. What students did not complete in class they accomplished by Skype, sharing materials online, or physical meetups on campus. As students explored their topics together, they exchanged ideas, posed half-formed thoughts, and constructively disagreed about their topics. This seemed to spur students to delve more deeply into their topics, and to sharpen the debates that emerged in each presentation. Working together toward the same goal seemed to build camaraderie among classmates, as we noticed more students socializing with each other during class breaks, and some students shared with us that they developed ongoing friendships with group members through this process.

The activity of collaboration in pursuit of intellectually engaging questions seemed to create a friendly and open community of learners. One of the students in Sawyer's class, to his delight, described this classroom atmosphere as an "intellectual playground." Because students co-constructed the content and style of their presentations, they felt that they were not merely summarizing (as happens with many presentations), but actively contributing to knowledge and stimulating debate among classmates about important psychological ideas.

PRESENTERS: _____TOPIC: _____

The importance of the topic was communicated to the audience (1-5)	A debate or controversy in development was presented (1-5)	Slides and other visuals have appropriate content (1-5)	Content is organized with a well-defined topic (1-5)
Speakers were easy to understand, good speaking voices (1-5)	A useful history of the debate or controversy was presented (1-5)	Slides/visuals are easy to read/see (1-5)	Interaction with students is effective (1-5)

Write ONE thing that you learned from this lesson—a particularly strong aspect:

_____

Write ONE thing that could be improved, with advice for future presentations:

_____

Please grade your peers on their presentations. Keep in mind the following points:
- Slides are clear / Easy to read
- Made eye contact
- Elaborated on slides (didn't just read them)

Presentation Topic:	Score: 1 — 5 (1 being POOR, 5 being Excellent)	Notes/Comments:
1.		
2.		

**the average of the peer group score will be added to each group's presentation grade.*

Figure 1. Two examples of audience feedback forms for oral presenters

To encourage maximum audience engagement and constructive feedback, the instructor distributed peer review forms to audience members before each presentation. We used different peer review forms in each class, and forms varied in terms of how they structured student feedback. Examples of these forms are provided in Figure 1. The process of peer review allowed students to provide written feedback on what they learned and enjoyed from each presentation. Students shared feedback on what they saw as strengths of the presentation, as well as tips for improving the content and style of future presentations.

Instructors collected these forms, and selected the best, most constructive feedback to pass along to presenters. Audience feedback helped the instructor to remember salient aspects of each presentation, and to see it from the students' point of view. This eased the process of grading and allowed targeted instructor feedback to each group. Alternatively, one could incorporate audience grading of presentations into students' final presentation grades. Telling students that their grading plays a role in their peers' grades (e.g., 20% of the presentation grade) holds students accountable to make their feedback constructive. By presenting to the class, and giving and receiving feedback, students reported gaining confidence in their oral presentation skills and their ability to plan and create presentations. Presentations were typically made the last few weeks of the semester, which allowed for a lively way to wrap up the course. Based on student ratings of the class, audience feedback on peer review forms, and engaged audience questions during the question-and-answer periods, this activity was highly motivating and enjoyable for students. As a result, we have used this activity in multiple semesters and plan to continue doing so.

Using the CRAAP Test Collaboratively

The results of psychological studies, not to mention their "pop" distortions, are frequently (mis)reported in the mainstream media. These often-questionable interpretations and uses of psychology are the way in which many students first encounter the work of psychologists. Rather than ignoring how psychology is represented in the media and larger world, collaborative activities around media literacy can provide excellent opportunities for students to exercise and build critical thinking faculties. In order to foster media literacy in our students, we have utilized the CRAAP test (also called CAARP test; Fisher, Buckner, Hunter, & Nolan, 2016; also see Fisher, Hunter, Nolan, & Buckner, this volume for a discussion of the CRAAP test) as an efficient way of bringing the larger world into the classroom. This activity works by engaging students in evaluating source materials (e.g., blogs websites, articles) using several criteria (Currency, Relevance Authority, Accuracy, and the author's Purpose in writing the material). During this activity, students typically select an online news article online that is relevant to the psychological concept that we are discussing in class (e.g., attachment styles), and they then evaluate the article based on the previously mentioned CRAAP criteria. We have both used the CRAAP test in our teaching and have found it to be a fun and efficient tool to promote information literacy, which involves the ability to critically evaluate news and information sources. We believe that teaching students about information literacy and connecting our classrooms to the "offline" world promotes genuine interest in real-world applications of psychology among our students. This approach also equips them with the tools needed to process and critically evaluate sources that they are exposed to daily through news, blogs, and social media. This activity allows us to think about research in every class session, by discussing reliable and unreliable sources of information about various developmental topics. There are many online templates that guide instructors on how to incorporate the CRAAP test into their courses (for example:

http://legacy.juniata.edu/services/library/instruction/handouts/craap_worksheet.pdf or https://libraries.mercer.edu/research-tools-help/citation-tools-help/images/PrintableCRAPtest.pdf).

The CRAAP test typically does not feature a built-in collaborative or cooperative component, but we have incorporated cooperative learning into this method. We pair this activity with student interaction and discussion. First, groups of 2-3 students choose an article about a relevant topic, and then they read the article and think about it individually. The group then reassembles and discusses the article in light of the CRAAP criteria. Students discuss whether the source they found is a relevant and reliable one or if it did not pass the CRAAP criteria. We then hold full-class discussions about the articles, and whether or not they pass the CRAAP test. This activity merges both the CRAAP test and the think-pair-share method that we will discuss in the next section. Think-pair-share (Lyman, 1992) is a well-known cooperative learning technique in which students think about and discuss a question in pairs, and then share their ideas with the larger class. We feel that the benefits of the CRAAP test can be maximized using cooperative approaches. This not only teaches students about information literacy, but also allows students to exchange views while interacting and learning from other students' perspectives on different articles. When we use this activity, the CRAAP test itself provides the structure for group interaction, and the aim is to foster critical thinking and negotiation skills between students (see http://nova.campusguides.com/evaluate for further information about CRAAP criteria and commonly used handouts).

Cooperative Learning with Multimedia

When integrating cooperative and collaborative learning approaches into classroom lessons, the question arises as to the modality in which to present lesson content. The use of multimedia-driven instruction (e.g., projected text and images, video, computer animations) in college courses is an ever-growing practice designed to facilitate student learning and motivation (Bartlett & Strough, 2003). Theory suggests that multimedia facilitates learning because students process audio and visual information simultaneously, and this multimodal processing leading to better retention (Mayer & Moreno, 2003), in accordance with Paivio's dual-coding theory (Clark & Paivio, 1991). The ongoing infusion of digital tools into higher education has increased interest in multimedia-supported and web-enhanced collaborative learning (Resta & Laferrière, 2007; Shane-Simpson, Brooks, Hotez, Sawyer & Dow, 2015).

In our developmental psychology classes, we experimented with cooperative learning activities featuring video as a multimedia tool for learning psychological concepts. When used effectively, videos can help to make abstract ideas concrete and memorable (Thompson & Fisher-Thompson, 2013). Videos can also provide vivid examples of psychological concepts as the basis for discussion and application of course content (Simpson, 2008). However, potential pitfalls are that the "activity" of watching a video may encourage passive learning unless it is specifically designed to engage students. The literature recommends that multimedia be used in an active and guided manner (Lawson, Bodle, Houlette & Haubner, 2006), with direct application of course concepts to the video (Kreiner, 1997).

With these caveats in mind, we set out to build a series of lessons around cooperative discussion of videos portraying classic developmental experiments and situations. We collaborated with three other graduate student developmental instructors (also GSTA members) to develop PowerPoint lesson modules with embedded videos to teach core developmental concepts (e.g., object permanence, joint attention, attachment, egocentrism). This was greatly facilitated by the fact that we had created a

collaborative course prep for Human Development in which we shared instructional materials among several GSTA instructors on different campuses within our university system (for more information about developing collaborative course preps see Schwartz, Powers, Galazyn, & Brooks, this volume). Each module featured a pair of videos carefully selected from YouTube that depicted a developmental experiment or situation in which one child displayed more advanced development and another child displayed less advanced development. For example, the egocentrism video pair featured a child passing Piaget's Three Mountains Problem (Piaget & Inhelder, 1956), and a slightly younger child attempting the same task unsuccessfully (https://www.youtube.com/watch?v=OinqFgsIbh0). We then designed three questions prompts for each module to scaffold students' understanding of the experiment. For the egocentrism modules, the questions were:

1) What differences did you observe in the behavior of the two children in the Three Mountains Problem?

2) What can you infer about the children's cognitive egocentrism from these behavioral differences?

3) What might be some consequences if a child does not develop perspective taking, and instead remains at the egocentric stage of mental representation?

A traditional lecture format might present the lesson about the Three Mountains Problem through text-based description. If augmented with low-stakes writing prompts, the instructor might invite students to individually write answers to the questions above, in order to reinforce key terms. However, this approach would not benefit from the social construction of knowledge inherent in cooperative interactions, nor would it take advantage of the unique affordances of multimedia. Cooperative learning with multimedia, in contrast, would invite students to watch the video comparison of children's responses to the Three Mountains Problem, discuss the question prompts using think-pair-share methodology, and then conclude the lesson with a whole-class discussion. Think-pair-share is considered a cooperative technique because the structure of discussion and interaction is largely defined by the instructor's choice of questions and allocation of groups. Partners are either assigned by instructors, or are "random" in the sense that students turn to talk with the student who happens to be sitting next to them. Partners are interdependent and accountable to each other, both being required to take an active role in the interaction.

While think-pair-share is substantially structured in the manner of cooperative learning, there are elements of collaborative learning at play as well. Although the instructor selects the discussion questions, students have leeway in how they conduct the discussion. Students decide who speaks first, and whether each partner will speak uninterrupted for a few minutes, or whether the discussion will take a more conversational, back-and-forth pattern. In addition, there are no roles in this interaction per se, but rather each partner contributes their own thoughts in whatever way they see fit. Thus, boundaries between ideas are fluid, and it is hoped that each member of the pair will build upon and respond to the other's ideas. Students inevitably offer different viewpoints, which may encourage their classmates to consider alternative perspectives. Conflicting perspectives may spur students to cognitively elaborate the reasons for their opinion. Students may persuade their partner, or be persuaded to see things in a different light. We further scaffolded the activity by giving instructions to students beforehand about allowing equal time for each partner to share their ideas, and modeling how to engage in active listening and dialogue with one's partner. Having students discuss key questions for a

few minutes in pairs provides an effective bridge into class-wide discussion, as students get a chance to practice expressing their ideas to one partner before sharing with the rest of their classmates. The paired discussion allows students to clarify their ideas and raise their confidence, making them more likely to participate in the subsequent, full-class discussion.

To compare traditional cooperative learning and multimedia cooperative learning to traditional instruction, as well as examine the benefits of individual multimedia and cooperative components, the instructors taught pairs of modules to their respective classes in the three counterbalanced conditions shown in Table 1. At the end of each module, students completed the Intrinsic Motivation Inventory (IMI, Ryan, 1982) to rate their enjoyment and effort on each module, and took a six-question quiz assessing learning of the module content and concepts.

Table 1. *Three instructional conditions*

Condition	Description
Multimedia Cooperative Learning	Video of experiment, think-pair-share, and whole-class discussion
Traditional Cooperative Learning	Textual description of experiment, think-pair-share, and whole-class discussion
Traditional Instruction	Textual description of experiment, individual writing about prompts, and defining key terms

Four instructors each taught their own section of the course at the same college, collectively enrolling 165 undergraduate students. The students (69% female and 31% male) were a diverse sample, with ages ranging from 17 to 57 years (M = 22.53 years, SD = 6.51 years), and ethnicities were self-reported as 42% Caucasian/White, 17% Asian/Asian-American, 14% Latino, 13% Black/African American, 8% Middle Easterner, 1% Pacific Islander, and 5% Other.

After controlling for instructor effects and module difficulty, the results of our assessment indicated that students scored significantly higher on module quizzes in the multimedia cooperative learning condition than they did with traditional instruction (p = .02). Students also scored marginally higher in the text-based cooperative learning condition than with traditional instruction (p = .06). The adjusted means for quiz scores in each condition are shown in Figure 2.

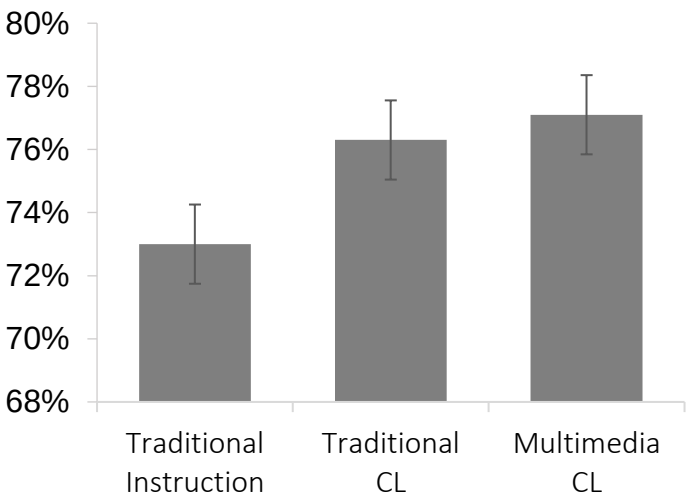

Figure 2. *Percentage of quiz questions answered correctly by instructional condition.*
Note: CL = Cooperative learning

At the end of each module, students rated their intrinsic motivation level on the IMI, which included items such as, "I enjoyed doing this activity very much," and "I put a lot of effort into this." After adjusting for instructor effects, students reported higher intrinsic motivation levels with multimedia cooperative learning than traditional cooperative learning (p = .02). The adjusted means for motivation in each condition are shown in Figure 3.

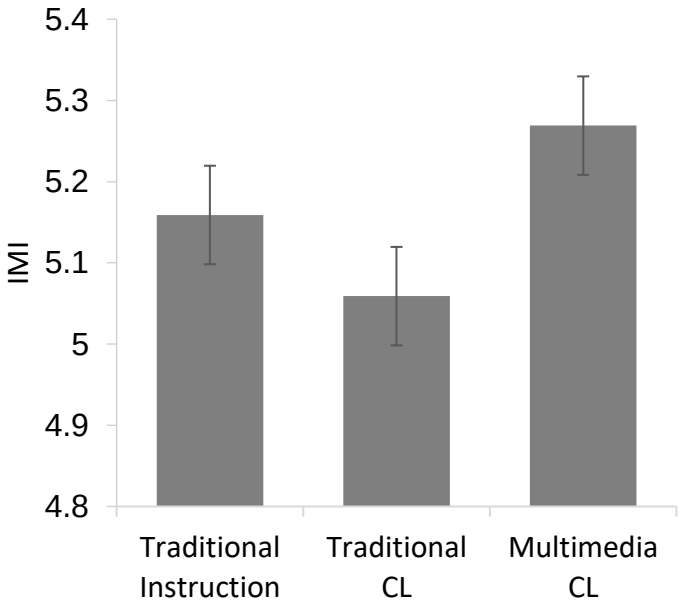

Figure 3. *Student self-rated intrinsic motivation (IMI) by instructional condition.*
Note: CL = Cooperative learning

Overall, our results indicated that adding cooperative learning to a traditional, text-based lesson marginally increased student learning, but that adding multimedia video and cooperative learning elements significantly increased learning. The combination of multimedia and cooperative learning also resulted in higher student motivation than adding only cooperative learning to traditional text-based lessons. It seems that promoting student engagement with multimedia in an active, cooperative manner allowed beneficial discussion and exchange of ideas between students. The socio-cognitive conflict engendered by these discussions likely allowed students to co-construct richer representations of developmental concepts, and to process these ideas more deeply and meaningfully. Scaffolding think-pair-share interactions with question prompts that helped to guide student discussion also likely contributed to the beneficial effects of the cooperative multimedia instructional technique.

Conclusions

In this chapter, we have highlighted the advantages of applying cooperative learning, collaborative learning, and cooperative-collaborative hybrids in the teaching of psychology. We described examples of how we have incorporated these techniques into our classrooms, and provided some anecdotes and data to illustrate how these methods can enhance student learning and motivation. Of course, there are multiple ways to adapt your current course assignments to take advantage of group-based learning, and we encourage you to experiment with these cooperative and collaborative approaches in your own classrooms.

While approaches derived from Piagetian and Vygotskian theory are especially apropos for a developmental course, they can be applied to virtually any course in psychology or other subjects. In addition to promoting key student skills such as critical thinking and communication, students find cooperative and collaborative work highly motivating. When students find pleasure in learning, it improves their classroom experience and the relationships they form with fellow students. This increases the likelihood that they will transfer these new skills and these developing abilities to future collaborative projects and endeavors. Finally, students were not the only ones in our classes who reaped the benefits of cooperation. In the course of collaboratively designing our course preparation, we shared materials and insights with other instructors and advising faculty. Part of fully committing to cooperative and collaborative approaches is realizing that no teacher is an island, and that we all have a lot to learn from each other by working together.

References

American Psychological Association. (2013). *APA guidelines for the undergraduate psychology major.* Washington, DC: American Psychological Association.

Aronson, E., & Bridgeman, D. (1979). Jigsaw groups and the desegregated classroom: In pursuit of common goals. *Personality and Social Psychology Bulletin, 5*, 438-446. doi:10.1177/014616727900500405

Barkley, E. F., Major, C. H., & Cross, K. P. (2014). *Collaborative learning techniques: A resource for college faculty, 2nd Edition*. San Francisco, CA: Jossey-Bass.

Bartlett, R. M., & Strough, J. (2003). Multimedia versus traditional course instruction in introductory social psychology. *Teaching of Psychology*, *30*(4), 335-338. doi:10.1207/S15328023TOP3004_07

Bereiter, C., & Scardamalia, M. (2006). Education for the knowledge age: Design-centered models of teaching and instruction. In P.A. Alexander (Ed.), *Handbook of educational psychology* (pp. 695 - 713). New Jersey: Lawrence Erlbaum Associates Publishers.

Brown, A. L., & Campione, J. C. (1994). *Guided discovery in a community of learners*. Massachusetts: The MIT Press.

Brown, A., & Campione, J. (2002). Communities of learning and thinking, or context by any other name. In P. Woods (Ed.), *Contemporary issues in teaching and learning* (pp. 120 –126). New York, NY: Routledge.

Bruffee, K. A. (1986). Social construction, language, and the authority of knowledge: A bibliographical essay. *College English*, *48*(8), 773-790. doi:10.2307/376723

Bruffee, K. A. (1995). Sharing our toys: Cooperative learning versus collaborative learning. *Change: The Magazine of Higher Learning*, *27*(1), 12-18. doi: 10.1080/00091383.1995.9937722

Chi, M. T. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, *1*(1), 73-105. doi:10.1111/j.1756-8765.2008.01005.x

Clark, J. M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review*, *3*(3), 149-210. doi:10.1007/BF01320076

Collaborate. v. (2017). In *Oxford English Dictionary Online.* Oxford University Press. Retrieved from http://www.oed.com/view/Entry/36195?redirectedFrom=collaborate (accessed January 12, 2017).

Cooperate. v. (2017). In *Oxford English Dictionary Online.* Oxford University Press. Retrieved from http://www.oed.com/view/Entry/41036?rskey=5eByTb&result=2&isAdvanced=false#eid (accessed February 3, 2017).

Davidson, N., Major, C. H., & Michaelsen, L. K. (2014). Small-group learning in higher education—cooperative, collaborative, problem-based, and team-based learning: an introduction by the guest editors. *Journal on Excellence in College Teaching*, *25*(3&4), 1-6.

Dillenbourg, P. (1999). What do you mean by 'collaborative learning'? In P. Dillenbourg (Ed.), *Collaborative-learning: Cognitive and computational approaches.* (pp.1-19). Oxford: Elsevier.

Driver, R., Asoko, H., Leach, J., Scott, P., & Mortimer, E. (1994). Constructing scientific knowledge in the classroom. *Educational Researcher*, *23*(7), 5-12. doi:10.3102/0013189X023007005

Dunn, D. S., McCarthy, M. A., Baker, S., Halonen, J. S., & Hill IV, G. W. (2007). Quality benchmarks in undergraduate psychology programs. *American Psychologist*, *62*(7), 650. doi:10.1037/0003-066X.62.7.650

Fisher, P. H., Buckner, J. P., Hunter, A. S., & Nolan, S. A. (2016, October). *Beyond "I know it when I see it." Developing Concrete examples of critical thinking in psychology classrooms.* Workshop presented at the 7th Annual Pedagogy Day Conference, the Graduate Center, CUNY, New York: NY.

Freire, P. (1970). *Pedagogy of the oppressed*, trans. Myra Bergman Ramos. New York, NY: Continuum.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, *16*(3), 235-266. doi:10.1023/B:EDPR.0000034022.16470.f3

Johnson, D. W., & Johnson, R. T. (1994). Learning together. In. S.E. Sharan (Ed.), *Handbook of cooperative learning methods*. Connecticut: Greenwood Press.

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, *38*(5), 365-379. doi:10.3102/0013189X09339057

Kreiner, D. S. (1997). Guided notes and interactive methods for teaching with videotapes. *Teaching of Psychology, 24*(3), 183-185. doi:10.1207/s15328023top2403_6

Lawson, T. J., Bodle, J. H., Houlette, M. A., & Haubner, R. R. (2006). Guiding questions enhance student learning from educational videos. *Teaching of Psychology*, *33*(1), 31-33. doi:10.1207/s15328023top3301_7

Lyman, F. (1992). Think-pair-share, thinktrix, thinklinks, and weird facts: An interactive system for cooperative thinking. In: N. Davidson, T. Worsham (Eds.), *Enhancing thinking through cooperative learning* (pp. 169-181). New York, NY: Teachers College Press.

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, *38*(1), 43-52. doi:10.1207/S15326985EP3801_6

Perkins, D. V., & Saris, R. N. (2001). A" jigsaw classroom" technique for undergraduate statistics courses. *Teaching of Psychology*, *28*(2), 111-113. doi:10.1207/S15328023TOP2802_09

Piaget, J. (1951). *The child's conception of the world* (No. 213). London, England: Rowman & Littlefield.

Piaget, J., & Inhelder, B. (1956). *The child's conception of space.* London, England: Routledge and Kegan Paul, Ltd.

Resta, P., & Laferrière, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, *19*(1), 65-83. doi:10.1007/s10648-007-9042-7

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, *1*(4), 209-229.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology, 43*, 450–461. doi:10.1037/0022-3514.43.3.450

Shane-Simpson, C., Brooks, P. J., Hotez, E., Sawyer, J. & Dow, E. A. (2015). Web-enhanced collaborative learning in undergraduate psychology courses: Examples using the ASD Video Glossary, CHILDES, and Wikipedia. In Roberta V. Nata (Ed.), *Progress in Education, Vol. 36* (pp. 25-47). NOVA Science Publishers, e-book.

Shimazoe, J., & Aldrich, H. (2010). Group work can be gratifying: Understanding & overcoming resistance to cooperative learning. *College Teaching*, *58*(2), 52-57. doi:10.1080/87567550903418594

Simpson, K. E. (2008). Classic and modern propaganda in documentary film: Teaching the psychology of persuasion. *Teaching of Psychology*, *35*(2), 103-108. doi:10.1080/00986280802004602

Slavich, G. M., & Zimbardo, P. G. (2012). Transformational teaching: Theoretical underpinnings, basic principles, and core methods. *Educational Psychology Review*, *24*(4), 569-608. doi:10.1007/s10648-012-9199-6

Slavin, R. E., Hurley, E. A., & Chamberlain, A. (2003). Cooperative learning and achievement: Theory and research. *Handbook of Psychology*, *3*(9). 177–198. doi:10.1002/0471264385.wei0709

Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research*, *69*(1), 21-51. doi:10.3102/00346543069001021

Strobel, J., & Van Barneveld, A. (2009). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *Interdisciplinary Journal of Problem-based Learning*, *3*(1), 44-58. doi: 10.7771/1541-5015.1046

Thompson, W. B., & Fisher-Thompson, D. (2013). Analyzing data from studies depicted on video: An activity for statistics and research courses. *Teaching of Psychology*, *40*(2), 139-142. doi:10.1177/0098628312475035

Tomcho, T. J., Wolfe, W. L., & Foels, R. (2006). Teaching about psychological disorders: Using a group interviewing and diagnostic approach. *Teaching of Psychology*, *33*(3), 184-188. doi:10.1207/s15328023top3303_6

Vygotsky, L. S. (1934/1986). *Thought and language, Revised edition*. (A. Kozulin, Ed.). Boston, MA: The MIT Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner & E. Souberman, Eds, 14th ed.). Cambridge, MA: Harvard University Press.

Chapter 13: Empowering Your Students through Teamwork

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Abstract

The power of teamwork very often remains untapped in a college classroom, although learning in a team and as a team creates opportunities to develop skills that are transferable, and even required, for success outside the classroom. A prerequisite for successful teamwork is understanding that learning in a team happens "behind the scenes," in the process of preparing the final product. Concerned with the product, as opposed to the process, instructors may fail to create a learning environment that facilitates individual growth through teamwork. The first half of the chapter reviews essential steps required to lay the groundwork for team projects. The power of low-stakes collaborative activities in pairs and in groups, in addition to explicit and deliberate emphasis on the importance and nuances of collaborative learning, is used to build rapport within the learning community and to scaffold skills and knowledge required for successful accomplishment of higher-stakes projects by stable teams. The second half of this chapter addresses specific aspects of team development from its formation to task completion. Examples of various activities and pedagogical tools illustrate how theoretical frameworks can be applied in practice.

Introduction

As a key distinction between "group" and "team" work, groups can form sporadically, and can include unfamiliar people who do not share a common goal. Teams are structured groups of individuals whose success is inseparable from and dependent on the success of each and every team member and, as a result, the team as a whole (McKendall, 2000). A group of people evolves into a team as it strives to achieve a common goal through shared responsibility. In this chapter, I will describe how group work can be used to facilitate formation of teams. Since both types of activities require joint effort, the term "collaborative learning" (Bruffee, 1995; Panitz, 1999) will be used as synonymous with either one of them.

Step 1: Convincing students that they want to collaborate

All of us have had experiences working with other people. Maybe in college or at work you were asked to engage in a group discussion, solve problems, or brainstorm ideas with others; maybe you were placed on a team to prepare a PowerPoint presentation or to write a report on an important topic. Did you feel adequate? Did you learn more with others than you would have learned alone, or did you slack off and catch a free ride? Did you feel like you were the only person doing all the work? Were there any conflicts? How did you resolve them? Hansen (2010) found that a lack of attention to group dynamics and the process of team building may be acceptable if we are only concerning ourselves with short, low-stakes, in-class group assignments, but if an instructor assigns a team project that is worth a significant portion of the final grade, it is imperative to dedicate time and effort to the process of building and facilitating effective teamwork. It is the team's progression towards their goal as a cohesive group that

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provides opportunities for positive learning and individual growth. In other words, you have to teach teams to be teams (Clinebell & Stecher, 2003). This way you can have a reasonable expectation that the communication between team members that happens outside of class is happening in a manner that is conducive to students' individual growth. Implemented correctly, teamwork can amplify opportunities to learn, because instead of relying on just one person – the instructor – students can also learn from one another.

So, where do you start? I recommend setting the tone for the class by including a description of the advantages of student-centered learning and the benefits of teamwork in your syllabus (Rau & Heyl, 1990). In addition to explicitly stating that it will be part of their course, you can also use the first day as an opportunity to demonstrate and practice collaborative learning by using various exercises that involve working in pairs or groups. To help my students achieve social goals and to set the stage for active learning, I ask my students to answer a quiz that identifies their prior knowledge of the material essential for their success in the class. I then ask them to form pairs to tackle the questions together. This is what Lyman (1981) called a think-pair-share task. It involves asking each student to first think about the question individually, then share their ideas with another student and discuss each other`s responses. While explicitly the class is answering quiz questions, implicitly everyone is reminded of the saying, "two heads are better than one." By the end of this collaborative assignment, students can answer many more questions correctly than if they were doing the task alone. The activity also changes the classroom atmosphere – all of sudden, students realize that it's okay to talk to one another. This is a big relief to them and an opportunity for the instructor to engage their minds in ways that may be foreign to them.

Another first-day activity that helps set the tone for teamwork could be the following: You ask your students, individually and without the help of the Internet, to spontaneously recall five Greek philosophers, five hormones, five neurotransmitters, five psychologists, or whatever suits the topic of your class. Then, ask students to stand up and to remain standing if they can recall one item, two items, etc., until you only have a few students left standing. Depending on the difficulty of your question, you can have no or very few people who can recall more than three items. Then suggest students form small groups of 3-4 individuals to answer the same question again. You are guaranteed that more people will know more items after they have brainstormed the question in groups. After the assignment, offer your students an opportunity to reflect on the purpose of the task and ask them to explain to you the advantages of working with other people. Emphasize on day one that working in groups will be a regular occurrence in your classroom and that it is meant to prepare them to work as teams, either in your classroom or in their professional lives outside of the class.

Step 2: Building rapport - exercises that help students get to know each other

While it is useful to help students realize the value of working collaboratively, getting students to value potential team members, in all their diversity, is the second challenge. An effective team is impossible without its members recognizing the special characteristics that other team members might bring to the table (Clinebell & Stecher, 2003). Working together requires an open mind and appreciation of diverse points of view. This is easier said than done: ethnic heritage, religious beliefs, native culture and language of immigrant students, socio-economic and academic backgrounds can have a profound effect on our attitudes. It is a cliché, but also true: we all bring our unique strengths and weaknesses. To start addressing this challenge, ask students to reflect on and note down the strengths they can bring to the team: technical, interpersonal, conceptual, or a mix of the above and any others they can brainstorm

(Katz, 1955). If some of them feel like they have a lot to learn, encourage them to acknowledge it, because they bring the long-forgotten skill of a fresh perspective to the group.

Keeping those influences in mind, I believe classroom rapport and teamwork can be best established if we take time to get to know one another as people first. This is, of course, not a novel idea. Lowman (1995) wrote that instructors enjoy teaching more if they have good personal relationships with their students. According to a large survey conducted by Buskist and Saville (2004), the main factors that contribute to rapport are instructors' sense of humor, availability, encouragement of class discussions, interest in students, knowledge of their names, willingness to share personal insights and experiences, ability to relate course material to everyday life, and understanding that students can have personal problems that might negatively affect their academic performance. To lay the groundwork for successful teamwork, I strive to meet students` expectations, projecting to them the kind of attitude and behavior I would want them to project to one another.

I want students to start connecting on a personal level from the first day of class in order to break artificial boundaries and create a safe learning environment. To help me achieve this goal, I ask students to fill out a 12-minute free personality questionnaire (16 Personalities, n.d.). Once they are done, I ask them to form groups of 4-5 people and play a sharing game I call, "Out Of the Envelope." Each group gets an envelope, which contains 5-7 questions from the personality questionnaire. Each student pulls out a question and shares their response with the rest of the group. Other students are encouraged to chime in and reveal their own responses to the same question. You can also include in the envelope questions about students` attitudes towards teamwork, as suggested by Byrnes and Byrnes (2009). If someone doesn`t feel like sharing, they are free to not disclose their answer. While students are sharing the results of their personality tests, I ask them to evaluate how accurately the results match their idea of themselves. This activity allows students to reflect on their own personality traits while getting to know their fellow students. As a follow-up, you can divide students into groups based on their personality type and ask them to discuss how they would tackle a team project that needs to be accomplished in a limited amount of time or how they envision a perfect learning environment. You could then compare answers produced by groups to highlight the differences in the answers. Although this activity is longer and requires more effort, I think it supports the formation of future teams better than shorter icebreakers, such as engaging students in a "Scavenger Hunt" (The Food Project, n.d.). In general, I try to create many opportunities for students to get to know each other because knowledge of one another's dispositional attributes can have a profound effect on team success.

Now that each student has reflected on and shared their strengths, weaknesses, or other personal characteristics, it is a good time to ask groups to come up with descriptions of an effective team. Follow up with a discussion of the characteristics of ineffective, maybe even toxic, team environments. As students give their suggestions, write them out on the board. Positive attitude, accountability, and responsibility of each team member, timeliness, and respect or lack of those are some of the descriptions that are most likely to pop up; for a helpful list, see Balsom, Barras, Michela, and Zdaniuk (2009). Based on these characteristics, ask students to think about what they need to improve on as individuals, write it down on an unsigned piece of paper, and ask them to turn it in. This is an exercise in trust and in vulnerability, and I want to encourage you, as the instructor, to reciprocate it: share your strengths and your weakness with the class. Suggest to them that working in an effective team can allow them to observe those needed skills in action in others, providing opportunities to grow and learn. Emphasize that you also are looking forward to learning from them and improving as a teacher.

Once students have experienced and discussed the benefits of working with others, evaluated and shared their strong and weak characteristics, and identified good teamwork behaviors, continue incorporating collaborative activities into your class. Doing something on the first day of class only to return to it several weeks later will simply eliminate all of the preparatory effort you invested. In addition to think-pair-share and Out of the Envelope activities, you might consider assigning group quizzes, or even exams (see below), or ask students to work together to create concept maps or rubrics. For example, you can give students an unfinished rubric for the assessment of their own future performance and ask them to complete it. As a building block for concept mapping, students can be given a prompt: a term, a definition, a formula, a phrase, and asked to write as many ideas and facts related to it as they can (Lewis, Shaw, & Freeman, 2010). Students can draw out their concept maps on the board or large poster paper. They can then be given an opportunity to walk around the class and evaluate concept maps created by other groups, leaving their notes and remarks written on sticky post-its. As always, the exercise is concluded with a class discussion and reflection. Another short exercise that is perfect for the beginning of the class is called "Dusting Off the Cobwebs" (Harrington, 2013). In this activity, students form pairs or triads and, with notebooks closed, try to recall what they learned in the previous class or in assigned readings. After about 10 minutes, they are allowed to open their notes to see what they missed in their recall. All of these group activities serve as a basis for a larger, high-stakes team project that you may want to incorporate later on in the semester. As students develop skills required for teamwork, they are also getting to know each other on a more personal level, especially if you make sure students move around the class and form groups or pairs with different partners (Prince, 2004).

Step 3: Keep the momentum up – incorporating habitual teamwork into your course

Once you have introduced collaborative work into your class environment through low-stakes exercises that help your students develop the skills needed to operate in a group successfully, you can start transferring these skills to higher stakes contexts. For example, you might consider giving a group exam. Although this may sound controversial, I find this practice really empowering. In a typical semester, my students take three exams. For one of them, I give a multiple-choice exam in which they have to explain, in 2-3 sentences, their responses to about 20% of the questions. In the first half of the class they tackle these on their own. Individual work is followed by a discussion in small groups in the second half of class. Students consistently tell me that they learn a lot and really enjoy this kind of exam. To avoid inflating scores of the students who didn't know the material to begin with, an instructor can collect individual exams first, and provide groups with a clean exam copy to collaborate on. The score on an individual exam is averaged with the score on the group exam.

As another example, I engage, teams in conducting research on a particular topic that results in an oral presentation and a final written report. Effective teamwork on this longer-term team project is the goal of all the small group exercises that precede it and serves as a reward for those early efforts. I assign a team project in the middle of the semester. The assignment is broken into several parts, each with its own deadline. Detailed instructions with the due dates for all parts of the assignment are given orally in class and shared electronically. This timing of the project assignment is strategic. I rely on the fact that by the middle of the semester I have been able to build rapport within my class, and we all have gotten to know one another better. If you form teams with permanent members too early in the semester, you risk having more teams that are not reaching their potential. Poorly introduced and organized team projects can antagonize students to the idea itself, so the goal of the instructor is to build the foundation

for a positive learning experience. Students need to know each other sufficiently enough to be able to choose partners that they think will match their personality, communication style, level of preparedness, and work ethic. The short-term, collaborative work that I have been incorporating from the beginning of the semester should make this selection easier. It is of note that the assignment has to align with the objectives of the class, be doable, and require collaborative efforts of several people (Finelli, Bergom, & Mesa, 2011). If the assignment is given just to incorporate teamwork, students will not be motivated. If it can be done by one person, the requirement of working as a team will become a hindrance rather than a practical way to improve social skills and acquire knowledge.

Step 4: Tips for facilitating and maintaining team harmony

There is no ideal number of people that you want to have in a team. Research shows that 4 to 5 people may be the most optimal number (Johnson, Johnson, & Smith, 1998). I do not recommend random team assignments. You can have students form teams on their own, should they express an interest in doing so. Alternatively, you can form teams yourself. Importantly, do not group together only minority students or place single minority students or women in an otherwise homogeneous group. This is especially important during the first two years of college, as it may negatively affect their performance if their opinions are dismissed by other group members or they are given trivial tasks (Michaelsen & Sweet, 2008). Personality types and learning skills also have to be taken into account. To avoid teams of lone wolves or free riders, you have to put your students through the sieve of personality traits and academic prowess to create more or less balanced teams. With that said, sometimes, putting lone wolves or free riders in one team can work wonders *if* you can create an assignment that *absolutely* requires collaboration or a consistent graded effort, respectively. I usually give my students an opportunity to self-organize into teams. Those who fail to find a team are asked to join an existing team, or form a team of their own. The presence of such individuals in your class should alert you to the fact that some people may not be as open to the idea of collaboration as other students. Do not let this information go unnoticed and unaddressed: reiterate in class the importance of collaborative effort for their success in class, in their future careers, and in life in general.

As an instructor, I strive to turn moments of defiance or disagreement into teaching moments. For example, when I found out that some students were irked by the reality of teamwork in my Human Sexuality class, I referred them to one of the topics we covered: intimate relationships. Communication was positioned as the key to developing a fulfilling romantic bond with another human being. Moreover, one of the homework assignments required students to ask people of different ages to name the qualities that are essential for a successful relationship. Unsurprisingly, the older generation placed good communication above everything else. We discussed effective and ineffective communication strategies, and how to give criticism with kindness (Columbia University Graduate School of Arts & Sciences Teaching Center, n.d.; Popova, 2014).

If the final project is an APA-style report paper or a PowerPoint presentation, you have to scaffold students throughout the whole process. Students should receive explicit instructions on what constitutes a good presentation (Schoeberl & Toon, n.d.) or you risk ending up with 20 or more PowerPoint slides of a poorly written novel. Although you can refer students to instructional videos and websites, I make sure to share with the class both good and bad examples of PowerPoint presentations as well as snippets of papers from previous semesters. Students then discuss and evaluate these samples in small groups. When you open the floor to a class discussion, make sure to draw their attention to the missteps students are most likely to make: unprofessional background for the slides,

small unreadable letters, too much text and not enough images or figures are among the top PowerPoint "offenses." If you plan to include a written report as a team assignment, make sure to "advertise" the Reading and Writing Center on your campus. I also offer to read and correct their paper if they share it with me at least four days before the deadline. English may not be their first language, and I see it as my duty to help them learn it rather than punish them for not knowing it.

The very first task I assign is creating a team charter. Charters allow students to establish internal mechanisms to control team dynamics, providing a greater sense of autonomy, freedom, and responsibility (Cox & Bobrowski, 2000). There are numerous formats of team contracts you can find online. I require that each charter include a description of the team goals, logistics regarding communication, attendance, timelines, effort, descriptions of strengths of each team member, and conflict resolution strategies; for an example, see Appendix A.

The charter is signed by each team member. Again, samples of charters are provided in advance to allow students to borrow useful ideas. In the charter, students are also asked to indicate their role on the team (for example, they might be a leader, a facilitator, a communicator, an editor), as well as the responsibilities associated with the chosen role. If several team projects are given throughout a semester, roles should be rotated (Rau & Heyl, 1990). As discussed above, I ensure through regular pair and group activities, that students are not complete strangers to one another when they start writing a charter because the official contract can create a formal atmosphere that will hinder, rather than facilitate, teamwork by creating a hierarchy and limitations of specific roles.

In general, I try to allow my students as much freedom as possible in assigning and changing their roles, if they must, throughout the project. Students usually need at least two weeks to create and sign the contract, which is then shared with me via Google docs for review and comments. Many students take the business of writing a team charter very seriously, and it is a treat to read their contracts and the witty team names they come up with. By the end of this task, the reigns of the assignment are in the hands of the students. They have appropriated it. But don't rush to rest on your laurels just yet,; take a moment to incorporate into your busy class schedule a primer on communication and conflict resolution skills. Deliberately introduce them to the tenets of effective teamwork (Mickan & Rodger, 2000), as you will have teams where students will have very different ideas of what constitutes a deadline, work of low or high quality, sufficient or insufficient effort, or availability. Oftentimes, students are afraid to voice their concerns or criticism to other team members for fear of hurting their feelings. I remind my students that issues should be addressed as soon as they arise, so as not to snowball into bigger problems later on. One creative way to warn your students of possible stumbling blocks is by reading and discussing short skits describing problems associated with difficult team members and then asking the class to come up with ideas to resolve the conflict (Oakley, Fedler, Brent, & Elhajj, 2004). Indeed, teamwork requires having good interpersonal communication skills such as perspective taking, social perceptiveness, behavioral flexibility, and social performance (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000). These skills must be deliberately taught if you want your students to enjoy and benefit from working together.

Very often, conflicts within the team arise because of circumstances that are outside students' control: job and family obligations, other school-related work. That is why once students begin working on the project in earnest, I try to allocate time at the end of the class (20-30 minutes), where I allow them to break out into their respective teams and discuss their projects. Although students get together outside

the regular classroom hours to work on their assignments, they also appreciate having this opportunity to collaborate during class time. Students repeatedly state that the most productive meetings are meetings face-to-face. It is also a perfect moment for you to grab a chair and sit down next to them to go over what they have done, what they are planning to work on next, and to see if they have any questions or concerns. This is an opportunity to show your involvement and to observe the team dynamics. This can give you clues to the inside process and ability to preempt any potential difficulties. In addition to meeting with groups in class, I organize short on-line sessions with teams using free conference call platforms. These meetings mobilize students and help them stay on track. It also serves as a means of formative assessment, which in contrast to summative assessment, happens when learning is still underway. Formative assessment makes learning and teaching visible (Hattie, 2012). It allows you to assess how successful your teaching methods are, provides students with feedback on their accomplishments, and informs both the instructor and the student of what needs to be modified to achieve learning goals. By analogy with a Global Positioning System or a GPS used for navigation, I think of formative assessment as a "guided progress system" for orienting students who may find themselves in an unfamiliar situation. Your goal as an instructor is to provide a detailed map of where you are, where you want to be, and how to get there. This feedback allows a student to feel in control of their journey and gives them strategies to increase the chances of success.

By breaking down the assignment into parts with pre-set deadlines, and having written work submitted via a Google document (or other collaborative editing software), I can systematically monitor their progress and intervene when progress is not being made, the quality of work needs improvement, or not all of the members are contributing equally. Do not falsely assume that students will miraculously self-organize and self-manage. Timely formative assessment is essential to the point I made at the beginning of this chapter: the biggest empowerment and growth happens through the process, not in the product. The product is just the product. You look at it, listen to it, hear it, but unless you were present through all the stages of the learning process you can never know the contributions of each student or the benefits they were able to reap.

Grading team assignments is one of the most challenging assessment tasks. I attribute at least 15% of the grade to the team assignment. If the assignment includes a written report, I give out a common grade for it. Oral presentations are evaluated by me and by the other students in class (see Appendix B for a sample rubric). It is not uncommon, however, that by the end of the team project, some students can be left with a feeling that they were shorthanded because other members didn't pull their full load, or in contrast, you can have students with artificially inflated grades. And although giving students the benefit of the doubt in teaching can have a positive impact, I do incorporate a peer assessment within each team (see Appendix C). This allows me to incorporate individual evaluations into the calculation of the final grade. Students know about all of these assessments from the beginning of their work on the project, since their descriptions are included in its instructions. Rubrics are helpful in allowing students to align their individual and team performance with the evaluation criteria. I also ask students to fill out a questionnaire addressing their experience working in a team. This gives me insight into what worked and what failed, allowing me to foresee and prevent potential pitfalls in my future team assignments (see Appendix D).

Conclusion

As a final comment, I would like to add that in many ways the success of teamwork depends on the atmosphere that you help create in your classroom. Are you an involved, engaging, kind, and fair teacher? If your answer is yes, then most likely the majority (not all!) of your students will mirror many of the same characteristics. Start building this rapport from your first moments together. Better yet, send out an email before the first day of class that sets the tone for the learning experience that you want your students to engage in; see also Dyrenforth (2014) on how to build a positive environment where students can flourish as learners and the instructor can feel satisfied with their work. Remember that your students look to you to be a role model for the interpersonal skills that you expect from them in teamwork. Be that role model! Try to find time to learn their names (with 30 minutes of practice a week, I have been able to memorize 45−50 names in the first 3 weeks of classes) and connect with them as individuals first.

Good luck! And when you succeed… or fail, reflect on the process, go over the emails you exchanged with the students, consult with well-meaning peers, and always ask your class about their experience. Fortunately, with multiple online tools for data collection, this should not be difficult at all.

References

16 Personalities. (n.d.). Free Personality Test. Retrieved from https://www.16personalities.com/free-personality-test

Balsom M., Barrass R., Michela J., & Zdaniuk A. (2009). Processes and attributes of highly effective teams. Retrieved from https://uwaterloo.ca/psychology/sites/ca.psychology/files/uploads/files/processesattributeseffectiveteams.jm_.v4.pdf

Bruffee, K. A. (1995). Sharing our toys: Cooperative learning versus collaborative learning. Change: The *Magazine of Higher Learning, 27*, 12-18.

Byrnes, J. F., & Byrnes, M. (2009, May 26). Dealing with students who hate working in groups. Faculty Focus. Retrieved from http://www.facultyfocus.com/articles/effective-classroom-management/dealing-with-students-who-hate-working-in-groups/

Buskist, W., & Saville, B. K. (2004). Rapport building: Creating positive emotional contexts for enhancing teaching and learning. In B. Perlman, L. I. McCann, & S. H. McFadden (Eds.), *Lessons learned: Practical advice for the teaching of psychology* (2nd Ed.) (pp. 149-155). Washington, DC: American Psychological Society.

Columbia University Graduate School of Arts & Sciences Teaching Center. (n.d.). How to provide constructive feedback— that won't exasperate your students. Retrieved from http://www.columbia.edu/cu/tat/pdfs/feedback.pdf

Clinebell, S., & Stecher, M. (2003). Teaching teams to be teams: An exercise using the Myers-Briggs type indicator and the five-factor personality traits. *Journal of Management Education, 27*, 362-383. doi:10.1177/1052562903251353

Cox, P. L., & Bobrowski, P. E. (2000). The team charter assignment: Improving the effectiveness of classroom teams. *Journal of Behavioral and Applied Management, 1*(1), 92-103. Retrieved from https://submissions.scholasticahq.com/api/v1/attachments/1953/download

Dyrenforth, T. (2014). Classroom success through rapport building. Retrieved from http://www.westpoint.edu/cfe/Literature/Dyrenforth_14.pdf

Finelli, C. J., Bergom, I., & Mesa, V. (2011). Student teams in the engineering classroom and beyond: Setting up students for success. *Center for Resources on Learning and Teaching*. Retrieved from http://www.crlt.umich.edu/sites/default/files/resource_files/CRLT_no29.pdf

Hansen, R. S. (2010). Benefits and problems with student teams: Suggestions for improving team projects. *Journal of Education for Business, 82*, 11-19. doi:10.3200/JOEB.82.1.11-19

Harrington, C. (2013, August 5). Dusting off the cobwebs activity [Web log post]. Retrieved from http://blog.cengage.com/top_blog/dusting-off-the-cobwebs-activity/

Hattie, J. (2012). Visible learning for teachers: Maximizing impact on learning. Retrieved from http://www.tdschools.org/wp-content/uploads/2013/08/The+Main+Idea+-+Visible+Learning+for+Teachers+-+April+2013.pdf

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Maximizing instruction through cooperative learning. *ASEE Prism, 8*(2), 24-29.

Katz, R. L. (1955). Skills of an effective administrator. Harvard Business Review, 33(1), 33-42. Retrieved from https://hbr.org/1974/09/skills-of-an-effective-administrator

Lewis, S. E., Shaw, J. L., & Freeman, K. A. (2010). Creative exercises in general chemistry: A student-centered assessment. *Journal of College Science Teaching, 40*(1), 48-53.

Lowman, J. (1995). Mastering the techniques of teaching (2nd Ed.). San Francisco, CA: Jossey-Bass.

Lyman, F. (1981). The responsive classroom discussion: The inclusion of all students. In A. Anderson (Ed.), *Mainstreaming digest* (pp. 109-113). College Park, MD: University of Maryland.

McKendall, M. (2000). Teaching groups to become teams. Journal of Education for Business, 75, 277-82. doi:10.1080/08832320009599028

Michaelsen, L. K., & Sweet, M. (2008). The essential elements of team-based learning. In L. K. Michaelsen, M. Sweet, & D. X. Parmelee (Eds.), *Team-based learning: Small group learning`s next big step. New Directions for Teaching and Learning*, No.116 (pp. 7-27). San Francisco, CA: Jossey-Bass.

Mickan, S., & Rodger, S. (2000). Characteristics of effective teams: A literature review. *Australian Health Review, 23*(3), 201-8. doi:10.1071/AH000201

Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, T., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex problems. *The Leadership Quarterly, 11*(1), 11–35. doi:10.1016/S1048-9843(99)00041-7

Oakley, B., Felder, R. M., Brent, R., & Elhajj, I. (2004). Turning student groups into effective teams. Journal of Student Centered Learning, 2(1), 9–34. Retrieved from http://owww.brookes.ac.uk/services/ocsld/group_work/turnin_student_groups_into_effective_teams.pdf

Panitz, T. (1999). Collaborative versus cooperative learning – A comparison of the two concepts which will help us understand the underlying nature of interactive learning. Retrieved from http://files.eric.ed.gov/fulltext/ED448443.pdf

Popova, M. (2014, March 28). How to criticize with kindness: Philosopher Daniel Dennett on the four steps to arguing intelligently. Retrieved from https://www.brainpickings.org/2014/03/28/daniel-dennett-rapoport-rules-criticism/

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*(3), 223-231. doi:10.1002/j.2168-9830.2004.tb00809.x

Rau, W., & Heyl, B. S. (1990). Humanizing the college classroom: Collaborative learning and social organization among students. *Teaching Sociology, 18*, 141-155. Retrieved from http://www.jstor.org/stable/1318484

Schoeberl, M., & Toon, B. (n.d.). *Ten secrets to giving a good scientific talk*. Retrieved from http://www.cgd.ucar.edu/cms/agu/scientific_talk.html

The Food Project. (n.d.). *Scavenger hunt*. Retrieved from http://thefoodproject.org/sites/default/files/ScavengerHunt.pdf

Appendix A

Example of a Team Charter

Team Name: The Four Truthseekers
Team Members: TP, DP, KW, LY

Project: Opposing Views on Legal Prostitution

Goals

As a team, our common goals are to help each other reach our fullest potential and to maximize our efficiency by assigning specific roles and responsibilities for each member. Every member has unique, individual strengths that can help the team to achieve a higher level of academic excellence and personal growth. By learning and benefiting from each other, we can strengthen our individual weaknesses accordingly and make this a positive learning experience for everyone!

Role Identification

Leader: KW
Editor: LY
Facilitator: DP
Communications Coordinator: TP

Values

1. Equality
    a. We hold each group member to the same level of expectation that we hold other members to.
    b. No specific member will receive more or less work than the others receive.
2. Respect
    a. We will respect each other's opinions, no matter what. If there is disagreement between two members, they will resolve it in a timely, professional manner.
    b. All opinions, thoughts, and concerns matter. We will not ignore what others say or express without acknowledging them first!
3. Efficiency … *WITH* quality
    a. We will work in harmony to maximize our productivity and meet all deadlines - a few days in advance ideally.
    b. To ensure quality, the editor will look over the work, make adjustments as necessary, and inform the person what the editor has changed. Then, the editor will ask other members to look over the final draft so that every member is in agreement before the work is submitted.

Ground Rules

<u>Team Meetings</u>
There will be announced meetings to discuss our progress, verbalize our ideas, clarify our responsibilities, dissolve any misunderstands, and plan our next actions. Everyone is expected to attend team meetings and be on time. The meetings are scheduled a few days in advance with everyone's confirmation, so there is no reason

for any member to miss the meeting, unless if there is an emergency. In that case, the member should contact and inform the group prior to the meeting so the group can proceed with the meeting without having to wait. The member is still responsible for finding what was discussed during the meeting and meeting discussed deadlines.

Responsibilities

Every team member is expected to make an equal contribution by completing his or her part(s). Failure to complete an assigned part will result in a reduction in grade and notification to the professor.

Though each member is assigned a specific role and specific responsibilities within the project itself, it is acceptable to seek help and advice from the rest of the team members if something is not understood. We would rather spend time helping you to understand your role and responsibilities than wait for you to correct something you did incorrectly. Help is always available. Just ask!

Deadlines

It is expected of all team members to meet all deadlines. There will be no exceptions and excuses will not be tolerated. Please be advised that the editor will ask you to finish your work a few days prior to the deadline. This is to ensure that the editor has sufficient time to review and edit your work. Please do not expect the editor to review your work the day before it is due!

Method of contact:

Primary method of contact will be by messaging. There is a group messaging where all correspondence occurs. If you are not receiving any texts, please contact the communications coordinator, TP either by private message or by email.

Conflict Resolution Mechanisms

In the event of two different conflicting views, perspectives, or ideas, the following steps should be taken to resolve the issue:

1. The members in disagreement should try to privately negotiate with each other to settle their differences in a civil, respectful manner!
    a. Do not interrupt and object while one person is speaking. Wait until the person is finished speaking before making a counter-argument or presenting a different perspective.
    b. Try to understand each other's perspectives in the form of ideas, concerns, requests, and/or intentions.
    c. Try to resolve the issue using reason and rationale.
2. If a negotiation cannot be made between the conflicted individuals, then they should immediately inform the whole group of the conflict. A team meeting will then be scheduled; all group members must attend to mediate the conflict. Facilitator DP is responsible for recording the minutes of the meetings.

a. A minutes meeting template can be found here: http://i2.wp.com/www.officetemplatespro.com/wp-content/uploads/2011/09/Meeting-Minutes-Template.jpg

3. All of the other group members should act as mediators to help the conflicted members reach a resolution.
    a. Mediators should facilitate and encourage open communication between the conflicted members.
    b. The mediators should be impartial, but acknowledging to both sides; they should guide the conflicted members towards a *mutual* resolution by reminding the members the goals and purposes of forming a group in the first place.

4. If mediation is unsuccessful, arbitration should occur. Once again, facilitator D is responsible for recording the minutes of the meetings. A minutes meeting template can be found in the link above. The other group members should act as arbitrators and have full power to make a final decision on the conflict. Please consider the following when making a final decision:
    a. What is best for the group as a whole?
    b. What do most members of the group want?
    c. Is this decision reasonable?
    d. Does this decision have any potential consequences?
    e. What is being sacrificed?

In the event that a member does not contribute, or contributes below the expectation level, other group members will:

1. Arrange a meeting to allow the individual to explain himself/herself.
    a. Please keep in mind that excuses will not be tolerated.
2. Impose a penalty on the individual:
    a. Not contributing at all will result in notification to Professor Schnieder and permanent removal of your name from the project. Absolutely no credit will be rewarded at all!
    b. Failure to contribute to the expectation level will result in a warning and a temporary removal of your name from the project. Your name will only be placed back onto the project when you meet the expectation level.

Project Plan / Division of work: Opposing Views on Legal Prostitution

Please utilize databases to find credible sources for answering your questions. These questions should be completed by Saturday 11/12/16 so there is sufficient time for the editor to put everything together into an outline - due 11/19/16.

Additional dates to keep in mind:

October 23, 2016	Projects are assigned.
October 30, 2016	Team charter/contract is due.
November 19, 2016	Project outlines are due.
December 10, 2016	Students present their projects and hand in their papers (one per group).

DP: I will be responsible for the history of opposing views on legal prostitution. I will answer the following questions:

1. When was the issue first raised and why? What was the context?
2. How did it evolve over time (major players, events and/or dates)?

TP: I will be responsible for the current state of affairs. I will be answering the following questions:

1. What is happening currently (major players, locations, events and/or dates)?
2. What are the opposing views on the issue? Which side do you take individually and as a team and why?

KW: As the editor, I will be reviewing everyone's work after they finish and making necessary corrections. I will also be assisting T with the current state of affairs by addressing the following questions:

1. What are the implications to date on the people affected by the issue?
2. Besides the people affected directly by the issue, who else might be affected, why, and how?

LY: I will be responsible for addressing the implications for future activities and policies. I will answer the following questions:

1. What are the upcoming next steps (as revealed during your research and/or based on your informed predictions)?
2. How might current and/or imminent actions shift the debates and laws?

By electronically signing below, you are acknowledging that you have received this charter and agree to the terms, conditions, and rules set forth above.

T P
Signed 10/29/16
D P
Signed 10/29/16
KW
Signed 10/29/16
LY
Signed 10/29/16

Date when document was prepared: 10/29/2016

Appendix B

Rubric for a Team Presentation

Names of the Team Members:

Instructions:
Please, carefully read the descriptions of different levels of performance for each of the four qualities you will be evaluating: delivery, organization, content, enthusiasm/audience awareness. Please, write the score you assign to the team for each quality in the first column under the name of quality you are assessing. Alternatively, you can simply circle the most appropriate description.

If you choose to assign a very low score of 1, please, take a moment to explain your decision in comments below the rubric. I have recently come across the ideas of how to compose a successful critical commentary proposed by Daniel C. Dennett, a contemporary American philosopher and scientist. I find them useful, and I think they are a great continuation of what we discussed last class regarding active listening and giving constructive feedback.

1. You should attempt to re-express your target's position so clearly, vividly, and fairly that your target says, "Thanks, I wish I'd thought of putting it that way.
2. You should list any points of agreement (especially if they are not matters of general or widespread agreement).
3. You should mention anything you have learned from your target.

Only then are you permitted to say so much as a word of rebuttal or criticism.

Please, think of these when you feel particularly critical of someone. Take a minute and try to rephrase what you were going to write to make sure your criticism reflects respect and attention to the point of view of another human being.

Quality	Excellent - 4	Good - 3	Fair - 2	Needs improvement - 1
Delivery	Team was able to hold attention of the audience with the use of direct eye contact, seldom looking at the notes; Presenters were speaking with fluctuation in volume and inflection to maintain audience interest and emphasize key points.	Team consistently used direct eye contact with the audience, but at times a presenter or presenters returned to notes; presenters spoke with satisfactory variation of volume and inflection keeping the audience engaged most of the time.	Minimal eye contact with the audience was displayed throughout the presentation with reading mostly from the notes; presentation was mostly monotone making it difficult to stay engaged and connect with the presented material.	No eye contact with the audience, as entire presentation was read from the notes; presentation was monotonous not allowing the audience to engage with the presented material.

Organization	Team created a presentation with a clear structure; all team members presented equal amounts of material; if PP was used, the slides were prepared according to the provided instructions; they included relevant images and/or graphs with minimal amount of text cluttering the slide. Transitions between the speakers were smooth. It was obvious the team invested significant time and effort in rehearsal of the presentation.	The structure of the presentation was for the most part clear; most team members presented equal amount of material; if PP was used, it met most of the criteria required for a professional and engaging PP talk; team could have minimized the amount of text and include more figures and/or graphs instead. Transitions between the speakers were for the most part smooth and reflect an adequate but not exemplar level of preparation.	The structure and the subject matter were not presented with sufficient clarity leaving the audience at times confused and puzzled; presented material was not equally distributed between all the team members; if PP was used, slides did not meet the required standards of a professionally made PP talk: the background was distracting, the font was too small, there was too much text with a few visual aids, etc.; transitions between the speakers were awkward indicating that minimal effort was put in practicing the talk as a team.	The structure and the subject matter of the talk were completely undeveloped leaving the audience questioning the purpose of the presentation; some presenters seemed unaware of what was going on as if they had little or no input in the preparation of the talk; transitions between the speakers were clumsy and confusing; if PP was used it looked as if the team failed to educate itself about the qualities of a professional PP presentation or chose to ignore those; the overall impression left was that the team put minimal amount of effort and work in making the presentation engaging to its potential audience.
Content	Team chose to present the most salient and important issues from their research on the topic of interest; each team member demonstrated full knowledge of the material they presented, and it was clear that each team member knew the key points presented by other team members and could have done	Team seemed to have chosen to present the most salient and important issues from their research on the topic of interest; most team members demonstrated adequate knowledge of the material they presented and it seemed that most them would have been able to present the information	Some points presented by the team could have been omitted in favor of more salient and relevant issues; some team members did not seem adequately prepared and engaged with the content of their own presentation and it was clear that most team members were unfamiliar	The choice of the content for the presentation reflected that the team failed to research the topic to be able to pinpoint the most salient and relevant issues; presenters clearly didn't know the subject matter of their own material or the material that was read by other team members; although facts and evidence were

	an adequate job had she or he been asked to step in and present someone else`s information; team included facts that were supported by evidence and presented an unbiased view of the topic informed by the careful and thorough research of the relevant material; examples were engaging, arguments were informed by accumulated knowledge and not just personal opinion.	delivered by other team members; facts and examples were engaging and relevant, but more evidence supporting statements from both sides of the argument would have made the presentation more convincing and balanced.	with the key points presented by the rest of the team; most of the information was presented in the form of personal opinions and was not informed by deliberate research into the history, current status and potential implications of the discussed issue.	presented, team was unable to analyze them sufficiently to be able to inform their own personal opinions leaving the impression of a talk that can happen in an unprofessional setting with participants merely expressing their own views, while reading out loud various facts the meaning of which they failed to understand.
Enthusiasm/ Audience Awareness	Team displayed strong enthusiasm about the topic during the entire presentation; it was able to engage the audience, coherently answer questions; as a result of the presentation the audience obtained new knowledge about the topic; the team succeeded in convincing the audience to recognize the importance and validity of the subject matter.	Enthusiasm displayed by the team was sufficient to convince the audience of the team`s motivation and engagement with the material; audience questions were adequately addressed; team was able to raise understanding awareness about the issue presented.	Team displayed significant fluctuations in enthusiasm throughout the presentation; at times, questions from the audience were met with some confusion; the team was able to raise awareness and understanding of some points.	It was clear the team was doing a required chore without much interest in the topic or in the need to engage with the audience; if questions were asked they were answered incoherently leaving the impression of disconnect between the team members, as well as their topic of choice whose importance and validity remained untapped.

Additional Constructive comments:
I liked it that:

I did not like it that:

Appendix C

Peer Assessment Rubric with Instructions

For each of the other members of your project team, including you, assign a rating of the team member on each of the following criteria listed in the table below. Indicate the extent to which you agree, or disagree with each assertion about each of your team members (see the Likert scale below). Your evaluation of the teammate will not be disclosed to them.

5	4	3	2	1
Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree

Criteria	Your name:	Name of team member 1:	Name of team member 2:	Name of team member 3:	Name of team member 4:
The role assigned to the team member was:					
Team member showed a clear understanding of what was expected of him/her.					
Team member completed assignments in a timely manner.					
Team member was present at all planned meetings and was available for unplanned routine communication regarding matters of the team project.					
Team member contributed his/her share of work.					
Team member contributed more to the project than other members of the team.					
Team member was available to others if they needed help with their part of the assignment.					

Team member was flexible and adaptable to changing requirements and circumstances.					
Team member actively sought and shared information with other team members.					
Team member showed respect for the opinions of other team members.					
Team member showed positive and professional attitude, making it easy for others to work with her/him.					

Additional Constructive comments:

I liked it that:

I did not like it that:

Appendix D

Assessment of the Team Dynamics and Performance.

1. How useful for the performance of the team was the creation of the team charter/contract?

4	3	2	1
Very useful	Quite useful	Had no effect	Hindered team performance

2. How useful for your personal understanding of how teamwork should be "ideally" accomplished was the creation of the team charter/contract?

4	3	2	1
Very useful	Quite useful	Had no effect	Hindered team performance

3. What did you contribute to the successful accomplishment of the final products: Presentation, Report, or both?
4. What do you think you personally could have done to improve your team`s performance, including internal team dynamics, but did not do?
5. What did you learn about yourself as a result of the teamwork experience?
6. Is there anything you wish your teammates knew about you prior to the work together?
7. Overall, how do you evaluate your internal team dynamics?
8. Thinking of the qualities of the effective teams such as clear goals, defined roles, open and clear communication, effective decision making, positive atmosphere, cooperative relationships, balanced participation, valued diversity, managed conflict, which of these qualities did your team have?
9. Which of these did your team lack?
10. What would you change if you had to do the same task again?

Chapter 14: Critical Thinking in Psychology Classrooms: Beyond "I Know it When I See It"

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Abstract

Critical thinking is an important skill for success inside and outside of the classroom. While some students likely improve critical thinking skills as a by-product of regular classroom instruction, the abstract and nebulous nature of critical thinking can create challenges to developing these skills. This chapter emphasizes approaches and activities to help instructors build a course that explicitly focuses on critical thinking. We review several concepts that can set the stage for critical thinking and provide suggestions for classroom structures that support critical thinking. Four specific classroom activities are also described for instructors to use in their courses.

Introduction

Critical thinking benefits students both inside and outside of the classroom, providing tools that allow them to more effectively use information to make decisions and evaluate outcomes in their everyday lives (Brookfield, 2011). However, while most people recognize critical thinking as a basic academic and life skill, it can be somewhat intangible and difficult to define. Peter Ellerton (2014) calls critical thinking the "Cheshire Cat" of educational content – connected to many domains but somewhat ephemeral. This can pose challenges for instructors intending to enhance their students' critical thinking skills. The purpose of this chapter is therefore to briefly define and describe critical thinking in ways that can be shared with students, and to provide suggestions and activities that support the development of critical thinking in the classroom setting.

Setting the Stage for Critical Thinking

There are several key principles that can support the development of critical thinking in classroom settings. Most of these are general principles applicable to any number of skills and content areas but which can be particularly relevant for critical thinking.

- *Repetition*: As critical thinking can be difficult for students to grasp and to generalize to novel situations, instructors should cover relevant skills and concepts often and in as many contexts as possible. As with most complex concepts, knowledge can become "stuck" in specific content, so repeating the content through multiple activities can help to connect the ideas to everyday life.
- *Build on What Students Already Know*: Students are more successful in learning new information when it is connected to familiar concepts (regardless of whether the familiar content relates to psychology). For instance, Ambrose and Lovett (2014) demonstrated increased retention for new information presented about a familiar individual (e.g. an historical figure) when compared with information presented about an unfamiliar individual. This phenomenon can be further strengthened if students initially generate examples themselves that can then be connected to

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the relevant content (e.g., Peeck, VanDenBosch, & Kruepeling, 1982; Garfield, delMas, & Chance, 2007).

- *Applications to Students' Experiences*: The positive effects of building on what students know can be further heightened when connected to students' own experiences. Personalizing content that is often abstract or technical can help students understand and remember core concepts. Guided questions can help students generate their own examples for course content, such as "Who has ever been thinking of someone and had the phone ring" to help them consider alternatives to "I have ESP," or "Think of a time that you felt strongly about an issue and someone presented evidence that contradicted your views. What did you do in this situation?" to illustrate the tendency toward belief-perseverance. Additionally, one of the activities described at the end of this chapter focuses on using articles found in mainstream media to better understand information literacy.

- *Errorful Learning*: While students (and perhaps instructors) might believe that ease in comprehension signals optimum learning, research on "errorful learning" (or "desirable difficulty") suggests that challenges and errors facilitate comprehension and retention more so than "easy" experiences. In other words, pedagogical approaches that increase initial learning "mistakes" typically result in improved retention and generalization of material (Clark & Bjork, 2014). This might result from increased learning behaviors that students employ when faced with challenging material, such as self-quizzing as a study method and spreading study sessions over time rather than cramming (Clark & Bjork, 2014). Students can be encouraged to apply similar efforts to their general approach to learning, i.e., do not give up too easily and don't be satisfied with the initial level of information provided for a complex issue.

- *Labeling*: Instructors can indicate topics of "importance" to students in numerous ways (both explicit and implicit). Particularly with abstract content such as critical thinking, it can be helpful to start the semester with a discussion of its importance and emphasis in the course (more on this below). Then, throughout the course, instructors can use labeling to increase students' comprehension of what constitutes "critical thinking," such as stating when activities are designed to practice critical thinking and noting examples where students demonstrate critical thinking during discussion, activities, and homework (Halonen, 1996).

- *Feedback*: Research suggests that instructor feedback can deepen student learning for several reasons. Instructor feedback directs students towards the "important" content and allows them to focus their efforts on material or skills that have been emphasized (Northcraft, Schmidt, & Ashford, 2011; Whiteman & Ochakovskaya, this volume). Additionally, feedback that learning is challenging and mistakes are beneficial (i.e. errorful learning as described above) can increase student understanding of content (Autin & Croizet, 2012), perhaps by normalizing effort as the expected response to comprehending difficult material.

- *Active Learning*: Active learning (which typically utilizes group work and discussion to engage students directly in the process of learning) has strong empirical evidence for its benefits, particularly in STEM fields, including psychology (see meta-analysis by Freeman et al., 2014). Given that critical thinking encourages active exploration and consideration of information, classroom activities that engage students robustly in their learning parallel the general approach

of critical thinking. See the end of the chapter for several specific activities that can be used in Psychology courses.

Initial Stages of Course Development

In the initial stages of developing any course, determining the content to cover can be challenging. For numerous reasons, instructors often err on the side of including "more" (i.e. breadth). However, as is hopefully clear, committing to critical thinking requires a significant amount of in-class time and sophisticated exploration of concepts (i.e. depth). Therefore, critical thinking is best supported by prioritizing depth over breadth whenever possible. When deciding which topics to cut and which to include, complex topics that are somewhat nebulous or controversial can provide ample opportunities for critical thinking practice with compare/contrast, considering alternate perspectives, synthesize, evaluate, etc. When constructing the goals/objectives section of a syllabus, include the enhancement of critical thinking as a stand-alone course goal/objective to signal its importance to students. This could be framed as "learning to think like a professional in this discipline."

When reviewing the syllabus on the first day of class, it can be helpful to devote substantive time to introducing critical thinking to students. Because many have a nebulous grasp on critical thinking, starting with a short definition, such as "the propensity and skills to engage in activity with reflective skepticism focused on deciding what to believe or do" (Halonen, 1996, para. 2) can introduce the value of critical thinking. Discussion can then focus on specific skills connected to critical thinking, such as observation, questioning conclusions, assessing for bias, compare/contrast, synthesis, evaluating information, and applying information to novel situations, etc. (see Brookfield, 2011 for additional terms related to critical thinking).

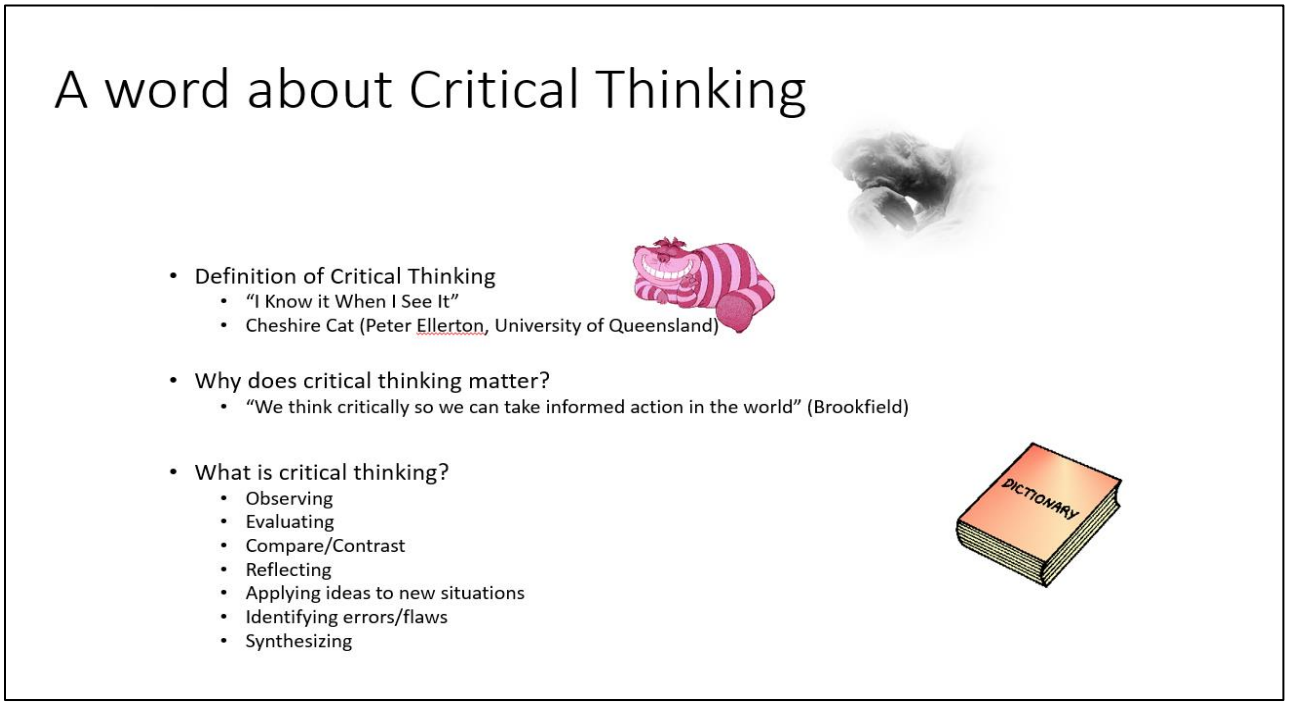

Figure 1. PowerPoint slide used to introduce students to critical thinking.

Reviewing a general definition and specific components of critical thinking provides everyone with a similar language to draw upon throughout the semester. It can also be helpful to discuss why critical thinking is important to student development, as thinking critically increases one's agency in the world. Eliciting students' ideas regarding the value of developing critical thinking can increase "buy-in," particularly for the students who tend to be more fact/information oriented. See Figure 1 for an example of a PowerPoint slide that can be used to introduce critical thinking.

Facilitating Discussions

While we have included several in-class activities that instructors might use to support the development of critical thinking, much of encouraging critical thinking development comes from incidental and informal behaviors that instructors utilize during their courses. Discussion-based activities are one of the cornerstones of critical thinking, and general techniques to encourage vibrant discussion apply here as well.

- *Endorse a questioning attitude*: As critical thinking is fundamentally an orientation toward challenging information and thinking deeply, instructors should support (both implicitly and explicitly) their students' questions, challenges, and concerns regarding the course material. Early on, explicitly state that there is rarely a "right answer" to much of the complex content that is discussed in the course and that the goal is to be open-minded and willing to re-evaluate one's assumptions. One aspect of this work is helping students develop comfort with uncertainty and hearing "it depends" as a response to questions. By normalizing feelings of confusion or struggle when faced with complex ideas, dense text, etc., students can resist the idea that not knowing the "answer" is problematic or means that they are poor students. Instructors can share stories about concepts they have struggled with, or times they themselves have not thought critically (Halonen, 1996), such as examples of one's own "correlation does not equal causation" errors.

- *Encouraging RRA (Reflect, Reasons, Alternatives) in classroom discussions*: Robert Ennis (2013) suggests three core concepts to guide students in developing critical thinking. The first step, Reflection, emphasizes providing time to think about the question or topic before beginning the discussion. This models the importance of considering concepts carefully before speaking, as well as increasing participation opportunities for students who prefer time to think. Throughout the discussion, instructor responses can focus on the foundations or Reasons for students' views. Questions such as "How do you know this is true?", "What are the reasons?" and "Is that a good source of information?" provides students practice with questions they can ask themselves (and others) when evaluating information and opinions. Lastly, remind students to consider Alternatives (of information, sources, opinions, outcomes, etc.) as practice for another key component of critical thinking. Specific questions might include "What could be a different explanation?" or "Consider the experience of someone from [fill in background/perspective]. What do you think their viewpoint might be and why?"

- *Structuring discussions for student involvement*: In addition to providing general encouragement to students to participate in discussion, instructors can enlist students in helping to formulate what is written on the board (Ennis, 2013). This includes students in the process of summarizing, synthesizing, and identifying the most important components of what has been

said. Whenever possible, label points made by individual students with their name (Ennis, 2013) to increase their connection with the material.

Connecting Critical Thinking to Psychological Content

While critical thinking can be infused into all academic content, psychology is a particularly good fit, both in terms of content and skills emphasized. Halonen (1996) outlines three domains of psychology that map well onto critical thinking skills.

- *Practical (influencing our behaviors and how we understand others' behavior)*: Psychology's primary scientific "mission" is to understand behavior, which gives it immediate relevance and application to student experiences. The role of bias and subjectivity is particularly germane for psychology, as a number of psychological concepts focus explicitly on the impact of bias on judgment, decision-making, and subsequent behavior. Students will likely be able to share or relate to real-life examples of overconfidence, confirmation bias, actor-observer bias/fundamental attribution error, etc. Exposure to individual differences in experiences and interpretations can teach students to be appropriately less confident in their immediate conclusions, more tolerant of ambiguity, and more likely to propose alternative explanations. As understanding behavior requires that one first be able to identify and describe it, psychology courses can emphasize developing observational skills and recognizing the challenges to unbiased observation. In terms of developing observational skills, one task is distinguishing between observation (objective) and inference (subjective). Videos that can be used for observational practice are readily available on YouTube. For instance, there are numerous training videos for professionals working with children in educational settings that can be shown in class, such as the YouTube videos from the National Quality Standard Professional Learning Program, distributed through Early Childhood Australia Learning Hub (https://www.youtube.com/user/EYLFPLP). Students can be instructed to make observations (either general or specific targets identified by the instructor) about a particular child in a video. In small groups, students can share their observations and prioritize as a group those they find most important. As groups report back to the whole class, discussion can focus on similarities and differences in student observations and possible explanations for differences. It might also be interesting to run the activity with two different behavior samples, one that is clear-cut and one that is more ambiguous to discuss the qualities that relate to both and their impacts.

- *Theoretical (understanding scientific principles)*: Psychology's wealth of theories and "big ideas" map well onto several critical thinking skills. For instance, studying psychological theories provides opportunities to synthesize related concepts and identify the main ideas. Instructors might present the class with several tenets of a particular theory and ask the class to hypothesize some of the principles of the overall theory based on connections between the tenets. Once the primary concepts of a theory have been discussed, attention can then focus on more evaluative concepts, such as pros and cons, quality of sources, and compare and contrast with other relevant theories.

- *Methodological (testing concepts)*: The scientific method provides numerous critical thinking opportunities, both through learning experimental techniques and evaluating experimental outcomes (see Lewandowski, Ciarocco, & Strohmetz, this volume). Once students have learned the basic components of experimental design, instructors can provide opportunities for

interpreting data, exploring the limitations of the scientific method, and engaging in discussions of "correlation does not equal causation," considering alternate explanations, identifying the benefits and limitations of different experimental designs, and decreasing subjectivity and bias by reviewing examples of "bad" designs or poorly written journal articles (Halonen, 1996). As the popular press commonly often reports scientific results, students then have tools to question "data" they encounter outside of the classroom. While many students will not be producers of information, they are all consumers of information. Pointing out the ways in which they will utilize research to find answers to questions pertinent to their desired careers (e.g., What is the most effective treatment for social anxiety disorder?) and their personal life (e.g., Are vitamin supplements beneficial?) helps reinforce the point that critical thinking isn't something that is only useful in the classroom.

Challenges to Implementation

There are a number of challenges in teaching critical thinking. First and foremost is that proficiency with critical thinking takes time and practice. It is difficult to give up class time to make space for critical thinking, but actively practicing a skill is necessary for mastery (e.g., Freeman et al., 2014). Second, an underlying assumption of critical thinking is to be open to changing one's mind if presented with contradictory evidence. However, changing beliefs can be difficult and unsettling. Finally, and perhaps most importantly, is convincing students of the value of critical thinking. Many students have the misperception that the helping professions are based on intuition and experience instead of research (Overholser, 2007), and since they are typically interested in these professions, rather than academia, they rarely perceive critical thinking as useful to their careers. In fact, one study showed a negative correlation between practitioner interests and interest in psychology as a science among psychology majors (Holmes & Beins, 2009). It is also challenging to convince students to value scientific data over their personal experience. Students need to be convinced that their experience doesn't necessarily represent the norm, and therefore they should not use their own experiences to generalize to others.

In conclusion, while critical thinking is challenging to teach it is most certainly worth the effort. Particularly in today's atmosphere of fake news and information overload where opinion masquerades as fact, mastering critical thinking skills is essential for an educated population. And while instructors do not often know the impact of their courses on students' general thinking ability, prioritizing critical thinking can make a difference for students. As an example, one of the authors received the following in an e-mail from a former student:

> *I know you're super busy all the time but I figured I'd quickly express my gratitude toward our faculty and curriculum. The skills I've acquired through my psych classes have helped me tremendously in not only my business law classes, but even taking the LSAT last month. I'm at an advantage compared to students in other majors because of how frequently I exercise my critically thinking and analyzation skills. Entering college I thought that if I were to pursue a career in psychology it would definitely be in therapy but after taking these science-based courses, I've realized how passionate I am toward research. I'm very appreciative of the way the curriculum is designed and even though most of the classes are challenging, I've gained an invaluable skill set. Thank you for all you do!*

Four Classroom Activities to Encourage Critical Thinking

The following activities are examples of exercises instructors can use to teach critical thinking in psychology classes.

1. Developing Information Literacy through Internet Media

Information literacy (sufficient knowledge regarding requiring, procuring, and evaluating information) is particularly important in the technology age, as immense amounts of content are available with fewer filters and gatekeepers. As with most complex skills, active learning and repetition are crucial components to building information literacy. The following activity, based on the CRAAP test, provides students with tools to evaluate content from any source, but is focused on Internet media.

The CRAAP test provides a checklist that encourages students to evaluate content in five domains: Currency (timeliness of information), Relevance (importance of information to goals), Authority (legitimacy of the source of information), Accuracy (reliability and correctness of the content) and Purpose (reason the information exists/possible bias). Examples of the checklist, which includes questions to ask oneself for each domain, can be found at: https://libraries.mercer.edu/research-tools-help/citation-tools-help/images/PrintableCRAPtest.pdf or http://legacy.juniata.edu/services/library/instruction/handouts/craap_worksheet.pdf.

Nolan and Hockenbury (2015) outline an approach to developing information literacy that can be used in any Psychology course. Instructors first ask students to find online articles related to psychology (this can be done before or during class). The article should be current (within 24 hours) and needs to be from a general news publication (not one that publishes only psychological content). Using one article as a model, the class can evaluate its strengths and weaknesses using the steps outlined in the CRAAP test. Discussion might include additional searching on the Internet to find out more about sources, authors, etc. If possible, this can be a regular activity in the course and included on assessments such as exams. For instance, an exam question can include an article chosen by the instructor with instructions to evaluate the article using the steps of the CRAAP test.

2. Autonomic Nervous System Lab as a Demonstration of Critical Thinking (adapted from LaVoie, 1987)

This activity, adapted from LaVoie (1987), was initially designed as a demonstration of the autonomic nervous system (ANS), but also makes an excellent tool for practicing critical thinking. It is most relevant for Biopsychology and related classes, but can also be used in introductory courses. It is best to use this at the very beginning of a class period with little explanation (this adds another confound that can be used in discussing the activity later). Ideally, it should be done over two class periods so that students can collect data from others outside of class, with the class analyzing a larger data set during the second class period (note that using data from previous semesters would work as well).

First, have students record their heart rate (HR) to get a baseline: The instructor times them for 15 seconds and they multiply beats x 4 to get beats per minute. Second, ask students to think about an emotional event in their lives. Be clear that they will not have to share anything about this event with the instructor or class; this is completely private. The event can be either positive or negative. Ask them to write about this event in detail: *What led up to the event? What were they thinking and feeling during*

the event? What happened afterwards? They can write longhand or on a laptop, but the key is that they provide a good deal of detail about the event. Have them write for about 5 minutes, then stop them and have them measure their HR again (it can be helpful to provide a 10 to 15 second warning to let them finish their thought and find their HR before they need to start counting). Have them repeat writing for 5 minutes and measuring HR for a total of 4 HR measurements during the writing task. Third, discuss what happened: Did their HR change from baseline? Did it go up or down? Fourth, discuss the functions of ANS, e.g., sympathetic and parasympathetic divisions and their functions. Finally, record HR one or two more times.

Students are then provided directions to collect ANS data on their own and upload the data into an Excel file that is due a few days before the next class meeting. The instructor can then compile all the data into a single Excel file and run descriptive and inferential statistics. These results can then be discussed at the next class meeting.

While the demonstration often works, it sometimes doesn't and it never works for everyone. Of course, the main point of the demonstration is that merely thinking about an emotional event can activate one's ANS, but this is a great opportunity to utilize some critical thinking: Why didn't it work for everyone? If there were gender differences, why might that be the case? If there were no gender differences, based on these data can we say that men and women process emotions similarly? How could the procedure be improved? Is this really an experiment? Often there are no differences in heart rate during the baseline and writing phases, but there are differences during writing and the post-writing period, so we discuss why that might be the case. This demonstration is subject to a number of confounds including (but not limited to) the lack of a control group, individual variability in the degree of emotionality of the event chosen by each student, and measurement error in recording heart rate, which can be discussed.

3. Addressing Pseudoscience in Assessment

There are many opportunities in a psychology course to help students identify pseudoscience (claims or beliefs that erroneously seem based on scientific methods). For courses covering clinical diagnosis and testing, instructors can focus on psychological testing approaches that are not empirically validated, such as projective tests. Such activities typically capitalize on the "Barnum effect," the tendency to interpret vague personality statements as being unique to oneself. For instance, Wood and colleagues (2003), describe an in-class experiment published by Bertram Forer in 1949. Forer provided each of his introductory psychology students with a brief personality statement and asked them to evaluate the statement's accuracy regarding their personality. While the students generally rated the statements as accurate, Forer had given all students the same statement, modeled after horoscopes (Wood, Nezworksi, Lilienfeld, & Garb, 2003). Forer's approach can be implemented easily, but some instructors have created materials that more clearly mimic psychological tests. For instance, Michael Birnbaum created a web-based "personality" test where students can take a Likert-style personality test on-line and be given "canned" results (http://psych.fullerton.edu/MBIRNbAUM/psych101/LittleBig5B.htm). For instructors wanting to focus on projective tests, the activity below (adapted from Nicolai, 2004) uses an inkblot-style stimulus to mimic a personality test.

The activity takes place over two separate class periods. If used in a course that will be examining projective tests, the activity might be best introduced several class periods before students read or discuss the relevant material.

On the first day, tell students they will be taking a personality assessment in class and that their responses will be confidential (or anonymous if the instructor wants to create subject identifiers). Students are given a form with an inkblot and space to write down three things they "see" in the inkblot (see Document A below) and told a computer will score their responses, which will be returned at the next class.

Document A

Test of Personal Style Test – Brief Form
Responses are computer scored.

Name: _____

Gender: Male Female Other

Age: _____

Highest education level completed: _____

Instructions: **What might this be?** Write at least 3 responses below. There are no "right" or "wrong" answers.

On the second day, students are given their "testing feedback" (Document B). This is a pre-written document that is formatted to look like official feedback on a psychological test. The feedback has several vague statements such as "you are friendly but sometimes like to be alone." "You are bright but don't always live up to your potential." Every student is given the exact same feedback sheet stapled to their original responses (though students should not know they are all receiving the same feedback at this point in the exercise).

Document B

Personal Style Test – Brief Form

INTERPRETIVE SUMMARY OF PST NUMBER 1156
Your response indicates the following:

Intellectual orientation

You are above average in intelligence. Performance on intellectual and academic tasks is probably also above average, but is very dependent on your level of motivation.

Goal orientation

You have clear short-term goals, but several of your long-term goals are vague and/or you are unsure whether they can be reached.

Relational orientation

You are loyal to your closest friends and family. You seem to feel some sadness or regret about a current or previous personal relationship.

You seem to have substantial capacity to be caring and nurturing, but under stress you tend to become more selfish with your time and energy.

After students review their feedback during class, they complete a handout (Document C) regarding their responses to their "personality results." Questions focus on how true the information is of them, how "good" a test they think it is, how they think the test "worked" to give the information, etc.

Document C

Reactions to Personal Style Test – Brief Form

1) How accurate is this report regarding your personality traits on a scale of 1 (not at all) to 5 (extremely)? _____
2) How unique do you think this report is to you on a scale of 1 (not at all) to 5 (extremely)? _____
3) How much confidence do you have in this measure to accurately identify people's personality on a scale of 1 (Not at All) to 5 (Quite A Lot)? _____
4) Would you recommend that others use this measure to assess people's personality? Yes or No? (circle one)

   Why/Why not?
5) Look at your responses on the measure. Why/how do you think your responses led to your results? In other words, how did your responses indicate these aspects of your personality (your best guess)?

After students have handed this document in, the instructor then facilitates a discussion where students express their views on the "test," if they thought it was valid, etc. Once the discussion seems to have run its course, the true nature of the activity is revealed (the instructor can either tell students that everyone received the same "feedback" or, for more dramatic effect, can ask for a volunteer to read their "feedback" aloud). Alternatively, instructors can read anonymous student responses from

Document C, or class statistics on the quantitative items can be calculated outside of class and then presented to indicate the number of students who believed the activity was a real test.

Once students understand the true nature of the activity, several discussion points can be made: 1) Reassure students that the statements made on their test "results" sheet might very well be true about them. It just wasn't the "test" that identified those characteristics, and these characteristics are not unique to them; 2) Discuss the Barnum effect and why it commonly occurs (e.g. high probability that the statements are true; the higher the level of detail and "professionalism" in the questions/stimuli, the more likely people the test is to be seen as an "authority"; self-confirming bias; wishful thinking/hopefulness as effect is more pronounced with positive feedback than negative; 3) Generate examples of how the Barnum effect can apply to the real-world, such as astrology, psychics, internet/popular magazine tests. In courses that focus on projective tests, the exercise can be applied to students' understanding of the empirical limitations of projective tests.

4. Considering Theories through Developmental Psychology

Through the study of psychological theories, students compare their preconceptions to the empirical research underlying such theories. Because developmental psychology focuses on several theories fundamental to the human experience, students already have beliefs about relevant concepts, which can be foundational for critical thinking in the course. When students learn the various explanations of human behavior and experience, they learn that theories of development should describe, explain, predict and modify behavior. Effective and useful theories pertaining to development over time must debate over the mechanisms and processes of both change over time as well as stability.

Two related exercises that focus on these themes are described below (though they are independent of one another). If possible, conduct these exercises the first day of class as they set a critical-thinking tone for the course.

Exercise 1
As an introductory activity, present the following exercises to students.

a. Think about this question briefly and write down your answer: *Is change inevitable or do people stay the same over time?*

b. Draw your lifeline and mark at least five significant moments on it. *How might you categorize the things you've listed? Are they marked by particular ages, by theme (first bike ride, first lost tooth, first boy/girlfriend)? What do these events mean to you?*

After students have completed both exercises, instructors can begin discussion by asking, "*Did YOU stay the same over time? In what ways?"* This stimulates discussion about the different types of change experienced in a lifetime:

a. Normative versus non-normative
b. Expected versus unexpected
c. Positive versus negative

Exercise 2
From the get-go, an examination of the human experience can exemplify the nature of life as a series of phases in which stability and change wax and wane. Students can examine their initial beliefs about

development by completing a worksheet [adapted from Berk, Harris, & Barney-Young (2004), see below)] with statements exemplifying four foundational debates with which theorists must grapple in explaining development:

1. Continuity versus discontinuity (discrete stages)
2. Nature versus nurture (etiological argument)
3. One course versus many courses (universality)
4. Stability versus open-to-change (fixed characteristics or plasticity)

Students are asked to read pairs of statements exemplifying these debates and choose either the A or B "side" of the theory. They then write a paragraph for three or four of these statements explaining their choices with relevant personal examples. While it is a falsehood that either A or B are entirely correct, explaining their thoughts during discussion as to why neither A nor B alone are comfortable choices focuses students on the tenets of valid theory building, and that "it depends" responses can be acceptable at times. Class discussion addresses additional critical aspects of scientific thought, such as:

- Individual anecdotal experiences versus empirical evidence
- Limits to data and ideas
- Describing, explaining, predicting and modifying behavior
- From a Lifespan Perspective, development is:
    - Lifelong,
    - Multidirectional/multidimensional,
    - Plastic/malleable,
    - Impacted by many influences

It can be instructive to return to this exercise at the end of the semester to examine whether students' answers have changed and why. (It is helpful to use online discussion threads for this activity so that students can click back to their original entries.) Students can examine given answers and provide more support for them, while further considering the concepts described above.

Worksheet for Debates in Developmental Psychology

_____

Directions: Listed below are eight pairs of statements related to basic issues in child development. Read each statement carefully. Then circle the statement in each pair that most closely reflects your own view. YOU MUST CHOOSE either A OR B (not both or none).

1A. Development is a continuous, gradual progression, with new abilities, skills, and knowledge gradually added at a relatively uniform pace.
1B. Development occurs at different rates, alternating between periods of little change and periods of abrupt, rapid change.

2A. Most psychological disorders have a biological basis.
2B. Most psychological disorders are the result of environmental causes.

3A. Children everywhere follow the same general sequence of development.
3B. Each child passes through a unique course of development.

4A. Children who exhibit a certain characteristic, such as shyness or aggressiveness, will likely exhibit that same characteristic in adulthood.
4B. Whether a shy or aggressive child will become a shy or aggressive adult is dependent on the experiences that that child undergoes during development.

5A. Children respond to the world in much the same way as adults. The main difference is that children's thinking is less sophisticated and complex than adults'.
5B. Children have unique ways of thinking about and responding to the world that are very different from those of adults.

6A. Powerful negative events in the first few years of life cannot be fully overcome by later, more positive events.
6B. Children and adults can recover from early, powerful negative events with the help of new opportunities and favorable life circumstances.

7A. All children follow the same general path of development.
7B. There is an infinite number of possible paths of development.

8A. Children’s intelligence is determined almost exclusively by genetic factors.
8B. Children's intelligence is largely the result of experiential factors.

References

Ambrose, S.A. & Lovett, M. C. (2014). Prior knowledge is more than content: Skills and beliefs also impact learning. In V. A. Benassi, C.E. Overson, & C. M. Hakala (Eds.), *Applying science of learning in education: Infusing psychological science into the curriculum*. Retrieved from the Society for the Teaching of Psychology web site: http://teachpsych.org/ebooks/asle2014/index.php

Autin, F., & Croizet, J.-C. (2012). Improving working memory efficiency by reframing metacognitive interpretation of task difficulty. *Journal of Experimental Psychology: General, 141,* 610-618. doi: 10.1037/a0027478

Berk, L., Harris, S., & Barnes-Young, L. (2004*). Learning Activity 1.1. In Instructor's Resource Manual for Berk, Development through the Lifespan* (3rd Ed, pp. 31). New York: Allyn and Bacon.

Brookfield, S. D. (2011). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. San Francisco, CA: Jossey-Bass.

Clark, C. M., & Bjork, R. A. (2014). When and why introducing difficulties and errors can enhance instruction. In V. A. Benassi, C.E. Overson, & C. M. Hakala (Eds.), *Applying science of learning in education: Infusing psychological science into the curriculum*. Retrieved from the Society for the Teaching of Psychology web site: http://teachpsych.org/ebooks/asle2014/index.php

Ellerton, P. (2014). How to teach all students to think critically. Retrieved from http://theconversation.com/how-to-teach-all-students-to-think-critically-35331

Ennis, R. (2013). Twenty-one strategies and tactics for teaching critical thinking. Retrieved from http://www.criticalthinking.net/howteach.html

Forer, B. R. (1949). The fallacy of personal validation: A classroom demonstration of gullibility. *Journal of Abnormal and Social Psychology, 44*, 118-123.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410-8415. doi: 10.1073/pnas.1319030111

Garfield, J. B., delMas, R., & Chance, B. (2007). Using students' informal notions of variability to develop an understanding of formal measures of variability. In M. C. Lovett, & P. Shah (Eds.), *Thinking with data* (pp. 117-148). Mahwah, NJ: Lawrence Erlbaum Associates.

Peeck, J., Van den Bosch, A. B., & Kreupeling, W. J. (1982). Effect of mobilizing prior knowledge on learning from text. *Journal of Educational Psychology*, *74*, 771-777. doi:10.1037/0022-0663.74.5.771

Halonen, J. S. (1996). On critical thinking. *The APS Observer.* Retrieved from http://www.psychologicalscience.org/observer/on-critical-thinking

Holmes, J. D., & Beins, B. C. (2009). Psychology is a science: At least some students think so. *Teaching Of Psychology*, *36*, 5-11. doi: 10.1080/00986280802529350

LaVoie, A. L. (1987). The autonomic nervous system. In V. P. Makosky, L. G. Whittemore, & A. M. Rogers (Eds.), *Activities handbook for the teaching of psychology*, Vol. 2 (pp. 286 - 288). Washington, DC: American Psychological Association.

Nicolai, K. (2004). Instructor's Resource Manual for *Psychological Testing: Principles, Applications, and Issues*, 6th Edition by R. M. Kaplan & D. P. Saccuzzo. Boston, MA: Cengage Learning.

Nolan, S. A. & Hockenbury, S. E. (2015). Think like a scientist: Harnessing current events to teach psychological science. *Psychology Teacher Network.* Retrieved from https://www.apa.org/ed/precollege/ptn/2015/12/think-like-scientist.aspx

Northcraft, G. B., Schmidt, A. M., & Ashford, S. J. (2011). Feedback and the rationing of time and effort among competing tasks. *Journal of Applied Psychology*, *96*, 1076-1086. doi: 10.1037/a0023221

Overholser, J. C. (2007). The Boulder Model in academia: Struggling to integrate the science and practice of psychology. *Journal of Contemporary Psychotherapy, 37,* 205–211. doi:10.1007/s10879-007-9055-z

Wood, J. M., Nezworski, M. T., Lilienfeld, S. O., & Garb, H. N. (2003). The Rorshach Inkblot test, fortune tellers, and cold reading. *Skeptical Inquirer, 27*(4). Retrieved from http://www.csicop.org/si/show/rorschach_inkblot_test_fortune_tellers_and_cold_reading

Chapter 15: Using Role-Play to Enhance Critical Thinking about Ethics in Psychology

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Abstract

In this chapter, I describe a highly structured, student-centered role-play activity. Before coming to class, students read about the Tuskegee Syphilis Study. They then work cooperatively in small groups to decide on how to collectively portray the role of their assigned character from the study. Each group then presents their character's testimonial at a tribunal, with the aim of clarifying the injustices that occurred during the study. The activity is designed to foster collaboration and communication skills and to encourage students to think critically about how this historical study violated ethical standards for conducting research with human subjects. Assessment data suggest that the activity deepens students' understanding about the significance of the study and the purpose of giving informed consent as a research participant.

Introduction

Consistent with the principles of backward design (McTighe & Wiggins, 2012), I design my courses with the end in mind (for more details about backward course design see also Strashnaya and Dow, this volume). Based on the goals suggested by APA for the Undergraduate Major in Psychology (APA, 2013), my learning objectives in my Introductory Psychology classes are to enhance my students' collaborative, communication, and critical thinking skills. Although it is not quick or easy to change how students think (e.g., Benassi & Goldstein, 2006; Halonen, 2008; Halpern, 1998, 1999; King & Kitchener, 2004), I have found that using learner-centered activities that my students find enjoyable (like the role-play I describe here) increases their motivation to engage in higher-order thinking. The role-play exercises in my classes involve highly structured small-group activities in which students learn to cooperate and construct knowledge with their peers. Having opportunities to work on improving their collaborative skills is particularly important for students because employers increasingly value these skills in a variety of career settings (National Association of Colleges and Employers (NACE), 2014). Using role-play activities is also consonant with the American Association of Higher Education's evidence-based principles for effective undergraduate education (Chickering & Gamson, 1987), who advocate for the use of active learning and collaboration among students.

Role-plays have been used extensively to educate students across multiple disciplines (Rao & Stupans, 2012), including medical (Lane & Rollnick, 2007; Nestel & Tierney, 2007) and mental health fields (Rabinowitz, 1997; Schwitzer, Gonzalez, & Curl, 2001; Smith, 2009), as well as for training teachers (Çerkez, Altinay, Altinay, & Bashirova, 2012; Kilgour, Reynaud, Northcote, & Shields, 2015; Koc, 2011) and encouraging students to take leadership roles (Brown, 1994; Shapiro & Leopold, 2012). Role-play enhances student learning across multiple domains (e.g., Stroessner, Beckerman, & Whittaker, 2009), including perspective taking (Pusateri, Halonen, Hill, & McCarthy, 2009), critical thinking (Poling & Hupp,

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2009), and communication skills (Lane & Rollnick, 2007; Nestel & Tierney, 2007). There is growing evidence to suggest that role-plays also help students to consolidate and enhance their knowledge in a particular subject area (DeNeve & Heppner, 1997; McCarthy & Anderson, 2000; Poling & Hupp, 2009; Poorman, 2002). Role-play has also been used in a variety of different undergraduate psychology classes to deepen students' understanding about psychological disorders (Poorman, 2002), research design (Bleske-Rechek, 2001), ethics (Rosnow, 1990; Strohmetz, 1992), historical influences in the field of psychology (Zehr, 2004), acculturation (Tomcho & Foels, 2002; Zamboanga, Ham, Tomaso, Audley, & Pole, 2016), and key concepts in developmental psychology (Poling & Hupp, 2009).

The role-play exercise that I describe here was originally developed with my innovative colleague, Kimberly Helmer, when she was teaching in the English department at John Jay College, for students in our Introductory Psychology/Introductory English learning community classes. This particular role-play centers on portraying characters in the highly unethical 40-year-long Tuskegee syphilis study (Jones, 1993; Rivers, Schuman, Simpson & Olansky, 1953; Shafer, Usilton, & Gleeson, 1954; Thomas & Quinn, 1991). The Tuskegee study researchers decided that they wanted to study the natural trajectory of syphilis, and consequently, all of the study participants (nearly 400 impoverished Black men) tested positive for syphilis but were purposefully left untreated and uninformed about the nature of their illness or its communicability (Jones, 1993; Thomas & Quinn, 1991). The role-play exercise is designed to increase students' skills in terms of communication, collaboration and critical thinking, while helping them to understand how this historical study has shaped protection for human subjects participating in research studies today. I describe both the basic structure of the role-play and also provide details for a follow-up homework assignment that is suitable for introductory psychology students (who are often in their first-year at college). However, the role-play itself can be used at all levels of the baccalaureate, by adapting the follow-up homework assignment to fit the appropriate developmental level of the students.

Role-play activity

Students are first assigned the role of a person associated with the Tuskegee Study (see Table 1 for suggestions) and then, prior to coming to class, they read a thought-provoking description of the study written by Thomas and Quinn (1991). Thomas and Quinn (1991) explain that the study began as a collaborative effort between the Public Health Service (PHS) and the Rosenwald Fund to control syphilis among impoverished Blacks in the rural south of the United States. From 1929 to 1931, a large number of Black study participants were tested and identified as having the disease. However, during the Depression, the Rosenwald Fund withdrew from the project due to lack of finances and so the proposed treatment phase of the study could not be carried out. This dramatically changed the nature of the study. PHS scientists decided that they would continue the study by investigating the effects of untreated syphilis among Blacks. Initially they planned to do this for 6-9 months, but the study actually continued for 40 years. Moreover, the study persisted long after penicillin had become widely available as an effective treatment for syphilis, because the researchers wanted to track changes in these untreated participants until they died. In fact, the investigators went to extraordinary lengths to ensure that participants were never given the chance to receive effective treatment by involving a wide range of authorities (including the draft board and local and state health authorities across the country). The participants were not informed about the true nature of the study, nor were they told that they had syphilis and how this disease could be communicated to others. Moreover, the PHS involved community leaders, a Black nurse, and Black doctors from the Tuskegee Institute in order to increase the chances of

persuading the men to participate in the study. The incentives that the participants were offered – free physical examinations, food, transportation, and burial costs – were also clearly coercive given their impoverished financial situations. During the mid-sixties, Peter Buxton, a PHS investigator tried to bring the study to an end by writing to the Director of Venereal Diseases, who eventually discussed his communications with the Director of the Center for Disease Control (CDC). However, a CDC panel then decided that the study should still continue until the men died. The study finally came to a halt following the public outcry after Buxton told his story to the *Washington Star*. Thomas and Quinn (1991) contextualize the study in terms of feelings of mistrust among Blacks in relation to public health programs designed to control the spread of HIV in the 1990s.

Table 1. *Suggested characters for the role-play* (** extra characters for large classes*)

Representative from Julius Rosenwald Fund
Representative from the Public Health Service
Eunice Rivers, study nurse
Study participant
Peter Buxton
*Taliferro Clark**
*Relative of study participant (spouse or child)**
*Tuskegee Institute doctor**

After completing the reading, each student prepares a very short written statement to bring to class that explains their assigned character's role in the Tuskegee study. The role-play itself occurs in the form of a tribunal that brings together the people (both living and dead) who were associated with the study in order to clarify what happened in the study and to decide the level of injustice that occurred. Students are free to express their feelings about the study (within the context of their character) in their statements, including justifications or apologies for their behavior.

This role-play activity is highly structured so that all students (irrespective of any previous role-play experience) can quickly grasp what is expected of them. Structured activities have also been shown to increase learning more effectively that unguided discovery learning (Alfieri, Brooks, Aldrich, & Tenenbaum, 2011). The role-play activity is designed to encourage students to learn how to work with peers from different backgrounds and with different viewpoints, and so is predicated on the best practices for cooperative learning (Johnson, Johnson, & Smith, 1998; Slavin, 1995; see also Sawyer & Obeid, this volume). The role-play class period begins with students meeting in small 4-5 person groups with others who have been assigned the same character. They share their statements with the other group members and then collaboratively write a short script for their character's testimonial. Consistent with Vygotsky's theory of social constructivism (Vygotsky, 1978), students benefit from hearing each other's interpretation of the reading as they help each other to identify and elaborate on the main points that they feel are most pertinent to their character's role in the study. This cognitive elaboration is also likely to result in deeper understanding and greater retention of the information (Pressley et al., 1992; Slavin, 2011).

One of the benefits of this small group work is that students have to use multiple levels from both the affective and cognitive domains of Bloom's Taxonomies for Educational Objectives (Anderson et al., 2001). Within the affective domain, students have to be ready to *receive* information and *respond* to

their peers in their small groups and at the tribunal, as well as use this information to make *value* judgments about the injustices that they perceived to have occurred during the study. Within the cognitive domain, after *recalling* information from the reading and demonstrating to their peers that they *understand* it, they then have to *analyze* the information to *create* their role. The small-group activity is designed to promote positive interdependency (Johnson, et al., 1998; Slavin, 1995), i.e., the success of the individual is dependent on the success of the other group members. The likelihood of free-riding, a relatively common problem in unstructured group work, is therefore reduced because students depend upon each other in order to write their script and produce a coordinated character depiction (Johnson & Johnson, 2009). Another way that I ensure that students contribute equitably to the small-group discussion and character creation is by using peer evaluation. After the class, students fill in a form (see Table 2) where they rate both their own contribution and that of the other group members. I then use this to make any necessary adjustments to students' participation grades.

Table 2. *Peer evaluation form for role-play process*

Group Member _____	Group Member _____	Group Member _____
____ did fair share of work ____ was cooperative ____ was positive, helpful 3= definitely 2= a bit 1= not really	____ did fair share of work ____ was cooperative ____ was positive, helpful 3= definitely 2= a bit 1= not really	____ did fair share of work ____ was cooperative ____ was positive, helpful 3= definitely 2= a bit 1= not really

Note: My peer evaluation form typically has entries for five group members and one for self-assessment.

After about 15- 20 minutes of this small group work, the groups then come together at the tribunal itself. Each character is asked to give their testimonial and because each group is representing one person, students are asked to think of themselves as one body with multiple heads. Each person within the group speaks for one minute, and as one person speaks the other group members pay careful attention and mimic their body language and gestures. This practice helps to keep students on task and promotes active listening when one of their group members is speaking. I usually start with the representative from the Rosenwald Fund to help students to understand that the initial rationale for the study was benevolent. Then we rotate through the characters: the PHS official, the study participant, the study nurse, and end with the whistle-blower, Peter Buxtun. I act as the judge at the testimonial, and ask clarifying questions to make sure that the students accurately present the role portrayed in the article that they read. This also ensures that important information is not glossed over. The structure of the activity is similar to that used in jigsaw designs (Aronson, Blaney, Stephin, Sikes, & Snapp, 1978; Carroll, 1986; Clump, 2012; Crone & Portillo, 2013); students become experts in a particular area (their own character) and then at the tribunal all students benefit from hearing from the other characters in the study. Students in the class are motivated to pay attention to whoever is speaking during the tribunal because they know that they may have to use this information when answering questions about their own role in the study. Furthermore, they know that they will need a strong understanding of multiple aspects of the study to successfully complete the related homework assignment. From a practical viewpoint, instructors who teach large classes (in excess of 40 students) may find it better to

hold multiple (simultaneous) tribunals by dividing the class into smaller subgroups. Teaching assistants (or another student within the group) can act as tribunal judges for each subgroup, and the faculty member can rotate from group to group.

There is considerable freedom for students to explore ideas within their small groups, with the result that across classes, the tribunal is never the same. Inevitably, some students are tasked with playing the role of someone who they feel behaved very badly in the study, especially if they have to play the part of a PHS official. Although no one has ever complained about this, students vary considerably in their willingness to temporarily put aside their personal feelings about the role. Consequently, sometimes, the PHS official is apologetic and admits that the PHS behaved unethically. However, in other classes, the PHS official plays the devil's advocate and cites societal norms for racism at the time of the study as justification for their behavior toward the Black study participants. Students may have to take the perspective of other characters such as Eunice Rivers, the community nurse, who they often imagine tries to be kind to the men in the study, but still has to carry out the orders of her superiors. My students are particularly passionate in their indignant portrayals of the impoverished black men who participated in the study, by describing how they were persuaded to participate by influential community leaders and the lure of food, money, and medical attention. They also express their anger that they were denied treatment and that they had unknowingly spread the disease to family members. Moreover, they are emphatic in their disbelief that this study went on for forty years. To bring the role-play activity to a close, we talk about what students have learned about the study. We finish by discussing what kinds of protections are in place for participants in research studies today, such as giving informed consent, and what students felt they gained by participating in the role-play exercise. This discussion is a very important part of the process as it helps to bring about closure and ensures that students understand the relevance of the role-play (Hertel & Millis, 2002).

In my undergraduate courses, my students' enthusiasm during the classroom activity carries over as they engage with the written homework (see Table 3) that follows the exercise. The homework has two main objectives, one is to assess whether students have understood the main points of the Tuskegee study, and the other is for students to gather information about other unethical psychological studies. In doing the latter, students participate in one of a sequence of scaffolded assignments designed to promote informational literacy. This particular assignment, which comes near the start of the semester, allows me to assess which search strategies students use in looking for information and what criteria they use to assess reliability of sources. These questions start to prompt students to consider the effectiveness of their strategies for finding and evaluating information.

Table 3. *Homework*

You both read about the Tuskegee study and acted out some of the roles of the characters involved. Please answer the following questions:

1. Do you think that the original idea for the Tuskegee study was ethical? Why/Why not?
2. When do you think the Tuskegee study became unethical? What factors that made it so?
3. Why do you think that so many African Americans agreed to participate in the study?
4. How long did the study go on for?
5. Who provided funding for the study?
6. What did the scientists who conducted the study think that they would find out?
7. Why do you think that the scientists felt justified in carrying out the study?

DIG DEEPER QUESTION: *As a result of studies like this one, in 1979, the Belmont Report made recommendations about how research must be conducted. Nowadays, all research involving human participants must be approved by an ethics review board (institutional review board or IRB) that protects the rights of research participants. I want you to dig deeper into the history of science/psychology to find* ***another example of an unethical experiment****. You can use any sources that you feel are appropriate for this assignment, but you must complete the worksheet below so that I can understand where and how you found the information.*

Tuskegee – Dig Deeper Worksheet

1. Where did you find the information?
   a. Internet
   b. Book
   c. Newspaper
   d. Other – please state
2. Tell me where more exactly how you found the information, i.e. the name of the search engine that you used if you did an Internet search, or how you found the book etc. Give me as much detail as possible so if I wanted I could find exactly the same information.
3. What keywords did you use to search?
4. Tell me the exact source of the information – i.e. the html of a website, the information about the book – again, be as precise as possible, imagine that you are leaving me a trail of clues to follow so that I can see exactly what you did and so that I can do the same.
5. Make a copy of the information to hand in.
6. How reliable do you think that this information is? Tell me why you think this.

Assessment

I formally assessed the efficacy of the role-play exercise on increasing student learning in two ways. First, in two English/Psychology learning community classes (a total of 46 first semester first-year students) I compared scores on the homework assignment related to the role-play activity (described in Table 3) to the combined scores on all other comparable homework assignments that did not involve role-plays. The score (out of 20 points) on the role-play related homework (M =16.2, SD = 2.8) was significantly higher than the combined scores for all other comparable homework assignments (M =14.9,

SD =2.4), $t(45) = 3.33$ $p = .002$. These data suggest that role-play helped to deepen students' understanding of research ethics within the context of the Tuskegee study. Secondly, I compared the scores on a multiple-choice test item relating to informed consent that I administered to six different sections of Introductory Psychology classes that I taught over various semesters. In three of the classes, all of the students ($n = 58$) engaged in the Tuskegee role-play described above, but in the other three classes ($n = 96$) there was no role-play activity. More students in the role-play group (96.6%) answered this question correctly than in the non-role-play group (79.8%), $\chi 2$ (1, N=152) = 8.47, $p = 0.003$. Students' perceptions about the role-play activity were not formally collected but I have provided a summary of some of their general impressions during the debriefing session in the conclusion section below.

Conclusions

This role-play exercise helps to bring psychology to life in the classroom, and despite the gravity of the topic, students find it to be very enjoyable. This enjoyment may help to explain why they are so highly engaged during the role-play activity (Slavin, 2011). Students usually tell me that the role-play helped them to understand the study from multiple viewpoints. Even doctoral students, who have participated in the exercise as part of a Teaching of Psychology class, report that engaging in the role-play increased their ability to take the perspective of others. The assessment data support the notion that the role-play activity helped students to internalize and reflect on what they knew about the study in their homework assignments and helped them to understand the concept of informed consent. Other studies have also found evidence that role-play increases comprehension of a topic (DeNeve & Heppner, 1997; McCarthy & Anderson, 2000; Poling & Hupp, 2009; Poorman, 2002). In addition, Poling and Hupp (2009) found evidence that role-play can increase critical thinking skills. I did not explicitly measure gains in critical thinking before and after the role-play, but students clearly engaged in higher-order thinking both during the creation of their testimonials, and also when asking and fielding questions during the tribunal. Some of these questions required students to extrapolate beyond the reading and imagine more explicitly the motivation behind their character's actions.

One criticism of role-plays among medical students is that some people find them to be anxiety provoking (Stevenson & Sander, 2002) and in some of the debriefing sessions at the end of my role-play activities, a few students have stated that they felt nervous before coming to class. However, they typically go on to say that collaborating on the script with their classmates lessened their anxiety. Therefore, having students work cooperatively on a role-play activity may lead to better outcomes. Students also think that this activity helps them with their public speaking skills, which they acknowledge is likely to be valuable in their future careers.

The role-play activity helps students to think about ethical issues in psychology studies. Students seem particularly invested in the part of the homework assignment where they have to find another unethical study, and they enthusiastically share the details of these in subsequent class discussions. Other studies have also shown various role-plays to be effective for deepening students' understanding of ethics in research studies. In some cases, students played the parts of Milgram (Obedience to Power) or Zimbardo (Stanford Prison experiment) or other authors of unethical studies who had to defend their study to the IRB (Rosnow, 1990; Strohmetz, 1992). Similarly, Kraus (2008) found that sociology students who made up skits that addressed various ethical issues in research design improved their ability to identify situations in which research ethics were violated.

In general, I have found this role-play activity to be a highly successful student-centered learning practice. It motivates students to engage with their peers in thinking deeply about ethics and the motivation behind a historically important research study.

References

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology, 103*(1), 1-18. doi:10.1037/a0021017

Anderson, L. W. E., Krathwohl, D. R. E., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., & Pintrich, P. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives.* New York, NY: Longman.

American Psychological Association. (2013). APA guidelines for the undergraduate psychology major. Version 2.0. Washington, DC: American Psychological Association.

Aronson, E., Blaney, N., Stephin, C., Sikes, J., & Snapp, M. (1978). *The jigsaw classroom*. Beverly Hills, CA: Sage Publishing Company.

Benassi, V. A., & Goldstein, G. S. (2006). Students' beliefs about paranormal claims: Implications for teaching introductory psychology. In D. S. Dunn & S. L. Chew (Eds.), *Best practices for teaching Introduction to Psychology* (pp. 225-243). Mahwah, NJ: Lawrence Erlbaum Associates.

Bleske-Rechek, A. L. (2001). Obedience, conformity, and social roles: Active learning in a large introductory psychology class. *Teaching of Psychology, 28*(4), 260-262. doi:10.1207/s15328023top2804_05

Brown, K. M. (1994). Using role play to integrate ethics into the business curriculum a financial management example. *Journal of Business Ethics, 13*(2), 105-110.

Carroll, D. W. (1986). Use of the jigsaw technique in laboratory and discussion classes. *Teaching of Psychology, 13*(4), 208-210.

Çerkez, Y., Altinay, Z., Altinay, F., & Bashirova, E. (2012). Drama and role playing in teaching practice: The role of group works. *Journal of Education and Learning, 1*(2), 109-120.

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *American Association for Higher Education and Accreditation (AAHEA) Bulletin, 3*, 3-7.

Clump, M. A. (2012). More than just stepping away from the podium: A jigsaw classroom. In J. Holmes, S.C. Baker, & J.R. Stowell (Eds.), *Essays from e-xcellence in teaching. XI*, 15-22. http://teachpsych.org/resources/documents/ebooks/eit2011.pdf#page=18

Crone, T. S., & Portillo, M. C. (2013). Jigsaw variations and attitudes about learning and the self in cognitive psychology. *Teaching of Psychology*, *40,* 246-251. doi: 10.1177/0098628313487451

DeNeve, K. M., & Heppner, M. J. (1997). Role play simulations: The assessment of an active learning technique and comparisons with traditional lectures. *Innovative Higher Education, 21*(3), 231-246. doi:10.1007/BF01243718

Halonen, J. S. (Ed.). (2008). Measure for measure: The challenge of assessing critical thinking. Malden, MA: Wiley-Blackwell.

Halpern, D. F. (1998). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist, 53*(4), 449-455. doi:10.1037/0003-066X.53.4.449

Halpern, D. F. (1999). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *New Directions for Teaching and Learning, 1999*(80), 69-74. doi:10.1002/tl.8005

Hertel, J. P., & Millis, B. J. (2002). *Using simulations to promote learning in higher education: An introduction*. Sterling, VA: Stylus Publishing, LLC.

Johnson, D. W., & Johnson, F. P. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher, 38*(5), 365-379. doi:10.3102/0013189x09339057

Johnson, D. W., Johnson, F. P., & Smith, K. A. (1998). Cooperative learning returns to college what evidence is there that it works? *Change: The Magazine of Higher Learning, 30*(4), 26-35. doi:10.1080/00091389809602629

Jones, J. H. (1993). *Bad blood: The Tuskegee syphilis experiment (Rev. ed.)*. New York, New York: The Free Press.

Kilgour, P., Reynaud, D., Northcote, M. T., & Shields, M. (2015). Role-playing as a tool to facilitate learning, self-reflection and social awareness in teacher education. *International Journal of Innovative Interdisciplinary Research, 2*(4), 8-20.

King, P. M., & Kitchener, K. S. (2004). Reflective judgment: Theory and research on the development of epistemic assumptions through adulthood. *Educational Psychologist, 39*(1), 5-18. doi: 10.1207/s15326985ep3901_2

Koc, M. (2011). Let's make a movie: Investigating pre-service teachers' reflections on using video-recorded role playing cases in Turkey. *Teaching and Teacher Education, 27*(1), 95-106. doi:10.1016/j.tate.2010.07.006

Kraus, R. (2008). You must participate: Violating research ethical principles through role-play. *College Teaching, 56*(3), 131-136. doi:10.3200/CTCH.56.3.131-136

Lane, C., & Rollnick, S. (2007). The use of simulated patients and role-play in communication skills training: a review of the literature to August 2005. *Patient Education and Counseling, 67*(1), 13-20. doi:10.1016/j.pec.2007.02.011

McCarthy, J. P., & Anderson, L. (2000). Active learning techniques versus traditional teaching styles: two experiments from history and political science. *Innovative Higher Education, 24*(4), 279-294. doi:10.1023/B:IHIE.0000047415.48495.05

McTighe, J., & Wiggins, G. P. (2012). Understanding by design framework. White paper. Retrieved from http://www.ascd.org/ASCD/pdf/siteASCD/publications/UbD_WhitePaper0312.pdf

National Association of Colleges and Employers (NACE). (2014). The skills/qualities employers want in new college graduate hires. Retrieved from http://www.naceweb.org/about-us/press/class-2015-skills-qualities-employers-want.aspx

Nestel, D., & Tierney, T. (2007). Role-play for medical students learning about communication: Guidelines for maximising benefits. *BMC Medical Education, 7*(3), 1-9. doi: 10.1186/1472-6920-7-3

Poling, D. A., & Hupp, J. M. (2009). Active learning through role playing: Virtual babies in a child development course. *College Teaching, 57*(4), 221-228. doi:10.1080/87567550903218703

Poorman, P. B. (2002). Biography and role playing: Fostering empathy in Abnormal Psychology. *Teaching of Psychology, 29*(1), 32-36. doi:10.1207/s15328023top2901_08

Pressley, M., Wood, E., Woloshyn, V. E., Martin, V., King, A., & Menke, D. (1992). Encouraging mindful use of prior knowledge: Attempting to construct explanatory answers facilitates learning. *Educational Psychologist, 27*(1), 91-109. doi:10.1207/s15326985ep2701_7

Pusateri, T., Halonen, J. S., Hill, B., & McCarthy, M. (Eds.). (2009). *The assessment cyberguide for learning goals and outcomes*. Washington, D.C. American Psychological Association.

Rabinowitz, F. E. (1997). Teaching counseling through a semester-long role play. *Counselor Education and Supervision, 36*(3), 216-223.

Rao, D., & Stupans, I. (2012). Exploring the potential of role play in higher education: Development of a typology and teacher guidelines. *Innovations in Education and Teaching International, 49*(4), 427-436. doi: 10.1080/14703297.2012.728879

Rivers, E., Schuman, S. H., Simpson, L., & Olansky, S. (1953). Twenty years of followup experience in a long-range medical study. *Public Health Reports, 68*(4), 39-95.

Rosnow, R. L. (1990). Teaching research ethics through role-play and discussion. *Teaching of Psychology, 17*(3), 179-181. doi: 10.1207/s15328023top1703_10

Schwitzer, A. M., Gonzalez, T., & Curl, J. (2001). Preparing students for professional roles by simulating work settings in counselor education courses. *Counselor Education and Supervision, 40*(4), 308-319.

Shafer, J. K., Usilton, L. J., & Gleeson, G. A. (1954). Untreated syphilis in the male Negro: a prospective study of the effect on life expectancy. *Public Health Reports, 69*(7), 684-690.

Shapiro, S., & Leopold, L. (2012). A critical role for role-playing pedagogy. *TESL Canada Journal, 29*(2), 120-130.

Slavin, R. E. (1995). *Cooperative Learning: Theory, Research, and Practice. 2nd ed.* Boston, MA: Allyn and Bacon.

Slavin, R. E. (2011). Cooperative learning. In V.G. Aukrust (Ed.), *Learning and Cognition in Education* (pp. 160-166). Oxford, UK: Academic Press.

Smith, A. L. (2009). Role play in counselor education and supervision: Innovative ideas, gaps, and future directions. *Journal of Creativity in Mental Health, 4*(2), 124-138. doi:10.1080/15401380902945194

Stevenson, K., & Sander, P. (2002). Medical students are from Mars - business and psychology students are from Venus - University teachers are from Pluto? *Medical Teacher, 24*(1), 27-31. doi:10.1080/00034980120103441

Stroessner, S. J., Beckerman, L. S., & Whittaker, A. (2009). All the world's a stage? Consequences of a role-playing pedagogy on psychological factors and writing and rhetorical skill in college undergraduates. *Journal of Educational Psychology, 101*(3), 605-620. doi: 10.1037/a0015055

Strohmetz, D. B. (1992). The use of role-play in teaching research ethics: A validation study. *Teaching of Psychology, 19*(2), 106-108. doi: 10.1207/s15328023top1902_11

Thomas, S. B., & Quinn, S. C. (1991). The Tuskegee Syphilis Study, 1932 to 1972: implications for HIV education and AIDS risk education programs in the black community. *American Journal of Public Health, 81*(11), 1498-1505.

Tomcho, T. J., & Foels, R. (2002). Teaching acculturation: developing multiple" cultures" in the classroom and role-playing the acculturation process. *Teaching of Psychology, 29*(3), 226-229. doi:10.1207/S15328023TOP2903_11

Vygotsky, L. S. (1978). *Mind in society*. In M. Cole, V. John-Steiner, S. Scribner, & E. Souberman (Eds.). Cambridge, MA: Harvard University Press.

Zamboanga, B. L., Ham, L. S., Tomaso, C. C., Audley, S., & Pole, N. (2016). "Try walking in our shoes": Teaching acculturation and related cultural adjustment processes through role-play. *Teaching of Psychology, 43*(3), 243-249. doi:10.1177/0098628316649484

Zehr, D. (2004). Two active learning exercises for a History of Psychology class. *Teaching of Psychology, 31*(1), 54-56.

Chapter 16: Ten TED Talk Thinking Tasks: Engaging College Students in Structured Self-Reflection to Foster Critical Thinking

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Abstract

When technology is used in a purposeful and structured way as an online learning tool, students engage in the self-reflection about past face-to-face learning experiences and link them to the new learning experiences. As a result, students learn to synthesize the learning material and participate in higher order thinking. I use Ten TED Talk Thinking Tasks posted on Blackboard as an effective student-centered activity to spark student interest in complex topics and to help students perceive their relevance in relation to developmental psychology. These weekly online thinking routines serve as a powerful learning tool that prompts students to consider how their personal experiences and professional goals are related to ideas spread by inspirational TED thinkers. In doing so, I involve students for a longer period of time with the course material to foster critical thinking and develop competence in academic writing. The online tasks enhance student comprehension of textbook reading and confidence to participate in class discussions, but more importantly, they establish routines in active self-reflection and writing that help students to attend more closely to their own learning through metacognition.

Introduction

Using the principles of blended learning theory (Garrison & Kanuka, 2004), recommending the traditional classes be augmented with online learning opportunities, I started to use freely accessible Technology, Entertainment and Design Talks, also known as TED Talks, posted online to a Blackboard (BB) discussion board as an effective student-centered activity to spark student interest in course topics prior to class. Averaging 10 to 18 minutes, the short TED Talks are recorded conference presentations given by expert speakers on thought-provoking topics related to global issues (Masson, 2014). Sir Ken Robinson questions the modern education system and asks the audience why we cannot teach students dance the way we teach them math and educate their whole being rather than from the waist up. In this chapter I describe how I use TED Talks as a pedagogical tool for students to engage in deeper thinking, develop personal grit, and gain understanding of the mindset of professionals. I use structured TED Talk Thinking Tasks to prompt my students to be involved in self-reflection while learning about human development from experts in the field. Stirring TED Talks that are linked with material in the textbook chapters can serve pedagogical purposes of enhancing self-efficacy and confidence to approach complex topics.

When technology is used in a purposeful and structured way, students spend time engaged in self-reflection about past face-to-face learning experiences and can link these experiences to new learning experiences. As a result, students learn to synthesize the learning material in a meaningful way and engage in higher order thinking, which allows for longer retention of textbook material (e.g., Benjamin, 1991; Hartlep & Forsyth, 2000; Mayer, 2008). Recorded media, when combined with questions, allows

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students to pay more attention to the topic and encourages them to engage in reflective thinking about prior, as well as upcoming, class discussions (e.g., Fleck, Beckman, Sterns, & Hussey, 2014; George & Dellasega, 2011). Spending more time on coursework leads to deeper learning experiences and facilitates active participation in the classroom (Berk, 2009; Fleck et al., 2014).

Conventional teaching materials and textbooks tend to lack a level of diversity that is reflected in current student populations and in societal changes due to rapid technological advancement. Consequently, it is recommended that educators consider the diverse perspectives of their students to foster an inclusive learning experience and at the same time acknowledge students' interest in the use of social media as an information source (Hussey, Fleck, & Warner, 2010). The use of multimedia tools has shown benefits in student learning as it attracts students' attention, includes a broader diversity of materials than the standard textbook, and increases student engagement and interest in the subject matter (Berk, 2009; Sherer & Shea, 2011; Roodt & Peier, 2013). According to Berk (2009, p. 2), the use of multimedia in the classroom can generate as many as 20 potential student-learning outcomes (see Table 1).

Table 1. *The Use of Multimedia Generates 20 Potential Student Learning Outcomes (Berk, 2009, p. 2)*

1. Grab students' attention
2. Focus students' concentration
3. Generate interest in class
4. Create a sense of anticipation
5. Energize or relax students for learning exercise
6. Draw on students' imagination
7. Improve attitudes toward content and learning
8. Build a connection with other students and instructor
9. Increase memory of content
10. Increase understanding
11. Foster creativity
12. Stimulate the flow of ideas
13. Foster deeper learning
14. Provide an opportunity for freedom of expression
15. Serve as a vehicle for collaboration
16. Inspire and motivate students
17. Make learning fun
18. Set an appropriate mood or tone
19. Decrease anxiety and tension on scary topics
20. Create memorable visual images

TED Talks in the classroom have become a popular tool in higher education (Donovan, 2013; Sugimoto et al., 2013), yet little is known about best practices in relation to student learning outcomes. Previous studies have shown that the use of media in higher education, such as YouTube clips, supports students' learning of course materials and is favorably perceived by students (Cleveland, 2011; Fleck et al., 2014). Blended learning combines face-to-face, in-class learning with online learning and is advantageous when learning contexts complement each other (Garrison & Kanuka, 2004). From an educator perspective, TED Talks spark class discussions and help to facilitate student comprehension of course material. From a learner perspective, TED Talks are "ideas worth spreading," with the potential to motivate students to

engage with topics in a deep and personally meaningful way. When students show interest in the course topics, they are more likely to participate in class. Furthermore, varied exposure to course topics across multiple contexts is beneficial for long-term retention (Seabrook, Brown, & Solity, 2005).

Nowadays, college students need to acquire content knowledge to become competent professionals in their field and to participate in a democratic society. As students need to become independently thinking citizens who value the choices and perspectives of others, they also have to be able to clearly communicate their own thinking and demonstrate open-mindedness. According to the APA guidelines for the undergraduate psychology major, student need to develop "ethically and socially responsible behaviors … in a landscape that involves increasing diversity … [in order to] work effectively even with those who do not share their heritage and traditions" (American Psychological Association, 2013, p. 15). Engaging students in both online self-reflective and classroom discussions is a developmental process that can strengthen students' active involvement in meaningful social practices related to ethics (see Grose-Fifer, this volume) and foster civic responsibility. The educational content has the potential to stimulate students' engagement and commitment to their community and society as a whole. When educators motivate self-reflection, students develop critical thinking and competence to participate in a modern democratic society (APA, 2013).

The Ten TED Talk Thinking Tasks that I describe in this chapter are matched with topics covered in my introductory course in developmental psychology. The conference talks were selected to inspire students to think about developmental concepts and to complement their textbook reading, facilitating comprehension of abstract psychological concepts by connecting psychological paradigms to real-world practices of experts in the field. The Ten TED Talk Thinking Tasks aim to inspire students to reflect on the brilliant work of men and women who often started off with a simple idea that ultimately led to a TED talk watched around the world. These TED conferences convey educational information through discussion of real-life problems in cross-cultural contexts, allowing students to connect with experts whose diverse interests and viewpoints span the breadth of the field of psychological science. Students receive ample opportunities to develop cognitive strategies, such as analysis, interpretation, problem solving, and reasoning about complex developmental themes. At the same time, students practice formulating their ideas in higher-level writing as they summarize the ideas presented by others and aim to express their own thoughts with clarity— an important skill as many students lack confidence and competence in academic writing at the time of college entry (Bok, 2006; Pajares, 2003). The Ten TED Talk Thinking Tasks can be used at all levels of developmental psychology by adjusting the questions to match students' prior academic background knowledge.

TED Talk Thinking Task

Starting in the second week of a 15-week long semester, I selected Ten TED Talks closely related to the course material and textbook reading covering development from birth to adolescence (Berk, 2014) and posted one talk each week to the discussion forum on Blackboard (BB), an online teaching platform (see Appendix A for Blackboard video postings from BB1 throughout BB10). Each discussion was due 24 hours prior to the start of class and required students to respond in a one-page Word document using APA style (introduction, discussion, conclusion, and references). In particular, students were asked to write three paragraphs that provide the overall background of the talk, linking it to research or overall developmental concepts and approaches. During class in the second week of the semester, students learned about academic writing and finding reputable sources using *PsycINFO* (an expansive database

with peer-reviewed literature in the field of psychology) and science news reports published in the *New York Times* or *Scientific American*. For the Ted Talk Thinking Tasks, students were assigned to watch the online presentations at home and write their answers to two questions. In order for students to receive two full points, they had to define the TED Talk's problem statement, discuss the solution offered to the problem, and describe the developmental concepts and explanations for these outcomes. Alternatively, instructors can also ask students to engage in peer online forum discussion, raise questions about the theoretical frameworks (1 point), and provide their own perspectives on general societal applications (1 point). Students had to demonstrate an understanding of the scientific explanations offered by the experts, and, in doing so, would begin to internalize the discipline's community of practice. In the subsequent class, I summarized the Blackboard responses to the TED Talks and directly asked students how they liked the talk and how it related to the textbook reading. In the class discussions, I challenge my students to think about development in diverse contexts and about the solutions offered to real-world problems from various psychological perspectives.

My pedagogical goal on this assignment was to enhance student self-directed reading and learning using the corresponding TED Talk Tasks as a means for developing deeper discussions of concepts from the textbook (Berk, 2014). In addition to the textbook reading, students engaged with the course material through self-reflection and posted their answers to Blackboard, which helped them to be prepared for in-class discussions with peers and to practice communication skills by listening and responding to others' viewpoints.

Appendix A lists the Ten TED Talks (BB1-BB10) pertaining to development and learning that I incorporated in my course, each connecting with a related course topic from the textbook (Berk, 2014). On some weeks, the TED Talks functioned as an extension of the assigned textbook readings, drawing connections between developmental theories and concepts and real-world experiences as narrated by inspirational TED thinkers. For example, in Chapter 3 (Berk, 2014, p. 80-117) students read about prenatal and postnatal development, with the chapter covering topics ranging from conception, birth complications, neonatal assessment to newborn reflexes. The TED Talk under BB1 went beyond the biological concepts and medical concerns surrounding birth to focus on important learning that occurs prior to birth. On other weeks, the TED Talks described psychological research that was cited in the textbook. For example, a conference talk by the distinguished scientist Patricia Kuhn (BB3) described laboratory studies that showed how infants develop sensitivity to foreign-language speech sounds through social interactions with a foreign language tutor—research that was also discussed in Chapter 4 of their textbook (Berk, 2014, p. 141). Corresponding with Chapter 9 (Berk, 2014, p. 306-307), the TED Talk in BB7 gave students the opportunity to learn more about the development of theory of mind (i.e., a set of ideas about mental activities) by observing laboratory footage of a typical paradigm called the false belief task. BB7 allowed students to see the connection between cognitive development and the methods used to study how children make inferences about other people's mental states and feelings.

Student Writing Excerpts

The selected TED Talks offered a diversity of speakers, allowing a wide range of theoretical frameworks to be used to frame the talks. Some questions required students to discuss how a TED Talk presentation was linked to scholarly work (i.e., published research) or reputable media reports. I asked students to synthesize newly acquired information with research findings or real-life situations that they could find at their fingertips using PsycINFO or Google Scholar (see BB1, BB2, BB3, BB6, in Appendix A). Other TED

Talks provided opportunities for students to consider their own and others' responsibilities in relation to societal problems, such as poverty (BB2), child maltreatment (BB6), juvenile delinquency (BB9), and teen pregnancy (BB10). This is illustrated in the following excerpt (1) of a female student who is planning to go to medical school, writing about a video on childhood trauma in relation to brain development (BB6). In her first paragraph, she clearly defines the problem statement that children do encounter adverse childhood experiences (ACE) and are misdiagnosed. In her second paragraph, she reflects upon the responsibilities of professionals (doctors and teachers) to examine children for signs of ACE and provide help that extends beyond the standard treatment of ear infections and colds.

Excerpt (1)

> Children trauma has been overlooked for years. Dr. Nadine Burke Harris addressed the problems of why adverse childhood experiences (ACE), such as sexual, physical, and verbal abuse, physical and emotional neglect, or losing a parent through divorce or imprisonment cause the child to suffer from toxic stress, which can kill brain cells. Since children are still developing and growing they are sensitive to repeat stress attacks resulting in long-term stress. 46% of children in the U.S. have experienced at least one stress attack (Sacks, 2014). We can change this by understanding that people are suffering.
>
> "Early adversity dramatically affects health across a lifetime" (Harris, 2014). Children are suffering and getting misdiagnosed because of the fact that no one is aware of ACE or no one cares enough to take it into effect. If people are more educated on what they can do to help the children through these tough times we can help diminish ACE. Teachers can help students by talking to them and if suspecting any behaviors resulted from home life they should approach someone that can help the child. If a teacher knows something and does not tell anyone then the child is at lose because he/she does not know who to go to so it is the adults that help. Parents can be mindful of what happens around their child. Parents cannot control everything but they can help what they personally expose to their child. Also, parents can help by stepping up and acknowledging the toll their children is taking on and get the child screened. Doctors and policy makers are a vital factor to helping the children. According to Dr. Sara Bode, "we're rethinking the entire idea about how we take care of kids .. we're getting away from the old model of treating only ear infections and colds" (Ellen, 2014). Doctors can start by educating parents, screening children, and making this a more serious and talked about topic since it has such high impact on children long term health. ACE is curable and treatable.

In their weekly writings, I want students to apply a developmental perspective to the online lessons and integrate previous learning materials with the TED Talk by reflecting back on what they had already learned in class (see BB5, BB10, as examples). These weekly writing tasks created a routine for students to engage in self-reflection in relation to their prior and future learning (metacognition), linking their online learning to the face-to-face in-class learning experience. As an example of this integration, consider excerpt (2), written by a student who wants to specialize in early-childhood education. This student describes how television affects young brains (see BB5) by linking this new information to a prior, in-class learning experience. Although educational shows such as "Dora the Explorer" and "Blue's Clues" are marketed for parents with young children, the student critiques theses "early-childhood educational shows" by stating that toddlers learn more from social interaction with their family and friends than from television.

Excerpt (2)

> So far in class we have learned how children, especially babies have a small brain that consumes hundreds of different and new information that runs through their tiny brains. Children are better prepared for the real world when they have interactions with their family and friends rather than learning from a television screen up until the age of 3. Babies learn the way people interact with their mothers by finding out different ways to communicate non-verbally like the "reaching effect" or crying. In-person interactions are a great way to help build a stronger social bond. When a child under the age of 3 or even 2 years old watches television it is not benefiting them due to the fact that they simply do not have a full understanding of the education being taught in shows like, "Dora the Explorer" and "Blue's Clues"— two of the most popular early-childhood educational shows.

In their weekly online discussions students also had the opportunity to apply major theories and developmental themes, such as nature vs. nurture, or continuity vs. discontinuity in developmental processes, that were covered in previous classes and textbook readings to their own life experiences (see BB3, BB9). While students were encouraged to reflect on their own life experiences and share them, they were under no obligation to disclose any information that would make them uncomfortable or could be embarrassing. As an example of this reflection, after watching Sarah-Jayne Blakemore's talk on adolescent brain development (BB9), one female student reflected on her past and applied continuity vs. discontinuity as a developmental perspective to understand the behavior and decisions that she made as a teenager, as illustrated in excerpt (3):

Excerpt (3)

> The prefrontal cortex dominates decision making, social interaction, self-awareness and inhibits a person from making irrational or risky decisions. Studies have shown the prefrontal cortex decreases during adolescence in which the limbic system in the brain is hypersensitive. The limbic system located in the brain results in emotion and rewarding process. Therefore, when a teenager is feeling risqué, their limbic system outputs a signal of sensation of being rebellious, or acting out.
>
> One has to agree with the discontinuity model, which is a person has to go through abrupt changes in his/her lifetime that must be tackled in order to reach the next phase in life. Growing up, I believed I was a well-mannered teenage girl but I did rebel a bit at times, going against my parents' rules. My parents advised me and forbid me to date a boy who was a typical ``bad boy.'' He had tattoos, was a couple years older than me, had no job, was doing graffiti, my friends thought he was so cool, and somehow I was attracted. Telling my parents I was hanging out with friends, I snuck to see my boyfriend every chance I could, and would always be reprimanded for it when they did find out. I found myself pregnant and not knowing what to do, I was so afraid to come clean to my parents. Now, looking back, if I listened to my parents' advice, I wouldn't have become a teenage pregnancy statistic, which I face and try to overcome every day. I know now that those qualities do not suit any woman well and advice coming from elders should always be considered.

As future professionals in mental health counseling, early childhood education, social work, and other fields, I want my students to relate their learning to current societal challenges (e.g., learning, poverty, teen pregnancy) and express their own ideas on how to prevent negative developmental outcomes. In particular, students are asked to discuss solutions to help underserved populations and generate new ideas for change (see BB2, BB6, BB10), as reflected in excerpt (4), where a student, after watching the success story of Thailand's fight against AIDS and unplanned parenthood (BB10), explained reasons for teen pregnancy and the need for more open sex education in the US.

Excerpt (4)

> In order to prevent teen pregnancy we need to promote education. If teens do not know the repercussions of their actions then how can we fault them for making the wrong choices? Sex education today does not give the information that girls need to make the right decisions. Sex is looked at as a bad thing and girls are taught to not engage in it. Instead of teaching what not to do, educators should be teaching what to do. Girls need to be informed about contraception, where to access it, and how to use it. They need to know that sex is okay as long as safety precautions are taken. If sex isn't shamed upon, then girls won't feel the need to hide it. The bottom line is that teenagers are going to have sex regardless if they are told not to, but if we instill in them the right practices, the chances of them having safe sex will increase and as a result, the teen pregnancy rate will decrease.

Students' Perceptions of TED Talks

Although the TED Talk Tasks required additional homework time and Internet access, close to 80% of the enrolled students contributed to the weekly online postings prior to class. Upon completion of the Ten Ted Talk Thinking Tasks, students completed a short survey (see Appendix B). Of the 51 students who responded, 94% indicated that they enjoyed the TED Talks. Almost all of them (N=50, 98%) reported that the talks helped them understand the course material and would recommend TED Talks as an online learning activity; 92% indicated that their weekly participation motivated them to think about their personal experiences, 84% rated it as helpful in improving academic writing, and 74% indicated that it helped them to consider their future professional responsibilities.

Conclusions

Using TED conference presentations to structure online learning activities seemed to help students better prepare for discussions about complex developmental themes in class and develop a critical stance towards their personal and professional development. In assigning the Ten TED Talk Tasks, my goal was to promote students' perspective taking and enhance their ability to evaluate alternative viewpoints while developing their own point of view. The Ten TED Talk Tasks can aid students in developing critical thinking and writing skills by encouraging them to connect the content of the conference talks with their personal lives and professional aspirations. Through self-reflection, students learn to use cognitive strategies, interpret other people's ideas, apply content knowledge, and discuss developmental themes and issues, which in turn allows them to monitor their own higher order thinking (Paul, 1992). Moreover, asking students routinely to reflect upon concepts and ideas in class discussions may foster the development of thinking in a disciplined way through knowledge exchange (Paul & Binker, 1990).

References

American Psychological Association. (2013). APA guidelines for the undergraduate psychology major. Version 2.0. Washington, DC: American Psychological Association. http://www.apa.org/ed/precollege/about/psymajor-guidelines.pdf

Berk, L. E. (2014). *Development through the lifespan*. New York, NY: Pearson.

Berk, R. A. (2009). Multimedia teaching with video clips: TV, movies, YouTube, and mtvU in the college classroom. *International Journal of Technology in Teaching and Learning, 5*(1), 1-21.

Benjamin Jr, L. T. (1991). Personalization and active learning in the large introductory psychology class. *Teaching of Psychology, 18*(2), 68-74. doi:10.1207/s15328023top1802_1.

Bok, D. (2006). Our underachieving colleges: A candid look at how much students learn and why they should be learning more. Princeton, NJ: Princeton University Press.

Cleveland, M. (2011). A practical guide to using YouTube in the classroom. In D. S. Dunn, J. H. Wilson, J. E. Freeman, & J. R. Stowell (Eds.), *Best practices for technology-enhanced teaching and learning: Connecting to psychology and the social sciences* (197-206). New York, NY: Oxford University Press. doi:10.1093/acprof:osobl/9780199733187.003.0013

Donovan, J. (2013). *How to deliver a TED talk: Secrets of the world's most inspiring presentations. New York*, NY: McGraw Hill.

Fleck, B. K., Beckman, L. M., Sterns, J. L., & Hussey, H. D. (2014). YouTube in the classroom: Helpful tips and student perceptions. *Journal of Effective Teaching, 14*(3), 21-37.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education, 7*(2), 95-105. doi:10.1016/j.iheduc.2004.02.001.

George, D. R., & Dellasega, C. (2011). Use of social media in graduate-level medical humanities education: Two pilot studies from Penn State College of Medicine. *Medical Teacher, 33*(8), 429-434. doi:10.3109/0142159X.2011.586749.

Hartlep, K. L., & Forsyth, G. A. (2000). The effect of self-reference on learning and retention. *Teaching of Psychology, 27*(4), 269-271. doi:10.1207/S15328023TOP2704_05.

Hussey, H. D., Fleck, B. K., & Warner, R. M. (2010). Reducing student prejudice in diversity infused core psychology classes. *College Teaching, 58*(3), 85-92. doi:10.1080/87567550903418560.

Masson, M. (2014). Benefits of TED talks. *Canadian Family Physician, 60*(12), 1080-1080.

Mayer, R. E. (2008). Applying the science of learning: evidence-based principles for the design of multimedia instruction. *American Psychologist, 63*(8), 760-769. doi:10.1037/0003-066X.63.8.760.

Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading & Writing Quarterly, 19*(2), 139-158.

Paul, R. W., & Binker, A. J. A. (1990). *Critical thinking: What every person needs to survive in a rapidly changing world*. Rohnert Park, CA: Center for Critical Thinking and Moral Critique.

Paul, R. (1992). Critical thinking: What, why, and how. *New Directions for Community Colleges*, *77*, 3-24. doi:10.1002/cc.36819927703

Roodt, S., & Peier, D. (2013). Using YouTube© in the classroom for the net generation of students. *Issues in Informing Science and Information Technology, 10*, 473-487.

Seabrook, R., Brown, G. D., & Solity, J. E. (2005). Distributed and massed practice: From laboratory to classroom. *Applied Cognitive Psychology, 19*(1), 107-122. doi:10.1002/acp.1066.

Sherer, P., & Shea, T. (2011). Using online video to support student learning and engagement. *College Teaching, 59*(2), 56-59. doi:10.1080/87567555.2010.511313

Sugimoto, C. R., Thelwall, M., Larivière, V., Tsou, A., Mongeon, P., & Macaluso, B. (2013).

Scientists popularizing science: characteristics and impact of TED talk presenters. *PloS one, 8*(4), e62403. doi:10.1371/journal.pone.0062403.

TED. (2016). 2300+ talks to stir your curiosity. Retrieved from https://www.ted.com/talks

Appendix A

Ten TED Talk Thinking Tasks for Developmental from Birth Through Adolescence

Related Course Topic: Theories of Development
BB1: When Does Learning Begin?
http://www.ted.com/talks/annie_murphy_paul_what_we_learn_before_we_re_born

One of the biggest questions in terms of childhood education is when does learning begin. Clearly, if we want to understand early childhood education, few questions are as crucial as this one. Psychologists state that the age range from 0-3 years is the most crucial developmentally. Science writer Annie Murphy Paul presents evidence of even earlier development. Using numerous studies from across the globe dealing with food and even cultural preferences, she shows that some of the most important learning may occur while we are still in the womb.

a) What do fetuses learn in the womb? (1 point)? Provide examples.
b) Refer to a research article or newspaper report, etc. to discuss prenatal learning in view of sensitive and critical period (1 point).

Related Course Topic: Prenatal Development and Infancy
BB2: Poverty and Brain Development
https://degreed.com/videos/poverty-and-brain-development?d=163473

Chaya Kulkarni explains how poverty affects early brain development and what parents can do to mitigate its effect.

a) What is development? Explain your theory and provide specific examples (1 point).
b) How can politicians, parents, teachers, and researchers influence the development of children? Refer to a research article, newspaper report, etc. to discuss your perspective on early brain development (1 point).

Related Course Topic: Infancy & Toddlerhood
BB3: Language and Perceptual Development
https://www.ted.com/talks/patricia_kuhl_the_linguistic_genius_of_babies?language=en

Developmental scientist Patricia Kuhl shares astonishing findings about how babies learn one language over another — by listening to the humans around them and "taking statistics" on the sounds they need to know. Clever lab experiments (and brain scans) show how 6-month-old babies use sophisticated reasoning to understand their world.

a) Explain how children learn to differentiate various sounds (1 point).
b) Discuss what the lab findings mean for raising bilingual children (1 point). Refer to a research article, newspaper report, your life experience, etc. to discuss your perspective on bilingual development.

Related Course Topic: Infancy & Toddlerhood
BB4: What Do Babies Think?
https://www.ted.com/talks/alison_gopnik_what_do_babies_think

Developmental psychologist Alison Gopnik takes us into the fascinating minds of babies and children, and shows us how much we understand before we even realize we do.

a) Please summarize the main points that Gopnik is making about baby's mathematical abilities and their learning capacities (1 point).
b) How do babies learn to think? (1 point)? Refer to a research article, newspaper report, etc. to discuss your perspective on cognitive development.

Related Course Topic: Early Childhood
BB5: How Does TV Affect the Young Brain?
https://www.youtube.com/watch?v=v2SdEpHjrjw

Infants and toddlers are exposed to TV and digital media before they start going to school and spend on average 1-2 hours in front of the TV or screen. How does this exposure affect development?

a) Summarize Christakis' talk and highlight important facts about how media exposure affects brain development (1 point).
b) Discuss what you have learned so far during class about social development in reference to early media exposure (1 point).

Related Course Topic: Early Childhood
BB6: Childhood Trauma and Brain Development
https://www.ted.com/speakers/nadine_burke_harris_1

Pediatrician Nadine Burke Harris noticed a disturbing trend as she treated children in an underserved neighborhood in San Francisco: Many of the kids who came to see her had experienced childhood trauma.

a) According to Dr. Harris it is time to change the standard of pediatric practice across demographics. But how can we effectively treat toxic stress in children? (1 point).
b) Discuss how teachers, psychologists, and policy makers can influence the development of children who experience trauma (1 point). Refer to a research article, newspaper report, your life experience, etc. to discuss your perspective on childhood trauma.

Related Course Topic: Middle to Late Childhood
BB7: How do We Read Each Other's Minds?
https://www.ted.com/talks/rebecca_saxe_how_brains_make_moral_judgments?language=en

Developmental scientist Rebecca Saxe studies how we think about other people's thoughts. She uses fMRI to identify what happens in our brains when we consider the motives, passions, and beliefs of others.

1) Summarize and discuss her findings on children's participation in the false belief task and how children come to understand that others have a mind (1 point).
2) What do brain scans show in children and adults? Discuss differences and similarities (1 point)?

Related Course Topic: Middle to Late Childhood
BB8: When and Why do Children Start to Lie?
https://www.ted.com/talks/kang_lee_can_you_really_tell_if_a_kid_is_lying?language=en

Are children poor liars? Do you think you can easily detect children's lies? Developmental researcher Kang Lee studies what happens physiologically to children when they lie. They do it a lot, starting as young as two years old, and they're actually really good at it.

a) Summarize Lee's talk on why children lie and why it is important to "celebrate" when kids start to lie (1 point).
b) What kind of methods do developmental researchers use to understand cognitive and emotional development (1 point)?

Related Course Topic: Teenagers and Adolescence
BB9: The Growing and Developing Brain of Teenagers
https://www.ted.com/talks/sarah_jayne_blakemore_the_mysterious_workings_of_the_adolescent_brain?language=en

Cognitive neuroscientist Sarah-Jayne Blakemore compares the prefrontal cortex in adolescents to that of adults to show us how typical "teenage" behaviors are linked to the growing and developing brain. Remember being a teenager? Rocked internally with hormones, outwardly with social pressures, you sometimes wondered what was going on in your head. So does Sarah-Jayne Blakemore. And what she and others in her field are finding is that the adolescent brain really is different. New brain imaging research and clever experiments are revealing how the cortex develops – the executive part of the brain that handles things like planning, self-awareness, analysis of consequences and behavioral choices. It turns out that these regions develop more slowly during adolescence, and in fascinating ways that relate to risk-taking, peer pressure and learning.

a) Discuss what is going on in an adolescent's brain and how it differs from an adult's brain (1 point).
b) Relate the empirical findings to your personal experience as an adolescent and discuss your past behavior and decisions relate to our theoretical theme: continuity vs. discontinuity in developmental processes (1point).

Related Course Topic: Teenagers and Adolescence
BB10: How a Bold Plan Impacts Healthy Family Planning
https://www.ted.com/talks/mechai_viravaidya_how_mr_condom_made_thailand_a_better_place/transcript?language=en

Mechai Viravaidya is a widely acclaimed leader in the fields of public health, education, and community development. Since 1974, Mr. Mechai has initiated community-based family planning services, innovative poverty reduction and rural education programs, large-scale rural development and environmental programs, as well as groundbreaking HIV/AIDS prevention activities throughout Southeast Asia.

a) How did Mr. Condom make Thailand a better place for life and love? Summarize his bold ideas and action plan (1 point).
b) The U.S. teen pregnancy rate is substantially higher than in other industrialized nations and racial/ethnic and geographic disparities in teen birth rates persist. Now that you have learned to think like a developmental psychologists what are your ideas on preventing teen pregnancy? (1 point)

Appendix B

Student Feedback for the 10 TED Talk Tasks

1. Did you enjoy participating in the weekly TED Talk Tasks? Please circle:
    a. Enjoyed very much
    b. Enjoyed somewhat
    c. I am not sure
    d. Did not enjoy
    e. Did not enjoy at all

2. Do you feel that the TED Talks helped you understand the course material?
    a. The talks helped me understand the course material better.
    b. The talks helped me understand the course material.
    c. The talks did not help me understand the course material.
    d. The talks did not help me understand the course material at all.
    e. I did not see a connection between the TED Talks and the course material.

3. How helpful was the online writing activity to understand and use APA style?
    a. very helpful
    b. helpful
    c. not sure
    d. not helpful
    e. not helpful at all

4. Do you feel that the TED Talks helped you understand concepts in human development?
    a. The talks helped me understand human development better.
    b. The talks helped me understand human development.
    c. The talks did not help me understand human development.
    d. The talks did not help me at all understand human development.
    e. I did not see a connection between the TED Talks and human development.

5. Do you feel that the TED Talks helped you think about your own personal experiences?
    a. The talks helped me to think more about my personal experiences.
    b. The talks helped me to think about my personal experiences.
    c. The talks did not help me to think about my personal experiences.
    d. The talks did not help me at all to think about my personal experiences.
    e. I did not see a connection between the TED Talks and my own personal experiences.

6. Do you feel that the Talks helped you think about your future professional responsibilities?
    a. The talks helped me to think more about my future professional responsibilities.
    b. The talks helped me to think about my future professional responsibilities.
    d. The talks did not help me to think about my future professional responsibilities.
    e. The talks did not help me at all to think about my future professional responsibilities.
    e. I did not see a connection between the talks and future professional responsibilities.

7. Do you think the weekly writing tasks on Blackboard improved your academic writing?
    a. Engaging in weekly writing has very much improved my academic writing.
    b. Engaging in weekly writing improved my academic writing.
    c. I am not sure if the weekly writing improved my academic writing.
    d. Engaging in weekly writing did not improve my academic writing.
    e. Engaging in weekly writing did not at all improve my academic writing.

8. Would you recommend the TED Talks to your peers as a learning tool?
    a. yes
    b. I am not sure
    c. no

Chapter 17: Internationalizing Your Teaching: Bringing the World to Your Classroom

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Abstract

The discipline of psychology has much to offer the global community. The growing body of psychological research that addresses international issues has highlighted this. Yet, the global perspective embraced by many psychologists has not been fully integrated into the instruction of our students. The purpose of this chapter is to address this void by providing psychology instructors with ways to internationalize their courses. Suggestions and examples are provided on how this can be done without having to alter the structure of a course. By using the APA's guidelines for undergraduate majors, we offer means by which instructors can internationalize the content of lessons, incorporate research methodologies that are sensitive to differences across cultures, and foster students' self-awareness regarding their place in the global community. A movement toward internationalizing instruction will enhance student appreciation for psychology and prepare them for entering an increasingly interconnected world.

Introduction

How do people become terrorists? How can we change people's decision-making in ways that curb harm to the environment? What factors fuel and mitigate ethnic conflict? How can we facilitate the assimilation of resettled refugees? This is just a short list of the many headline-generating international issues in which psychological science has something to say. Of course, we also have a great deal to offer regarding less newsworthy, but equally important, issues of global interest and with global repercussions. Psychological researchers have, for example, compiled evidence on the diagnosis and treatment of psychological disorders, best practices for teaching and learning across educational levels, and the way individuals respond to authority figures, just to name a few.

This growing body of work is, increasingly, leading psychologists to recognize the importance of an international approach to the undergraduate psychology curriculum (Gross, Abrams, & Zerbe Enns, 2016; Leong, Pickren, Leach, & Marsella, 2012). Indeed, in a recent book, Jacquelyn Cranney and Dana Dunn suggested that psychological literacy with a global citizenship focus is perhaps the "most important outcome of undergraduate education in the discipline" of psychology (p. 5, 2011).

Based on the clear importance of an international approach to psychology as well as the increasingly global nature of so many careers, we believe that it is essential to teach students from an explicitly international perspective. Too often, however, this doesn't happen. Particularly in North America, instructors often fail to integrate international and multicultural topics in their courses, and programs and departments fail to encourage their inclusion (Fuentes & Shannon, 2016; Takooshian, Gielen, Plous, Rich, & Velayo, 2016).

Among the most important reasons that topics related to global diversity are underrepresented in our classrooms are the constraints we all face. In particular, we all face daunting time constraints, with a

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broad canon of content and a range of important skills that we feel we must teach. In this chapter, we make the case that instructors can internationalize their courses while not adding to what they cover. This feat is achieved by tying international research and concepts directly to the American Psychological Association's (APA's) guidelines for the undergraduate major 2.0 (APA, 2016). Many departments have adopted or adapted these guidelines as learning outcomes for their programs, and many instructors have done the same in their individual courses. An instructor can substitute what she typically teaches to address the guidelines with something similar, but international.

In this chapter, we also offer specific suggestions for internationalizing courses via alterations in how instructors teach three of the five guidelines. Although all five of them can be addressed in ways that offer an international perspective, the first three particularly lend themselves to an international adaptation. For the first guideline, the knowledge base of psychology, instructors can include international content, such as research that addresses the same concepts that they typically teach. We will suggest several ways in which instructors can make international "knowledge" a regular part of their courses.

For the second guideline, scientific inquiry and critical thinking, instructors can address research techniques, such as participatory action research, that are grounded in a global perspective. We will provide specific examples of ways in which a global research focus can become a seamless part of courses. Critical thinking, of course, can be addressed through just about any topic related to psychological science! And we'll suggest a few ways to promote critical thinking in the international psychological arena. The third guideline, ethical and social responsibility in a diverse world, has an international perspective baked in. If an instructor is adequately addressing this guideline, an international perspective is assumed. We will offer several suggestions to address the outcomes and indicators for this guideline.

These suggestions will be discussed in three sections: how to explicitly make lessons in your courses more international in terms of content; how to incorporate methodologies that are more sensitive to differences across cultures; and how to foster student reflection about ethics, our diverse global society, and their own international identities in your lessons.

International Content

International ideas and research can contribute to lessons that address the first guideline, knowledge base of psychology. Here are some straightforward ways that you can up the international content in your courses without overhauling your course. All of them involve making it explicit to students that international psychology is a recurring theme for a course.

International examples.

First, instructors can focus on the international examples that almost certainly are in the textbook or other reading materials. Look both for examples that are clearly international in nature (e.g., research studies that highlight differences or similarities across countries) and those that are less directly international (e.g., research conducted by an international research team, even if not on an international topic). Make a note of these examples as you prepare your lessons, and try to highlight at least one of each in every chapter.

Many instructors already use current events as part of their classroom lessons. Psychology is so central to our lives that it is almost impossible to open a news source and not find a relevant article. It is just an additional step to find current events with both a psychology and an international bent. Instructors can

focus news searches on international or cross-cultural sources to increase diversity. For example, they might turn to the "world" or "international" sections of newspapers such as the *New York Times* or the *Washington Post*. They can visit Today's Front Pages at the Newseum website to find links to newspapers all over the world (http://www.newseum.org/todaysfrontpages/). Many are in English, so students can click through and see how the same psychology-related event is covered across countries. Or they might discover parts of the world in which the media failed to cover the event in question at all. Instructors or their students can also peruse the list of news sources at Nations Online (http://www.nationsonline.org/oneworld/news.html) to get a sense of what is "news" around the world.

It also is important to remember that many events that occur in our own countries are international ones. We live and teach in the United States, and many U.S. events and issues have international repercussions. We think it is helpful to be explicit about this. One of us teaches a course in international psychology and includes U.S. topics in that course. On multiple occasions, students have asked why a particular topic "counts" as international psychology given that it is U.S.-based. At moments like this, we remind students that the U.S. is also a country in the world. In courses in which students might not, on their own, see U.S. topics as international ones, we encourage instructors to make this connection for them.

Finally, it is important for instructors to update examples in ways that reflect our global world, even in seemingly small ways. If instructors use names in examples – say, in exam questions – they can diversify these names by looking for suggestions on the Wikipedia list of popular given names from around the world: https://en.wikipedia.org/wiki/List_of_most_popular_given_names. Instructors might then choose Marwa or João instead of Mary or John. There's also a link to the list of Wikipedia's most popular surnames, so instructors can refer, for example, to Dr. Satō instead of Dr. Smith.

Instructors can also think internationally when choosing images for PowerPoint presentations. If a generic photo is called for, conduct a Google Image search using any name selected from the Wikipedia list. We looked up Marwa, and filtered our search for photos labeled for reuse. We found several candid photos of women named Marwa in a large format ideal for blowing up for projection. If Marwa hadn't led to any useful images, we would just try another name. Similarly, if you need an image of something, you can use Google Translate to get the word in another language and then search for the image using that word. For example, if you need an image of a classroom, translate "classroom" to the Malay word and search for "kelas" instead of "classroom." Your search will lead to classroom images from Malaysia. The goal is to use diverse names and photos – not only to represent international situations, but also to help students remember that when we talk about any aspect of psychological science, the goal, at least, is to talk about all of us around the world.

International resources. Instructors also can take advantage of existing resources. Here we will describe just four of the many that are available – one each from the United Nations, the American Psychological Association, the Society for the Teaching of Psychology, and the International Teaching of Psychology Network.

The United Nations produces a monthly video newsmagazine that includes three stories, each approximately 10 minutes in length. The highly professional and engaging pieces focus on stories from around the world and cover "a wide range of themes, including human rights, environment, women's

issues, science and culture, and more" (United Nations, 2016a). In our estimation, at least half involve problems or solutions that relate to the social sciences, including psychological science. Recent topics have included coping with the aftermath of a natural disaster, the particular stressors and traumas faced by refugees and migrants, the dying language of an indigenous culture, diplomatic approaches to peace-making, behavioral change efforts related to HIV prevention, and even a virtual reality program aimed at engendering empathy for global victims such as refugees or those living in a community struck by Ebola. To get a sense of the newsmagazine, instructors can view a brief trailer here (United Nations, 2016b; http://www.unmultimedia.org/tv/21stcentury/detail/5180566576001.html) and can see the most recent editions and search the archives here (United Nations, 2016a; http://www.unmultimedia.org/tv/21stcentury/). We suggest scanning through the list at the beginning of each semester to see if there are any videos relevant to your courses that you could integrate into your existing lessons or that you could develop a new lesson around.

The American Psychological Association's Office of International Affairs (OIA) hosts a range of resources on the website: http://www.apa.org/international/. Click the link for "Directories of International Organizations" and explore the websites of APA's counterparts around the world – an easy way to get an idea of how psychologists' priorities vary by country. Click the link for "Psychology International" to subscribe to a quarterly newsletter that keeps psychologists abreast of international psychology and the OIA's initiatives. Click "Internationalizing Psychology" and then "International Educational Resources" where instructors will find a wealth of valuable materials and sources.

The Society for the Teaching of Psychology (STP) has increasingly prioritized the internationalization of courses and curricula, and STP's Office for Teaching Resources in Psychology has an expanding list of international resources. Go to http://teachpsych.org/ and click "teaching resources" under the resources tab. Scroll down to the "International Psychology" section.

Finally, the International Teaching of Psychology Network (http://interteachpsy.org/) has a "Resources" link with an extensive list of resources for instructors and students. The resources include journals, listservs, teaching tips, and course-specific materials. Note that not all are related to international psychology. Many are simply aimed at providing support for teachers of psychology around the world. However, we think it is worth exploring.

Instructors interested in internationalizing their courses should become familiar with some or all of these resources, and others like them that they will encounter as they delve into these websites and sources. Developing a mindset of noticing new international examples and new ways to internationalize lessons in terms of psychological knowledge and content will start to become an automatic impulse.

International Methodologies.

When teaching research methodologies, instructors can emphasize the way certain approaches are more sensitive to and inclusive of social and cultural factors than are others. The emphasis in psychology on teaching the methods of laboratory experimentation can inadvertently guide students toward formulating research questions that fit this methodology. Questions pertaining to international concerns, such as those posed at the start of this chapter, often require data gathering by means other than conducting experiments in a laboratory. Because of this, instructors can introduce students to the value of alternative approaches, including quasi-experimental designs, qualitative inquiry, and action research.

Students of psychology are, in most programs, introduced to quasi-experimental methods and qualitative inquiry (e.g. Cook & Campbell, 1979). As part of this introduction, instructors can emphasize how these approaches require researchers to be aware of social and cultural influences. For instance, knowing about social context is essential to quasi-experimental design because researchers must attend to environmental factors that pose threats to validity. Similarly, the methods involved in qualitative inquiry, such as interviewing, require familiarity with local terminology and the subtleties of language in a particular region. Both methodologies are conducive to gathering data sensitive to social and cultural factors. Instructors can guide students in seeing the value of these approaches by asking students to generate questions relevant to international issues. A discussion can then ensue on how different methodologies are or are not sensitive to cultural factors.

Instructors can also introduce students to action research, a broad approach to inquiry that includes participatory action research (Borda, 2001), action science (Argyris, Putnam & Smith, 1985), action inquiry (Torbert, 1991), and co-operative inquiry (Heron & Reason, 2001). Although not typically taught to psychology students today, the broad action research approach has played an influential role in the history of the discipline (e.g., Lewin, 1973). Action researchers reframe the way the traditional inquiry process is conceptualized. Their approach is to collaborate with practitioners to effect social change and identify practical solutions for individuals and their communities; additionally, this work contributes to scholarly understanding (Reason & Bradbury, 2001). As such, the action research approach is especially conducive to taking on problems of international concern. In contrast to traditional researchers who focus on controlling and identifying single, fixed variables, action researchers consider the inquiry process to be open, dynamic, and reflexive.

Torbert (2001) points out three core perspectives from which action research emerges. Labeling them first-, second-, and third-person perspectives, these refer to, respectively, a focus on the researcher, a focus on the relationship between researchers and community practitioners, and a focus on the link between researchers and the international learning community. The following provides a summary and resources in support of understanding the three perspectives and how they have been applied to international research.

A first-person action research report focuses on the perspective of the researcher in the inquiry process. Instructors can emphasize to students that a first-person action research account is predicated on applying academic rigor to one's own experience. Susan Kidd and colleagues (2014) provide an example of this approach in their documentation of the first author's experience working in a mental health treatment center in rural Australia. Kidd notes that her reflective process began by considering the research on her patient population, people with low prevalence psychological disorders. Outcome data on this group show them to have poor health and shorter life expectancies even after receiving treatment. Kidd sought to examine the possibility that the prevailing biomedical model for understanding mental illness – the model incorporated in her center – could, in fact, be contributing to these poor outcomes. In order to reflect on how assumptions associated with the biomedical model shape patient care, Kidd assembled a group of patients and clinicians who met regularly over the course of a year to discuss their different perspectives on giving and receiving treatment. Kidd took the discussions as an opportunity to reflect on her own assumptions and actions, keeping a journal of her experiences, observations and behaviors during this time. Her perspective as a psychiatric nurse and an 'insider' to the treatment center, came to be shaped by listening to the perspectives of patients considered 'outsiders' in terms of the treatment center's distribution of power. Specifically, Kidd came

to see that there was an unquestioned way of treating patients in the center that excluded the subjective, lived experience of these people. Kidd concluded that this discounting of personal experience hindered the overall treatment process, an insight the author then used to modify her own treatment practices so validation of patient experience could be included.

The reflexive process documented by Kidd and colleagues (2014) shows how unexamined assumptions among those in power can lead to behaviors that reinforce the very problems for which solutions are being sought. As psychology instructors present students with this account, they can highlight the way Kidd's process of self-reflection serves as a model for this type of inquiry. Seeking out and engaging the perspectives of those holding different positions within a system allows one to self-reflect on her or his place in that system. Journaling is another means for stepping out of our common way of seeing the world to examine our thoughts and actions. Both practices can be invaluable when applying psychological principles to the experiences of others around the world. Engaging in dialogue with those from other countries or who maintain beliefs different from our own can help us appreciate the lived experiences of others while also facilitating a deeper understanding of ourselves.

A second-person report focuses on the relationship between researchers and community practitioners. Here, instructors can show students how this type of account focuses on the learning that surfaces out of the collaborative process itself and how changes in the researcher-practitioner relationship can affect the unfolding process of inquiry. An example comes in Duncan and Ridley-Duff's (2014) work with Pakistani women living in Sheffield, UK. The researchers set out to better understand the social forces in this community that shaped the identities of these women and contributed to their experience of disempowerment. In addition to obtaining an understanding of the Pakistani women, most of whom were in Sheffield as a result of arranged marriages, the researchers were also committed to engaging in a process of inquiry that would be of service to the women. The researchers, two white, English-speaking men, enlisted six local Urdu-speaking, Pakistani women to join the project and work as research assistants. The research assistants led group discussions and conducted interviews with the Pakistani women, welcoming stories that captured their experiences. The authors document the core learning that occurred for them over the course of the research that led to a shift in their inquiry process. That is, they began the project by asking the research assistants to emphasize the 'positive' in the stories from the Pakistani women. Yet, they discovered that their attempt to shape the stories or guide the women toward 'positive' interpretations wound up being another means of wielding power that was counterproductive for the women. Therefore, they shifted to a methodology that more accurately validated the experiences of these women and captured the natural way that their stories emerged. This created a safe and confidential environment for the women, enabling novel stories to come forth. Ultimately, there was a shift in the perspective for the women with new realms of possibility for the lives being considered.

In using the work of Duncan and Ridley-Duff (2014) for teaching purposes, psychology instructors can highlight the learning that occurred for both the researchers and the Pakistani women. By attending to their own expectations, the researchers were able to adjust their data collection process so that it more accurately captured the experiences of the women. By responding to the safe environment provided by the researchers, the women in this project were able to speak about their lives authentically, ultimately contributing to the overall validity of the research. For students, this example of second-person action research demonstrates the value that can emerge when attending to the relating that occurs during the process of collaboration. Focusing on one's own responses in relation to the responses of others

provides opportunities for learning that go beyond that which emerges when self-exploration and real-time adjustments are not part of the inquiry process. This lesson can be applied to issues with international relevance. For instance, instructors can guide students in considering the real-time relating that occurs when researchers from a wealthy region of the world travel to a poor region to learn about and provide assistance to those in need. Do such efforts include learning from and adjusting to the desires of those in need or are they dictated solely by the predetermined values and assumptions held by the researchers? By presenting this type of thinking to a class, students can explore new ways of relating to themselves and others.

A third-person action research project is conducted so the work can extend beyond researchers and practitioners to reach those not immediately engaged in the project. According to Reason and Bradbury (2001), the intent here is to "create a wider community of inquiry involving persons who, because they cannot be known to each other face-to-face…have an impersonal quality" (p. xxvi). A third-person project may, for instance, involve researchers partnering with community leaders so that the leaders' learning can be shared and can empower the community's members. One way a third-person perspective is achieved is when a process of inquiry and its outcomes are written about and disseminated. A published action research account is different from that produced by traditional research in that the former involves rigorous attention to first- and second-person dynamics that occurred during the inquiry process.

An example of third-person action research can be found in the efforts of Espinoza and colleagues (2016) following the earthquake and tsunami that struck Chile in 2010. Following the disaster, an interdisciplinary team of researchers strove to provide therapeutic healing to older adults in a rural Chilean community. The researchers partnered with local leaders of senior organizations as a means of reaching the community members. This partnership facilitated specific learning for the researchers regarding the community's history and folk traditions. The researchers came to see that re-establishing community practices and traditions that existed prior to the disaster was necessary for the recovery of the older adults. Thus, traditional music and story-telling were integrated with art therapy and made part of the practices that were brought to the community. These practices helped earn the trust of the community's members and facilitated healing. In documenting the learning process and success of their outcomes, the researchers note that their account is offered so comparable methodologies can be applied to other settings in which disaster strikes.

Instructors using the account of Espinoza and colleagues (2016) can point to two qualities of this work that represent the third-person approach: first, the research team partnered with community leaders as a means for reaching a broader community of individuals; second, the publication of this project was intended to present learning processes and outcomes that others could adopt in comparable situations. Instructors can highlight for students the way first- and second-person practices were part of producing this third-person account. As this is understood, students can engage all three perspectives in addressing an issue of international relevance. For instance, there are regions around the world in which women and girls are legally afforded equal opportunities for education but that, in practice, this does not happen because such laws go against historical gender norms in a region. As a member of a research team seeking to learn about and affect change in this community, how would one go about doing this work? What practices could be put in place to ensure that researchers are self-reflecting on their own assumptions and expectations? How might the researchers initiate a partnership with community leaders that would facilitate the inquiry process? Considering all members of this community, what

goals or outcome measures would serve as markers of the project's success? Questions structured around the three perspectives can provide students with a means for thinking about these issues so the true complexity of such work can be acknowledged and addressed.

Action research is conducive to international research because, fundamentally, this methodology embraces and focuses on the variables that characterize the differences between groups and cultures. Instructors can use the examples noted above to initiate discussions on how researchers can address differences when crossing national boundaries. Examples of the three perspectives can also highlight the importance of the identity of a research team in relation to those being studied and served. Alderfer and Tucker (1996) addressed this directly by showing how a research team of mixed-race and gender was intentionally composed to assess issues of race relations in an organization. Results from this effort showed that the race and gender of the researchers interacted with that of the organization's members such that each researcher obtained different information. Thus, students can think about the factors researchers must consider when working internationally. For instance, instructors can ask students how a research team composed of, for instance, North Americans could increase their chances of obtaining valid data when engaged in inquiry with a community of laborers in regions such as rural Honduras or Rwanda. Even if this research team were to gather data in their home country, students can consider the importance of the team matching a target population with respect to race, class, gender, and knowledge of regional customs.

Additional means for showing the value of action research can come from posing questions to students that encourage consideration of each of the three perspectives noted above. It may be helpful to have students consider a familiar experience before moving on to one with international relevance. For instance, many students have been in a situation where they have had to approach a school administrator or faculty member to remedy a problem or make a personal request. A first-person perspective can be held as students reflect on what their individual experiences were like in terms of thoughts, feelings and actions before, during and after speaking with this person. Prior to and during the interaction, what assumptions were held that can now be reflected upon? A second-person perspective can then be introduced. Assuming the students were speaking with an administrator, they can reflect on what happened during the interaction. Were there behaviors from the student that may have contributed to the reactions from the administrator? Were any of the assumptions held by the student and administrator discussed during the interaction or was each simply speaking from his or her respective position? Finally, a third-person perspective allows for a statement about the outcome of the dynamic. What can be said about the overall system in which this interaction occurred? Did insight come from the exchange that would be of value to others? After having held first- and second-person perspectives, students can then reflect on any insights and consider how they may approach future interactions differently. After applying this exercise to a familiar experience, instructors can then challenge students to do the same for an issue with international relevance. For instance, students can entertain first-, second-, and third-person approaches to reducing tensions in a region with conflicted political factions. Students can also consider what it would be like to be an action researcher collaborating with community leaders in providing support to refugees or, in another setting, working to provide health and sex education to a region where sexually-transmitted disease is a community-wide problem.

Internationally Related Reflection. A first step in getting students to think about psychology and their lives from an international perspective is to make them consciously aware of their place in a global society. Early in our courses, we ask students to discuss their international experiences. We often have students in our courses who are from other countries or have had extensive travel backgrounds, but just as many declare they have none. About every student we encounter does indeed have international experience. To elicit these, we ask them: Did you have a grandparent or other relative from another country? Have you had a close friend from another country? Have you lived in or visited an international neighborhood in your own country – a "Little India" or a Chinatown, for example? We also remind students that their experiences, even if they are part of the majority culture in their country, are informed by their country and culture.

For American students, we often ask them to read foreign policy reporter Joshua Keating's creative, and often hilarious, "If It Happened There" series in the online magazine *Slate* (http://www.slate.com/topics/i/if_it_happened_there.html). Keating reports on U.S. events for U.S. audiences, but in the manner in which American reporters often describe similar events in other countries – in a way that makes them seem exotic and "other." In a passage on the Super Bowl, the annual American football championship, Keating (2014) explains:

> "The ethics of such an event can be hard for outsiders to understand. Fans, who regularly watch players being carted off the field with crippling injuries, are unbothered by reports of the game's lasting medical impact on its players. Nevertheless, fans and the national media can become extremely indignant if players are excessively boastful at the game's conclusion."

We encourage students to keep their international experiences and perspectives, and an international framework based on them, in mind as they explore international psychology.

We also remind them of their privilege as university students. We show them the miniature earth infographic that shows them what the world's demographic breakdown would look like if there were just 100 people (http://www.miniature-earth.com/). For example, just 7 of those 100 people would have a university degree. Eighty would live on less than $10 a day. It only takes a few minutes to use this tool in a lesson on why we should be careful about generalizing psychology research, much of which is conducted with participants who are university students. Even a graphic or map of the world itself can serve as an exemplar of how many view the world; mapmakers often place the home country at the center of the global image.

Should instructors want to develop a more detailed lesson on this topic, we recommend Joseph Henrich, Steven Heine, and Ara Norenzayan's (2010) article on the problems with generalizing research conducted on Western, Educated, Industrialized, Rich, and Democratic (WEIRD) people. (For a quicker read for students, instructors can have them read Slate online magazine's version for the lay reader: http://www.slate.com/articles/health_and_science/science/2013/05/weird_psychology_social_science_researchers_rely_too_much_on_western_college.html; Brookshire, 2013). In our experience, these resources often lead to thoughtful reflection and discussion among students.

Reflection is also served when instructors focus lessons around students' personal identities and one's lived experience. Instructors can help students consider the group memberships that shape one's own identity. For example, you might begin by having students write down the groups they belong to by virtue of birth, including race, ethnicity, gender, family background, and age-related cohort. These group

memberships can be differentiated from those that are taken voluntarily or through interaction with others. For these, students can list their memberships in social groups, schools, and organizations. After the two lists are composed, small group discussions can ensue in which students consider which group memberships are distinct from others, which interact, and how they influence one another.

The generation of lists pertaining to identity can be followed by a consideration of environmental factors that make certain aspects of identity more or less salient. For instance, students who grow up in English-speaking families within predominantly English-speaking cultures may not be aware of this aspect of identity. Yet, if instructors ask to hear from those who have traveled to settings in which English was not the dominant language, students will share experiences of how this component of identity became highly salient. By tapping into personal experience a discussion can address shared group identities. Rather than focusing exclusively on the practicality of having, for instance, a language in common with the majority, instructors can emphasize how such identities define our ways of relating with and to others.

The exercise of listing group memberships can also enhance students' appreciation for the influence of social status around the world. For instance, a person with high social status in one culture may, in fact, have a lived experience more similar to those of comparable social standing in a different culture than they do with those in the same culture who have low social status. Returning to their identity lists, students can entertain how issues such as gender and race are interconnected with social standing. There are various exercises that can be found online that offer in-class exercises highlighting this point. For instance, "The Privilege Walk" has students respond to particular questions (e.g., "If you grew up in an urban setting take one step backward") by taking steps toward the front or back of a classroom (http://www.albany.edu/ssw/efc/pdf/Module%205_1_Privilege%20Walk%20Activity.pdf). Ultimately, one's standing with respect to the privileges and obstacles encountered in life are displayed according to one's location in the room. This and similar activities should be done after instructors are confident that a trusting environment has been established. The strength of these exercises – they can evoke intense personal reactions regarding social standing – can also leave students feeling vulnerable and exposed to unwanted emotions.

In total, reflecting on group memberships highlights the complex nature of our own and others' lived experiences. As students discuss the many interacting forces that shape identity, instructors can help them appreciate that others around the world have just as much richness and complexity to their own lives as we do in ours. As outsiders, we may be quick to acknowledge that we do not know how different components of identity emerge for those living in different cultures. Yet, as students reflect on the complex nature of their own experience, it can help them appreciate that there is just as much complexity to the lives of others. Perspective-taking is not just an exercise in which we put ourselves in the shoes of others; it requires an appreciation for the way others think about and experience factors that shape their lives (Kegan & Laskow-Lahey, 2001).

We also find it beneficial to lead students in a critical reflection of their own learning processes. This helps students differentiate what they know from how they know it. Do students know where their beliefs and assumptions of others around the world came from? This type of reflection allows instructors to discuss how information makes its way into our beliefs without conscious awareness. This can lead to a discussion on the credibility of the sources from which students obtain information, such as newspapers, Internet sites, social media, friends, and family. By empowering students to simply

reflect upon their own learning processes, they move toward reconsidering the accuracy and validity of what they assume to be true. Instructors can emphasize the importance of this process by noting that this type of reflection is not intended to discredit sources and credit others, but to consider this type of critical thinking as an ongoing exercise.

Finally, instructors can turn to foundational research in psychology to foster critical thinking on students' perceptions of others around the world. For instance, we know from psychological research that social forces powerfully shape attitudes, perceptions, and behavior (e.g., Haney, Banks & Zimbardo, 1973). Yet, psychological researchers have also shown us that people are biased toward making personal attributions of others when attempting to understand their actions (Weiner, 1986). Social perceptions are also biased in that we tend to see great diversity within our own groups, but assume there is homogeneity among those in other groups (Judd, Ryan, & Park, 1991; Park & Judd, 1990). To highlight these biases, instructors can lead a discussion on how students describe a "typical person" living in another region of the world. This can be followed by a description of a "typical person" living in his or her own region of the world. In many instances, the former description will emerge from simplistic stereotypes while the latter can lead to speculation on whether or not there is a "typical person." Thus, students can see the need to put intentional effort into neutralizing information-processing biases and balance initial assessments with understandings that include social context and counter-stereotypical examples.

Conclusion

In summary, there is a clear need for the expansion of international coverage in undergraduate psychology courses as a matter of practicality in an increasingly global world and as a means to fulfilling some of the APA's guidelines for the undergraduate major (APA, 2016). Instructors can, perhaps, most easily manage the inclusion of international material by using it to achieve the learning outcomes built on the guidelines. The three guidelines that offer the most direct opportunities for an international focus are the ones on the knowledge base of psychology, scientific inquiry and critical thinking, and ethical and social responsibility in a diverse world.

In this chapter, we organized suggestions into three categories: making lesson content more international, expanding the repertoire of research methodology lessons to include ones that address cultural and global differences, and incorporating lessons that allow students to reflect about ethics and their own international identities. We encourage instructors to select an idea from each of these categories and add to the international coverage in their classes, whether you currently do a lot or a little in this area. If an instructor currently has very little global coverage, adding some international lessons will likely lead to more and more. If an instructor already makes international issues a major focus, we hope that this chapter will offer some new ideas.

Regardless of what instructors currently cover, continuing to internationalize our courses is key to developing a mindset in our students that will help them engage in the world in a thoughtful and critical way. Indeed, with or without our instruction, our students are going to face an interconnected global future. As a recent American Psychologist article concluded, "psychology undergraduates must develop global psychological literacy—to think in broad international terms, communicate across cultural borders, integrate multiple identities in themselves, and support others in their efforts to achieve goals that are in part culturally shaped" (Takooshian et al., 2016, p. 145). We owe it to our students to help them develop these skills.

References

Alderfer, C. P., & Tucker, R. C. (1996). A field experiment for studying race relation in organizations. *Journal of Organizational Behavior, 17*(1), 43-57. Retrieved from http://www.jstor.org/stable/2488534

Argyris, C., Putnam, R., & Smith, D. M. (1985). *Action science: concepts, methods, and skills for research and intervention*. San Francisco, CA: Jossey Bass.

American Psychological Association. (2016). Guidelines for the undergraduate psychology major: Version 2.0. *American Psychologist, 71*, 102-111. doi:10.1037/a0037562

American Psychological Association (2016). Office of International Affairs. Retrieved from http://www.apa.org/international/

Borda, O. F. (2001). Participatory (action) research in social theory: origins and challenges. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (pp. 27-37). London: Sage.

Brookshire, B. (2013). Psychology is WEIRD. *Slate*. Retrieved from http://www.slate.com/articles/health_and_science/science/2013/05/weird_psychology_social_science_researchers_rely_too_much_on_western_college.html

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: design & analysis issues for field settings*. Boston, M.A.: Houghton Mifflin.

Cranney, J., & Dunn, D. (2011). *The psychologically literate citizen: Foundations and global perspectives.* New York, NY: Oxford University Press.

Duncan, G., & Ridley-Duff, R. (2014). Appreciate inquiry as a method of transforming identity and power in Pakistani women. *Action Research, 12*(2), 117-135. doi:10.1177/1476750314524005

Espinoza, A. E., Osorio-Parraguez, P., & Reyes, P. (2016). Interdisciplinary-action-research: Post-earthquake interventions with older people in Chile. *Action Research, 14*(3), 276-294. doi:10.1177/1476750315607608

Fuentes, M. A., & Shannon, C. R. (2016). The state of multiculturalism and diversity in undergraduate psychology training. *Teaching of Psychology, 43*, 197-203. doi:10.1177/0098628316649315

Gross, D., Abrams, K., & Zerbe Enns, C. (2016). *Internationalizing the undergraduate psychology curriculum: Practical lessons learned at home and abroad*. Washington, DC: American Psychological Association.

Haney, C., Banks, W. C., & Zimbardo, P. G. (1973). A study of prisoners and guards in a simulated prison. *Naval Research Reviews*, 9, 1-17. Retrieved from http://www.zimbardo.com/downloads/1973%20A%20Study%20of%20Prisoners%20and%20Guards,%20Naval%20Research%20Reviews.pdf

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? Behavioral and *Brain Sciences, 33,* 61-83. doi:10.1017/S0140525X0999152X

Heron, J., & Reason, P. (2001). The practice of co-operative inquiry: research 'with' rather than 'on' people. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (pp. 179-188). London: Sage.

Judd, C. M., Ryan, C. S. & Park, B. (1991). Accuracy in the judgment of in-group and out-group variability. *Journal of Personality and Social Psychology, 61*, 366–379. doi:10.1037/0022-3514.61.3.366

International Teaching of Psychology Network (2017). International Teaching of Psychology Network. Retrieved from http://interteachpsy.org/

Keating, J. (2016). If it happened there. *Slate*. Retrieved from http://www.slate.com/topics/i/if_it_happened_there.html

Keating, J. (2014, January 30). If it happened there: In brutal contest of strength and strategy, a culture Is revealed. *Slate*. Retrieved from http://www.slate.com/blogs/the_world_/2014/01/30/if_it_happened_there_how_would_we_cover_the_super_bowl_if_it_were_in_another.html

Kegan, R. & Laskow-Lahey, L. (2001). *How the way we talk can change the way we work: seven languages for transformation*. San Francisco, CA: Jossey-Bass.

Kidd, S., Kenny, A., & McKinstry, C. (2014). From experience to action in recovery-oriented mental health practice: A first person inquiry. *Action Research, 12*(4) 357-373. doi:10.1177/1476750314534997

Leong, F. T., Pickren, W. E., Leach, M. M., & Marsella, A. J. (Eds.). (2012). Internationalizing the psychology curriculum in the United States. New York, NY: Springer.

Lewin, K. (1973). Action research and minority problems. In G. Lewin's (Ed.), *Resolving social conflicts: selected papers on group dynamics* (pp. 201-216). London: Souvenir Press.

Lucca, A. (n.d.) *The Miniature Earth*. Retrieved from http://www.miniature-earth.com/

Nations Online (2016). *News from around the world*. Retrieved from http://www.nationsonline.org/oneworld/news.html

Newseum (2016). *Today's front pages*. Retrieved from http://www.newseum.org/todaysfrontpages/

Park, B. & Judd, C. M. (1990). Measures and models of perceived group variability. *Journal of Personality and Social Psychology, 59*, 173–181. doi:10.1037/0022-3514.59.2.173

Reason, P., & Bradbury, H. (Eds.) (2001). *Handbook of action research; Participative inquiry and practice.* London: Sage.

Society for the Teaching of Psychology (2016). *Society for the Teaching of Psychology*. Retrieved from http://teachpsych.org/

Takooshian, H., Gielen, U. P., Plous, S., Rich, G. J., & Velayo, R. S. (2016). Internationalizing undergraduate psychology education: Trends, techniques, and technologies. *American Psychologist*, 71, 136-147. doi:10.1037/a0039977

The Privilege Walk (2017). Retrieved from http://www.albany.edu/ssw/efc/pdf/Module%205_1_Privilege%20Walk%20Activity.pdf

Torbert, W. R. (2001). The practice of action inquiry. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (pp. 250-260). London: Sage.

Torbert, W. R. (1991). *The power of balance: transforming self, society, and scientific inquiry*. Newbury Park, CA: Sage Publications.

United Nations (2016a). *21st Century*. Retrieved from http://www.unmultimedia.org/tv/21stcentury/

United Nations (2016b, October 21). 21st Century. Retrieved from http://www.unmultimedia.org/tv/21stcentury/detail/5180566576001.html

Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York, NY: Springer-Verlag.

Wikipedia. (2016, November 22). *List of most popular given names*. Retrieved from https://en.wikipedia.org/wiki/List_of_most_popular_given_names

Chapter 18: Expanding Student Agency in the Introductory Psychology Course: Transformative Activist Stance and Critical-Theoretical Pedagogy

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Abstract

This chapter seeks to expand current understanding of student engagement, which is the cornerstone of student-centered approaches. Our contention is that despite advances spurred by the education reform movement, active engagement remains under-theorized and, as a result, related practical implementations for pedagogy remain stalled. Employing the Transformative Activist Stance approach, we demonstrate how an alternative critical-theoretical pedagogy creates conditions for meaningful teaching/learning that relies on and spurs learners' agency. In this pedagogical model, knowledge is presented as embedded in sociocultural practices, made accessible through interrogation and active exploration by learners, and critically reliant upon learners' own stances and future-oriented pursuits. We illustrate this approach with the topic of nature versus nurture in an introductory psychology course at a community college. This model is particularly germane to empowering minority students from underprivileged backgrounds as it spurs critical engagement to interrogate ethical-political implications of knowledge for promoting equity and diversity versus legitimizing inequality and social stratification.

Introduction

In this chapter we examine the role of curriculum design in supporting student-centered pedagogy in terms of providing tools for agentive learning. Specifically, we offer steps to promote meaningful, engaged, and agentive learning in an introductory course in psychology. Our contention is that, despite advances spurred by the liberal education reform movement, especially in moving towards connecting learning and identity development while focusing on student-centered approaches (Baxter Magolda, 1999; Keeling, 2004), such notions as active engagement of "the whole student" are still largely under-theorized and therefore, their practical implementation remains stalled. This exacerbates significant gaps between student-centered pedagogy and disciplinary knowledge construction. In our view, extant guidelines for undergraduate psychology teaching (e.g., APA, 2013; Halpern, 2010) need to be further developed, including the advancement of more solid theoretical foundations for integrating teaching with agentive learning and development. Still missing from the literature are practical and efficient guidelines to resolve tensions between student-centered pedagogy and teaching disciplinary content in ways that are relevant and meaningful to students. For example, student-centered approaches in higher education commonly result in teaching practices that narrowly focus on displacing lecturing with group

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work. Often, this leads to a lack of a systematic introduction into disciplinary knowledge (to avoid top-down knowledge transmission), which risks impoverishing the conceptual tools at the students' disposal.

In addition to the pedagogical problems in current theory, a curricular shift is needed. Attention to integrating curriculum design and progressive pedagogy has become paramount in light of the recognition that "psychology has traditionally presented a culturally limited perspective of human beings", as "culture, ethnic minority groups, gender, sexual orientation, and disability were often viewed as peripheral or outside of the mainstream of psychology" (Sue, 2003, p. xvii). Therefore, recent scholarship on psychology teaching has made a compelling case for infusing curricula with diversity topics. Importantly, APA has also committed to promoting the significant role of psychological science in achieving the twin goal of (a) understanding and reducing discrimination and (b) identifying and implementing pathways to beneficial diversity (APA, 2012).

As an integrated response to such curricular and pedagogical challenges, we suggest a more thorough conceptualization of effective conditions for meaningful teaching/learning that centrally relies on learners' agency as its critical component, yet also acknowledges the necessity of conceptual tools that support agency for successful learning. This approach integrates and expands upon Vygotsky's approach (1978) with its emphasis on cultural mediation as central to teaching/learning; Freire's critical pedagogy (1970) with its emphasis on critical consciousness; and sociocultural theories such as Bakhtin's dialogism and participatory learning (Lave & Wenger, 1991) in a composite framework termed the Transformative Activist Stance (TAS, see Stetsenko, 2008, 2010, 2014, 2016, in press-a, b; and for applications, see Stetsenko & Vianna, 2009; Vianna, 2009; Vianna & Stetsenko, 2006, 2011; Vianna, Hougaard & Stetsenko, 2014).

According to TAS, teaching and learning become meaningful if these processes are integrated with students' evolving identities as activist agents in their learning, lives, and wider community practices. We illustrate TAS-based critical-theoretical pedagogy as a model to arrange necessary conditions for agentive learning and meaningful knowledge construction by learners in a community college. One of the central components of this pedagogical model is the notion that knowledge is a process that is embedded in sociocultural practices and their histories, accessible through interrogation and active exploration by learners, and critically reliant upon learners' own stances and future-oriented pursuits (Stetsenko, 2010, 2016).

Our approach is particularly germane to engaging and empowering students from marginalized and underprivileged backgrounds by providing them with analytical tools that promote critical engagement with knowledge to interrogate its competing and often clashing ethical-political underpinnings and implications and thus spur agentive positioning in learning. We provide an example of teaching the biological basis of behavior, or nature-nurture debate, in an introductory psychology course (for an additional example of how TAS can be applied, see Podlucka, this volume). The critical element consists of providing learners with the tools for exploring and contrasting reductionist (e.g., genetic determinism) versus dynamic and open-ended (e.g., epigenetic) theories of human nature including unearthing their sociopolitical underpinnings and implications such as promoting equity and diversity or, conversely, legitimizing inequality and social stratification. We also discuss how our approach provides a foundation for other topics such as human development, intelligence, and social psychology (i.e., prejudice) while infusing issues of diversity, power, privilege, and oppression throughout the curriculum.

To conclude, we briefly mention our model's broader implications for spurring students' agentive positioning and activism.

Teaching-and-Learning from a Transformative Activist Stance (TAS) Perspective

To present a brief synopsis, the central notion in TAS (which is a broad philosophical-theoretical framework that posits transformative worldview and onto-epistemology; for a summative expose, see Stetsenko, 2016) is that people contribute to and thus change their world and its community practices – while the world is reciprocally changing them through the cycles of recursive interactions – in the process of struggling for a sought-after future that people themselves (both individually and communally) envision, imagine, and commit to. In opposition to passive adaptation, the active contributions to community practices are rendered central to development in all of its facets including knowledge building in the process of teaching and learning. In this dialectically recursive and dynamically co-constitutive process, development and learning are contingent on individuals taking a stance — imagining and enacting changes in their community practices, and simultaneously, their own lives, including their selves, minds, understandings, and identities. These transformative processes are situated in shared contexts of communal history, enacted by collective practices, and reliant on these practices' resources, tools, spaces, and collaborative interactivities. Yet the active role of people themselves in realizing these processes while acting on their commitments and stances, to what they themselves deem important and worth struggling for, is placed at the center. Applying this approach to education suggests that teaching/learning is about activism—understood as the right and ability to know for oneself, make up one's own mind, and be an *agentive actor* of community practices including knowledge building that *matters*, all while striving to make a difference in the world. Critical, therefore, is the ability to take a stand on what is going on in one's community and the wider world, to contest the existing status quo, and to stake a claim to how things could be understood and changed to achieve a better world (Stetsenko, in press-a).

According to this position, teaching/learning and science education should not be about the transmission of knowledge and facts (a point articulated already by Dewey, e.g. 1922) and not even about participation in community practices (as in the sociocultural framework, e.g. Lave & Wenger, 1991). In a more radical vein, teaching/learning are about agentive, authorial, authentic and activist stances and *contributions* by each learner, and each teacher, to meaning-making and knowledge construction. Importantly, knowledge in this approach is understood, firstly, as immersed in social practices and reliant on their interactivities and tools, yet also contingent on each and every learner's own quests that are uniquely positioned, authentically conceived, and authorially carried out. Thirdly, science is understood to be open-ended, indeterminate, forever un-finalized and contested, and therefore resisting any final definition or canonization (for details, see Stetsenko, in press-a). Teaching/learning is an important pathway to developing one's identity, whereby each act of learning and understanding is transformative of one's identity. Yet this is possible only when knowledge and facts are authored, that is, revealed by the learners in *relevance to themselves*, to their evolving stances and life projects. Therefore teaching/learning has to be about connecting to, engaging with, and even more critically, *spurring* agentive identities by providing the tools of agency for taking a stance on knowledge and associated social practices.

Any lesson about, for example, the nature-nurture debate is also a lesson about how knowledge is "made," how it came about and how it has been and can be now enacted to play a role in community

practices in view of present challenges and conflicts. It is also about each learner finding out and expanding on who she or he is and, importantly, could be (see Stetsenko, 2016). Classroom lessons are about science and knowledge as human endeavors infused with strivings and pursuits that are embodied and implicated in each and every fact and act of science, each and every bit of knowledge, and also, quite critically, in each and every act of learners' own knowing and understanding. This is not about indoctrination or imposition of alien agendas on students. Instead, science education needs and can be, to use Barone's (2006, p. 227) expression, about artfully coaxing learners "into collaborative interrogation of stale, tired, taken-for-granted facts" *while learners carry out the work to assert themselves in the actualization of their potential to know and to matter* (Stetsenko, in press-a). Therefore, teaching needs to afford and be about learning that opens up possibilities for forming and discovering active social positioning, voice, and stance, including critical appraisal of conflicts in current community practices and their histories, the forming of a vision for what needs to be changed, and a commitment to this vision. In such an approach, both teachers and students teach each other and learn from each other – as one process of *teaching/learning* (or *obuchenie*; see Vygotsky, 1978).

This pedagogical model seeks to bridge the gap between direct instruction entailing provision of cultural tools (such as theoretical concepts and generalizations) on one hand, and independent discovery entailing learners' active reconstruction of these tools, on the other – in a systemic-theoretical approach that renders knowledge meaningful through revealing practices "hidden" behind it (Arievitch & Stetsenko, 2000). In adding emphasis on learners' future-oriented agentive stances, a three-fold model (Stetsenko, 2010, 2016) highlights how teaching/learning needs to integrate knowledge while revealing it: (1) as stemming *out of social practice* – as its constituent tools; (2) *through social practice* – where students need to rediscover these tools through their own active pursuits and inquiries; and (3) *for social practice* – where knowledge and "facts" are rendered meaningful in light of their relevance to activities, imaginations, and projects significant to students, that is, to activities engendered by and engendering their identities.

Practical Illustration in Community College Teaching

We present now the outline for a unit on biological foundations drawing on both authors' teaching experiences, especially the first author's teaching in the introductory psychology course at a community college as this provides the most dramatic illustration.

To teach this topic in a student-centered manner is challenging because it requires knowledge of biology that community college students often have not yet mastered. Moreover, it deals in abstractions about human nature, which can appear far removed from students' lives and concerns. Our strategy to confront this difficulty is to avoid the typical techno-scientific emphasis of textbooks, which sever this topic's connection to its meaning and relevance to political-ideological positions related to colonialism, racism, sexism, ableism, etc. In contrast, our lesson goal seeks to expose such connections by interrogating them from students' histories, experiences, and positions. This is critically relevant for underprivileged minority students who continue to be subjected to marginalization and oppression, as these practices are grounded in and legitimized by biologically determinist views and their biased implications, for instance, in intelligence testing and biomedical approaches to mental health.

We recommend beginning this exploration by inviting students to interrogate common views about human nature and biases embedded in them (typically shaped by previous school learning and media), with topics such as human learning and intelligence, mental health, criminal behavior, race, and gender.

Given the role that knowledge of neuroscience and genetics plays in such discussions, including their contested status, students welcome the opportunity to understand *what is at stake* in this debate so they can meaningfully weigh in. Before we proceed we present some basic guidelines for creating a community of inquiry conducive to exploring and interrogating complex knowledge and associated social practices including their ideological underpinnings and entailments in ways that spur learners' own evolving stances, positions, and identities.

As such explorations tap into different, divergent, and often conflicting perspectives commonly held by students, it is imperative to consider how to structure the course and its impact on classroom interactions (Cannon, 1990). An initial step is to discuss with students the very nature of the learning process, which entails transforming the learner (Lave & Wenger, 1991). We stress that such transformation is both intellectual and emotional; learning, if it is meaningful, likely challenges one's beliefs, values and attitudes. Moreover, instructors must make clear to students that knowledge is ineluctably contested as claims are made from different, often competing positions and must therefore be interpreted in different ways, with different implications. Thus, we believe an introductory course should prepare students to critically approach theories and claims by (a) identifying underlying assumptions, (b) emphasizing that this is how science develops, by contesting and debunking its own claims, without ever reaching the "final" answer and (c) with learning often challenging one's assumptions and positions. This discussion prepares students to accept that difficult debates and emotions are inherent to the learning process. It is also crucial to tell students that they are expected to work together – just as scientists typically do, too – and, given our diverse backgrounds, that we will need to create an environment for learning across difference. Group-dynamics activities help students become familiar with one another and their diverse communication styles and can be geared to exploring students' varied personal experiences calibrated to increase their comfort in talking and participating in class (See appendix B for examples of games and activities that help students get to know and feel comfortable with the class).

As this lesson touches on both race/racism and evolution, topics that often become deeply personal and sometimes explosively emotional, we recommend the literature on difficult dialogues in the classroom (APA, 2012; Sue, 2015; Sue et. al., 2009; Tatum, 1992; Young, 2003). For lack of space, we only briefly highlight the following basic guidelines. First, instructors must recognize themselves as racial/cultural beings to anticipate how their own identity might impact classroom dynamics. Second, they must take stock of the structure of the classroom (e.g., class size, physical layout, seating arrangement) and whom they teach (i.e., the class distribution across gender, race, religions, ethnicity, age, national origin, physical ability, etc.). This should include attention to the dynamics of intersectionality, as people belong to multiple axes of identity (e.g., gender, race, ethnicity, class, religion, and disability) that intersect in significant ways (APA, 2012). At community colleges, classes consist overwhelmingly of low-income students of color and immigrants with incredibly diverse cultural and religious backgrounds. Because the first author is a first-generation, Latino immigrant our examples reflect his experience as a faculty member of color teaching extremely diverse classes where White students are the exception (White instructors will find thorough guidelines for teaching students of color as the literature on racial dialogues focuses on the challenges of Whites talking with/teaching people of color; e.g., Sue, 2015). Third, instructors must try and create a climate of inquiry in the classroom where emotions are attended to, validated, and discussed (Sue, 2015; Young, 2003). Given that discomfort and confusion are common when diversity/multicultural issues arise (e.g., anger, guilt, defensiveness, helplessness, etc.), these

feelings should not be avoided, denied or suppressed. Rather, instructors should be prepared to make sense of them, especially as they may not be acknowledged or understood by students (or teachers themselves). While it may seem easier to avoid potentially explosive conversations of race and racism, it is worth bearing in mind that discussion of virtually any social issue (e.g., inequality, sexism, gender, homophobia, religion), and even broader issues such as evolution, can trigger microaggressions in diverse classrooms (Sue, 2015). Studies from classroom settings indicate (a) the importance of allowing space for the strong expression of feelings, (b) the need to stress that it is okay to have them, (c) that talking about emotions helps students understand themselves and others better, and (d) that it is important to create conditions that allow for openness and receptivity to strong emotions (Sue, 2015). Instructors should avoid getting sucked into argumentative or polarized debates and instead direct students to examine their own reactions and feelings. This focus on emotions allows instructors to control the process, not the content of a discussion or debate.

To set the stage for exploring and interrogating claims related to the nature-nurture debate, the first author accesses, in the first week of class, students' initial positions on the debate by asking them to share why they are interested in psychology. A memorable answer came from a student who wanted to know why some people "*are born* serial killers." Many students express interest in mental disorders, which most attribute to a "chemical imbalance" in the brain though they also commonly attribute them to environmental factors. It is enough for an instructor to ask the class which factor (biological or environmental) is more important in determining psychological characteristics and behavioral traits for students to articulate three possible alternatives, namely, that nature is primary, that environment is primary, and that both sets of factors influence trait development, though they cannot say how such interaction takes place. Students' views are often driven by personal experiences with mental health services, as many of them or their family members have been diagnosed with mental disorders. Whether such disorders are, primarily, biologically or psychosocially based is something that personally matters to students and evokes their interest and concern. Moreover, many students apply notions of fixed ability to their own learning, which typically limits their career aspirations (see Whiteman & Ochakovskaya, this volume).

The first author then begins the actual unit on nature-nurture by inviting students to address the "logic" behind commonly held views in their most general, theoretical regularities, in this case reductionism and determinism (Lewontin, Rose, & Kamin, 1994). One clear and accessible example comes from a passage of the book "The Brain that Changes Itself" (Doidge, 2007) about brain plasticity in which neuroscientist Michael Merzenich reminisces about an episode from childhood when his relative was awarded national teacher of the year. After the ceremony in the White House this relative visited his family and was asked about her most important teaching principles. The relative answered, "Well, you test them when they come into school, and you figure out whether they are worthwhile. And if they are worthwhile, you really pay attention to them and you don't waste time on the ones that aren't" (p. 68). Students are asked to jot down their thoughts about that teacher's comment including how they feel about it. Invariably students express shock, disappointment and even anger, though many say that they are not surprised. Then they are asked to identify what assumption about human nature and development underlies the teacher's idea. Students easily make connection to the idea that human traits are biologically based, i.e. that intelligence and the ability to learn is not the same for all, that some people have more potential to learn than others. Then the class reads Merzenich's own comments

on his relative's assumption, that "it's just so destructive to imagine that our neurological resources are permanent and enduring and cannot be substantially improved and altered" (p. 6).

Then we discuss the implications of two opposite assumptions, namely, whether the development of psychological functions is biologically predetermined and fixed versus flexible and open to change. When asked to apply that to differential academic achievement, students can easily discern two opposite assumptions. One posits that the problem stems from children's intrinsic characteristics (e.g., neurological or genetic), whereas the other posits that the problem stems from the environment (e.g., inadequate schooling, lack of support). Then the notion of reductionism is introduced as a mode of explanation that attributes the properties of complex wholes (from proteins to societies) to the properties of their units (whether molecules or human communities). The corollary conceptualization, biological determinism, can then be explored as a way of thinking that explains human lives and actions as "inevitable consequences of the biochemical properties of an individual's cells; and these characteristics are in turn uniquely determined by the constituents of the genes possessed by each individual" (Lewontin, Rose, & Kamin, 1994, p. 6).

In a more technical vein, supporting students reading and writing is a persistent challenge especially in community colleges. Possible strategies to address this include reading key passages of sophisticated academic texts together with students in class. Another strategy is to ask students to break down complex sentences (e.g., clarifying causal links in subordinate clauses) and express their content in their own words.

Next, we invite learners to explore the history of these notions through works by Fancher (2004) on the legacy of Francis Galton. This is important because Galton was the founder of a tradition connecting the concepts of nature and nurture with the topics of heredity, intelligence testing, and eugenics. The term "eugenics" was introduced by Galton to describe a program of selective breeding, which, in his view, was "supported" by "experiments" on testing for a racial hierarchy of human capacities (Winston, 2004). Interested in "improving human stock," Galton studied the families of those he thought were outstanding men of his day and concluded that mental powers "run in families." Moreover, Galton sought to demonstrate that Africans were of "lower intelligence" than European Whites and he even hoped that "inferior" races would gradually become extinct. This opens the way to explore how eugenics thrived on the fears fueled by racist associations, dramatically influencing discriminatory policies in education, immigration, and mental health. Making eugenics' appalling legacy accessible to students is an avenue to discern the kind of practices that gave rise to the key nature-nurture debates. Such an exploration makes it possible for students to discover the meaning and relevance of these debates and related knowledge claims vis-à-vis the context of imperialist and racist practices. This implies seeing "how five centuries of studying, classifying, and ordering humanity within an imperial context gave rise to peculiar and powerful ideas of race, culture and nation [and nature-nurture] that were, in effect, conceptual instruments the West used both to divide up and educate the world" (Willinsky, 1988, p. 4). Students then explore whether and how these practices continue today by including readings on the recent rise of eugenics, essentialist biases, and biological reductionism. Useful materials include, for example, an article by Allen (2001) discussing how the recent developments in research on biological bases of human development bear similarity to what was happening in the 1920s and against the same background of deep economic crises, bitter anti-immigration sentiment, and social upheaval. Instructors can draw on other scholars echoing this assessment in exposing the rise of

eugenics across history, again in evidence today, reflecting the power of persistent essentialist biases in sciences and societies (Dar-Nimrod & Heine, 2011).

Students are also invited to explore the implications of these assumptions (i.e., what they imply about human potential) vis-à-vis current social issues, such as inequities across groups (e.g., race and gender). The first author does that by having students read the report "The State of America's Children" (Children's Defense Fund, 2014) and describe some noteworthy findings and how they feel about them. Consistently, students report surprise and puzzlement with the extent of child poverty as well as disparities in a range of social indicators across racial/ethnic lines. When asked about interpreting those findings according to biologically reductionist/determinist notions, students clearly recognize how problematic such views are, in that they help deflect social problems that require social change (e.g., in economic, educational, health, and related social policies) by turning them into biological problems, thus serving to blame the victims of societal inequality. Then students are asked to question whether outrageously racist scientific notions, as in eugenics, have been truly eradicated, a question many students do raise once the ground is paved for that.

The upshot of this exploration at the broad level of assumptions, before specific concepts and research findings are introduced, is that it lays the ground for students to discover and form their own active social positioning. This also begins to change their relation to learning in that they see it as involving articulating one's own voice and stance in order to make sense of conflicting views and positions. This is an important step to connect learning and identity as students begin to consider that their views might change, that learning might actually transform them, not merely provide them with information.

Once the relevance of these explorations to students' own lives and experiences is recognized, the ensuing step is to connect the debate about broad assumptions on human nature with a more specific psychological discussion. Thus, the first author asks students to indicate what they think the sources of human traits are. He begins by revisiting the issue of the origins of human traits by asking students to list several human traits (the instructor might provide examples, such as height, weight, eye color, intelligence, etc.) as the word trait can seem too vague to students. Then he asks students to indicate the origins of such traits. Invariably, they identify three types of traits, genetically determined, environmentally determined, and traits that result from the interaction of genes 'and' environment. In fact, most students take the view that biological and environmental factors interact, what Oyama (2000) calls conventional dualism. Students' interactionist views typically match the bio-psycho-social approach most textbooks use, according to which environmental influences interact with our genetic predispositions (Myers & Dewall, 2015). The next step involves an examination of how a textbook presents this material. Even though the first author does not assign a textbook, drawing instead on multiple sources for content knowledge, for this part of the lesson he assigns the chapter on nature-nurture from Myers & Dewall's (2015) textbook for general psychology. From this point onward, the class covers various concepts and research findings from different perspectives.

Though the textbook presents findings indicating that experience influences genetics and modifies the brain's pathways (i.e., neuroplasticity), behavioral genetics and evolutionary psychology figure in prominently. The focus is now on these approaches' underlying assumptions. In the passages assigned, students read that we are "mobile gene machines" whose natural desires represent our genes' way of reproducing themselves, so that we are living fossils —"collections of mechanisms produced by prior selection pressures" (Myers & Dewall, 2015, p. 148). Problematically, this translates into so called

gender differences, which posit, for example, that men are more sexually motivated than women. This is purportedly because "[w]omen have more at stake (…) Women are limited in how many children they can have between puberty and menopause" (p. 146). This gender bias rarely goes unnoticed and most likely the women in the class will call it out for what it is – an outrageously outdated and unacceptable bias. This is another step toward agentive positioning as students see that meaningful learning cannot escape examining its ethical-political context and articulating one's own stance. This can be strengthened by classroom discussions focusing on gender roles and their stereotypes, questioning who benefits from their perpetuation and an interrogation of their conceptual and empirical bases.

The class now turns to a close inspection of interactionism on both logical and empirical grounds. One common conceptual problem, rarely addressed in introductory courses, which afflicts the scientist and layperson alike, is the lack of understanding that population-genetic analyses deal only with factors that explain variation in traits rather than development of traits themselves. As Gottlieb (1992) reminds us, this has to do with "an indubitable legacy of Galton's thinking that the outcome of individual development is determined so much by nature and so much by nurture" (p. 118). Students are then very surprised to discover that a trait, such as one's intelligence or personality, cannot be said to result "this much percent" from genes and "that much percent" from one's experiences. This fallacy is easily debunked when students are presented with examples of how genetic and environmental influences cannot be partitioned but are integrated in developmental processes, such as alternative splicing and "immediate early genes" (see below for a description of each concept and how it can be used).

The following step to debunk this assumption consists of exploring, together with students, the critique of determinist and reductionist theories from dynamic and developmental systems perspectives (Gottlieb, 1992, 2007; Oyama, Griffiths & Gray, 2001). The focus is on conventional interactionism and its reductionist and determinist biases. This highly theoretical discussion can be made concrete to students with a compelling example Lewontin (2001) provides to deconstruct the old-fashioned (ironically, still popular in textbooks), erroneous formulation that "genes determine an organism's capacity, a limit that may or may not be reached depending on how adequate the environment is" (p. 26). Lewontin calls this the 'empty bucket' capacity metaphor. The idea is quite simple:

> Genes determine the size of the bucket, and environment how much is poured into it. If the environment is poor, then none of the buckets will have much in it at all and all genotypes will do poorly, but if the environment is favorable, then the large buckets will contain a great deal, while the smaller ones will be filled to their capacity and overflow (ibid, p. 27).

Lewontin explains how this notion has been widely invoked in the literature on IQ, such as notoriously expressed by Jensen in 1969 (cited in Lewontin, 2001): "The claim is that human IQ will indeed vary over environments" (p. 27). In his classes, the first author introduces Jensen's hypothetical graph, which plots 'mean phenotypic IQ' against 'favorableness of environment.' The graph (see Figure 1) shows four lines representing different genotypes arranged one on top of the other, so that the bottom one (genotype A) barely shows gains in an enriched environment, whereas gains are clear in the top one (genotype D). Students explore whether this graph demonstrates that genes influence IQ and whether it demonstrates that the environment does so too. Most students easily answer "yes" to both questions and the class, following a discussion, concludes that this is indeed an interactional explanation for the source of variation in human intelligence. Then the important question is explored, "Based on this graph, can all genotypes equally benefit from good quality environments? Why or why not?" Students quickly answer

"no" and point out that the example indicates that one's capacity for intelligence is genetically fixed, depending on whether one "has a small or big bucket", as they humorously take up the metaphor.

After students recognize the persistence of genetic determinism in interactional conceptions, the next step consists in together exploring research findings demonstrating the context-dependent functioning of genes. This requires that students learn what genes are and how they function (there are many videos and animations on the internet representing gene transcription into m-RNA and protein synthesis, which allows for 'flipping the classroom' by assigning students to view them outside class, see Arner, Aldosari & Morris, this volume). Learning about such explicitly biological content, which students otherwise resist as "too much biology in a psychology course", now becomes a condition of making sense of and weighing in on the nature-nurture debate. Such negotiations are fundamental to co-construct with students the meaning and relevance of scientific/academic knowledge. This is how the first author coaxes students to dig deeper into findings from molecular biology that matter for this debate and serve as the empirical basis on which the determinate or indeterminate nature of the origins and development of traits can be adjudicated.

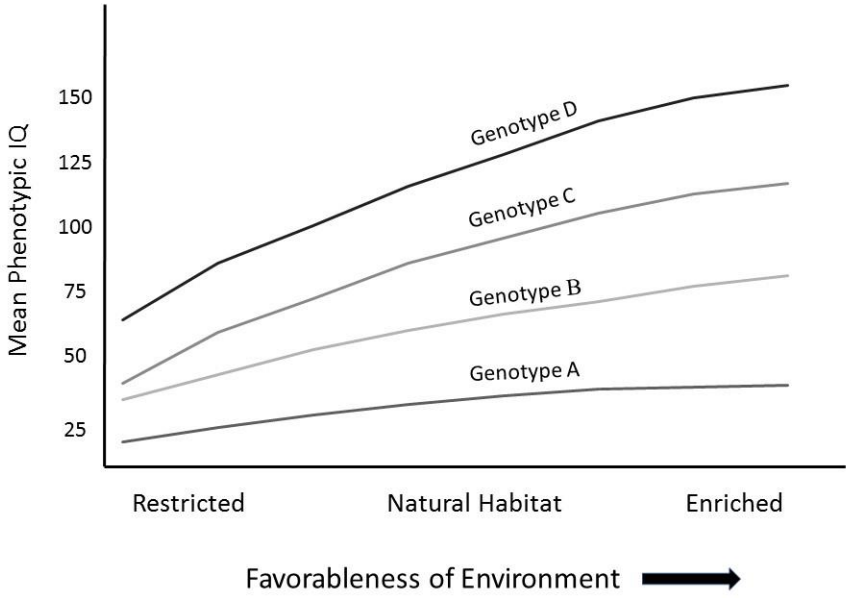

Figure 1. Phenotypic variation as a function of genotype and environment, adapted from Richard Lewontin's *The Triple Helix* (2001).

Students are then prepared to learn about new features in molecular biology that radically challenge the idea that genes single-handedly predetermine protein synthesis and by extension trait development (See appendix for resources). The most illustrative, in our opinion, is alternative RNA splicing (Moss, 2001), the context-dependent "editing" of the m-RNA out of which different proteins are synthesized from the same gene. The important point is that though genes are indispensable resources in protein synthesis, they do not determine what protein will be produced, as this depends on environmental conditions of the cell (Neumann-Held, 2001).

In the first author's experience, such biological detail makes a big difference in that it captures how genes and environment are inextricably linked, thus disclosing the indeterminate nature of protein synthesis and by extension, trait development. This example is so convincing to many students that they feel as though they can now "see with their own eyes" (as they put it) that genes do not control even the proteins made, let alone traits. It also persuades students, many of whom remain skeptical about the need for learning about this aspect of biology, that this type of knowledge actually matters to them personally.

Another compelling demonstration that genes and environment cannot be partitioned as alternative sources of influence or causal power in development is the activation of immediate early genes a few minutes following sensory stimulation, which controls the production of proteins involved in building nerve circuits and reshaping existing ones (Johnston, 2008). On this basis, the fallacy of conventional interactionism, which portrays the interaction between genetic and environmental influences as an additive one, incorrectly implying that "more of one kind of influence inevitably means less of the other" (Johnston, 2008, p. 18), can now be interrogated by students themselves. Moving now from specific details back to broad conceptualizations, students are invited to consider the bio-psycho-social model, ubiquitously present in the opening chapters of textbooks as the overarching framework for understanding nature-nurture interactions. Students can then quickly identify its implicit additive character and thus its determinist and reductionist bias and associated ethical-political implications.

One remarkable outcome of this lesson is that many students apply this knowledge to their own learning and potential. Having worked through the intricacies of this topic, which requires dealing with complex materials commonly deemed above the community college level and often resisted by instructors, students discover that this experience takes them beyond their initial learning level, not just cognitively but in their attitude and motivation to learn. They often jocularly express this to the first author saying that now they have a 'bigger bucket', referring to Lewontin's IQ metaphor. While this may not be the most elegant metaphor, it certainly captures and expands upon the dialectics of learning and development proposed by Vygotsky (1978) in the Zone of Proximal Development.

Conclusions

In the TAS-based approach, teaching/learning needs to afford the space and provide the tools for students to discover their own active social positioning, voice, and stance including critical appraisal of knowledge claims vis-à-vis their lives and current community practices. In order to teach in a truly student-centered way, a critical step is to provide the tools of agency so that students discover the meaning of knowledge claims for themselves while taking a position on these claims, rather than taking knowledge for granted.

In this context, highly complex knowledge about genetics and the nature-nurture controversy and the seemingly "abstract" onto-epistemological underpinnings of knowledge construction, such as reductionism and determinism, can be made meaningful to students as they discover these for themselves and contribute to discerning their history, practical relevance, and ethical-political underpinnings and implications. Importantly, this nature-nurture unit builds foundations for other topics, including learning about mental health, intelligence, and diversity, as it provides the tools to interrogate history, assumptions, and implications of knowledge claims. Moreover, this lesson addresses issues that are personally relevant especially to minority community college students, such as racism, sexism, and disability, allowing for the infusion of diversity across the curriculum, rather than

marginalizing these as merely added-on, separate topics. Learning such topics via activist positioning creates space for students to consider and examine their own views, stances, and life agendas, thus making learning truly meaningful and agentive.

Our strategy to introduce complex scientific knowledge and explicitly address its contested character and ideological ramifications runs counter to common instructional strategies. These strategies typically conceptually simplify the curriculum in order to make it "accessible" to community college students who are often approached from deficit-based views. Instead, our critical-theoretical approach to student engagement is based on providing the tools for making complex theoretical concepts personally relevant to students by connecting them to social issues and their histories, students' own lives and community practices in which they have a stake including as they embark on their future life agendas and careers. Thus, we approach student-centered pedagogy in the ethos of "infinite potential" of all students (see Stetsenko, in press-b) who, provided they have access to quality tools such as critical-theoretical concepts, can be empowered through college education as agents of their own learning, lives, and wider communities. In this approach, learning and students' identities become connected as learning provides tools for students to take a stand, first toward commonly held views, then toward the material learned, and by extension, to disciplinary and general knowledge.

The final step in this transformative cycle can take place when students expand their activist stance to their emerging life agendas and community practices. Though this cannot be fully achieved during a single course, contexts can be designed to spur such transformation as the cumulative result of approaching all topics in the curriculum in a critical-theoretical way. Additional spaces, such as co-curricular activities (e.g., undergraduate research, clubs, campus events, workshops, seminars, etc.), can play a vital role in allowing students to continue exploring and co-constructing the tools for their quests for meaningful contribution to community practices and society at large. Both authors have collaborated on such a co-curricular program in the community college termed the Peer Activist Learning Community where students collaboratively investigate and develop their transformative activist stances through the tools of learning, by expanding their contributions to a range of community practices and social issues (for details, see Vianna, Hougaard & Stetsenko, 2014). As a result, many students became more agentive in their communities and their own learning, such as establishing conferences at the community college for students and faculty, seeking and obtaining scholarships and awards, presenting their work at professional conferences, and moving on to graduate school. They have also become involved in activist endeavors in their communities, including joining in the struggle against tuition hikes in the university. Developing into activist agents is a complex process that only students themselves can embark on, yet we hope our chapter illustrates how providing the tools of agency for this process can be made central to the psychology curriculum.

References

Allen, G. E. (2001). Essays on science and society: Is a new eugenics afoot? *Science, 294* (5540), 59– 61. doi:10.1126/science.1066325

American Psychological Association. (2012). *Dual pathways to a better America: Preventing discrimination and promoting diversity*. Washington, DC: Author. Retrieved from http://www.apa.org/pubs/info/reports/ promoting-diversity.aspx

American Psychological Association. (2013). *APA Guidelines for the Undergraduate Psychology Major: Version 2.0.* Washington, DC: Author. Retrieved from http://www.apa.org/ed/precollege/undergrad/index.aspx

Arievitch, I. M., & Stetsenko, A. (2000). The quality of cultural tools and cognitive development: Galperin's perspective and its implications. *Human Development, 43*, 69-93. doi:10.1159/000022661

Barone, T. (2006). Making educational history: Qualitative inquiry, artistry, and the public interest. In G. Ladson- Billings and W. F. Tate (Eds.), *Education research in the public interest: Social justice, action, and policy* (pp. 213–230). New York: Teachers College.

Baxter Magolda, M. B. B. (1999). *Creating contexts for learning and self-authorship: Constructive-developmental pedagogy*. Nashville: Vanderbilt University Press.

Cannon, L. W. (1990). Fostering positive race, class, and gender dynamics in the classroom. *Women's Studies Quarterly, 18*(1), 126-134.

Children's Defense Fund (2014). The State of America's Children. Washington, DC: Author. Retrieved from http://www.childrensdefense.org/library/state-of-americas-children/2014-soac.pdf?utm_source=2014-SOAC-PDF&utm_medium=link&utm_campaign=2014-SOAC

Dar-Nimrod, I., & Heine, S. J. (2011). Genetic essentialism: On the deceptive determinism of DNA. *Psychological Bulletin, 137*, 800-818. doi:10.1037/a0021860

Dewey, J. (1922). *Democracy and education: An introduction to the philosophy of education*. New York: McMillan.

Doidge, N. (2007). *The brain that changes itself: Stories of personal triumph from the frontiers of brain science*. New York: Penguin.

Fancher, R. (2004). The concept of race in the life and thought of Francis Galton. In A. Winston (Ed.), *Defining difference: Race and racism in the history of psychology*, (pp. 49-75). Washington, DC, US: American Psychological Association

Freire, P. (1970/1990). *Pedagogy of the oppressed*. New York, NY: Continuum. (Original work published 1970).

Gottlieb, G. (1992). *Individual development and evolution: The genesis of novel behavior*. New York: Oxford University Press.

Gottlieb, G. (2007). Probabilistic epigenesis. *Developmental Science, 10*(1), 1-11.

Halpern, D. F. (2010). *Undergraduate education in psychology: A blueprint for the future of the discipline*. American Psychological Association.

Johnston, T. (2008). Genes, Experience, and Behavior. In A. Fogel, B. J. King and S. G. Shanker (Eds.), *Human development in the twenty-first century: Visionary ideas from systems scientists*. New York, NY: Cambridge University Press.

Keeling, R. (Ed.). (2004). *Learning reconsidered: A campus-wide focus on the student experience*. Washington, DC: American College Personnel Association and National Association of School Personnel Administrators.

Lave, J., and Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.

Lewontin, R. C. (2001). *The triple helix: Gene, organism, and environment.* Cambridge, MA: Harvard University Press.

Lewontin, R. C., Rose, S., & Kamin, L. J. (1984). *Not in our genes: Biology, ideology, and human nature*. New York: Pantheon Books.

Myers, D. G. & Dewall, C. N. (2015). *Psychology*. New York: Worth Publishers.

Moss, L. (2001). Deconstructing the gene and reconstructing molecular developmental systems. In S. Oyama, P. E. Griffiths and R. D. Gray (Eds.) *Cycles of contingency: Developmental systems and evolution* (pp. 85-97). Cambridge, MA: MIT Press.

Neumann-Held, E. M. (2001). Let's talk about genes: the process molecular gene concept and its context. In S. Oyama, P. E. Griffiths and R. D. Gray (Eds.) *Cycles of contingency: Developmental systems and evolution* (pp. 69-84). Cambridge, MA: MIT Press.

Oyama, S. (2000). *Evolution's eye: A systems view of the biology-culture divide*. Durham, NC: Duke University Press.

Oyama, S., Griffiths, P. E., & Gray, R. D. (2001). *Cycles of contingency: Developmental systems and evolution*. Cambridge, MA: MIT Press.

Stetsenko, A. (2008). From relational ontology to transformative activist stance: Expanding Vygotsky's (CHAT) project. *Cultural Studies of Science Education, 3*, 465-485. doi:10.1007/s11422-008-9111-3

Stetsenko, A. (2010). Teaching-learning and development as activist projects of historical Becoming: Expanding Vygotsky's approach to pedagogy. *Pedagogies, 5,* 6–16. doi:10.1080/15544800903406266

Stetsenko, A. (2014). Transformative activist stance for education: Inventing the future in moving beyond the status quo. In T. Corcoran (Ed.), *Psychology in Education: Critical Theory~Practice* (pp. 181-198). Rotterdam: Sense.

Stetsenko, A. (2016). *The transformative mind: Expanding Vygotsky's approach to development and education*. New York, NY: Cambridge University Press.

Stetsenko, A. (in press-a). Science education and transformative activist stance: Activism as a quest for becoming via authentic-authorial contribution to communal practices. In L. Bryan and K. Tobin (Eds.), *13 Questions: Reframing Education's Conversation*: *Science*. Peter Lang.

Stetsenko, A. (in press-b). Putting the radical notion of equality in the service of disrupting inequality in education: Research findings and conceptual advances on the infinity of human potential. *Review of Research in Education*.

Stetsenko, A., & Vianna, E. (2009). Bridging developmental theory and educational practice: Lessons from the Vygotskian project. In O. Barbarin and B. H. Wasik (Eds.), *Handbook of Child Development and Early Education. Research to Practice* (pp. 38-54). New York, NY: Guilford Press.

Sue, D. W. (2015). *Race talk and the conspiracy of silence*. Hoboken, NJ: Wiley.

Sue, D. W., Lin, A. I., Torino, G. C., Capodilupo, C. M., & Rivera, D. P. (2009). Racial microaggressions and difficult dialogues on race in the classroom. *Cultural Diversity and Ethnic Minority Psychology, 15*(2), 183-190. doi:10.1037/a0014191

Sue, S. (2003). *Forward: The richness of human realities*. In P. Bronstein & K. Quina (Eds*.) Teaching gender and multicultural awareness: Resources for the psychology classroom* (pp. xvii-xix). Washington, DC: American Psychological Association.

Tatum, B. (1992). Talking about race, learning about racism: The application of racial identity development theory in the classroom. *Harvard Educational Review, 62*(1), 1-25. doi:10.17763/haer.62.1.146k5v980r703023

Vianna, E. (2009). *Collaborative transformations in foster care: Teaching-learning as a developmental tool in a residential program*. Saarbrücken: VDM Verlag Dr. Müller.

Vianna, E., Hougaard, N., & Stetsenko, A. (2014). The dialectics of collective and individual transformation. In A. Blunden (ed.), *Collaborative Projects* (pp. 59-87). Leiden, the Netherlands: Brille Publishers.

Vianna, E., & Stetsenko, A. (2006). Embracing history through transforming it: Contrasting Piagetian versus Vygotskian (activity) theories of learning and development to expand constructivism within a dialectical view of history. *Theory & Psychology, 16*, 81-108. doi:10.1177/0959354306060108

Vianna, E., & Stetsenko, A. (2011). Connecting learning and identity development through a transformative activist stance: Application in adolescent development in a child welfare program. *Human Development, 54*, 313–338. doi:10.1159/000331484

Vianna, E., & Stetsenko, A. (2014). Research with a transformative activist agenda: Creating the future through education for social change. In J. Vadeboncoeur (Ed.), *National Survey of Student Engagement, 113* (2), 575–602.

Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University.

Willinsky, J. (1988). *Learning to divide the world: Education at empire's end*. Minneapolis: University of Minnesota.

Winston, A. S. (2004). Introduction: Histories of psychology and race. In A. S. Winston (Ed.), *Defining difference: Race and racism in the history of psychology* (pp. 3-18). Washington, DC: American Psychological Association.

Young, G. (2003). Dealing with difficult classroom dialogue. In P. Bronstein & K. Quina (eds.), *Teaching gender and multicultural awareness: Resources in the psychology classroom* (pp. 347-360). Washington, D.C., American Psychological Association.

Appendix A

Additional Resources on Role of Genes in Development:

Readings:

- Gould, S. J. (1996). The mismeasure of man. New York: W. W. Norton.
- Lickliter, R. (2008). Developmental Dynamics: The new view from the life sciences. In A. Fogel, B. J. King and S. G. Shanker (Eds.), Human Development in the Twenty-First Century: Visionary ideas from systems scientists. New York, NY: Cambridge University Press.
- Moore, D. S. (2003). The Dependent Gene: The Fallacy of "Nature Vs. Nurture". New York, NY: Macmillan.
- Smedley, A., & Smedley, B. D. (2005). Race as biology is fiction, racism as a social problem is real. American Psychologist, 60, 16 – 26.
- Zimmer, C. (2008, November 10). The Rest of the Genome. The New York Times, p. D1. Http://www.nytimes.com/2008/11/11/science/11gene.html?pagewanted=1&_r=2&ref=science&module=Search&mabReward=relbias%3As%2C%5B%22RI%3A5%22%2C%22RI%3A17%22%5D& New York Times, 2008).

Videos:

- The Brain that Changes Itself:

  https://www.youtube.com/watch?v=bFCOm1P_cQQ

- Secrets of Brain: https://www.youtube.com/watch?v=w6AfzCNDmbY

- The Secret Life of the Brain- Episode 1: The Baby's Brain: https://www.youtube.com/watch?v=h3BoUpMjY-YThe Secret Life of the Brain- Episode 1: The Baby's Brain: https://www.youtube.com/watch?v=h3BoUpMjY-Y

Appendix B

Resources for Group Dynamics Exercises and Games

- Boal, A. (2002). Games for actors and non-actors. New York: Routledge.

- Rohd, M. (1998). *Theatre for community, conflict & dialogue: The hope is vital training manual*. Portsmouth, NH: Heinemann.

Chapter 19: Collaborative Inquiry Project in the First-Year Seminar in Psychology: Students' Agentive Authorship of Learning and Development

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Abstract

Community colleges have increasingly invested in high-impact practices, such as First Year Seminars (FYS), focusing on students' meaningful engagement in learning. In this chapter, I reflect on designing and implementing the FYS in psychology at LaGuardia Community College based on the learning goals developed by the college and the Psychology program. My pedagogy was rooted in principles of the Transformative Activist Stance (Stetsenko 2008, 2016) and critical-theoretical approach (Vianna & Stetsenko, 2014), which highlight learning and teaching as a process of accessing, co-constructing, and authoring the tools of agency and identity development, enabling learners to position themselves as agentic members of their emerging professional communities and cultural worlds. Specifically, I implemented a collaborative, inquiry-based research project that facilitated students' exploration of becoming a college student while embarking on a new identity development as a researcher, and thus promoted integration of learning and development as students explored college culture while mastering and authoring the tools and knowledge of their discipline.

Introduction

In this chapter I focus on implementation of the First Year Seminar (FYS) in Psychology as I taught it at LaGuardia Community College. Specifically, I describe the process of students engaging in a collaborative, inquiry-based research project that facilitated their exploration of becoming a college student while becoming a researcher, and thus promoted integration of learning and development as students investigated college culture and life while mastering and authoring the tools and knowledge of their discipline.

The FYS is considered one of the most effective high-impact practices (Kuh, 2008) developed by the Association of American Colleges and Universities. Grounded in student-centered pedagogy, high-impact practices focus on connecting experiential and disciplinary knowledge and bridging learning and identity development by engaging students in reflecting on their discourses or frames of reference (Baxter Magolda, 1999; Kegan, 1994; Keeling, 2004). One of the dominant goals of high impact practices, and the FYS in particular, is to increase rates of student retention and student engagement (Kuh, 2008).

The FYS at LaGuardia CC is designed and taught by faculty in students' respective disciplines. Faculty members in each discipline design curricula depending on the needs and requirements of their major and program. The primary goals of the FYS in psychology are to introduce students to the field of

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psychology, to the college and its culture, including to available supports and services at the college, while addressing core competencies as proposed by the college and the psychology program developed in accordance of the APA guidelines (scientific inquiry, problem solving and critical thinking, global learning, ethical and social responsibility, integration, and communication skills). Importantly, faculty members are also supposed to provide advisement and guidance in education and career planning, including fostering students' self-exploration and self-development.

My pedagogy is rooted in the principles of the Transformative Activist Stance (TAS), the concept developed by Stetsenko (2008, 2014, 2016), which posits human development and learning to be grounded on agentive contribution to transformative collaborative practices. Learning and teaching are therefore understood as a process of accessing, co-constructing, and authoring the tools of agency and identity development (Stetsenko, 2016). Consequently, the role of the instructor is not only to facilitate students' construction of knowledge as, for example, proposed within the self-authorship theory (Baxter Magolda, 1999, 2004; Baxter Magolda & King, 2004; Kegan, 1994), but also to facilitate students' mastery, creation, and transformation of cultural tools, the tools of their own development that enable them to position themselves and act as agents of change in their professional communities and cultural worlds. Specifically, the implementation of this course was based on critical-theoretical pedagogy (Vianna & Stetsenko, 2014; Vianna & Stetsenko, this volume), which proposes creating a learning and teaching environment that fosters development of the learner's agency through connecting knowledge with social practice in the process of active exploration by learners. Importantly, this approach calls for students to be provided with tools of agency (e.g., theoretical concepts, methods of analysis and generalization, templates for exploring the historicity of knowledge claims) in order to actively discover and author knowledge for themselves. Consequently, the relevance of the knowledge to learners' lives and their future is revealed in this learning process (Vianna & Stetsenko, this volume; Stetsenko, 2016).

Considering the multiple and diverse goals of the course I realized that if students were introduced to the field of psychology, college culture and advisement separately, the course could easily be perceived and experienced by students as a mosaic of unrelated topics and activities. In order to address all the requirements and objectives of the course in a meaningful and integrative manner, and facilitate students' engagement in a collaborative learning, I aimed at develop a collaborative project with students as the leading learning tool of the course that would promote integration of their learning and development. Congruently, my main goals were to design a course that would promote integration of (a) the goals of FYS as defined by the college and Psychology program, and (b) students' learning and development through active engagement in the research project relevant to their current and future lives. Immersing students into the actual process of research enabled them to (co)construct and (co)author scientific tools and knowledge and gradually situate themselves as emerging researchers. Specifically, in this project students explored the process of becoming a college student at LaGuardia Community College as they engaged in all steps of the research process while utilizing ePortfolio (a web portal) and other digital technologies.

Before our class delved into developing the research project itself, as a part of the introduction to the field of psychology, students had an opportunity to collaboratively examine the complexity of the field through an exploration of the numerous subfields of psychology and interdisciplinary connections with other scientific fields. Furthermore, students were introduced into qualitative and quantitative research method traditions, including specific research methods such as a case study, naturalistic observation, participant observation, participatory action research, interviews, surveys, and experimental studies.

After having decided on this course plan, I began by getting to know my students very early in the semester. I found out several things that helped me to fine-tune my course objectives to fit the context and needs of my students:

- despite choosing psychology as their major, the majority of the students had not explored psychology, either as a field or as a set of possible career options
- students' understanding of psychological practice was (predominantly) practicing therapy and counseling
- about 90% of psychology major students in the class were interested in clinical psychology and envisioned themselves as future therapists
- almost 100% of students were planning to transfer to 4-year colleges
- none of the students had any research experience.

These preliminary findings based on an introductory survey and class discussions only further reassured me of the importance of inspiring students' interest in expanding their understanding of psychology, including their interest in research. I aimed at introducing psychology to students not only as a field with an enormous range of subfields and possible specializations that reflect the ever-growing complexity of human activities and society, thus offering almost endless possibilities of professional interests and career options. In addition, it was essential for me to provide students with the opportunity to expand their understanding of psychology as a diverse and even divergent field that operates within a plethora of theoretical approaches that lead to diverse and even contradictory explanations of human behavior and psychological processes. I saw creating an opportunity for students to actively engage in the process of collaborative knowledge and tools production as a way of learning about the field of their choice as well as immersing them into authoring psychological knowledge. Engaging students in the actual process of research promoted their development as it enabled them not only to reproduce but actively (co)construct and (co)author scientific tools and knowledge while taking an active stance on them and gradually situating themselves as emerging researchers.

The class met twice a week for three hours in total. In addition, students also spent one hour per week in a computer lab (Studio Hour) where, under supervision of a Student Success Mentor, they focused predominantly on developing their ePortfolio and other research project related assignments.

Collaborative Inquiry Based Research Project: Becoming a researcher through exploration of the process of becoming LaGuardia college student

Through students' engagement in the research project, described in detail below, they explored the process of becoming a college student at LaGuardia, with a special focus on college readiness, as they investigated various aspects of their own and other students' personal and professional journey. A collaborative inquiry based approach allowed for the investigation of student-driven questions, thus making learning more relevant and meaningful to students. The project created a learning environment that facilitated integration of learning and development as students learned about the college and themselves as college students, while mastering and appropriating the tools of psychology and thus developing new identities, those of researchers. Importantly, the project facilitated students' exploration of practices and tools that might promote or hinder their and other students' learning and development, as they were immersed in all steps of the research process (i.e., forming a research topic

and question, searching and using scholarly resources, designing an interview, collecting data and creating a shared database, analyzing and interpreting data, writing and presenting findings and conclusions).

Personal narrative: Becoming a college student

The first assignment that introduced students into the project and its theme was writing a short paper in which students were prompted, through a series of questions, to explore and reflect on: a) their motivation for going to college, b) their future goals and aspirations, c) their experiences of transitioning from high school, d) the type of skills and knowledge they considered necessary for college, and e) what skills, knowledge, or support they had or felt lacking when enrolling in college. In general, students' experiences and feelings of being ready for college varied significantly, reflecting the diversity of LaGuardia students. Their experiences ranged anywhere from feeling unsupported, unprepared, and overwhelmed with college expectations to feeling confident and adequately prepared for college and illustrating a range of skills as well as a variety of supports they received from their surroundings. However, the majority of students reported not being prepared for college, blaming the culture in high school for infantilizing them, having low expectations of them and thus enabling their low academic performance and motivation (see Kreniske & Todorova, this volume, for more on transitioning to college). I was struck to see how many students felt that their former high schools had practically no academic expectations from them, and that they were often rewarded for just 'showing up to classes.' While these findings emerged from self-reported data, students' subjective impressions were significant to me. I also learned about students' high level of anxiety about being able to keep up with the demands of college, especially working independently at a faster pace. One of the most striking themes in their reflections was the feeling of isolation, expected self-dependence in learning process and overall individualistic notion of learning. I found these epiphanies extremely valuable as they provided me with the opportunity to learn *about* students *from* students. They inspired me to attempt to create a learning community in the classroom, in which students could experience the collaborative nature of learning, develop a sense of belonging, as well as survey and master a substantial system of support and services available at the college.

Conceptualizing college readiness

In order to understand and illustrate the role of theoretical concepts in research, I developed an assignment that led to (a) exploration of relevant concepts around our topic of interest, 'becoming a college student', (b) expansion of existing concepts and developing our own conceptualizations of the topic, and (c) application of a concept to simply organize and analyze data. First, we discussed the notion proposed by Conley (2008), a leading researcher in college readiness, that one of the most important factors determining students' success in college is college readiness, i.e. "the degree to which previous educational and personal experiences have equipped them for the expectations and demands they will encounter in college" (ibid, p3). Then, students were assigned the original article by Conley (2008), in which he proposes a broader understanding of college readiness and conceptualizes it as multifaceted set of skills, knowledge and behaviors, namely, (a) key cognitive strategies, (b) key content knowledge, (c) academic behaviors, and (d) contextual skills and awareness. Students were asked to use their personal narratives as data to which they would apply Conley's fours facets of college readiness. Specifically, they had to identify which of the facets of college readiness they described in their narratives. Students were also asked to reflect on their strengths (i.e., abilities, types of knowledge, and skills that they believe they had already mastered) and their future development (i.e., what they want to

or need to develop in regard to college readiness and becoming a successful college student). They were encouraged to use the following matrix (see Table 1) to organize their data and propose additional items that they believed would expand Conley's categories of college readiness. This experience introduced students to the process of analyzing data (organizing items according to Conley's or their own categories or codes) by applying a conceptual tool (Conley's four facets of college readiness).

Table 1. *Conley's Facet of College Readiness*

Conley's Facets of College Readiness	**My Personal Narrative** (examples from my personal narrative)	**My Strengths** (what are my strengths)	**My Future Development** (what I want to /need to develop, learn etc.)
Key cognitive strategies			
Key content			
Academic behaviors			
Contextual Skills & Awareness			
Additional items (not included in Conley's version of CR)			

Many students struggled to produce generalizations and labels that would represent their concrete experiences and operated predominantly on the level of concrete examples (e.g., entering a detailed description of their time management skills instead of referring to 'management skills'). We addressed this issue in a class discussion where students reflected on and demonstrated the kind of analysis that working with data involves, including making generalizations (i.e., inferences from specific cases), as one of the goals of research. We also discussed their opinions about Conley's categorization and understanding of college readiness as well as their ideas of potentially expanding the concept while bringing in their lived experiences and funds of knowledge. As a key component of the class, students deliberately and consciously reflected on their own assumptions, distinguished between personal opinions and conclusions based on evidence from the data and using theoretical concepts, and started to position themselves as emerging researchers producing and authoring knowledge.

Research question design

After our inquiries into personal experiences and theoretical conceptualizations of college readiness, we started to draft research questions. Students were quite amazed, though at times frustrated, at how unexpectedly lengthy and complicated this process is. Occasionally, the frustration from continuous revision of research questions led to resistance or even disengagement of some students. In these situations, I did not persist on their formulating a perfect (or even workable) research question, and we took a break, turned to a simpler task or just moved forward in order to maintain students' engagement. Although theirs were far from well-articulated research questions, students were able to formulate more focused research topics. As described in the following sections, we returned to designing and finalizing research questions later in the process.

Finding sources and creating a collection of relevant resources

One of the institutional requirements of the FYS was for students to participate in two library workshops that would introduce them to library resources and literature searches with relevant databases. Workshops were integrated into our research project and in the workshops students used academic databases to find at least one article related to our topic of 'Becoming a College Student' (e.g. college readiness, learning in 21st century, college culture, etc.). Students posted the papers online on Blackboard and thus, the class created a collection of articles relevant to our research project that students could refer to throughout the semester.

Collective interview design

Based on students' research interests and initial research questions, we agreed that an interview would be the best research method to generate data. We revisited interview research methods, with a focus on qualitative interview design (Turner, 2010) and discussed it in further detail within the context of our research project. Our goal was to develop one collective semi-structured interview that could be used to interview LaGuardia students. I suggested that each student would interview one LaGuardia student using the same interview protocol so we would build a database that the class would have access to.

Students developed more focused research topics based on personal interest within our general theme of becoming a college student (e.g., students' support system and their academic achievements, gender and ethnic differences in college readiness, levels of stress and anxiety) and started to develop interview questions around those topics in small groups. We started with the relatively modest goal of ten interview questions relevant to the topic. Although students generated questions quickly and easily, they often did so without careful reflection. Consequently, their questions were repetitive, focused only on demographic characteristics, failed to reflect their research topics, or simply suffered from common interview mistakes (e.g., biased, suggestive, or double-barreled questions) that we discussed and addressed in earlier assignments. Interview design was a lengthy process and several additional assignments were developed to provide more elaborate scaffolding as students struggled to design questions that would potentially generate data conducive to finding some answers to their research questions. Many students struggled to understand the difference between research questions and interview questions. After building the additional scaffolding into exercises that required students to systematically revise their questions, each group of students developed simple interview protocols on their topics. Finally, based on students' proposed questions, I drafted an interview protocol and students provided feedback and commented on the draft. The final interview included questions on expectations and future goals; differences between high school and college; transitions, changes and

adjustments; college readiness; international students; support and services at LaGuardia; managing college and interests; and recommendations for high-school students, high school teachers, and LaGuardia students and faculty. Overall, the interview design process turned out to be a great learning experience and opened opportunities to incorporate discussions on several important topics in psychology. For example, when designing the interview introduction, we considered who would be our participants, the recruitment process, and the kind of questions about participants' demographic characteristics we would need to include. We discussed and questioned the differences between gender and sex, and race and ethnicity. As a result of the discussion, students decided to expand a traditional dichotomized categorization of gender and include the third choice for 'other' that students considered as the most inclusive.

By this point students formed more stable partnerships and small groups that emerged around their research interests. Students' continuous work promoted deeper and more meaningful collaboration and sense of community, and sub-communities. This was particularly visible while students were designing and especially rehearsing the interviews among themselves. They not only practiced an important research skill, and often had a good laugh, but also got to know each other better and formed closer relationships.

Data collection and data entry

Given that the students were interested in learning from LaGuardia students about their experiences of transitioning from high school, how they manage the demands of college, and what promotes or hinders their success, we decided to recruit full-time LaGuardia students who were, at least, in their 3rd semester of study. Before conducting the actual interviews, students practiced interviewing in class using the final version of our interview. We paid special attention to skills of listening, note taking, and probing during the practice. Students developed their own lists of probes to use during the actual interview. We also discussed possible strategies to use in approaching potential interviewees and ethical issues around conducting an interview. Although we did not obtain IRB approval for our project, we discussed the purpose and the steps of the process. While the practice of interviewing was supposed to at least minimally prepare students and build their confidence, in some students the practical experience led to a build-up of anxiety as they realized the complexity of the process. I believe that such emotional reactions were also due to the students' developing sense of ownership of the project and bearing the responsibility as the authors of the knowledge being produced. Therefore, in my concluding words of advice, I tried to ease their concerns and point out the fun aspect of interviewing by encouraging them to enjoy the process and simply focus on the opportunity to talk to and learn from their fellow students.

Each student interviewed one LaGuardia student, took notes during the interview and wrote up field notes. The interview was designed to take about thirty minutes, but students reported their conversations took anywhere from fifteen minutes to one hour. Students had a lot to share after the interviews and reported mostly positive experiences. They made many insightful observations in their field notes and in the follow-up class discussion about the interview, including observations about themselves as researchers. I was particularly pleased that many students recognized mistakes that they had made, and appreciated the interview as a learning experience, and positioned themselves as researchers rather than as students completing the instructor's assignment.

During the Studio Hour with assistance of their Student Success Mentor students entered data into a spreadsheet, which they shared as a google document accessible to all students. Once the dataset was (almost) complete with entries (a small number of students failed to interview or enter the data into the database), most of the students felt a great sense of accomplishment. They were quite impressed with the result of our collective efforts while acknowledging its shortcomings (missing, incomplete data, etc.). Generating the dataset was indeed one of the high points of the project for all of us. I personally felt that developing the database was worth the effort and energy invested into the project up to this point.

Refining the research question

Students examined the dataset and were asked to revise their research questions, identify the participants they would focus on, and choose specific interview questions and respective data to analyze within the dataset. The richness of our collective database allowed students to focus on a specific topic of their choice and include in their analysis relevant research participants from our pool. Therefore, the scope of database allowed not only for a great variety of research topics but it also provided opportunities to develop unique projects at various levels of complexity and sophistication, based on students' individual zones of proximal development (Vygotsky, 1978); in other words, based on students' potential for achievement relative to the extent and quality of instructional support provided.

Although the process of designing a research question *after* the data were collected did not represent a typical order of steps taken in the research process, availability of data allowed for meaningful and targeted revisions of students' research questions, as they were able to 'test' if their question was investigable given the availability of data. Many students came up with interesting questions, though many of those were impossible to answer given the data available. The concreteness and immediateness of data helped students to reflect on their potential questions and their applicability in relation to the data. For example, several students were interested in pursuing a line of research around retention and wanted to find out why so many students (40%) drop out of LaGuardia college in the first semester, a fact that we found out about LaGuardia students early on in the semester. Only after reviewing the data they realized that our dataset neither includes anybody who dropped out of college in the first semester, nor any data about whether the interviewed students have ever thought of, or were close to, dropping out of college, and for what reasons.

Thematic data analysis and findings

Students were introduced into thematic data analysis (Braun & Clarke, 2006; Clarke & Braun, 2013) as one of the most flexible, relatively easy, and accessible methods for novice researchers to learn (Braun & Clarke, 2006). Thematic analysis is also recommended as the first qualitative method of analysis that researchers should learn, as it provides the key skills that can be useful for conducting any other type of qualitative analysis (ibid).

All the steps of the process of analysis were modeled on several examples, with a special focus on identifying patterns and themes across a dataset. Students also worked with a small subset of data from our dataset to practice data coding and looking for emerging themes. Subsequently, they had the opportunity to analyze their individual subsets of data in class and in the Studio Hour.

Final paper and oral presentation

Students were provided with a detailed outline for writing a final paper based on their collective inquiry project. Students also developed a brief PowerPoint presentation that was presented in class in which

they focused on (a) the rationale and context of their project and research question, (b) a description of the participants and data subset they focused on in their analysis, and (c) synthesis of their findings and conclusions.

Even though many students used college readiness as a central concept to explore their research questions, their projects were unique. Each student focused on a particular aspect of the overall theme or chose a different set of participants. The final presentations provided students with opportunities to compare their findings and understand that, depending on their choice of participants from the dataset, their conclusions could be different and even contradictory despite exploring the same question. Having such opportunity helped students gain a deeper understanding of authoring and producing knowledge, the dynamic, value-laden, and culturally based nature of scientific knowledge, as well as the necessity of articulating and providing rationale for their choice of research question and research participants.

As we progressed with in-class presentations, students improved their ability to ask challenging questions with increasing levels of professionalism and collegiality. Students increasingly expanded their understanding of how we can learn from mistakes. Any errors or limitations that surfaced during the students' presentations allowed the class to engage in meaningful learning while reflecting on their own performance as researchers, raising new questions and possibilities for further research. Thus, the follow-up discussions became a rich learning experience for the class in terms of further extending students' learning about their peers, college, and the research process.

Although the students were increasingly producing and authoring knowledge throughout the whole semester while working on this project, their authorship was fully materialized in these two stages of the project, their final papers and presentations. For the majority of the students this was not only their first research project but also their first time publicly presenting their work and using PowerPoint. Not all students followed through with all the requirements and three (out of twenty-four) even failed to present. However, most students clearly demonstrated personal and professional growth, as will be illustrated below with specific examples.

Students' findings and conclusions: Students' authorship of learning and development

While I do not present quantitative data on assessment and students' accomplishments, the following reflections on students' analysis and conclusions illustrate what they, as novices to psychology and research, were able to achieve.

Taken together students' findings revealed their development as college students and emerging researchers. Overall, the complexity of students' findings and the sophistication of their synthesis depended on the depth and extent of their analysis. Although some students stayed mostly on a descriptive level, they were able to engage in comparing and contrasting participants' opinions and experiences and juxtapose those with their own. Even such minimal analysis enabled them to reflect on at least some aspects of the research process and the process of becoming a college student, develop their engagement with the discipline, and investigate social practices of the institution. However, as it became evident to all students during the presentations, those students who applied thematic analysis and other conceptual tools to interpret their data made great progress in critically examining the data and interrogating their own and institutional practices.

For instance, a student who chose to study gender differences in stress among students found out that male students who participated in our study reported a higher level of stress than female students. This

was a surprising finding to most of the students as it contradicted their initial belief that "females are more stressed because they are more emotional." This student also found out that male students were better in seeking support and coping with stress by, for instance, engaging in leisure activities, whereas female students tended to interiorize the stress and dealt with it individually and internally. The student situated her findings within the body of literature on levels of stress in college students and compared it with several studies that either supported (Misra & McKein, 2000) or contradicted her findings (Allen & Hiebert, 1991). She also explored possible explanations for such discrepancies. Importantly, the student discussed the significance of her findings in the context of LaGuardia college, for instance by relating it to existing support and services and making further recommendations for students, faculty, and the institution (e.g., to provide relevant and differentiated services and support for female and male students, involve the Women's Center in approaching female students in dealing with stress, promote peer support groups for students dealing with stress).

Another student, using Conley's four facets of college readiness (2008), analyzed LaGuardia students' understanding of college readiness, with a particular focus on types of knowledge and skills outlined in Conley's model. Based on his findings, the student researcher concluded that participating students' understanding of college readiness has not changed substantially over time. Rather, it remained relatively limited and consisted primarily of key content knowledge (e.g., writing and math), and some academic behaviors (e.g., self-management including time management, persistence, and study skills). Most of the students did not include key cognitive strategies (e.g., analysis, interpretation, and problem solving) and contextual skills and knowledge (e.g., college tuition and the financial aid system, culture of college) into the repertoire of practices important for being a successful college student. Congruently, he found out that the students' perception of knowledge was represented solely and exclusively in terms of content knowledge without any reference to higher order thinking skills and appropriation of social practices relevant for successful study and graduation, thus reflecting students' limited understanding of knowledge and learning in general. Based on his analysis, the student suggested that the majority of participating students related to learning as an individualistic endeavor based on meritocratic principles. Reflecting on his findings and drawing on previous conversations about the nature of knowledge as a collaboratively constructed process, the students in class engaged in lively reflections on their learning experiences and attitudes to learning, as well as on the teaching practices of their instructors. These reflections led to discussion of what college education could and ought to be in order to expand students' understanding and experiences of learning and knowledge beyond such a limited view.

The last example represents a collection of findings that resonated in a number of students' presentations and led to one of the richest discussions. Several students explored interviewees' college readiness and learning experiences. They reported that LaGuardia students participating in our study felt underprepared and not college-ready when coming to LaGuardia, a finding that confirmed students' own experiences. Additionally, students also inferred that even if participating students initially did not feel college ready, they "grew into it", illustrating such developmental trajectories with data-based evidence. Collective sharing of such findings resulted in students' new understanding of college readiness as a *process* rather than as an individual attribute to *have*, which students somehow acquire during high school. Such reflection stood in striking contrast to their initial understanding of college readiness as explored in their personal narratives at the beginning of the project.

Moreover, students, by analyzing participants' experiences through the lenses of theoretical tools and surveying institutional practices (e.g., advisement, services and resources available), started to increasingly challenge their original individualistic and meritocratic notion of learning and to acknowledge learning as a social and collaborative process. For example, by discovering the extent of academic support available (tutoring, writing center, etc.), expanding their own study habits (creating study groups and other collaborative strategies), reflecting on the collaborative nature of learning in our and other classes, and learning from the experiences of their peers, students recognized that as learners they are not independent and solitary actors in the learning process (for more on collaborative learning, see Schnieder, this volume; Sawyer & Obeid, this volume). They acknowledged learning as an *inter*dependent activity embedded in sociocultural and historical contexts. Students were able to situate their own learning and development in the context of social practices that foster or inhibit them. For instance, they recognized the wealth and limitations of services and support at LaGuardia (e.g., diverse programs and initiatives promoting students' learning and graduation versus their limited access beyond business hours), the ever-increasing cost of education and living in New York City, and the context of their everyday lives (e.g., parenthood, long commute to school, employment, poverty, immigration status).

Conclusions

As illustrated above, the implementation of Transformative Activist Stance (Stetsenko, 2008, 2016) and critical-theoretical pedagogy (Vianna & Stetsenko, 2011; this volume) in the FYS class facilitated integration of learning and development as the project enabled students to (a) critically appropriate conceptual tools (e.g., employ Conley's model of college readiness, co-design an interview protocol as a research method, apply thematic analysis); (b) position themselves within the discipline of psychology as researchers; and (c) critically explore their positions within LaGuardia college as learners and contributors to social practices, including interrogating and challenging some of the tools and cultural practices typical of college and the broader sociocultural contexts of their lives. In contrast to the activities rooted in constructivist principles that allow students to *participate* in community practices and gain understanding of the socially produced nature of psychological knowledge, this project, inspired by the Transformative Activist Stance approach, promoted students' *contribution* to developing and co-creating conceptual tools and social practices. Importantly, as the students explored themselves and other LaGuardia students in the context of becoming college students, they actively *positioned themselves towards the future*, as individuals *becoming* successful college students, researchers, and psychologists. This inquiry included exploration of what their future at the college and beyond could and should be, for instance, by interrogating institutional practices and providing recommendations for future and current LaGuardia students, instructors, and the administration of the college.

My overarching goal for this class was to implement a student-centered approach that de facto engaged students in agentive learning. To this effect, I sought to collaboratively implement a curriculum to capitalize on students' interests and previous knowledge and give them voice and tools for authoring knowledge. Following the Transformative Activist Stance, what my approach adds is the focus on equipping students with *tools* with which they can act upon the world and take a *stand* from which they can change it. I hope that by engaging students in this project we collaboratively took the first steps towards this ever-expanding goal.

References

Allen, S., & Hiebert, B. (1991). Stress and coping in adolescents. *Canadian Journal of Counselling*, *25*(1), 19-32.

Baxter Magolda, M. B. (1999). *Creating contexts for learning and self-authorship: Constructive-developmental pedagogy*. Nashville, TN: Vanderbilt University Press.

Baxter Magolda, M. B. (2004). *Making their own way: Narratives for transforming higher education to promote self-development*. Sterling, VA: Stylus Publishing, LLC.

Baxter Magolda, M. B., & King, P. M. (2004). *Learning partnerships: Theory and models of practice to educate for self-authorship*. Sterling, VA: Stylus Publishing, LLC.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist*, *26*(2), 120-123. http://eprints.uwe.ac.uk/21155

Conley, D. T. (2008). Rethinking college readiness. *New England Journal of Higher Education*, *22*(5), 24-26.

Keeling, R. (Ed.). (2004). *Learning reconsidered: A campus-wide focus on the student experience*. Washington, DC: American College Personnel Association and National Association of School Personnel Administrators.

Kegan, R. (1994). *In over our Heads: The mental complexity of modern life.* Cambridge, MA: Harvard University Press.

Kuh, G. (2008). *High impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges & Universities.

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, *16*(1), 41-51.

Stetsenko, A. (2008). From relational ontology to transformative activist stance: Expanding Vygotsky's (CHAT) project. *Cultural Studies of Science Education, 3*, 465–485. doi:10.1007/s11422-008-9111-3

Stetsenko, A. (2014). Transformative activist stance for education: Inventing the future in moving beyond the status quo. In T. Corcoran (Ed.), *Psychology in education: Critical theory & practice* (pp. 181-198). Rotterdam, The Netherlands: Sense Publishers.

Stetsenko, A. (2016). *The transformative mind: Expanding Vygotsky's approach to development and education*. New York, NY: Cambridge University Press.

Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigators. *The Qualitative Report*, *15*(3), 754-760.

Vianna, E., & Stetsenko, A. (2011). Connecting learning and identity development through a transformative activist stance: Application in adolescent development in a child welfare program. *Human Development, 54,* 313-338. doi:10.1159/000331484

Vianna, E., & Stetsenko, A. (2014). Research with a transformative activist agenda: Creating the future through education for social change. In J. Vadeboncoeur (Ed.), *National Survey of Student Engagement, 113*(2), 575–602.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological functions*. Cambridge, MA: Harvard University Press.

Chapter 20: Using Blogs to Engage First-Generation College Students

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Abstract

Only a fraction of low-income and first-generation students earn a Bachelor's degree within six years of enrolling in college, and many leave college before even completing their first year. The challenge for educators lies in designing courses that engage and support first-generation students. We first present the theoretical and empirical evidence for using blogs in college courses and examine how blogs provide an engaging medium for students to think through challenging questions, support their peers, and acquire cultural capital. We conclude with the description of a blogging activity that could be adapted for a variety of courses. While first-generation students in particular may benefit, we believe educators can better engage all of their students by integrating interactive digital writing, like blogs, into their courses.

Introduction

Research consistently shows that even among students with comparable academic records, socioeconomic status (SES) is a powerful predictor of who will complete college (Hudley, Moschetti, Gonzalez, Cho, Barry, & Kelly, 2009; Pascarella, Pierson, Wolniak, & Terenzini, 2004). In fact, from 2004-2009 only 11% of low-income and first-generation students earned a Bachelor's degree within six years, compared to 54% of the general population (Wine, Janson, & Wheeless, 2011). Comparing income levels of graduates and non-graduates is one approach for measuring the importance of a college degree: College graduates from low-income backgrounds earn more than their non-graduate peers, and a college degree is an important factor for upward social mobility (Torche, 2011). The challenge for educators lies in designing and implementing support systems that can help youth succeed in their courses and complete college.

In this chapter we examine how blogs can function as one type of support system for students in their first year of college (Kreniske, in press), and offer guidance to educators seeking to create similar digital contexts for learning. We detail three main benefits for incorporating blogs into college courses: First, blogs encourage students to use writing to make sense of their transition to college experiences (for more on becoming a college student, see Podlucka, this volume). Second, blogs provide a space for students to create a digital community of support. Third, as students share advice and exchange ideas the blog can become a space for accumulating and disseminating cultural capital. Social and cultural capital theory (Bourdieu, 1986; Coleman, 1988) considers social networks and the resources those networks provide as key in facilitating access to activities and opportunities. Although teaching and learning with blogs may enhance the college experience for all students, throughout the chapter we will focus on how blogs can be an especially important tool for first-generation college students.

We illustrate these three benefits with examples drawn from a study by Kreniske (2016) where 66 low-income students, 63% of whom were first-generation college students, blogged about their transition to

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college experiences in a first-year seminar at an urban four-year college. We will then present a second blogging activity and examples from a psychology research methods course (taught by Todorova) at a different four-year urban college. Where relevant, individual students will be referred to by their self-selected pseudonyms and other than inserting an *X* in place of the college name all student narratives appear without any spelling or grammatical adjustments. While these activities are intended for use in a digital writing space they could also be completed using pen and paper. As we will show the digital platform allows for the generation of a supportive community and functions as a collection of cultural capital that current and future students may draw from.

In setting up your course, there are many blogging platforms to choose from and we recommend checking with your university colleagues and department to see if there is an existing campus platform. One benefit of using an existing campus platform is that faculty and students can elicit support from colleagues and college technical support staff. If there is not an existing digital writing platform at your university, WordPress.com is the most widely used blogging software, and it is free and open source. Another easy-to-use free blogging software is Blogger (operated by Google). For further discussion of course design, blogging platforms, and privacy settings, see Henninger and Neal (2012).

What's a Blog Anyway?

While blogs take a number of forms, they most often consist of personal opinion pieces organized as dated entries, called *posts*, which are presented in reverse chronological order (Bukvova, 2011; Powell, Jacob, & Chapman, 2012). Posts are generally text-based and often include images and hyperlinks to other websites and blogs. Once an author *publishes* a post readers are then able to view and write comments on the post. Some posts and subsequent comments may appear synchronously, almost like an instant message communication, while other posts and subsequent comments occur asynchronously (Bolander, 2012). Blogs are often used as a space for narrators to express their thoughts and values about particular topics (Gee, 2007). For example, Sosnowy (2013) showed how bloggers wrote about their experience with multiple sclerosis, Greene (2013) focused on bloggers who wrote about teaching in the New York City public schools, and Ducate and Lomicka (2008) described the ways students blogged about shared values in a college language class.

While blogs are one type of social media, they differ from platforms like Facebook and Twitter in two main ways: first, the opportunities for interaction are more limited and structured on a blog. Second, blogs generally place more emphasis on longer written texts, with a typical post being more than 500 words, as opposed to Twitter where writers are limited to 140 characters. Though Facebook does not have the same limitations, the average post is around 122 words (Cvijikj & Michahelles, 2011). The structured nature of interactions and the emphasis on longer written texts make blogs an ideal environment for college learning and especially for use with first-generation students.

For contemporary college students, blogs offer a writing and communication space that is reminiscent of other familiar social media platforms. Blogs occupy a space somewhere in between the freewheeling environment of other social media where there are seemingly infinite possibilities for audience interactions and the, at times constraining, prescriptions of academic writing where the audience is often restricted to an instructor. It is in this middle ground that students who have had less access to formal writing instruction can develop as writers on a course blog and where instructors can create a variety of writing assignments. In this chapter we show how blogs are uniquely suited for fostering sense-making through reflective and academic writing for first-generation students.

Sense-Making on Blogs

Literacy and other educational psychological researchers have long understood the process of writing as a powerful tool for sense-making (Berthoff & Stephens, 1988; Daiute & Nelson, 1997; Emig, 1977; Fulwiler, 1983; Lucic, 2013). Sense-making relates to figuring out the relationship between one's self and one's relation to a surrounding context. For example, a student entering college must reconcile, or make sense of, past life experiences in relation to college life. What are the rules, the social mores, the expectations of this new place, and how do *I* as a newcomer fit in? Many first-generation college students also have to adapt to cultural and linguistic transitions as they enter higher education, which can make the assimilation to and completion of college difficult (Francis, Kelly, & Bell, 1993; Rose, 1989).

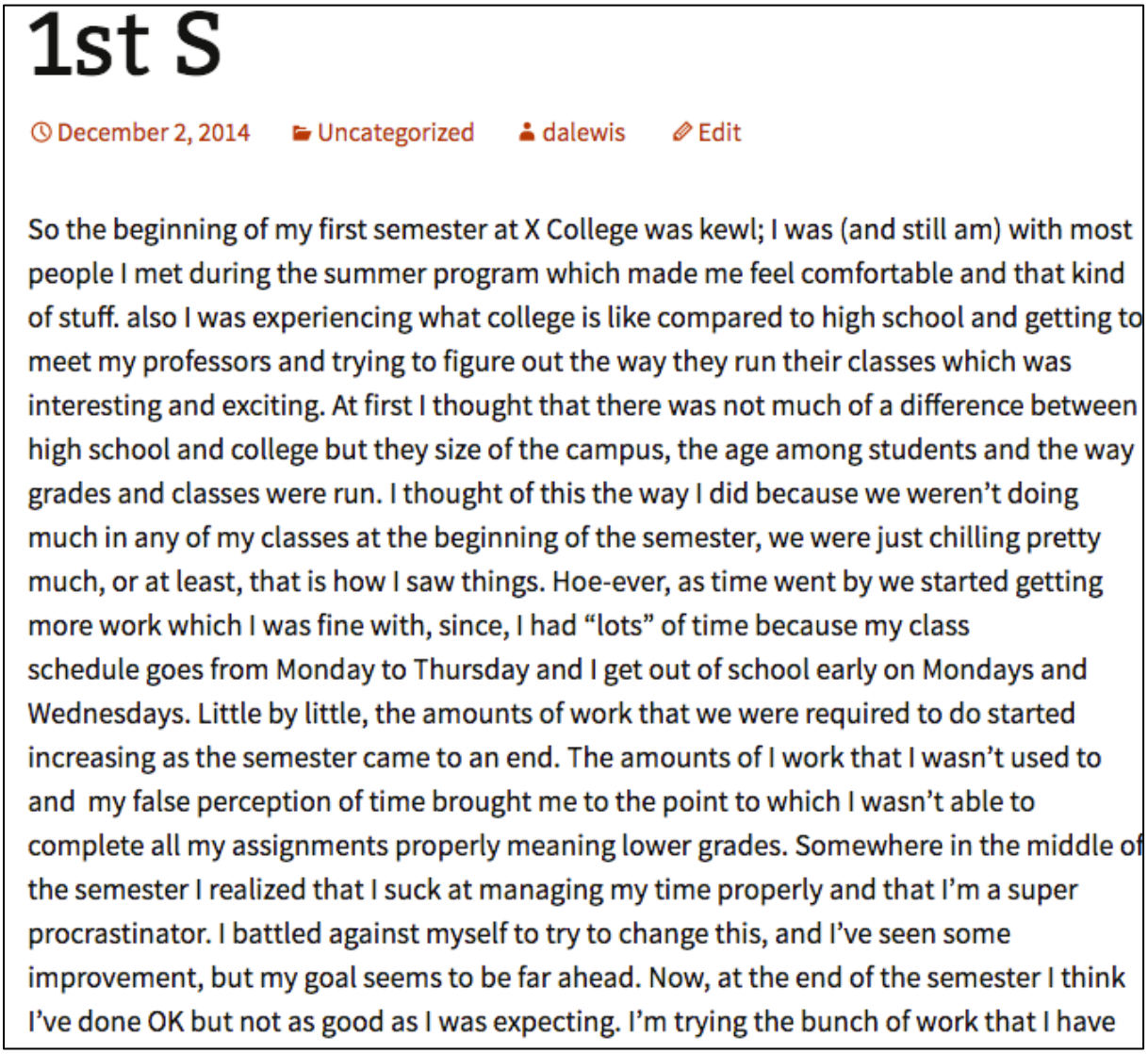
Cultural and linguistic transitions involve learning new practices of interaction and communication. For example, as detailed shortly, one first-year, first-generation, low-income student who self-selected the pseudonym dalewis wrote about adjusting to the way that "professors run their classes." Other students wrote about adjusting to the way of speaking and communicating at college and this was particularly challenging for students who were English language learners (Kreniske, in press). Writing about one's thoughts and emotions through difficult transitions can serve as a tool for figuring them out. While there are many demands on the time and attention of first-year students, by integrating expressive writing into first-year curricula, college educators can foster the type of physical and psychological environment that encourages first-generation students to make-sense of their initial thoughts and emotions regarding the transition to college.

The following is an example of one such prompt, adapted from Walton and Cohen (2011), which encouraged students to make sense of their transition to college:

> I invite you to tell a story about your first semester at college. Research has shown that during the first semester students often worry about whether or not professors and other students at their college will accept them, and how eventually students become comfortable there and find a family of people with whom they are close and feel they belong. Please describe how you have experienced your first semester at college. Be sure to illustrate your writing with examples from your own experiences in classes, seminars, lectures, study groups, and labs. What happened? How did you and others involved think and feel? How did that day turn out? You can take as much time as you like and try and write around 300-800 words. We hope this process will help you think about your transition experience. Once you have finished writing you will have time to read and comment on your classmates' stories. In addition, to help them understand what to expect your work may be provided, anonymously, to incoming students next year.

Writing during a first-year seminar course in response to this prompt dalewis articulated this process, see Figure 1. In this post, dalewis is making sense of the difference between his prior educational experiences in high school and the demands of a four-year college. In particular, he focuses on his understanding of time management. He explains that he now realizes that "I suck at managing my time properly and that I'm a super procrastinator." In this post dalelewis is reconciling his past educational experiences, such as high school, with the demands of college. In high school students complete much of their work in structured classes that meet daily. In contrast, college courses require students to complete much of their work outside the classroom and generally meet only once or twice a week. Dalewis used this post to think metacognitively about his approach to college. Through this writing

activity dalewis identified and made sense of one element of his academic struggles and then "realized" some approaches for improving.



1st S

December 2, 2014 Uncategorized dalewis Edit

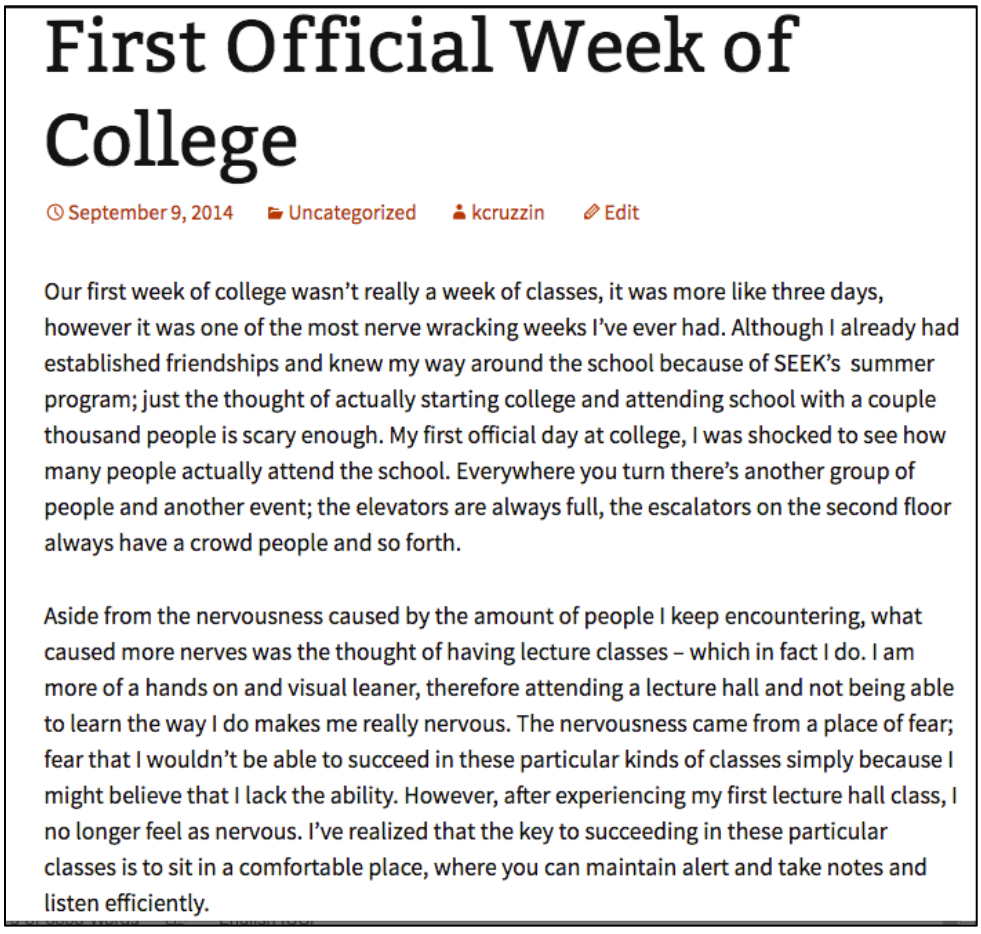
So the beginning of my first semester at X College was kewl; I was (and still am) with most people I met during the summer program which made me feel comfortable and that kind of stuff. also I was experiencing what college is like compared to high school and getting to meet my professors and trying to figure out the way they run their classes which was interesting and exciting. At first I thought that there was not much of a difference between high school and college but they size of the campus, the age among students and the way grades and classes were run. I thought of this the way I did because we weren't doing much in any of my classes at the beginning of the semester, we were just chilling pretty much, or at least, that is how I saw things. Hoe-ever, as time went by we started getting more work which I was fine with, since, I had "lots" of time because my class schedule goes from Monday to Thursday and I get out of school early on Mondays and Wednesdays. Little by little, the amounts of work that we were required to do started increasing as the semester came to an end. The amounts of I work that I wasn't used to and my false perception of time brought me to the point to which I wasn't able to complete all my assignments properly meaning lower grades. Somewhere in the middle of the semester I realized that I suck at managing my time properly and that I'm a super procrastinator. I battled against myself to try to change this, and I've seen some improvement, but my goal seems to be far ahead. Now, at the end of the semester I think I've done OK but not as good as I was expecting. I'm trying the bunch of work that I have

Figure 1. Screenshot of dalewis's blog post where he makes-sense of his first semester and the transition from high school to college.

Peer-to-Peer Connecting on Blogs

The fundamental difference between conventional word-processing software and interactive writing media like blogs is that when using a blog the writing is created on, and then shared, via the Internet. It is this Internet-based composition that creates the potential for the immediate sharing of, and commenting on writing, which is what distinguishes blogs and other interactive writing platforms from conventional word processing software (McFarland & Ployhart, 2015). Further, many students can read and comment on classmates work concurrently. Due to the interactive features of the blog, students can read and respond to their classmates' writing and this allows for the formation of supportive communities (Kreniske, in press).

Urban colleges, such as those referenced in this chapter, often have small campuses with few students living in dorms and many residing with family and commuting to school. These contextual factors pose challenges for students and faculty seeking to develop a physical community. As Benkler (2006) notes, blogs provide an environment where individuals can use writing to explore social possibilities and create dynamic relationships in a digital space. These relationships are formed as students write about meaningful topics and their peers respond with comments. For example, Kreniske (in press) detailed how one first-generation, first-year student felt incredibly shy and isolated during her first week at college. Her peers responded to her post with encouraging comments and offered her strategies for making social connections. Such interactions were not possible, or were at least cumbersome, with previous writing media such as the word processor. These interactions may be one reason that researchers have found that blogging contributes to positive emotional development (Baker & Moore, 2008; Bane, Cornish, Erspamer, & Kampan, 2010; Boniel-Nissim & Barak, 2011; Ko & Kuo, 2009; Schmitt, Davanim, & Matthias, 2008; Sosnowy, 2013) and perhaps cognitive development as well (Davidson, 2011; Ducate & Lomicka, 2008; Fishman, Lunsford, McGregor, & Otuteye, 2005).



First Official Week of College

September 9, 2014 Uncategorized kcruzzin Edit

Our first week of college wasn't really a week of classes, it was more like three days, however it was one of the most nerve wracking weeks I've ever had. Although I already had established friendships and knew my way around the school because of SEEK's summer program; just the thought of actually starting college and attending school with a couple thousand people is scary enough. My first official day at college, I was shocked to see how many people actually attend the school. Everywhere you turn there's another group of people and another event; the elevators are always full, the escalators on the second floor always have a crowd people and so forth.

Aside from the nervousness caused by the amount of people I keep encountering, what caused more nerves was the thought of having lecture classes – which in fact I do. I am more of a hands on and visual leaner, therefore attending a lecture hall and not being able to learn the way I do makes me really nervous. The nervousness came from a place of fear; fear that I wouldn't be able to succeed in these particular kinds of classes simply because I might believe that I lack the ability. However, after experiencing my first lecture hall class, I no longer feel as nervous. I've realized that the key to succeeding in these particular classes is to sit in a comfortable place, where you can maintain alert and take notes and listen efficiently.

Figure 2. Screenshot of kcruzzin's emotion laden blog post that elicited supportive peer comments.

In one cohort of first-year, low-income college students Kreniske (in press) documented how students used the interactive features of the blog over time to develop a culture of commenting. Kreniske showed that the students who were expressing the most intensely emotional and psychological experiences received the most peer comments. Students often used the comments to affirm the ideas and emotions communicated in the original writing. For example, kcruzzin wrote the following about her first week in classes, see Figure 2. Kcruzzin begins her post by writing that this was "the most nerve wracking weeks I've ever had." In her second paragraph, she notes her *nerves* and related feelings of nervousness a number of times and then connects these feelings with the challenge of learning in the lecture hall environment. In response, her classmates empathized with the emotions of nervousness communicated in this post and commented with the following, see Figure 3.

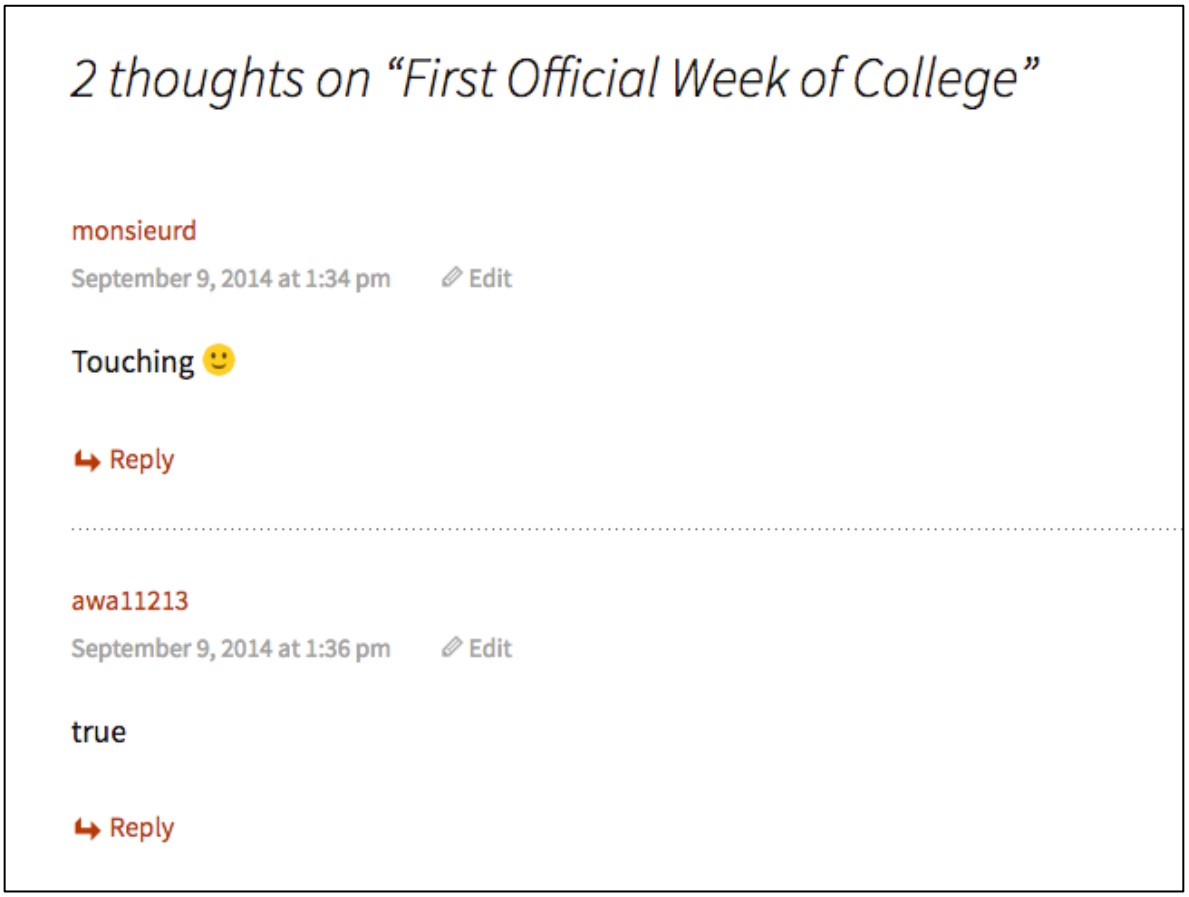
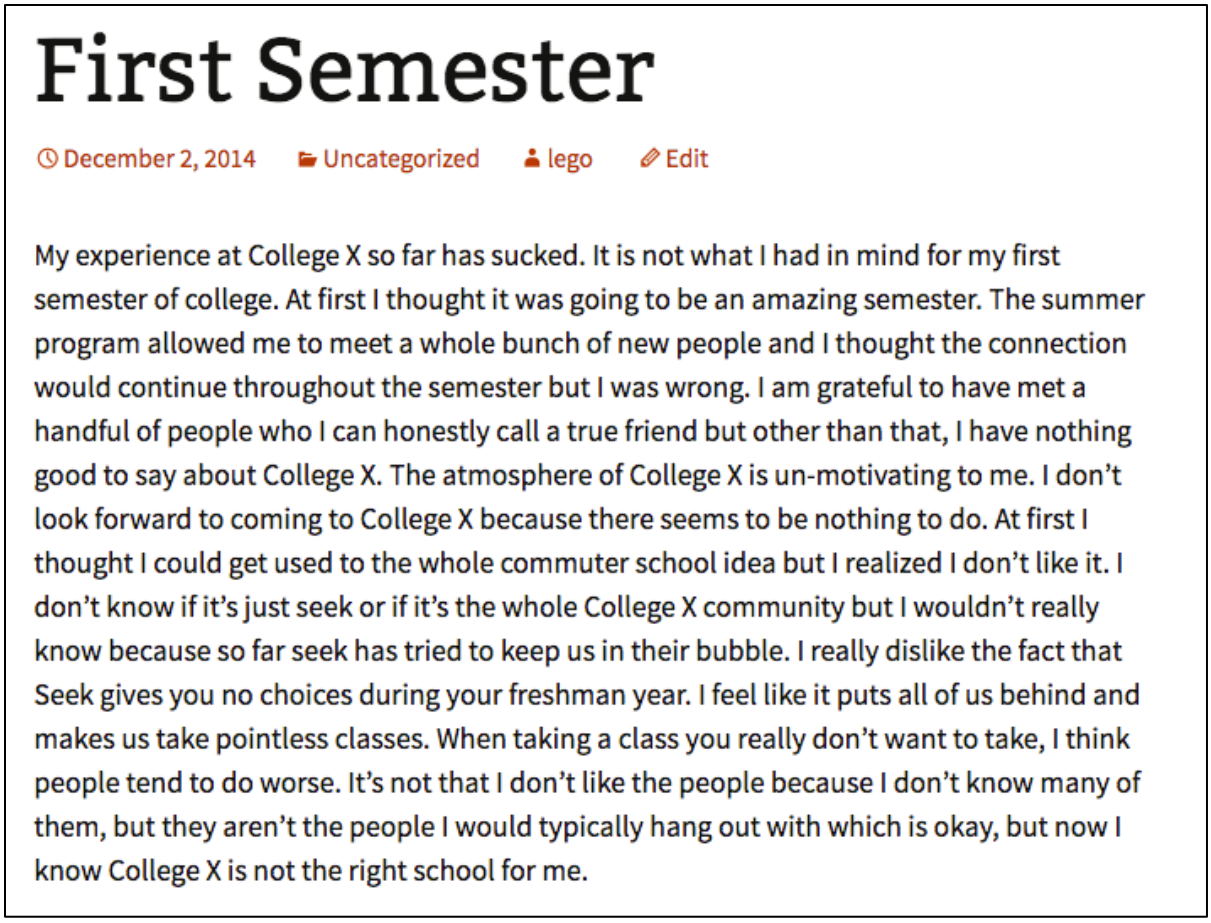


Figure 3. Screenshot of supportive peer comments written in response to kcruzzin's blog post.

Many first-generation students feel as though they are alone, or that they are the only ones who are feeling uncomfortable or struggling to adjust (Francis et al., 1993; Howard, 2003; Kreniske, in press; Rose, 1989). While these comments may seem like minimal responses, they showed kcruzzin that she was not alone and that her peers shared similar emotions and nerves. Further, the peers who wrote these comments were likely relieved to see that kcruzzin had articulated feelings that they too shared and could relate with.

Another student with the pseudonym lego wrote an emotionally charged post about his challenging first semester, see Figure 4.



First Semester

December 2, 2014 Uncategorized lego Edit

My experience at College X so far has sucked. It is not what I had in mind for my first semester of college. At first I thought it was going to be an amazing semester. The summer program allowed me to meet a whole bunch of new people and I thought the connection would continue throughout the semester but I was wrong. I am grateful to have met a handful of people who I can honestly call a true friend but other than that, I have nothing good to say about College X. The atmosphere of College X is un-motivating to me. I don't look forward to coming to College X because there seems to be nothing to do. At first I thought I could get used to the whole commuter school idea but I realized I don't like it. I don't know if it's just seek or if it's the whole College X community but I wouldn't really know because so far seek has tried to keep us in their bubble. I really dislike the fact that Seek gives you no choices during your freshman year. I feel like it puts all of us behind and makes us take pointless classes. When taking a class you really don't want to take, I think people tend to do worse. It's not that I don't like the people because I don't know many of them, but they aren't the people I would typically hang out with which is okay, but now I know College X is not the right school for me.

Figure 4. Screenshot of lego's dissatisfied blog post that elicited supportive peer comments.

Lego is clearly expressing his dissatisfaction with his first semester in college. He writes that college has "sucked so far," and notes a number of aspects such as the commuter school environment that he does not like. In response three different peers offered comments of support and empathy, see Figure 5.

In his post lego communicated deep dissatisfaction with his first-semester in college. In response, three different peers offered supportive comments that vary in complexity from the simple "feel better" sentiment to a complex engagement with a variety of the details and logistical assertions made by lego.

The potential for students to read and comment on peers' expressive writing created an environment where students could develop a supportive community during the challenging transition to college. In addition, writing about these experiences on the cohort blog created a collection of shared experiences and knowledge about the first year in school where dalewis, kcruzzin, and even lego communicated some of the dos and don'ts for being successful in the first semester of college.

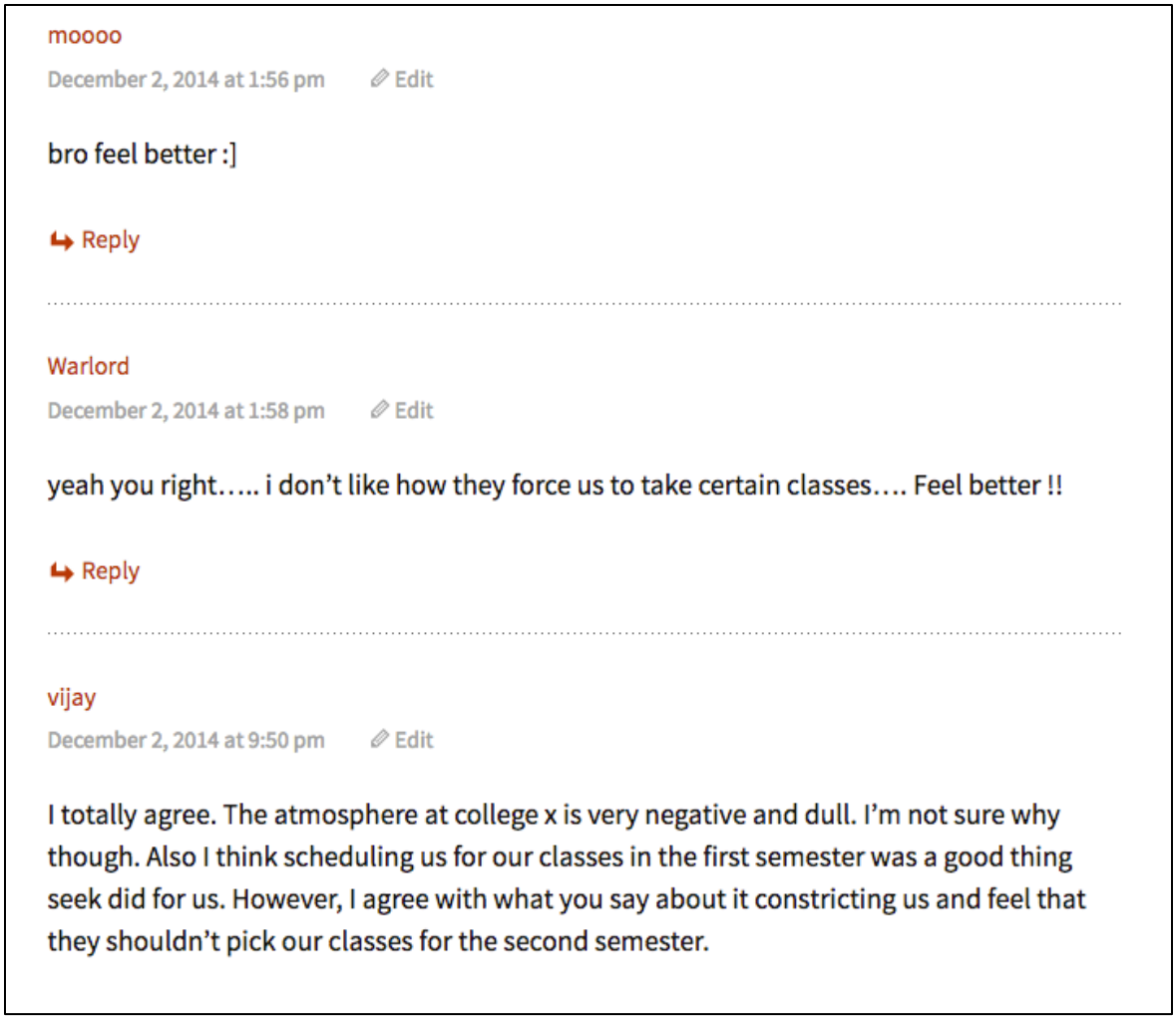


Figure 5. Screenshot of empathetic comments written in response to lego's post.

Blogs as a Tool for Creating, Sharing and Collecting Cultural Capital

The more resources available in one's social network, the more capital they have. The accumulation of cultural capital is thus based on relationships with individuals who can contribute valuable and potentially scarce resources. Cultural capital theory posits that social class differences are reproduced through institutions, which ultimately determine the possibility of social mobility (Lohfkin & Paulsen, 2005; Pascarella et al., 2004; Plank & Jordan, 2001). Students with college educated parents, as compared to first-generation students, transition into their own college experiences with more knowledge, background, and information about the expectations of college. Youth with more social capital receive guidance that is ingrained in their familial and cultural experiences and shapes their daily lives (Aries & Seider, 2007; Plank & Jordan, 2001).

Pascarella et al. (2004) suggest that although first-generation students start off with a deficit of cultural capital, they acquire significant gains through their academic and social engagements that may ultimately result in comparable levels of cultural capital for all students. Through the process of entering and graduating from college, students build their cultural capital by making connections and building

and expanding their networks. Digital spaces, like blogs, where students can share their expertise and experiences, can function as one tool to facilitate the sharing of cultural capital. Further, digital spaces can function as repositories for accumulating and archiving students' transition to college narratives and these may serve as useful resources for future cohorts of first-generation students.

In each of the previously referenced narratives students were communicating cultural capital. In their narratives dalewis, kcruzzin and lego each write of having a realization. These realizations relate to the process of understanding something about the college context that had previously been mysterious, or challenging, or in kcruzzin's words "nerve wracking." Examining dalewis's narrative we see how he *realized* that he needed to improve his time management. For kcurzzin, her moment came as she *realized* that taking notes and being alert and listening efficiently were important techniques for doing well in a large lecture hall. While for lego the realization was broader than any specific study skill. He *realized* that a residential college might better suit his needs. Despite their differences, each student was sharing cultural capital that they acquired during their first semester in college. The blog also served as a collection of capital that future incoming cohorts could draw from to increase their rate of college adjustment and mitigate what Pascarella et al. (2004) has referred to as first-generation students' deficit in cultural capital. The reflective writing process in the current chapter focused on student's transition to college experiences. Future work is needed to explore how cultural capital may continue to be an important component as students progress through college and pursue professional careers and advanced degrees.

The Benefits of Blogging in the Classroom

Integrating blogs into first-year curricula encourages all students to reflect on and explicitly work through the challenging transition to college. We know writing is a powerful tool that supports reflective thinking and that the process of writing about their experiences can help students make sense of the transition. Further, through reading and commenting, the blog provides a tool that students can use to interact with and support their peers. Ultimately, the blog can become a space for students to share the cultural capital they have developed over the course of their college transition and this may be particularly useful for their peers as well as for future cohorts of first-generation students. After all it is other first-generation students, like dalewis, kcruzzin, and lego who may best understand the challenges that future students will face. The next section of this chapter details a second blogging activity designed specifically for a psychology research methods course.

A Sample Lesson

As blogging is a space for sense-making about personal experience and creating supportive communities, it can also be a space for sense-making and commenting about academic questions (see also Panjwani & Cipollina, this volume). Blogging activities can be incorporated into curriculum and used to engage students throughout the semester. Both Todorova and Kreniske have used blogs in their psychology courses as a space for students to discuss readings, develop their own research projects, and respond to each other's ideas through comments. In such courses, the instructor directs the class to write about certain topics or respond to a specific prompt. Both Kreniske and Todorova assign a prompt on nearly a weekly basis and students write ten posts over the semester. One great blog question to start off the semester that both Todorova and Kreniske have used is:

> Please write your definition of science. In addition, do you think science must be for the greater good or can science be just about the pursuit of knowledge? Also, think about this in the context of ethics and what we have been discussing. Explain your position and/or agree or disagree with a previous post.

Creating an open-ended question such as the one above allows students to bring in their prior knowledge about the topic as they formulate responses to the prompt. Through blogging, students can respond to and interact with one another's ideas. For example, in Todorova's class of 22 students, the blog posts usually elicited between 35-45 total responses. The writing students do outside of class can then be used as a springboard to generate in-class discussion.

Blogging can also be a space that generates discussion outside of class. Earlier in this chapter we detailed how students used comments to develop a supportive community. The following examples show how students also use blog posts and comments to communicate regarding academic and psychology-specific assignments. In one assignment in a research methods course, Todorova asked her students the following:

> What reactions do you have to *The man who mistook his wife for a hat?* Can something be taken away from this case study and be used for understanding other individual situations? Do you think this case study could have been developed as a single-subject design instead?

Students then responded with short paragraphs that were read and commented on by peers.

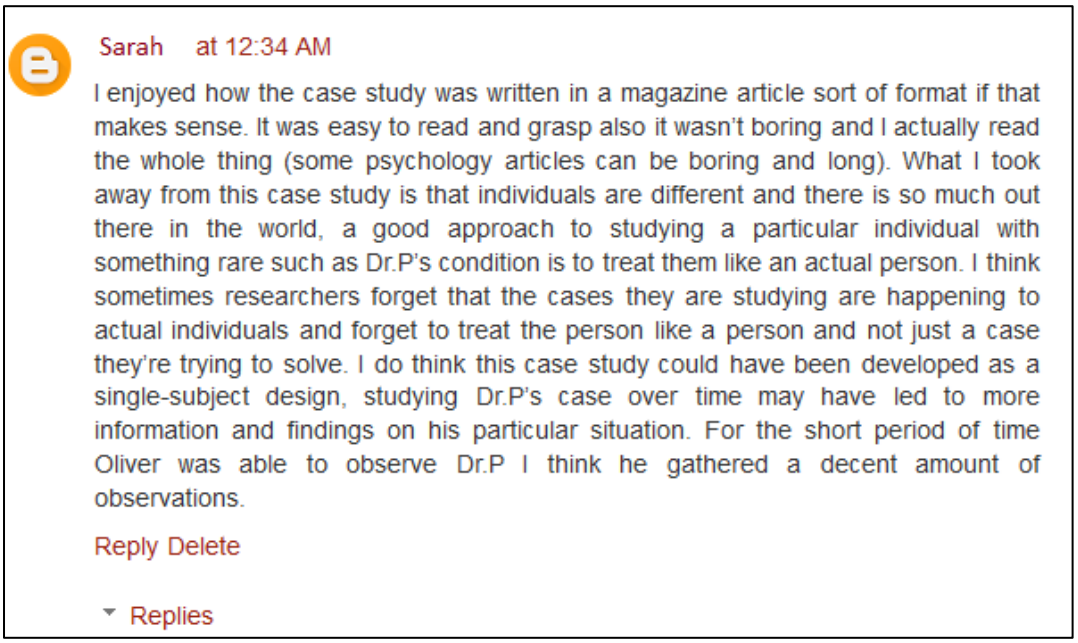


Figure 6. Screenshot of Sarah's (a pseudonym) post.

Mary (also a pseudonym), then wrote a comment that elaborated on Sarah's post:

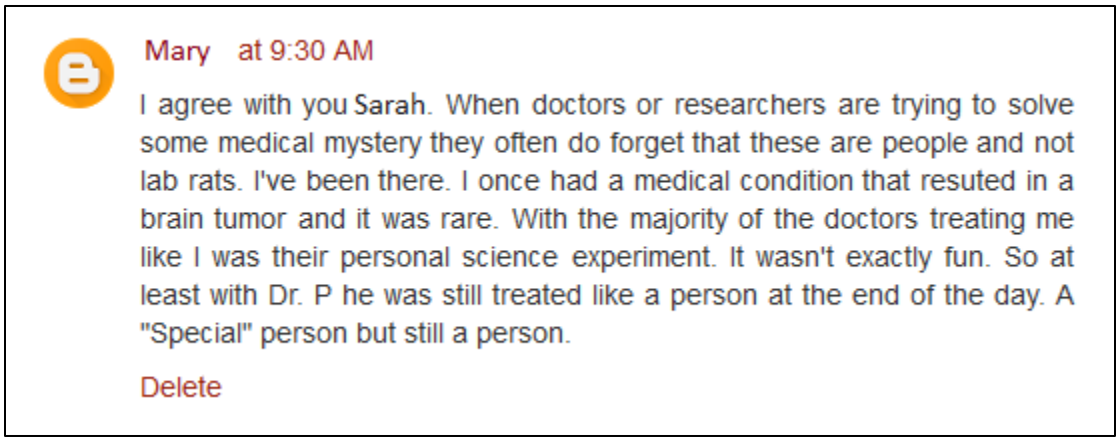


Figure 7. Screenshot of Mary's comment.

This is just one of many instances in the course where students used the course blog to engage in discussion about course readings (See Figures 6 & 7). The blog also helped students build a rapport with one another and this also facilitated discussions in the classroom. In fact, Todorova usually starts class by referencing the discussion question from the blog and students can use what they began discussing online as a foundation for class conversations.

In another approach to using blogs as a space for responding to readings, Todorova assigned an academic article and asked a different group of students to each focus on the introduction, method, results, and discussion section respectively (for more on helping students to read scientific articles, see Brosowsky & Parshina, this volume). Students were required to read the whole article but they would be tasked with writing a summary of only their section. Students then posted their section summaries on the blog, where peers could add on with their additional details via comments. This activity also allowed students who had a different section of the article to respond and build off of what one group had written with additional information that was presented in another part of the article. This is also useful for continuing the conversation back in the classroom. One strategy is to print the posted summaries and give each group a section that was not their assigned section, culminating in an overall group discussion that brings together the whole article. As compared to the traditional approach of reading and responding to an entire article, this process seems to facilitate a more in depth understanding of the material.

Finally, using a blog with your class can be an easy way to communicate information. Emailing is always an option, but when the blog becomes an integral part of the course curriculum and a space that students are regularly checking anyway, the instructor can use the blog to send reminders, notify students of changes, or share new ideas and materials. Depending on the mode you use, email reminders can be sent each time you post on the site or the posts themselves can be generated and sent directly as an email. That way students will receive the information, even if they are not always logged on to the site. It is also important to encourage students to check the blog often – and the more they begin engaging with it, the more regularly they will visit the blog. If you are using a blogging platform that allows you to get creative, you can incorporate imagery or manipulate the text in order to make it more captivating so that it grabs students' attention.

Conclusion

Whether reflecting on the transition to college or on the definition of science, blogs provide an engaging medium for students to think through challenging questions, support their peers, and share ideas. Blogging allows students to create and explore course- and personally relevant content on a platform that invites a type of writing that toes the line between the casual social digital exchanges that are so familiar to many contemporary college students and the mores and expectations of academic writing. While first-generation students may benefit in particular, we, as educators, can better engage all our students by integrating interactive digital writing, like blogs, into our courses.

References

Aries, E., & Seider, M. (2007). The role of social class in the formation of identity: A study of public and elite private college students. *The Journal of Social Psychology*, *147*(2), 137-157.

Baker, J. R., & Moore, S. (2008). Blogging as a social tool: A psychosocial examination of the effects of blogging. *Cyberpsychology, 11*(6), 747-749. doi:10.1089/cpb.2008.0053

Bane, C. M., Cornish, M., Erspamer, N., & Kampman, L. (2010). Self-disclosure through weblogs and perceptions of online and 'real-life' friendships among female bloggers. C*yberpsychology, Behavior, & Social Networking, 13,* 131-139. doi:10.1089/cyber.2009.0174

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven: Yale University Press.

Berthoff, A. E., & Stephens, J. (1988). *Forming, thinking, writing*. Portsmouth, NH: Boynton/Cook Publishers.

Bolander, B. (2012). Disagreements and agreements in personal/diary blogs: A closer look at responsiveness. *Journal of Pragmatics*, *44*(12), 1607-1622. http://dx.doi.org/10.1016/j.pragma.2012.03.008

Boniel-Nissim, M., & Barak, A. (2011). The therapeutic value of adolescents' blogging about social emotional difficulties. *Psychological Services*. http://dx.doi.org/ 10.1037/a0026664. Advance online publication.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). Westport, CT: Greenwood.

Bukvova, H. (2011) Taking new routes: Blogs, web sites, and scientific publishing. *ScieComInfo*, *2*(2), 2-7.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95-S120. doi: 0002-9602/89/9407-0010

Cvijikj, I. P., & Michahelles, F. (2011). Understanding the user generated content and interactions on a Facebook brand page. *International Journal of Social and Humanistic Computing (*IJSHC*) Special Issue "Contemporary Social Media Topics in Business and Public Organizations," 2*(1/2), 118-140.

Daiute, C., & Nelson, K. (1997). Making sense of the sense-making function of narrative evaluation. *Journal of Narrative and Life History, 7*(1-4), 207-215. doi: 10.1075/jnlh.7.25mak

Davidson, C. N. (2011, August 26). Collaborative learning for the digital age. *The Chronicle of Higher Education.*

Ducate, L. C., & Lomicka, L. L. (2008). Adventures in the blogosphere: From blog readers to blog writers. *Computer Assisted Language Learning, 21*(1), 9-28. doi: 10.1080/09588220701865474

Emig, J. (1977). Writing as a mode of learning. *College composition and communication*, *28*(2), 122-128.

Fishman, J., Lunsford, A., McGregor, B., & Otuteye, M. (2005). Performing writing, performing literacy. C*ollege Composition and Communication, 57*(2), 224-252.

Francis, K. C., Kelly, R. J., & Bell, M. J. (1993). Success in school: A research agenda on student attrition and retention in the SEEK program. *Educational Evaluation and Policy Analysis, 15*(4), 417-441. doi:10.3102/01623737015004437

Fulwiler, T. (1983). Why we teach writing in the first place. *fforum, 4*(2), 122-133. Retrieved from http://comppile.org/archives/fforum/fforum4(2).htm

Gee, J. P. (2007). What video games have to teach us about learning and literacy. New York, NY: Palgrave Macmillan.

Greene, K. (2013). *Teacher voice and the education policy-practice gap* (Unpublished doctoral dissertation). New York, NY: The Graduate Center, CUNY.

Henninger, M. & Neal, R. M (2012). Incorporating web-based engagement and participatory interaction into your courses. In R. M. Neal (Ed.), *Social media for academics: A practical guide* (pp. 141-158). Oxford, UK: Chandos Publishing.

Howard, T. C. (2003). A tug of war for our minds: African American high school students' perceptions of their academic identities and college aspirations. *The High School Journal, 87*(1), 4-17.

Hudley, C., Moschetti, R., Gonzalez, A., Cho, S., Barry, L., & Kelly, M. (2009). College freshman's perceptions of their high school experiences. *Journal of Advanced Academics, 20*(3), 438-471.

Ko, H. C., & Kuo, F. Y. (2009). Can blogging enhance subjective well-being through self disclosure? *Cyberpsychology, Behavior, and Social Networking, 12*, 75-79.

Kreniske, P. (in press). Developing a culture of commenting in a first-year seminar. *Computers in Human Behavior.*

Kreniske, P. (2016). *ThisCollegeStory.com: How interactive writing media influenced the way first-year students made sense of their college transition* (Unpublished doctoral dissertation). New York, NY: The Graduate Center, CUNY.

Lohfink, M. M., & Paulsen, M. B. (2005). Comparing the determinants of persistence for first-generation and continuing-generation students. *Journal of College Student Development, 46*(4), 409-428.

Lucic, L. (2013). Use of evaluative devices by youth for sense-making of culturally diverse interpersonal interactions. *International Journal of Intercultural Relations, 37*, 434-449. doi:10.1016/j.ijintrel.2013.04.003

McFarland, L. A., & Ployhart, R. E. (2015). Social media: A contextual framework to guide research and practice. *Journal of Applied Psychology 100*(6), 1653-1677. http://dx.doi.org/10.1037/a0039244

Pascarella, E. T., Pierson, C. T., Wolniak, G. C., Terenzini, P. T. (2004). First generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education, 75*(3), 249-284.

Plank, S. B., & Jordan, W. J. (2001). Effects of information, guidance, and actions on postsecondary destinations: A study of talent loss. *American educational research Journal*, *38*(4), 947-979. doi:10.3102/00028312038004947

Powell, D. A., Jacob, C. J., & Chapman, B. J. (2012). Using blogs and new media in academic practice: Potential roles in research, teaching, learning, and extension. *Innovative Higher Education*, *37*(4), 271-282. doi:10.1007/s10755-011-9207-7

Rose, M. (1989). *Lives on the boundary* (pp. 167 – 242). New York, NY: Penguin Books.

Schmitt, K. L., Davanim, S., & Matthias, S. (2008). Personal homepage construction as an expression of social development. *Developmental Psychology, 44*, 496-506. doi:10.1037/0012-1649.44.2.496

Sosnowy, C. (2013). *Blogging chronic illness and negotiating patient-hood: Online narratives of women with MS* (Unpublished doctoral dissertation). New York, NY: The Graduate Center, CUNY.

Torche, F. (2011). Is a college degree still the great equalizer? Intergenerational mobility across levels of schooling in the US. *American Journal of Sociology, 117*(3), 763-807. doi:10.1086/661904

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*(6023), 1447-1451. doi:10.1126/science.1198364

Wine, J., Janson, N., and Wheeless, S. (2011). 2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09) Full-scale Methodology Report on grad rates (NCES 2012-246). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved from http://nces.ed.gov/pubsearch

Chapter 21: Launching PSYCH+Feminism to Engage Undergraduates in Wikipedia Editing

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Abstract

Engaging students in online collaborative writing via Wikipedia may serve to promote research and information literacy skills, which include writing from a neutral point of view, locating and citing source materials appropriately, paraphrasing content to avoid plagiarism, and responding to editorial feedback. This chapter provides suggestions on how to implement Wikipedia editing assignments in introductory-level undergraduate courses, highlighting Wiki Education Foundation training resources and how to scaffold the development of skills. We describe the PSYCH+Feminism initiative, launched in 2016 through the Wiki Education Foundation Year of Science and aimed to increase the number and quality of Wikipedia biographies about prominent women in psychological science. We describe its implementation in an Introductory Psychology course, the alignment of Wikipedia editing with general education learning objectives, and student experiences.

Introduction

The act of teaching, or even expecting to teach, can foster deeper understanding and longer retention of course material by necessitating that students reflect on what they know in order to explain it to others (Fiorella & Mayer; 2013; Nestojko, Bui, Kornell, & Bjork, 2014; Ploetzner, Dillenbourg, Preier, & Traum, 1999). As such, online collaborative writing assignments have great potential to facilitate learning by engaging students in sharing their understanding with their peers and/or the general public (Farzan & Kraut, 2013). This chapter describes the PSYCH+Feminism initiative, which aims to actively engage students in *learning by teaching* (Gartner, 1971) using Wikipedia article creation and revision as opportunities for students to enhance their research and expository writing skills. PSYCH+Feminism uses Wikipedia as a platform for students to write biographies about prominent women in psychological science. Students are instructed to locate and summarize biographical information and the career contributions of a selected scientist, using what they have learned to create a Wikipedia article for a lay audience. Use of Wikipedia as a platform for learning encourages metacognitive reflection by challenging students to write about scientific topics using accessible language and refine their work in response to editorial feedback from course instructors, peers, and the other Wikipedia editors.

Although difficulties can arise in implementing Wikipedia editing assignments in traditional courses where interaction and collaboration are not emphasized (Cole, 2008; Karasavnidis, 2010), recent studies demonstrate the feasibility of assigning students in introductory-level courses to edit Wikipedia, reporting gains in students' ability to locate and evaluate the quality of source materials and distinguish empirical from non-empirical work (Shane-Simpson, Che, & Brooks, 2016; Traphagan, Traphagan, Dickens, & Resta, 2014). As such, Wikipedia provides a unique venue for students to develop general

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education skills that align with the American Psychological Association's broad guidelines for undergraduates majoring in psychology (APA, 2013). These guidelines emphasize the value of students acquiring (1) a knowledge base in psychology, (2) scientific inquiry and critical thinking skills, (3) ethical and social responsibility in a diverse world, (4) communication skills, and (5) professional development, all of which can be cultivated through research and production of Wikipedia content relevant to the discipline. In the following sections, we outline how to make Wikipedia editing feasible to implement in introductory-level courses with enrollments of 40-50 students. Such assignments may also work in larger classes if teaching assistants are available to help, see Shane-Simpson et al. (2016) for details on implementation of Wikipedia editing in an introductory human development course with 120 students.

The Wiki Education Foundation is highly supportive of initiatives to engage undergraduates in editing articles on Wikipedia and provides the necessary training materials for instructors and students to effectively contribute content to Wikipedia. Wiki Ed resources include online training modules, PDFs with formatting instructions for different types of Wikipedia articles (e.g., biographies, psychology articles), handouts covering topics such as how to cite sources and avoid plagiarism, and links to a network of partnerships with academic associations in the sciences (see Shane-Simpson & Brooks, 2016, for brief description and links to helpful resources).

Why PSYCH+Feminism?

Recognizing the potential of Wikipedia to support public education about psychological science, the Association for Psychological Science (APS) launched the APS Wikipedia Initiative in 2011, encouraging its membership to enlist their students in developing and contributing Wikipedia content as part of its commitment to give psychology away (Tomes, 2000). Wikipedia editing provides opportunities for students to learn to communicate effectively to a general audience, support statements with proper citations, organize their writing for logical flow and clarity, and respond to comments from reviewers (Association for Psychological Science, 2011).

As part of this broader initiative, PSYCH+Feminism calls on APS members, students, and the interested public to improve coverage of female recipients of the most prestigious awards in psychological science by writing new biographies or improving existing biographies on Wikipedia. Created in 2016 as part of Wikipedia's Year of Science initiative (https://wikiedu.org/yearofscience/), this WikiProject dovetails with the efforts of the Wikipedia Gender Gap Task Force to address the lack of women on Wikipedia (https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Countering_systemic_bias/Gender_gap_task_force). As noted by the Wikipedia Gender Gap Task Force, profound gender gaps are apparent on Wikipedia, both in terms of women's participation as active editors (i.e., Wikipedia content producers) and as subject matter (i.e., Wikipedia content about women); such gaps require strategic initiatives to ameliorate. Surveys have shown that many fewer women than men are involved as editors of Wikipedia articles, despite the fact that anyone can edit Wikipedia (Glott, Schmidt, & Ghosh, 2010). In a recent study that corrected estimates for biases associated with opt-in survey designs (i.e., surveys where respondents self-select to participate), it was estimated that only 16.1% of Wikipedia editors were women (Hill & Shaw, 2013). The authors' estimates of rates of participation by women increased only slightly when analyses were limited to adult editors based in the United States, with women comprising an estimated 22.7% of editors. In an investigation of the gender bias in encyclopedic content, Reagle and Rhue (2011) compared existing biographies of men and women on both Wikipedia and Encyclopedia Britannica with lists of biographical subjects from various sources. They found that both encyclopedias

provided less comprehensive coverage of notable women compared to men. Although Wikipedia contained a greater number of biographies overall (including more biographies of women) than Encyclopedia Britannica, it was missing a greater proportion of biographies of women relative to men than Encyclopedia Britannica (i.e., in relative terms, the gender gap in content coverage was larger on Wikipedia).

This gender gap is especially salient when searching for biographies of women who have received the most prestigious awards in psychological science, such as the APA Award for Distinguished Scientific Contributions or the APS William James Fellow Award. In collaboration with the Wiki Education Foundation, the authors of this chapter helped to assemble the PSYCH+Feminism list of notable women in psychology, comprising over 400 award recipients who do not yet have Wikipedia biographies about their career contributions, have stub biographies (articles with minimal details), or biographies that have been "flagged" by Wikipedia as in need of attention to improve content and/or structure. Note that this WikiProject exists in the public domain and anyone with Wikipedia access can add names to the list (https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Women_in_Psychology).

As a WikiProject, this list serves as a go-to site for instructors interested in involving students in improving psychology coverage on Wikipedia. Creating and/or expanding Wikipedia biographies is an ideal venue for undergraduates to develop their skills as novice editors, as relevant content can be accessed readily via university websites and search engines (e.g., Google Scholar) without requiring a great deal of prior background knowledge or expertise. In contrast to its enthusiastic support of instructors assigning biographies to student editors, the Wiki Education Foundation discourages the assignment of articles on biomedical or health-related topics (such as psychological disorders and treatments) due to their expectations, and those of the Wikipedia readership, that such articles have up-to-date content written by experts rather than novices. Student contributions to such articles risk deletion if the text is perceived as insufficiently sourced. Furthermore, having one's edits reverted by an established member of the Wikipedia community can lead to frustration for students who are unaccustomed to critical feedback via peer review (see Shane-Simpson et al., 2016).

Prep Work for Implementing PSYCH+Feminism in Introductory Psychology

In the Fall of 2016 we conducted a pilot investigation of the impact of introducing Wikipedia editing in an Introductory Psychology class, taught at a large, urban public university with an expected enrollment of 50 students. Initial steps in this project involved securing logistical support from the Wiki Education Foundation (https://wikiedu.org/for-instructors/), as well as our local campus library staff to assist students in using research databases. (Note that university libraries may have designated Wikipedia ambassadors to provide support for instructors who wish to incorporate Wikipedia editing assignment into their courses.)

Setting up the Dashboard.

The Wiki Education Foundation requests that instructors teaching with Wikipedia register their courses (contact@wikiedu.org); registration involves creating a Dashboard website to connect the class with the larger community of Wikipedia editors. The Dashboard serves as an online course management system within Wikipedia that provides a portal to the Wiki Ed online training modules, the contact information for Wiki Ed staff members assigned to support the class, and updates on student editing activities. Instructors are able to customize the Dashboard to include course-specific information, such as the course description, class schedule, and due dates for assignments. As students create their individual Wikipedia accounts, they are invited to "join" the class on the

Dashboard so that their User IDs appear in a list of registered students. To ensure that all student accounts are linked to the Dashboard before assigning any further work, it is important to schedule time in class to register students who are unable to figure it out on their own. (Note that registration takes only a couple of minutes per student and can be accomplished quickly with multiple devices.)

With students registered on the Dashboard, members of the class can track each other's editing activities. Not only does this allow the instructor to assess student progress in completing course assignments, but it also allows students to view the edits made by their classmates, which facilitates collaboration. As students edit on Wikipedia, the Dashboard updates the statistics for the class, which include the number of Wikipedia articles created, articles edited, total edits, student editors, words added, and article views. Each time a student uploads a new article to Wikipedia, another Wikipedia editor reads it within a few hours or a day. New articles may be flagged as needing additional work if lacking in sufficient source materials or connections with other Wikipedia content (see Figure 1).

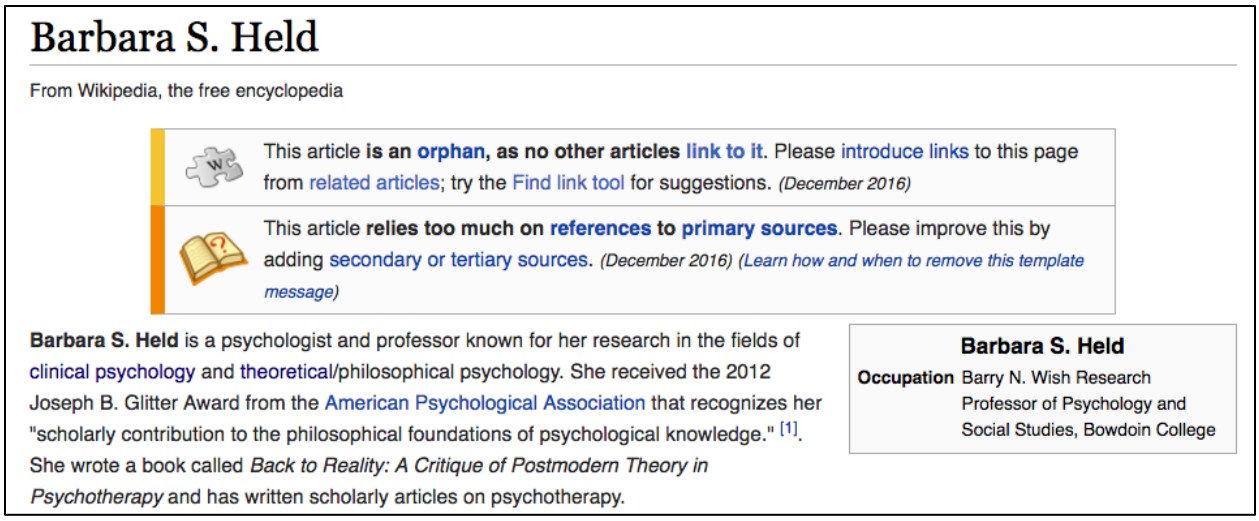

Figure 1. Screenshot of a portion of a Wikipedia article that is flagged for improvement.

Selecting articles for students to edit.

In designing a Wikipedia project for the Introductory Psychology course, we selected 36 scientists from PSYCH+Feminism who did not have an existing biography in Wikipedia and whose work was referenced in the Introductory Psychology textbook *Psychology: From Inquiry to Understanding* (Lilienfeld, Lynn, Namy, & Woolf, 2014). This short list comprised notable figures such as Jeanne Brooks-Gunn, Naomi Eisenberger, Cathy Spatz Widom, and Wendy M. Williams, whose contributions exemplify the diversity of subfields within psychological science. We created the short list to ensure that all students had an equivalent starting point in creating a Wikipedia biography of a researcher whose work was cited in the textbook and thus germane to the course. Once we had the short list, we created a set of resources specific to each scientist to help students get started in their research. This included the scientist's research area and professional website, Wikipedia articles that referenced the scientist's work, a research article representative of the scientist's contributions, and the chapter(s) and page numbers from the textbook that cited the scientist's work.

Creating a template for a Wikipedia biography. Next we created a template for a model biography (https://en.wikipedia.org/wiki/User:Celizas/BioTemplate) that adhered to Wikipedia guidelines. Our template provided subsection headers (i.e., Biography, Research, Representative Publications, References, External Links) for the main body of the text along with an "infobox" for general biographical information. Prompts and sample sentences inserted into each subsection were designed to help students outline the specific content of their article. Giving students a template for inserting biographical information assured that their work conformed to Wikipedia's article standards while greatly assisting them with the required HTML coding, allowing the students to focus on writing and revising article content instead of worrying about formatting (e.g., HTML syntax).

Linked Assignments to Scaffold Wikipedia Editing

In order to make the task of creating new Wikipedia biography articles feasible for Introductory Psychology students, we created four linked assignments with staggered due dates that culminated in students "publishing" their completed Wikipedia articles at the end of the semester. The project was introduced in Week 7 of a 15-week semester, after a library information session to familiarize students with research databases, such as PsycINFO, and introduce library support staff. The linked assignments, due two weeks apart, aimed to help build skills incrementally in preparation for article publication. The assignments encompassed: (1) online training, (2) insertion of initial content into the template, (3) content expansion in response to feedback, and (4) final revision and publication of the article.

Getting started with editing. The first step for the students enrolled in the class was to create individual Wikipedia accounts that were linked to the Dashboard. Due to confusion in how to find the Dashboard, this step was completed in class on multiple laptop computers with the assistance of several graduate students. At the end of the class period, we had registered accounts for 44 students on the Dashboard. Students were then assigned the "Basics" in the Student Training Modules as homework (https://dashboard.wikiedu.org/training/students). Training served to familiarize them with the practices and guidelines of the Wikipedia community, often referred to as the Five Pillars of Wikipedia editing (https://en.wikipedia.org/wiki/Wikipedia:Five_pillars):

1. Wikipedia is an encyclopedia;
2. It is written from a neutral point of view with citations to authoritative sources;
3. Its content is free to distribute and may not include content plagiarized from other sources;
4. Editors should treat each other respectfully and seek consensus regarding article content;
5. Wikipedia has policies and guidelines, but no firm rules.

In the basic training, students gained information about editing on Wikipedia with emphasis on the use of the *sandbox* to draft content for articles. Wikipedia sandboxes serve as "play spaces" within the user's Wikipedia account, allowing the user to develop content and practice editing without it being viewed by the general Wikipedia readership. Editing within the sandbox offers students the freedom to experiment with article content and HTML syntax, allowing them to go in and revise content without bringing it to the attention of other Wikipedians. (Note that sandboxes exist within the public domain; hence, a user's sandbox content is viewable by instructors, class members, Wikipedia support staff, and

anyone else who has access to their Wikipedia User ID). In addition to introducing students to the concept of editing within a sandbox, basic training covered how to add references to articles, consult the history page to view recent edits, and use *talk pages* to provide feedback to other editors about article content, amongst other topics.

Once the accounts were set up, students selected a topic for their Wikipedia biography from the short list of 36 psychologists, taken from the PSYCH+Feminism WikiProject. Students were given the option of working alone or with a partner; at this point in the semester students had already completed a separate project with a classmate and several rejected the idea of having to work with a partner again. To gain buy-in from all students, we decided to give the students flexibility in how they edited Wikipedia, with their full understanding that all biographies would be collaboratively edited once they entered the public domain. We then populated each student's sandbox with the biography template and information specific to their researcher (see Figure 2).

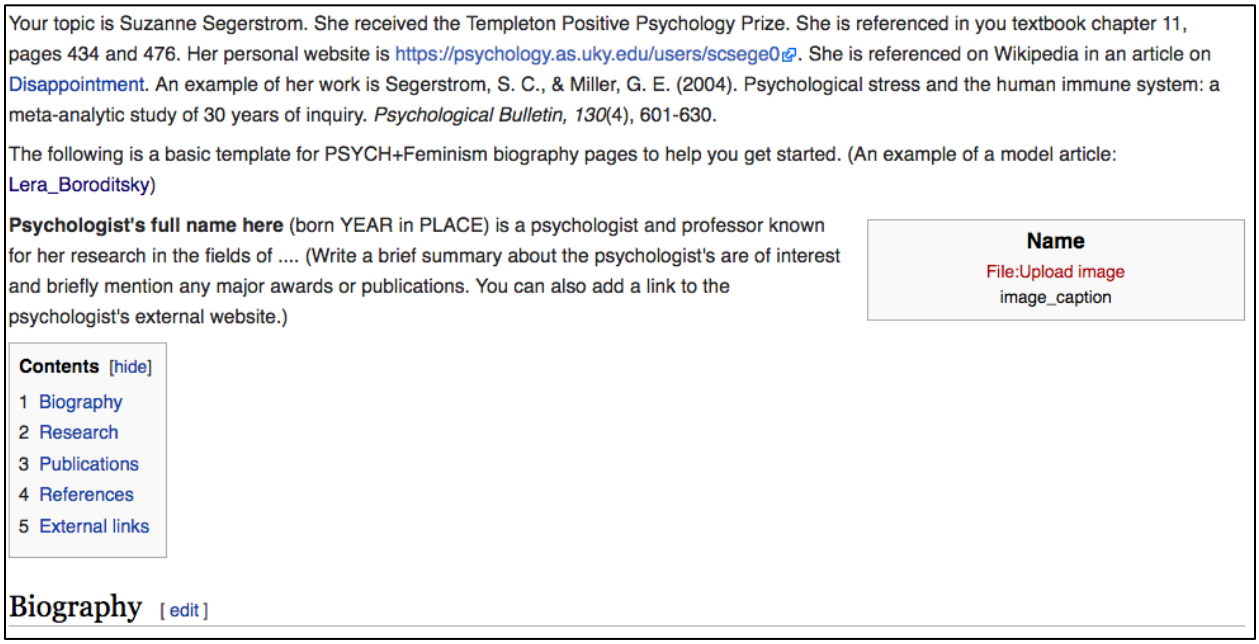

Figure 2. Screenshot of a portion of a Wikipedia sandbox where we provided information relevant to topic along with the biography template.

Filling in the biography template.

The second step was for students to fill in information in their sandbox using the resources we had provided (i.e., the editing template and resources specific to the scientist they were researching). At this point, our goal was for students to be comfortable editing in the sandbox without the added burden of locating new source materials. Students working in pairs were instructed to edit collaboratively in one of their sandboxes, with the understanding that each student's edits would be shown in the sandbox *history*. That is, students would receive credit for their contributions irrespective of whether they were editing in their own sandbox or that of their partner. Note, however, that despite instructions on how to edit collaboratively, some pairs initially edited the template in separate sandboxes, which had to be merged (by the instructor) prior to completing the next step of the assignment.

Students were provided with feedback via their talk page, which was in response to their initial edits on the talk page associated with the student's sandbox where they were editing. Email announcements were used to help students locate the talk page. Feedback included line-by-line edits to correct grammar, reminders of how to paraphrase content to avoid plagiarism and how to locate other sources using Google Scholar and library databases. Students were given further instructions on how to insert citations into the text to indicate its source and how to create hyperlinks to Wikipedia articles with related content.

Expanding and revising content for publication. The third step was for students to expand their stub articles by adding new content with links to sources. We conducted an in-class workshop to demonstrate how to use the Cite button within the Edit window (see Figure 3), as inserting citations in the correct format was difficult for most students. We also demonstrated how to create hyperlinks within the text to link to existing Wikipedia articles. Using the Dashboard to track students' editing activity, we provided individualized feedback after each round of editing, often by email as it proved to be the preferred means of communication due to our heavy reliance on email for other course announcements. Feedback included assistance in locating reputable Internet sites that were relevant to their topic, how to use search engines effectively to access source materials, and further encouragement to use their textbook as a secondary source.

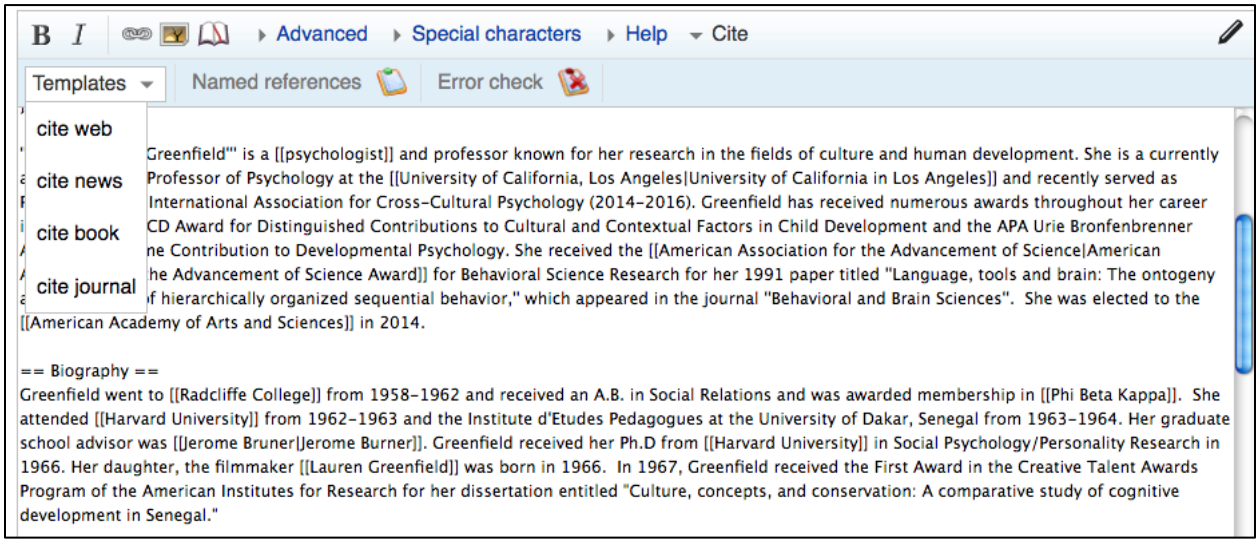

Figure 3. Screenshot of the Cite tool within the edit window.

As the semester reached closure, students were given the go-ahead to launch their articles, with specific instructions on how to open up a Wikipedia page for a new article, copy HTML code from the sandbox into the edit box of the new article, preview its contents, and save it. This fourth step of launching the articles was difficult for many of the students, perhaps because they did not feel their articles were ready and/or they hoped to continue to edit their articles in the future. To meet our goal of publishing student work, we devoted a portion of the final class period to launch the stub articles and reviewed how to track updates through the *view history* tab. We devoted considerable time to discussing possible flags that would appear on articles if Wikipedia editors viewed its content as inadequately sourced and/or insufficiently connected with other Wikipedia content (examples of flags are shown in Figure 1). As several students had already launched their Wikipedia articles prior to the final class period, we had

several articles to review online that had already received edits and/or flags from Wikipedians in the general public. We used the final class as an occasion to celebrate students' success in contributing content to Wikipedia, while discussing as a class what changes might need to be made to their articles to address critical feedback.

Student Experiences and Editing Success

Prior to setting up their Wikipedia accounts, we gave our students (N=38 in attendance) a two-part "Question of the Day" asking them to indicate their concerns about editing on Wikipedia. The first part of the question asked, *Given that anyone can edit Wikipedia, what are some of the barriers preventing you from trying to edit Wikipedia?* This prompt tended to elicit student concerns about the quality of information they were capable of producing. One student wrote, "Knowing that anyone can edit I'm a little nervous thinking 'what if what I put up is wrong' or what if all the information is already up there and I have nothing to contribute." Another student expressed a related sentiment by writing, "I won't put accurate information onto Wikipedia so that prevents me from editing anything." Such comments suggest that students felt unprepared to conduct research on a topic and produce valid content, and/or they viewed knowledge as something that "experts" have and not something that students can contribute to the public.

The first prompt also elicited negative views of Wikipedia as an information source, with students explicitly connecting the fact that anyone can edit Wikipedia as contributing to the poor quality of its content. One student commented, "I feel like it is not that reliable…I feel like anybody can edit it. In school I trust my peers but outside of school I am not sure who is writing what and how knowledgeable they are." Students' negative views were not surprising in light of evidence from prior studies that both instructors and students tend to view information on Wikipedia as less credible or trustworthy than information in traditional encyclopedias (Chen, 2010; Kubiszewski, Noordeweier, & Costanza, 2011; Lim, 2009). Instructors holding negative views about Wikipedia often tell their students to refrain from using it; consequently, both students and faculty may have resistance towards Wikipedia editing assignments due to their prejudiced view that it is a bad source of information. However, not all instructors are against the incorporation of Wikipedia editing assignments: some argue that Wikipedia editing provides students the opportunity to learn information literacy skills and encourages them to publically contribute and disseminate knowledge in the future (Calhoun, 2014; Miller, 2014; Ravid, Kalman, & Rafaeli, 2008; Lampe, Obar, Ozkaya, Zube, & Velasquez, 2012).

A second part of the question asked, *What feelings do you have about the upcoming assignment to create a new Wikipedia entry? How would you describe your motivation?* Of the 38 responses, only four expressed a positive view towards the assignment that we characterized as "eager and willing to learn." These students expressed eagerness to embark on a new experience, as in "It might be interesting to create a new Wikipedia entry so I am excited about trying something new. I am motivated to do this because it is something I've never done before." In contrast, 16 students expressed a negative view that they were "not motivated" to do the assignment, eight reported a neutral outlook that they would be "doing it for the grade," and ten expressed mixed feelings that they were "nervous and or confused, but interested." Students expressed confusion and anxiety about the project due to their inexperience with Wikipedia editing as expressed in "I honestly don't understand what I have to do. 'Edit an article,' but how? What article needs editing? Grammar wise? Fact wise? This is an example of my confusion."

Nevertheless, out of 44 students who registered Wikipedia accounts on the Dashboard, only three students dropped the course (officially or unofficially), leaving us with an enrollment of 41 students, of whom the overwhelming majority (92.7%, N=38) overcame the perceived barriers to working on Wikipedia. With regards to the Student Training Modules, 87.8% of the students (N=36) completed some of the training, and 61.0% (N=25) completed all of it. With regards to editing articles, 87.8% of the enrolled students (N=36) edited in their Wikipedia sandboxes by inserting information into the provided biography template, and all but two continued to edit after feedback was provided. (Note that two students completed training, but did not edit, and two students edited without completing any training. The three remaining students made no effort to complete any part of the assignment, even though it counted as 10% of the final course grade.)

By the end of the semester, 82.9% of students (N=34) had contributed content to one of 21 new biographies that we launched. (Note that one of these articles was inadvertently produced in collaboration with students at North Dakota State University, who managed to launch their new biography of Mary K. Rothbart just one day prior to our launch date. Luckily our students had written quite a lot of content that did not overlap with what the other class had written, and they were able to insert their work into the existing article on Wikipedia). Eleven new articles survived Wikipedia's critical peer review with no flags present at the end of the semester. The other ten received one or more flags from outside editors (or "bots"), indicating the need to improve content or integration with other Wikipedia articles. Seven biographies were flagged as "orphans" (i.e., with no other articles linking to them), indicating that other Wikipedia articles needed to be edited to make these connections. Conversely, only one article was flagged as needing more links to other Wikipedia articles (i.e., hyperlinks). With regards to information sourcing, only four articles were flagged as relying too much on references to primary sources, needing more citations for verification of information, and/or having insufficient inline citations, and only one article was flagged as having a topic that might not meet Wikipedia's notability guidelines for academics.

For the sake of comparison with Wikipedia editing, we looked at student contributions to Wiki-based study guides that were assigned as homework to help them prepare for each of three departmental exams. The study guides, collaboratively edited on Blackboard, comprised a series of questions for students to answer in relation to material from the textbook, with page numbers provided for each topic. Despite the obvious relevance of the study guides for test preparation (with exam grades counting as 45% of the final grade, and Blackboard homework counting as 20% of the final grade), percentages of students contributing to the Wikis were low (68.3% for Exam 1, 58.5% for Exam 2, 46.3% for Exam 3). The noticeably higher rates of editing Wikipedia, in comparison to editing the Wiki study guides on Blackboard, may suggest that students were motivated to learn more about the Wikipedia community and how to become part of it and that their reasons for editing Wikipedia extended beyond doing well in the class.

However, despite the fact that most of the students were curious enough about Wikipedia editing to give it a try, notwithstanding their initial apprehensions, only 37.8% (N=14 of 37 who responded to an end-of-semester evaluation) indicated that they intended to edit Wikipedia in the future. Nevertheless, the students expressed considerable enthusiasm about the project, such as writing, "It's great and cool that you can edit Wikipedia pages." Another student wrote, "It was fun and made me feel like I was smart enough to get my article launched, even if it was flagged." Other comments indicated a new appreciation of the peer review process within Wikipedia, as in "I used to believe anybody could write

anything they wanted. I now know everything gets verified." Expressing a related idea, another student wrote, "After fooling with it and learning about how it is monitored, I totally love it."

Benefits of Editing with a Partner

From an instructional perspective, providing feedback on a smaller number of collaboratively written articles is much more feasible than assessing a larger number of individually written articles, especially if the goal is to have them ready for publication by the end of the semester. Beyond practicality, a considerable body of prior research documents benefits for students working together as opposed to working alone (Johnson & Johnson, 2009; Shimazoe & Aldrich, 2010; Springer, Stanne, & Donovan, 1999). Cooperative and collaborative assignments provide opportunities for students to explain concepts to each other, help each other to revise their work in response to feedback, and merge their individual efforts to produce larger-scale products (Sawyer & Obeid, this volume; Shane-Simpson, Brooks, Hotez, Sawyer, & Dow, 2015). Benefits accrue as students monitor and revise their current understanding of topics by discussing and negotiating ideas with peers (Palincsar & Brown, 1984; Roscoe & Chi, 2008; Webb, 1989).

Due to the large class size (N=44) and limited number of available topics, we strongly encouraged students to work with a partner on the Wikipedia project. At the outset, the majority of students (81.8%, N=36) found partners they wanted to work with, while eight students either wanted to work alone or did not have a partner for other reasons (absent on dates when topics were distributed/discussed, social exclusion due to lack of effort on previous group work). Of the 18 projects assigned to pairs of students, 13 were successfully completed with both partners making visible contributions, whereas five became solo projects on account of social loafing or course withdrawal (four of these were published, nevertheless). As such, the rate of publication for articles that were originally joint projects (17/18) was markedly higher than for articles that were originally solo projects (4/8). This suggests that students may have benefitted from having a partner to work with and/or were more likely to ask for help from the instructor (as when their partner failed to contribute) than students working on their own. However, as noted above, students who had poor attendance and/or showed lack of effort in previous group work were less likely to have a partner—hence other factors may have contributed to the lower rate of completion for solo projects.

Given that the problem of social loafing is ubiquitous to group work (see Karau & Williams, 1993, for a review), we found it reassuring to show students how Wikipedia automatically tracked their edits, thus creating a transparent record of who was contributing to the articles. The online record of student contributions allowed us to provide one-on-one support for students who were struggling in the face of partner abandonment. This level of surveillance might also have created pressure for students to contribute more to the joint articles, i.e., to match the amount their partner had written, though we have no direct evidence bearing on this issue. In future implementations of this assignment, we recommend scheduling sufficient time in class for students to conduct research with their partners in order to facilitate communication and collaborative editing, with the potential to reassign students if their partners are no longer in attendance. (Note that only one student can upload changes at a time to a given sandbox or article, so students working synchronously need to communicate in order to coordinate their efforts.)

Why Editing Wikipedia in Introductory Psychology is Worth the Effort

PSYCH+Feminism created a context where we asked our students to (1) dig deeper into research contributions of women in psychology cited in their textbook, (2) engage in scientific inquiry by searching for relevant, reputable source materials, (3) consider the Wikipedia gender gap and how their efforts can contribute to ameliorating it for the public good, (4) enhance their skills in paraphrasing source materials and writing in accessible language, and (5) develop their professional skills by responding to feedback and revising their work. As previously noted by Traphagan and colleagues (2014) with regards to Wikipedia editing, introductory-level students have as much or more to gain from editing Wikipedia as students in advanced-level courses, in terms of building their information literacy, research, and writing skills, yet such assignments are only rarely implemented. Traditional survey courses like Introductory Psychology still focus almost exclusively on disciplinary content, without consideration that the majority of students take these courses for general education credit (e.g., only 11% of students in the current class reported Psychology as their intended major). In our view, courses targeted for first-year students must be revamped in light of general education learning objectives, such as the development of critical thinking and writing skills that yield benefits extending into upper-level coursework as well as non-academic life (Fallahi, Wood, Austad, & Fallahi, 2006; Halpern, 2002).

Wikipedia editing in Introductory Psychology creates a host of desirable difficulties as well as challenges that must be overcome for students to succeed. Challenges including facing the negative attitudes about Wikipedia that students bring to the assignment, often based on what their teachers have told them about its "bad" content, students' lack of experience in using the library and in reading primary sources, their difficulties in paraphrasing content as opposed to writing it down verbatim (i.e., plagiarizing content), their anxieties about posting work online, and their tendencies to procrastinate in completing homework. Bjork and Bjork's (2011) research on the value of desirable difficulties in undergraduate courses has shown that engaging students in effortful and elaborative processing of course material promotes deeper learning. Students show enhanced learning when exposure to information-to-be learned is distributed over time and occurs in varied study conditions, and when tasks require information retrieval.

Wikipedia editing creates desirable difficulties by putting students on the spot to explain what they have understood from the textbook and other source materials; however, such assignments have the potential to be overwhelming if not properly scaffolded. In this chapter, we have outlined how to structure Wikipedia editing to make the work manageable for students to complete: start by scheduling a training session to teach students to use library databases, assign Wikipedia student training modules, provide a template for students to insert information into rather than requiring them to develop articles from scratch, and give them timely and constructive feedback to ensure their contributions meet guidelines. Scaffolding student work in this way fosters students' sense of agency, while encouraging them to publish their work exposes them to Wikipedia's peer review process with the potential to alter their views about the quality of Wikipedia content.

References

American Psychological Association. (2013). *APA Guidelines for the undergraduate psychology major.* Retrieved from http://www.apa.org/ed/precollege/about/undergraduate-major.aspx

Association for Psychological Science. (2011). *APS Wikipedia Initiative*. Retrieved from http://www.psychologicalscience.org/apswi

Bjork, E. L., & Bjork, R. A. (2011). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In M. A. Gernsbacher, R. W. Pew, L. M. Hough, & J. R. Pomerantz (Eds.), *Psychology and the real world: Essays illustrating fundamental contributions to society* (pp. 56-64). New York: Worth Publishers.

Calhoun, C. (2014). Using Wikipedia in information literacy instruction: Tips for developing research skills. *College and Research Libraries News, 75*(1), 32-33. Retrieved from http://crln.acrl.org/content/75/1/32.short

Chen, H. (2010). The perspectives of higher education faculty on Wikipedia. *The Electronic Library, 28*(3), 361-373. doi:10.1108/02640471011051954

Cole, M. (2008). Using Wiki technology to support student engagement: Lessons from the trenches. *Computers and Education, 52*(1), 141-146. doi:10.1016/j.compedu.2008.07.003

Fallahi, C. R., Wood, R. M., Austad, C. S., & Fallahi, H. (2006). A program for improving undergraduate psychology students' basic writing skills. *Teaching of Psychology, 33*(3), 171-175. doi:10.1207/s15328023top3303_3

Farzan, R., & Kraut, R. E. (2013). Wikipedia classroom experiment: Bidirectional benefits of students' engagement in online production communities. CHI'13: *Proceedings of the ACM conference on human factors in computing systems* (pp. 783-792). New York: ACM Press.

Fiorella, L., & Mayer, R. E. (2013). The relative benefits of learning by teaching and teaching expectancy. *Contemporary Educational Psychology, 38*(4), 281-288. doi:10.1016/j.cedpsych.2013.06.001

Gartner, A. (1971). *Children teach children: Learning by teaching*. New York: Harper & Row.

Glott, R., Schmidt, P., & Ghosh, R. (2010). *Wikipedia Survey – Overview of Results*. United Nations University, Collaborative Creativity Group. Retrieved from http://web.archive.org/web/20110728182429/http://www.wikipediasurvey.org/docs/Wikipedia_Overview_15March2010-FINAL.pdf

Halpern, D. F. (2002). Teaching for critical thinking: A four-part model to enhance thinking skills. In S. Davis & W. Buskist (Eds.), *The teaching of psychology: Essays in Honor of Wilbert J. McKeachie and Charles L. Brewer* (pp. 91-105). Mahway, NJ: Lawrence Erlbaum.

Hill, B. M., & Shaw, A. (2013). The Wikipedia gender gap revisited: Characterizing survey response bias with propensity score estimation. *PLOS ONE, 8*(6), 1-5. doi:10.1371/journal.pone.0065782

Johnson, D. W. & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher, 38*(5), 365– 379. doi:10.3102/0013189X09339057

Karasavvidis, I. (2010). Wiki uses in higher education: Exploring barriers to successful implementation. *Interactive Learning Environments, 18*(3), 219-231. doi:10.1080/10494820.2010.500514

Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*(4), 681-706. Retrieved from https://pdfs.semanticscholar.org/dbfb/3c9153d3aa75d98460e83fa180bc9650d6fd.pdf

Kubiszewski, I., Noordewier, T., & Costanza, R. (2011). Perceived credibility of Internet encyclopedias. *Computers and Education, 56*, 659–667. doi:10.1016/j.compedu.2010.10.008

Lampe, C., Obar, J., Ozkaya, E., Zube, P., & Velasquez, A. (2012). Classroom Wikipedia participation effects on future intentions to contribute. In *Proceedings of the Association for Computing Machinery 2012 Conference on Computer Supported Cooperative Work*. Seattle, Washington: ACM.

Lilienfeld, S., Lynn, S. Namy L. S. & Woolf, N. J. (2014). *Psychology: From Inquiry to Understanding*, 3rd Edition. Upper Saddle River, NJ: Pearson.

Lim, S. (2009). How and why do college students use Wikipedia*? Journal of the American Society for Information Science and Technology, 60*(11), 2189–2202. doi:10.1002/asi.21142

Miller, J. (2014). Building academic literacy and research skills by contributing to Wikipedia: A case study at an Australian university. *Journal of Academic Language and Learning, 8*(2), A72-A86. Retrieved from http://journal.aall.org.au/index.php/jall/article/view/319

Nestojko, J. F., Bui, D. C., Kornell, N., & Bjork, E. L. (2014). Expecting to teach enhances learning and organization of knowledge in free recall of text passages. *Memory and Cognition, 41*(7), 1038-1048. doi:10.3758/s13421-014-0416-z

Palincsar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1,* 117-175. doi:10.1207/s1532690xci0102_1

Ploetzner, R., Dillenbourg, P., Preier, M., & Traum, D. (1999). Learning by explaining to oneself and to others. In P. Dillenbourg (Ed.), *Collaborative learning: Cognitive and computational approaches* (pp. 103-121). Bingley, UK: Elsevier.

Ravid, G., Kalman, R. M., & Rafaeli, S. (2008). Wikibooks in higher education: Empowerment through online distributed collaboration. *Computers in Human Behavior, 24,* 1913-1928. doi:10.1016/j.chb.2008.02.010

Reagle, J. & Rhue, L. (2011). Gender bias in Wikipedia and Britannica. *International Journal of Communication, 5*, 1138-1158. doi:1932-8036/20111138

Roscoe, R. D., & Chi, M. T. (2008). Tutor learning: The role of explaining and responding to questions. *Instructional Science, 36*(4), 321-350. doi:10.1007/s11251-007-9034-5

Shane-Simpson, C. & Brooks, P. J. (2016). Dos and don'ts of Wikipedia editing in the undergraduate psychology classroom. *The APS Observer, 29*(2), 32-33. Retrieved from http://www.psychologicalscience.org/observer/the-dos-and-donts-of-wikipedia-editing-in-the-undergraduate-psychology-classroom#.WCcy9BR05MY

Shane-Simpson, C., Brooks, P. J., Hotez, E., Sawyer, J., & Dow, E. A. A. (2015). Web-enhanced collaborative learning in undergraduate psychology courses: Examples using the ASD video glossary, CHILDES, and Wikipedia. In R.V. Nata (Ed.), *Progress in Education, Volume 36* (pp. 25-47). Hauppauge, NY: NOVA Science Publishers.

Shane-Simpson, C., Che, E., & Brooks, P. J. (2016). Giving psychology away: Implementation of Wikipedia editing in an introductory human development course. *Psychology Learning and Teaching, 15*(3), 268-293. doi:10.1177/1475725716653081

Shimazoe, J. & Aldrich, H. (2010). Group work can be gratifying: Understanding & overcoming resistance to cooperative learning. *College Teaching, 58*, 52–57. doi:10.1080/87567550903418594

Springer, L., Stanne, M. E., & Donovan, S. S. (1999). Effects of small-group learning on undergraduates in science, mathematics, engineering, and technology: A meta-analysis. *Review of Educational Research, 69*(1), 21-51. doi:10.3102/00346543069001021

Tomes, H. (2000). Giving psychology away. *Monitor on Psychology, 31*(6). Retrieved from http://www.apa.org/monitor/jun00/itpi.aspx

Traphagan, T., Traphagan, J., Dickens, L. N. & Resta, P. (2014). Changes in college students' perceptions of use of web-based resources for academic tasks with Wikipedia projects: A preliminary exploration. *Interactive Learning Environments, 22*(3), 253–270. doi:10.1080/10494820.2011.641685

Webb, N. M. (1989). Peer interaction and learning in small groups. *International Journal of Education Research, 13*, 21-39. doi:10.1016/0883-0355(89)90014-1

Chapter 22: Using the QALMRI Method to Scaffold Reading of Primary Sources

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Abstract

One of the most important goals of any undergraduate psychology program is to develop students' ability to comprehend and critically evaluate empirical research. This chapter demonstrates the QALMRI method as an instructional strategy for teaching students how to identify, comprehend, and critically evaluate conceptually important information in an empirical article. Originally created as a framework to help students to develop scientific literacy, QALMRI is an acronym that stands for Question, Alternatives, Logic, Method, Results, and Inferences. We first provide an overview of the QALMRI method with a student-directed instruction guide; we then demonstrate a scaffolding approach for integrating the QALMRI method across different education levels. We conclude with a set of learner-centered activities designed to apply the QALMRI method with specific learning objectives.

Introduction

One of the essential goals of any undergraduate psychology program is to teach students how to critically evaluate primary research. For example, the American Psychological Association (APA) guidelines identify scientific literacy as its second major learning goal (Halonen et al., 2013). As such, it may not be surprising to find that many psychology instructors incorporate primary source readings (i.e., empirical articles) into their courses. Among liberal arts colleges, one study found that 70.8% of psychology instructors assigned primary source readings (Oldenburg, 2005). Although assignment of these readings was more prevalent for upper-level courses, primary source readings were also assigned by 46% of introductory psychology instructors.

Empirical articles are often incorporated into a curriculum as a tool to support student learning of specific learning objectives. For example, articles have been used to help students understand basic statistical and methodological principles (Christopher & Walter, 2006; Pennington, 1992; Ware & Badura, 2002), spark classroom discussions (Suter & Frank, 1986), promote critical thinking (Chamberlain & Burrough, 1985), motivate engagement (Carkenord, 1994), improve student writing (Price, 1990; Ware & Badura, 2002), and serve as assessment tools (Bachiochi et al., 2011). Yet, there has been considerably less focus on teaching students how to make sense of the scientific literature as a whole, which begs the question: how do students learn to read empirical articles in the first place?

Primary source readings, as compared to textbook chapters, may be particularly challenging for undergraduate students. Whereas textbooks are written with students in mind, empirical articles are written for other professionals and present persuasive arguments rather than facts (Gillen, 2006). Additionally, textbooks provide a great deal of guidance, explicitly pointing readers to important information using text structure and signaling techniques like headers and keywords (Kardash & Noel,

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2000; Sanchez, Lorch, & Lorch, 2001) to scaffold reading comprehension (Varnhagen & Digdon, 2002). By contrast, scientific writing contains explanatory and argumentative text structures that are inherently challenging for non-experts to understand (for a review, see Britt, Richter, & Rouet, 2014). In short, the comprehension and critical evaluation of primary sources poses a unique challenge for undergraduate students in two important ways. First, the reader must be able to find and identify important conceptual information that may or may not be explicitly stated. And second, the reader must be able to understand the logical connections between important ideas, both within the context of the individual research article and in the broader context of the scientific literature and research methodology. Here we describe the QALMRI method as a teaching device that provides students with an easy-to-remember guide for identifying, summarizing, and integrating conceptually important information in an empirical article, see Figure 1.

The QALMRI

"QALMRI" is an acronym that stands for:

Question:	(a) What was the broad question being asked by this research project?
	(b) What was the specific question being asked by this research project?
Alternatives:	(a) What was the author's hypothesis?
	(b) What were the alternative hypotheses?
Logic:	What was the logic of the hypotheses? If the author's hypothesis is true, then what should happen?
Method:	What were the methods?
Results:	What were the important results?
Inferences:	What inferences about the hypotheses and questions can be made based on the results?

Figure 1. An outline of the QALMRI method adapted from Kosslyn and Rosenberg (2003).

What is the QALMRI method?

The QALMRI method is an instructional strategy for teaching students to identify key conceptual information necessary for the comprehension and critical evaluation of empirical articles. It was originally designed as a loose framework to help students understand the meaning of the research described in an empirical article by identifying and drawing connections between the questions being asked, how the researcher tried to answer them, and the implications of the answer. The QALMRI method is particularly suited for improving student comprehension of scientific literature because it provides a template for organizing ideas relative to each other, integrating prior knowledge, and encouraging active construction of meaning (Anderson & Pearson, 1984; Kintsch, 1988; Lorch & van den Brock, 1997). Below we provide an overview of the QALMRI method adapted from Kosslyn and Rosenberg (2003). We have written specific QALMRI instructions for students, which instructors can

copy as-is to create an instructional guide (see Appendix A for an example of a completed QALMRI summary).

Q stands for Question.

What was the broad question(s) being asked by this research project?

What was the specific question(s) being asked by this research project?

All research begins with a question, and trying to answer the question is the point of conducting research. The first step to understanding any empirical article is to identify the question or questions that were asked by the author (researcher), and understand why the question was important enough that we should care about the answer. In general, there are often two categories of questions being asked: broad and specific. Broad questions are typically too general to be answered by any single experiment and provide an overview of the general topic of interest (e.g., "What is the influence of playing video games on our daily behavior?"). Specific questions, on the other hand, can be addressed by a single experiment or set of experiments (e.g., "Does playing violent video games cause children to engage in more violent behavior?"). Answering one or more specific questions should be considered steps made toward addressing a broad question.

Generally, the first few paragraphs of the introduction of an empirical article should include the questions the article is addressing. The broad question can often be found in the very first paragraph of the introduction, where the author introduces the broad topic of interest that is being examined. It should be noted that sometimes the broad question is not made explicit, and may require some work on the part of the reader to draw a connection from the specific question to the broad topic. Additionally, specific questions might tap multiple broad issues making it difficult to identify a single broad question.

Hint: If you are having difficulty identifying the broad question, first identify the specific question, then try to connect that question to the broader topic. For example, the article might quickly introduce the specific question, "Does playing violent video games cause children to engage in more violent behavior?" and from this you might conclude that the broad question is about how video games impact our behavior. However, the topic could have been introduced by describing factors that can cause children to engage in violent behavior, and not by describing other ways video games have been shown to influence behavior. In this case, the larger issue might not be video games per se, but might center on aggression and childhood behavior. The specific question in this example is related to both of these broad questions, but it is important to separate the broad question as understood by the author, and other potential issues the question might relate to.

Depending on the writing style, the specific question might be found early in the introduction, shortly after the broad topic is introduced, or near the end of the introduction after the author has provided a review of previous work on the topic. The review of the previous work should also provide some context, explaining why the questions being addressed are interesting, important, and worth spending time and resources addressing.

A stands for Alternatives.

What was the author's hypothesis?

What were the alternative hypotheses?

A good empirical article will consider at least two possible answers to the specific question(s) being asked. Each possible answer proposed in the article is called a hypothesis. The author should explain why each possible answer is plausible, usually referencing previous articles and theories. However, the author's preferred or favorite answer is called "the hypothesis," while other proposed answers are called "alternative hypotheses." It is important to note that some studies have multiple questions. Each of these questions will require its own hypothesis and alternative hypotheses. The hypotheses can usually be found in the general introduction. After describing the questions, the author should provide the hypotheses and explain why those hypotheses are plausible.

Again, it is worth reminding students that the hypotheses are the possible answers to the question. However, sometimes the alternative hypotheses are not explicitly stated, or even considered by the author. If the alternatives are not stated clearly, the student should try to figure out what they could be on your own. For example, if the study is attempting to confirm the predictions of a single theory, what might other theories predict? Could a different interpretation of the theory proposed by the author make a different prediction?

L stands for Logic.

What was the logic of the hypotheses?

If the author's hypothesis is true, then what should happen?

The goal of any research project is to carry out an experiment or set of experiments to discriminate between alternative hypotheses. The logic, therefore, is the general idea underlying how the alternatives might be distinguished, using empirical data as evidence for or against each hypothesis. Ideally, you should be able to state the logic in the form of an *if–then* statement. That is, if the author's hypothesis is correct, we would predict that manipulating a particular variable should change the participant's behavior in a specific way. If the alternative hypothesis is correct, then we would predict that manipulating a specific variable would change the participant's behavior in a different way. The logic of the study generally appears near the end of the general introduction. Often, the author will provide an overview of the research methods being applied in the study, and the predictions made in accordance with relevant hypotheses. From these predictions, you should be able to derive *if–then* logical statements.

M stands for Methods.

The methods are the details of what the researchers did in the study. The amount of methodological information included in an article can be overwhelming. As a reader, you should first determine what your goals are, and what level of detail you wish to learn about research methodology. We will make a distinction between having a general understanding of research design and understanding all the methodological details. Depending on your goals as a reader, a general overview may be sufficient.

*A general overview of the research design***.** Before diving into the gritty details, you should first familiarize yourself with the general design of the study. It is important to note that there are a variety of different methods for testing a hypothesis and you should first try to identify the general method being applied. Some of the most common designs used in psychological research are experimental, quasi-experimental, and correlational. Experimental designs manipulate an independent variable to see changes in a dependent variable. For example, you could manipulate the time of day students take a test (evening vs. morning) and measure the change in test scores. Critically, in an experimental design

participants are randomly assigned to one of the groups (evening or morning). On the other hand, quasi-experimental designs do not randomly assign participants to groups and instead rely on existing group memberships (e.g., musician vs. non-musician, married vs. single). For example, you could measure the difference in test scores (dependent variable) for male and female students. In this case, gender is treated as an independent variable even though we do not randomly assign participants to each condition. Finally, in correlational designs we measure variables and look for relationships between them. For example, you could measure the amount of money people make and how happy they are to examine whether there is a relationship between salary and happiness. Once you have determined the general type of research design, you should identify all the key components of the design. If the study uses an experimental or quasi-experimental design you should be able to identify the dependent variable(s) (what is being measured) and the independent variable(s). Are the independent variables within- or between-subjects? Is the independent variable manipulated (i.e., experimental) or using existing group memberships (i.e., quasi-experimental)? If it is a factorial design, you should identify the levels for each factor. It might be worthwhile to draw a table, renaming and mapping the factorial design onto the appropriate cells of the table.

A general overview of the research design is usually described at the end of the general introduction, or if there are multiple studies, in the introduction to each study. If there are any details that are unclear from the general overview, you can search them out in the Methods section.

*Methodological details***.** The methodological details found in the Methods section, provide in-depth descriptions of all the materials and procedures used throughout the study. For example, the methods section will describe who participated in the study and how they were selected. It will also describe what materials they used, how they were constructed, etc. There should be enough detail included that any researcher could replicate the study without tracking down the original authors to ask questions. The Methods section is usually broken down into the following subsections:

Participants. While reading this section, you should try to understand who participated in the study. How were they selected? Are multiple groups being compared? To what population are the researchers intending to generalize their results? Is the sample representative of that population? If a study was conducted to examine a particular population (e.g., men in their early 20's), then the participants should be as similar to that group as possible. If no particular group is specified, then the sample should be representative of the population in general. If the study uses more than one group (i.e., a between-subjects design), they should be equivalent on important demographic variables such as age, education, or gender. You should try to think of any demographic variables that are not described, or controlled for by the experimenter, that could influence the results.

*Apparatus and materials***.** The apparatus is any equipment used during data collection, whether to deliver stimuli or measure responses. The materials can include scripts, surveys, and software used for data collection, as well as any stimuli presented to participants throughout the study. The authors should describe exactly how stimuli were presented, how those stimuli were constructed or chosen, and how responses were recorded. For example, if the researcher used a computer apparatus, they should describe the software used, how long stimuli were presented on the screen, the size of the stimuli, and the types of responses recorded. You should think about how the apparatus and stimuli would have looked to the participant. Is there any aspect that would have been distracting or confusing to the participant? Is the apparatus, stimuli, response collection, etc., appropriate for the specified task?

Procedure. The procedure is the step-by-step listing in chronological order of what a participant did in the study, and if appropriate, a step-by-step listing of what a participant did for any given individual trial. You should try to picture yourself as a participant in the study. Does the task seem easy or difficult? What were the instructions given to participants? Were the instructions clear enough that participants would have understood them? Is it possible the researcher treated participants in different groups differently?

R stands for Results

What were the outcomes? The outcome of the study will be detailed in the Results section. First, you should try to gain an understanding of how participants generally performed in the task. The results of the study are often summarized using descriptive measures of central tendency (means, medians, or modes) and variability (e.g., standard deviation). These descriptive measures are usually displayed in a table or figure that provides you with an easy-to-understand summary of the results.

Second, how do you know the differences you see in the descriptive measures are reliable and should be taken seriously? We rely on inferential statistics to help us make judgments about our data. In the results section, the author will report the statistical tests (e.g., *t*-test, ANOVA) that they used to analyze their data and the resulting *p*-values. The *p*-value of a statistical test represents the probability you would have observed the reported difference in the sample, by chance alone assuming there are no true differences in the population (for more information, see Gigerenzer, 2004). The *p*-value is always a number between 0 and 1, and the commonly accepted standard is 0.05. If the *p*-value is less than 0.05, (say, 0.049) the result is said to be "significant," and we can be reasonably certain that the difference found in the sample, represents an actual difference in the population. Other common *p*-values include 0.01 and 0.001, each of which increases the probability that your results were not due to chance and represent an actual difference in the population.

Sometimes, the results section can be difficult to navigate. There can be numerous statistical tests with many different results. You should try to identify the important results. Which statistical tests directly relate to the questions asked? In other words, the hypotheses made predictions about the changes we would expect to observe in our dependent variable for each of the groups or conditions. For example, there might be predicted differences between specific groups or, in the case of correlational designs, predicted associations. Try to find the statistical tests that test those specific predictions.

I stands for Inferences.

The results section details the results of the author's measurements, and statistical inferences about whether differences between those measurements should be considered reliable. But what does it all mean? The real payoffs of conducting an empirical study are the inferences one can draw from the results that bear on the questions asked and help identify which of the possible answers (i.e., hypotheses) are most likely to be true. Given the results, what did the authors conclude? The Discussion section will contain the inferences (note that the use of the word *inference* is separate from *inferential statistics*) the authors made about their results. Ideally, if the logic and methodology are sound, the results should be more consistent with only one of the hypotheses, allowing the authors to eliminate one or more alternatives. At this point, you should be able to work backwards through the first half of our QALMRI answering all the questions the authors originally set up. For example:

(Logic) How do the results line up with the logical if–then statements?

(Alternatives) Given the results, which hypothesis does the logic implicate?

(Questions) What does that hypothesis say about the specific and broad questions?

As a goal, you should try to summarize the author's conclusions in a short paragraph, as they relate to the logic, alternatives, and questions.

Once you gain an understanding of the inferences the authors have made regarding the results, you should try to think critically about their conclusions and about broader implications. Do the statistical tests support the author's conclusions? Were any of the alternatives not convincingly ruled out? Why? Were there any limitations or confounding variables that could alter their interpretation of the results? For example, if the study uses existing group memberships (e.g., musician vs. non-musician), are there any other differences between the groups that could also explain the results? What specific and broad questions did this particular study fail to address? Do the results of this study create new specific questions that might help us understand the broader question?

Introducing QALMRI in the classroom: A scaffolding approach

QALMRI is a tool that helps students identify, organize, and summarize important information found in an empirical article. To use the tool, however, students need help learning how to use it appropriately. Here we provide a scaffolding approach for introducing the QALMRI technique in courses at different levels. We have adopted the taxonomical progression proposed by Bloom (Anderson, Krathwohl, & Bloom, 2001). Our first two stages of learning focus on remembering and understanding methods of the QALMRI itself, while the final two focus on applying the method, which then can be used to analyze and evaluate primary source material.

Novice: QALMRI summaries

Most introductory psychology students have no experience with primary research and enter post-secondary programs unprepared to read, comprehend, and interpret scientific literature (Larson, Britt & Kurby, 2009; Larson, Britt, & Larson, 2004; Norris & Phillips, 1994; Norris, Phillips, & Korpan, 2003). Requiring students, who have no foundation for understanding, to read full empirical articles will probably be an ineffective and inappropriate teaching strategy. Yet, we do want to give students experience engaging with primary sources, and use the scientific literature as a tool to teach students about psychology in general. However, the QALMRI method is also a tool, and before students can use it effectively, we must introduce the method and teach students how to use it appropriately. To accomplish this, we suggest that instructors provide students with completed QALMRI summaries (like the one in Appendix A) without requiring the students to read the articles or even complete the questions themselves. By providing completed summaries, students can focus on understanding the method and connecting the content of the summaries to introductory psychological concepts. Using completed summaries is also the easiest way to incorporate the QALMRI method into existing courses as instructors can use QALMRI summaries as a way to support existing learning objectives. For example, and to name but a few, QALMRI summaries can be used to connect psychological concepts to research, highlight important findings, demonstrate research methodologies, demonstrate data collection and analysis techniques, and connect psychological concepts to real-world problems. Importantly, this stage does not require students to complete the QALMRI or read the original article, thereby scaffolding the

procedure for students, while giving them a framework to use themselves as they increase their skill level at reading primary literature.

Beginner: Adapting primary sources to include QALMRI summaries

Once students have a basic framework for evaluating primary sources, the next step is to expose them to the actual articles. However, the format of primary sources is inherently difficult for non-experts because they do not contain the guiding structure and signaling techniques built into textbook writing (Britt et al., 2014). One method that works well with the QALMRI approach is known as the adapted primary literature strategy (Yarden, Norris, & Phillips, 2015; see also Phillips & Norris, 2009). The adapted primary literature strategy is to rewrite primary source text by adapting and augmenting the article to include guiding structures, highlighting, and additional background necessary for non-experts to understand the article.

Although Yarden and colleagues (2015) advocate for rewriting entire articles, we suggest a simpler approach: keep the original text intact, but insert textboxes in critical parts of the article to highlight the QALMRI information. For example, immediately after the paragraph that contains the relevant information regarding the hypothesis, insert a textbox for the Alternatives section. At the early stage of learning, the instructor should include the answers to the QALMRI questions and, if necessary, an explanation as to how you arrived at that answer. The focus of this stage is to give students experience reading primary source articles while demonstrating how to locate and summarize key conceptual information. By providing the original text integrated with the completed QALMRI summaries, students can focus on connecting the summaries to the text while reinforcing their understanding of the QALMRI framework.

When constructing the adapted article, the instructor can include other information necessary for a non-expert reader to understand the article. For example, the instructor can provide definitions of technical terms, an explanation of jargon, or additional background information. The location of the inserted textboxes, however, is critical as a signal to the reader that they have just read the information being summarized.

Intermediate: Applying the QALMRI method to adapted articles

The intermediate stage is where the student progresses from learning and remembering the QALMRI to formally applying it. An introduction to applying the QALMRI method can be accomplished using the adapted primary literature strategy described above, but with the students (rather than the instructor) completing the QALMRI summaries themselves. That is, the instructor will provide the adapted article that contains the text boxes for each of the QALMRI sections in their relevant locations. However, the QALMRI will not be completed by the instructor and it will be up to the student to apply their knowledge and complete the QALMRI.

This approach allows the student to practice the application of the QALMRI, but retains the scaffolding of the adapted primary strategy. For example, the locations of the text boxes signal where the student should be looking for the necessary information (immediately prior to the textbox) and the instructor can include supplemental information in the relevant locations of the text to augment their understanding of the article content.

Advanced: Applying the QALMRI method to non-adapted articles

At this stage, students have learned the QALMRI framework for summarizing primary source material and have experience applying it to adapted primary articles. Now they should be ready to remove the guiding structures and supplemental information of the adapted primary literature strategy and begin practicing the QALMRI on non-adapted articles.

Using QALMRI as a student-centered teaching device

QALMRI is a flexible tool that can be used in a wide variety of ways. However, as with any educational tool, to be effective it should be used in a manner that connects to specific learning goals and engages students in active-learning strategies that will facilitate the development and organization of content knowledge and critical thinking (Kolb, 1984; Weimer, 2002). To that end, we will conclude this chapter with some examples of learner-centered activities that leverage evidence-based, effective education principles like active learning, practice, and collaboration (Chickering & Gamson, 1987), and describe how the QALMRI method and primary source reading can be incorporated into these activities. Sources are cited where applicable, however, we also provide some novel learner-centered activities in which case no source is cited.

Think / Write / Pair / Share

Source: Kaddoura, 2013

Learning-outcomes: comprehension, critical thinking

Purpose: This activity allows the instructor to start a broader discussion of the topic, to check for current understanding of the material, and challenge students to think critically.

Implementation: Taking only about 5-15 minutes from the total class time, this activity in combination with QALMRI is an excellent method to engage the whole class, while still giving students the opportunity to reflect individually.

The implementation of the activity is as follows: after a review and discussion of a study using the QALMRI method, the instructor asks students to write down their own thoughts concerning one particular aspect of QALMRI. For example, you could direct students to think about the relationship between the specific and the broad question (e.g., What aspect of the broad question is not addressed by the study? Do the results of this study create any new specific questions?). Students should pair up with a classmate and share their ideas with each other. The teacher then brings students back into a full class discussion by calling on students to share their own or their partner's answers.

Article abstract and/or introduction

Source: Bean, 1996

Learning-outcomes: comprehension, writing

Purpose: This activity challenges students to make connections between the QALMRI sections, reframing, and rewriting the QALMRI summary in a formal abstract or introduction format.

Implementation: The instructor selects a relevant article from the current topic being studied and provides a completed QALMRI summary to the students. From the QALMRI summary, students spend 10-15 minutes rewriting the QALMRI in the form of an abstract, summarizing the study in their own

words. Alternatively, for a take-home written assignment, you can instruct the students to write an introduction for the study, requiring additional sources to help motivate the study using background literature.

One-minute paper

Source: Angelo & Cross, 1993

Learning-outcomes: comprehension

Purpose: The main purpose of this activity is to quickly assess student's current knowledge of the topic of interest.

Implementation: This activity provides a structured way to elicit student participation during in-class discussions. The instructor directs the class to write down as much as they know about a particular section of QALMRI for several minutes. This allows students to formalize some thoughts on a particular issue. The instructor can either collect the written responses to assess student knowledge on the topic, or simply use the activity to spur class discussion. By allowing students time to gather their thoughts and write a response that ensures that everyone participates and allows the instructor, armed with the knowledge that every student has a response, to cold-call students for a response. This activity is often best implemented either before the start of the class to allow students time to think about the topic prior to the lesson, or after the lesson, as a reflection on what they have learned.

Reverse engineering

Learning-outcomes: comprehension, application, critical thinking, experimental design

Purpose: This activity challenges students to think critically about experimental design, and to practice data analysis and data interpretation.

Implementation: First, the entire class participates in an experiment, unaware of the purpose. The instructor acts as the researcher, conducts the experimental procedure and collects the class data. Then students break into groups and are tasked with identifying the important aspects of the experimental design (e.g., what were the independent/dependent variables?) and deciding, as a group, what questions the experimenter was asking, and identifying possible hypotheses.

In reverse engineering, and similar to the think/write/pair/share activity, the entire class then reconvenes to share their ideas and ultimately reach consensus on what questions were being asked and what the hypotheses were. Then the class data are analyzed, the results determined, ending with the class discussing the implications of the findings in relation to the hypotheses and questions. The data analysis can be completed by students in small groups or as a class led by the instructor.

Failure analysis

Source: Baker College, 2009

Learning-outcomes: critical thinking, experimental design

Purpose: Challenge students to think critically about how a study is motivated and constructed by identifying failures in experimental design.

Implementation: The instructor presents students with a completed QALMRI summary of an experiment. The chosen experiment could be from a published study (e.g. Flegal, Kit, Orpana, and Graubard, 2013; Wakefield et al., 1998) or the instructors can design their own study. However, the study chosen should be flawed in some critical way. For example, the study may have failed to account for a specific confounding variable, have poorly constructed logical if–then statements, or have used an inappropriate statistical analyses. The instructor can break students up into small groups who are tasked with identifying one or more critical flaws in the study and proposing a solution.

The construction of the flawed study can target various aspects of the QALMRI depending on the learning goals. For example, the failure in design could result from failing to address the questions asked (Questions), failures in logic (Logic), omitting important alternative hypotheses (Alternatives), methodological errors (Methods), incorrect use of statistical tests (Results), or unsubstantiated conclusions (Inferences). As an assessment, groups can either write down their analysis following the QALMRI guidelines or present their findings to the class.

Guided-discovery learning

Source: Apple & Krumsieg, 2000

Learning-outcomes: critical thinking

Purpose: An active-learning activity that puts the responsibility of discovering new course content on the student.

Implementation: The instructor gives the students a specific research question related to the current class topic. Students (either individually or as a group) are tasked with conducting a literature search to find an empirical article that addresses the question and tests a hypothesis. The QALMRI provides the set of guided questions that students need to answer from the chosen article. Each of the groups could then present their article and QALMRI summaries to the class, which is followed up with an in-class discussion about the various answers proposed.

Peer-review

Learning-outcomes: critical thinking, writing

Purpose: This activity aims to improve students' reading comprehension, writing skills, and develop effective collaboration practices.

Implementation: Peer-review is an invaluable technique that allows students to think critically about others' writing and incorporate constructive feedback into their own writing. QALMRI provides a nice rubric for students to review empirical, APA style research reports written by their peers and, in turn, receive constructive feedback on their own research reports. Students are instructed to exchange drafts of their research reports and try to complete the QALMRI, making note of information that is unclear or missing, and providing feedback about how the clarity of the reported information could be improved.

After students complete their peer-review, they should meet with their partner(s), exchange completed QALMRIs, and discuss the feedback. For the student receiving feedback via QALMRI, this activity provides an opportunity to see how a reader interpreted their writing and ideas. The rubric serves to identify areas where the reader misinterpreted the writing, and it provides specific suggestions for

improving the report. For example, the reviewer might state the specific and broad questions they thought the writer was asking. Were those questions the ones that were intended?

Question-of-the-day / Challenging misconceptions

Learning-outcomes: critical thinking

Purpose: The purpose of this exercise is to formalize an argument about commonly held misconceptions and challenge those arguments using primary sources and the QALMRI method.

Implementation: This in-class activity can serve as a starting point on the current class topic encouraging students to think critically about a topical issue. At the beginning of class, the instructor gives the class a "question-of-the-day" and instructs the students to spend 5-10 minutes writing an answer and justifying why they believe their answer to be correct. These questions need not be controversial. For example, the question could be "What is the best way to remember a new piece of information?"

Students are then given an article that addresses the issue, organized into small groups, and instructed to work through the QALMRI method to summarize the study. Or if time is limited, the instructor can present the study using the QALMRI format. The class can then discuss the strength of evidence for the study's conclusion, and whether they should update their own beliefs. Of course, if the topic is sensitive, students do not have to share their responses to complete this activity. The activity can be constructed as a personal reflection rather than public discussion of personal beliefs. For common myths and misconceptions to draw from as inspiration for this activity, see Lilienfeld, Lynn, Ruscio, and Beyerstein (2011) or Furnham and Hughes (2014).

References

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). A taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy of educational objectives. New York, NY: Longman

Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. *Handbook of Reading Research, 1*, 255–291.

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques: A handbook for college teachers*. San Francisco, CA: Jossey-Bass.

Apple, D. K., & Krumsieg, K. (2000). *Handbook on cooperative learning*. Corvallis, OR: Pacific Crest.

Bachiochi, P., Everton, W., Evans, M., Fugere, M., Escoto, C., Letterman, M., & Leszczynski, J. (2011). Using empirical article analysis to assess research methods courses. *Teaching of Psychology*, *38*(1), 5-9. https://doi.org/10.1177/0098628310387787

Baker College. (2009). *Learner-centered teaching*. Flint, MI: Effective Teaching and Learning Department, Baker College.

Bean, J. C. (1996). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom*. San Francisco, CA: Jossey-Bass

Britt, M. A., Richter, T., & Rouet, J.-F. (2014). Scientific literacy: The role of goal-directed reading and evaluation in understanding scientific information. *Educational Psychologist*, *49*(2), 104–122. doi: 10.1080/00461520.2014.916217

Batsell, W. R., Perry, J. L., Hanley, E., & Hostetter, A. B. (2017). Ecological validity of the testing effect: The use of daily quizzes in Introductory Psychology. *Teaching of Psychology*, 44(1), 18–23. doi: 10.1177/0098628316677492

Carkenord, D. M. (1994). Motivating students to read journal articles. *Teaching of Psychology*, *21*(3), 162–164. doi: 10.1177/009862839402100309

Chamberlain, K., & Burrough, S. (1985). Techniques for teaching critical reading. *Teaching of Psychology*, *12*(4), 213. doi: 10.1207/s15328023top1204_8

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, *3*, 3-7.

Christopher, A. N., & Walter, M. I. (2006). An assignment to help students learn to navigate primary sources of information. *Teaching of Psychology*, *33*(1), 37–63. doi: 10.1207/s15328023top3301_9

Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. *Journal of the American Medical Association*, *309*(1), 71-82. doi:10.1001/jama.2012.113905

Furnham, A., & Hughes, D. J. (2014). Myths and misconceptions in popular psychology comparing psychology students and the general public. *Teaching of Psychology*, *41*(3), 256–261. doi: 10.1177/0098628314537984

Gigerenzer, G. (2004). Mindless statistics. *The Journal of Socio-Economics*, *33*(5), 587–606. doi: 10.1016/j.socec.2004.09.033

Gillen, C. M. (2006). Criticism and interpretation: Teaching the persuasive aspects of research articles. *CBE-Life Sciences Education*, *5*(1), 34–38. doi: 10.1187/cbe.05-08-0101

Halonen, J. S., Buskist, W., Dunn, D. S., Freeman, J., Hill, G. W., Enns, C., … Kaslow, N. (2013). *APA guidelines for the undergraduate psychology major (version 2.0).* Washington*, DC: APA*. Retrieved from http://apadiv2.org/Resources/Documents/news/Guidelines%202%200%20FINAL%20for%20CoR%20Aug%202013.docx

Kaddoura, M. (2013). Think pair share: A learning strategy to enhance students' critical thinking. *Educational Research Quarterly*, *36*(4), 3–24.

Kardash, C. M., & Noel, L. K. (2000). How organizational signals, need for cognition, and verbal ability affect text recall and recognition. *Contemporary Educational Psychology*, *25*(3), 317–331. doi: 10.1006/ceps.1999.1011

Kintsch, W. (1988). The role of knowledge in discourse comprehension: A construction-integration model. *Psychological review*, *95*(2), 163-182. doi: 10.1037/0033-295X.95.2.163

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* Englewood Cliffs, NJ: Prentice Hall. Retrieved from http://academic.regis.edu/ed205/kolb.pdf

Kosslyn, S. M., & Rosenberg, R. S. (2003). *Fundamentals of psychology: The brain, the person, the world*. Boston: Pearson.

Larson, A. A., Britt, M. A., & Kurby, C. A. (2009). Improving students' evaluation of informal arguments. *The Journal of Experimental Education*, *77*(4), 339-366. doi: 10.3200/JEXE.77.4.339-366

Larson, M., Britt, M. A., & Larson, A. A. (2004). Disfluencies in comprehending argumentative texts. *Reading Psychology*, *25*(3), 205-224. doi: 10.1080/02702710490489908

Lilienfeld, S. O., Lynn, S. J., Ruscio, J., & Beyerstein, B. L. (2011). *50 great myths of popular psychology: Shattering widespread misconceptions about human behavior*. Hoboken, NJ: John Wiley & Sons.

Lorch Jr, R. F., & van den Broek, P. (1997). Understanding reading comprehension: Current and future contributions of cognitive science. *Contemporary educational psychology*, *22*(2), 213-246.

Norris, S. P., & Phillips, L. M. (1994). Interpreting pragmatic meaning when reading popular reports of science. *Journal of research in science teaching*, *31*(9), 947-967. doi: 10.1002/tea.3660310909

Norris, S. P., Phillips, L. M., & Korpan, C. A. (2003). University students' interpretation of media reports of science and its relationship to background knowledge, interest, and reading difficulty. *Public Understanding of Science*, *12*(2), 123-145. doi: 10.1177/09636625030122001

Oldenburg, C. M. (2005). Use of primary source readings in psychology courses at liberal arts colleges. *Teaching of Psychology*, *32*(1), 25–29. doi: 10.1207/s15328023top3201_6

Pennington, H. (1992). Excerpts from journal articles as teaching devices. *Teaching of Psychology*, *19*(3), 175–177. doi: 10.1207/s15328023top1903_15

Phillips, L. M., & Norris, S. P. (2009). Bridging the gap between the language of science and the language of school science through the use of adapted primary literature. *Research in Science Education*, *39*(3), 313–319. doi: 10.1007/s11165-008-9111-z

Price, D. W. W. (1990). A model for reading and writing about primary sources: The case of introductory psychology. *Teaching of Psychology*, *17*(1), 48–53. doi: 10.1207/s15328023top1701_12

Sanchez, R. P., Lorch, E. P., & Lorch, R. F. (2001). Effects of headings on text processing strategies. *Contemporary Educational Psychology*, *26*(3), 418–428. doi: 10.1006/ceps.2000.1056

Suter, W. N., & Frank, P. (1986). Using scholarly journals in undergraduate experimental methodology courses. *Teaching of Psychology*, *13*(4), 219. doi: 10.1207/s15328023top1304_14

Varnhagen, C. K., & Digdon, N. (2002). Helping students read reports of empirical research. *Teaching of Psychology*, *29*(2), 160–165. doi: 10.1207/S15328023TOP2902_14

Wakefield, A. J., Murch, S. H., Anthony, A., Linnell, J., Casson, D. M., Malik, M., . . . Walker-Smith, J. A. (1998). Ilead-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet, 351*, 637-641. (Retracted)

Ware, M. E., & Badura, A. S. (2002). Using student scholarship to develop student research and writing skills. *Teaching of Psychology*, *29*(2), 136–159. doi: 10.1207/S15328023TOP2902_13

Weimer, M. (2002). *Learner-centered teaching*. San Francisco, CA: Jossey-Bass.

Yarden, A., Norris, S. P., & Phillips, L. M. (2015). *Adapted Primary Literature* (Vol. 22). Dordrecht: Springer Netherlands. Retrieved from http://link.springer.com/10.1007/978-94-017-9759-7

Appendix A

Example of a completed QALMRI summary

Ecological validity of the testing effect: The use of daily quizzes in introductory Psychology (Batsell, Perry, Hanley, and Hostetter, 2017) Full article: http://journals.sagepub.com/doi/full/10.1177/0098628316677492	
The "testing effect" refers to the finding that people better remember information after being tested on that material, as compared to only studying. Testing has also been shown to enhance memory for study material that did not appear on the initial test (referred to as retrieval-induced facilitation), demonstrating more general benefits of testing as a way to enhance memory and learning. Although there is much evidence to demonstrate the testing effect in the laboratory, there is little evidence of the testing effect in real-life, classroom settings. The current study examines the testing effect in a naturalistic setting by comparing memory performance for Introductory Psychology material in one class that studied the material and received brief daily quizzes to another that studied the material but did not receive daily quizzes.	
Question: What was the broad question being asked by this research project? What was the specific question being asked by this research project?	What kinds of teaching techniques will improve student learning in a classroom? Will daily quizzes enhance retention of assigned study material?
Alternatives: What was the author's hypothesis? What were the alternative hypotheses?	H1: Daily quizzes will improve memory for study material whether the material had appeared in a quiz or not. H2: Daily quizzes will only improve memory for study material that appeared in the quizzes. H3: Daily quizzes will not improve memory for study material
Logic: What was the logic of the hypotheses? If the author's hypothesis is true, what should happen?	*If H1, then* a quizzed group will perform better than a study-only group on a memory test for all the studied material. *If H2, then* a quizzed group will perform better than a study-only group on a memory test, but only for the material that appeared on the tests.

	If H3, then a quizzed group will not perform better than a study-only group on a memory test for the studied material.
Methods: What were the methods?	**General overview:** The study used a 2x3 factorial design (quasi-experimental). Students enrolled in two Intro Psychology courses took part in the study. The participants were all assigned textbook readings which consisted of material not taught during the lectures. One class received daily quizzes (21 total), while the other did not. Memory was tested three times throughout the term using 15 multiple-choice questions. Test questions were either identical to the quiz questions (identical), similar in content to the quiz questions (similar), or questions that did not appear in the quizzes (new). **Independent Variable A:** Class (study-only and quiz) ● One class received daily quizzes while the other did not. ● This variable is between-subjects and quasi-experimental (students were not randomly assigned to classes). **Independent Variable B:** Question-Type (identical, similar and new) ● Memory test questions were either identical to those used in the quizzes (identical), similar in content to those used in the quizzes (similar), or did not appear in the quizzes (new). ● This variable is within-subjects and experimental (questions were randomly assigned to each condition). **Dependent Variable:** Accuracy averaged across three memory tests.
Results: What were the important results?	There were two results of importance: 1. The Class x Question-Type ANOVA and follow-up *t*-tests show that the quiz group outperformed the study-only group on all three question types. However, this difference was greatest for identical questions (21.8%), then similar questions (17.6%), and smallest for new questions (12.7%). 2. ANOVAs with follow-up *t*-tests were also run separately on the quiz and study-only groups. The results for the study group showed no differences in performance across the identical (58.4%), similar (62.8%), and new (60.4%) question types. The results for the quiz group however, showed that performance

	for the identical (80.2%) and similar (80.4%) questions was significantly better than performance for the new questions (73.1%).
Inferences: What inferences about the hypotheses and questions can be made based on the results?	**Summary:** The results of the experiment show enhanced retention of studied material when participants were quizzed daily regardless of whether the study material was actually presented during the quizzes or not. The authors conclude that they successfully replicated the testing effect, previously shown in laboratory settings, in a naturalistic classroom setting. Furthermore, they conclude that the testing benefit generalizes non-quizzed material and therefore instructors do not need to quiz all of the study material to gain the testing effect benefit. These results are consistent with the original hypothesis (H1), and suggest that periodic quizzes can enhance the retention of assigned material (specific question) and testing could be used as an effective teaching technique to improve student learning in a classroom setting (big question). **Thinking critically:** The authors ran multiple statistical tests on the same set of data without controlling for Type I error inflation. This potentially could impact the interpretation of their results. For example, the interaction between Class and Question Type resulted in a "significant" *p*-value of .047. From this result, the authors suggested that the testing effect varied across question types. Applying any error correction for the number of statistical tests would render that result non-significant. The use of two different classes, across two different semesters, with different instructors could potentially produce other confounds. As the authors note, they cannot rule out the possibility that some characteristics of the class or the instructor motivated students more in the quiz class than the study class, which lead to better performance. Additionally, students were not randomly assigned to each of the classes. Therefore, some characteristic of the course (e.g., time of day, time of year, instructor) might cause certain types of students to self-select for one class over the other, which could lead to differences in performance.

Chapter 23: Research Methods 2.0: A New Approach for Today's Students

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Abstract

Nearly every psychology department requires that students take a research methods course in an effort to accomplish a variety of goals, such as helping students think more scientifically or preparing them to do their own research. We wondered if our course accomplished those goals and did everything it could to fully engage today's students. Even though our old approach to teaching research methods was not broken, to help our students reach their full potential and maximize learning, we reimagined our teaching approach from the students' perspective. This started by realizing that most students were not going to replicate our career path, which forced us to think more about the modal or average student. In this chapter, we discuss our journey of reshaping a research methods course, including articulating our goals for the course, outlining the changes we made, creating resources to help others make similar changes, and showing evidence for its success.

Introduction

"A mediocre person tells. A good person explains. A superior person demonstrates. A great person inspires others to see for themselves."

~ Harvey Mackay

Research methods courses hold a special place in psychology departments. Nearly every department (99%) in North America includes a methods course in their curriculum (Stoloff et al., 2010). Whereas other courses – like abnormal psychology, personality psychology, and social psychology – focus on building students' knowledge of key concepts and theories, methods courses are distinct because they focus more explicitly on building students' skills. By the end of a methods course, instructors likely hope that students are able to think more scientifically, design quality studies, analyze data properly, and write more succinctly and clearly, to name a few learning goals. Yet, despite the variety of goals, many still teach methods by relying too heavily on techniques from traditional content courses, i.e., asking students to master concepts and memorize terms based on a classroom experience that is delivered primarily in a lecture format. We can do better. Over the last five years we have been on a mission to help teachers reimagine their methods courses. It is a journey that we have made ourselves, which we want to share with you.

What Do Students Want?

We believe that all research fundamentally starts with a question. Of all the courses in psychology, methods courses seemed like the best candidates to really take advantage of adopting a student-focused perspective. As we sat down to rethink our own methods course, the question that guided us was: if students were to design their ideal research methods course, what would it look like? Naturally

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this led to more questions. Would students learn more about methods through lectures or hands-on activities? Would they rather memorize concepts before applying them or engage in active problem solving? Would students rather work collaboratively in groups or sit alone at their desk taking notes?

Is the Course Broken?

There is a common colloquialism that suggests, "if it ain't broke, don't fix it." That is, when we considered things from our students' perspective, it was possible that what we wanted to "do better" was not necessary in the students' eyes. Maybe things were fine and our students really did enjoy our current methods course. In fact, at various teaching conferences over the years, we have anecdotally observed that methods and statistics teachers acknowledge students' less-than-enthusiastic mindset at the beginning of the course. However, these same colleagues also report that students' attitudes are much improved by the end of the semester. That sounds encouraging.

But we were skeptical. It is all too easy to remember the students who showed progress or told you how much the course changed their perspective on methods. We see them dutifully take notes, do well on tests, and even suggest that "it wasn't so bad," as they turn in their final exam. However, it is hard to know whether those students are truly representing the modal experience of the class. At the end of a course, the demand characteristics from the teacher are powerful. Students are nice. They also know that their methods teacher likes the topic and may feel compelled to say nice things to avoid hurting our feelings.

Know Your Audience

Unfortunately, the research on students' perceptions of methods courses suggest that students are not being converted to methods devotees as much as their methods teachers may believe. When researchers examined students who took a research methods course, they found that students had lost interest in scientific activities as a result of taking the course (Manning, Zachar, Ray, & LoBello, 2006). Importantly, this effect was not limited to only those who had an interest in becoming a practitioner. Taking a methods course also led those who wanted to pursue scientific occupations to lose interest.

One possible explanation is that the methods course erodes students' enthusiasm because the course is too hard; they struggle to learn the material. To test this, students taking an introductory research and statistics class completed pre- and post-measures of their concept knowledge and measures focused on students' perceptions of research and statistics (Sizemore & Lewandowski, 2009). On the positive side, the results indicated that students learned the concepts. The negative side was that increases in learning did not help their perceptions of research and statistics. After taking the course, students' attitudes failed to improve, despite them expressing negative attitudes before the course began. Students also neglected to recognize an improvement in their abilities over the semester, and ended up seeing methods as less useful than what they thought at the beginning of the semester (which was not high to begin with). That is, students came into the course with a bad attitude about methods, thinking they were not good at it and believing methods were not particularly useful. Actually taking the course made things worse, despite the fact that students learned the content. Methods courses allow teachers to emphasize the importance of science in our discipline. Our goal as teachers is to inspire our students and cultivate their interest in psychological topics. The data suggests that methods courses are not achieving these goals.

Time for Change

The definition of insanity is doing the same thing over and over again and expecting different results.

~ Albert Einstein

We knew that we had to start thinking differently about methods. Importantly, our desire to change our approach was not motivated by low teaching evaluations. In fact, our methods course teaching evaluations were all relatively high. We may like to think that is because we are stellar teachers. More realistically, it was likely due to students' incredibly low expectations for the course and when students expect the course to be awful, anything better than that looks relatively good. Besides, we did not become teachers to build our confidence through high teaching evaluations. Rather, we want to change the way students look at and think about the world. We want to provide them with skills and insights that improve their lives. We want to share our love of psychology and methods in a way that makes our students better people. With that in mind, our new approach to teaching methods centered around three key philosophical ideas: students aren't us, design doesn't occur in a vacuum, and research starts with a question.

Students Aren't Us

Having an advanced degree in psychology makes professors fairly unique. There are approximately 117,000 undergraduate degrees awarded in psychology each year (NCES, 2015). Of those, the vast majority of students enter the workforce. Only 24% are accepted to graduate school with only 13% accepted into doctoral programs (APA's Center for Workforce Studies, 2016). These numbers clearly show that we are not primarily in the business of training future researchers who will publish APA style papers in our journals. In other words, our students are not going to become us. With this in mind, we think it is time to take a more utilitarian approach to methods courses. We need to do the greatest good for the greatest number of students by focusing more on the types of skills and insights that will be most useful to most students after graduation. Through this lens, the specific content of the methods course becomes less vital. A student's lifelong success will not depend on distinguishing independent from dependent variables, or knowing how to calculate a t-test. Rather, a student's ability to think scientifically, to understand cause and effect, to appreciate the role of confounds and control, and to identify the difference between data and anecdotes will all impact their quality of life much more.

In other words, methods should be less about the memorization of concepts and more about learning how to think and problem-solve like a scientist. We believe that methods courses are critical to building students' scientific and psychological literacy (Halpern, 2010). Through improved psychological literacy, students will avoid biased decision-making and become better consumers of the information that they encounter in the world. The importance of influencing students' thinking habits is immense. Within our society, there seems to be a cultural movement that increasingly favors relying on your "gut" and focuses on visceral experiences to guide one's thinking. Science has come into question and is too easily dismissed as "just a bunch of numbers." However, if students take a more active role in the scientific process, they will see first-hand just how careful scientists are when drawing conclusions.

Design Doesn't Occur in a Vacuum

When students get a "behind the scenes" look at the scientific process, they quickly learn that scientific discovery requires the confluence of many different skills, including design, statistics, and writing. All too often we take a "silo" approach to these skills and fail to integrate them. Rather than belabor this point,

we suggest you read Janie Wilson's chapter in this e-book regarding the wisdom behind teaching research and statistics together.

Have Students Embrace Their Inner Scientist

Everyone has an inner scientist. You were born with it. Think back to when you were a kid. You learned about the world by formulating hypotheses and trying things out (Gopnik, Meltzoff, & Kuhl, 1999; Gopnik, 2012). If you cry, will that get your parents' attention? What happens when you pull the dog's tail? For kids, science is an active process of engaging with the world. Early on, our educational system understands and embraces this natural inclination. Consider how you learned science in elementary school. You generated power from potatoes, erupted volcanoes, and manufactured Mentos-powered rockets. Science was fun. It was interesting because teachers did not insist that their students patiently sit and learn key concepts before getting to the actual science. Teachers captured students' attention with engaging demonstrations, allowed students to engage in hands-on problem solving, and introduced concepts through those experiences. Juxtapose kids' love of science with the research on college students' negative perceptions of their methods courses (Manning et al., 2006; Sizemore & Lewandowski, 2009). What happened in the 10 to 15 years between elementary school and college? An educational experience that squeezed the enjoyment out of scientific discovery happened.

We believe that the key to improving students' research methods experience is to go back to their roots. We need to focus on what makes research fun. We have questions about our world and research allows us to answers those questions. Students need to learn the concepts, but we may be overemphasizing mastery of definitions at the expense of the experiences that lead students to value science.

Be the Change

There is a better way. In his book, *What the Best College Teachers Do* (2004), author Ken Bain describes the importance of creating a "natural critical learning environment" (pg.18). It is in this setting, Bain argues, that students learn best as they tackle "intriguing, beautiful, or important problems," (pg.18) and that these experiences lead students to "grapple with ideas, rethink their assumptions, and examine their mental models of reality" (pg. 18). In applying this to research methods, we should start with a question that intrigues students and captures their interest. As they attempt to discover answers to that question, students will inevitably experience a decision-making process that requires them to encounter new ways of thinking about the world.

This "learning by doing" approach is entirely consistent with our ever-evolving modern world. Today's students are increasingly unfamiliar with instruction books. When students open their brand-new smartphone, they will not find a full instruction book. Even if there are instructions, students most likely follow two steps. Step 1: ignore instructions. Step 2: play with the phone and figure it out as you go. The vast majority of smartphone apps also eschew instructions. Instead you get a guided tour that encourages you to play with the app and learn it by using it. Angry Birds does not require you to take a lesson on physics before you start attacking pigs. When you start off, your technique is not perfect, you make mistakes, but through trial and error, you improve. The exact same thing happens when you learn to do research. It is akin to learning how to ride a bike. Some things you just cannot learn in a book, and have to simply learn by doing.

Research 1.0

It is time to retire the traditional way that we teach methods. Clearly, there is no one clear traditional way that everyone teaches methods. When we refer to a "traditional" or the "Research 1.0" way of teaching methods, what we mean is the way that we learned methods as students. Those courses were lecture-based and content-focused with a clear intention of having us master concepts before applying them. As students in those courses, we had to read a densely worded textbook chapter that focused on defining a series of important terms and concepts. Class was fairly similar, with students dutifully taking notes as the professor offered similar definitions and a smattering of new examples. Some teachers had better examples than others, which made those classes slightly more interesting. But generally, our methods courses were meant as experiences to be endured and perhaps to express the serious nature of psychology as a science. Yes, we all emerged respecting psychology as a science, but at what expense?

To be fair, research demonstrates the traditional method's effectiveness (Sizemore & Lewandowski, 2009). Students learn the material and though students find research less useful, the course does not worsen their already low attitudes toward research and statistics. Furthermore, as current professors, the traditional style of teaching methods served us well. We learned the material and did well enough in our courses to make graduate school a realistic option. Though it all worked out well for three future PhDs in social psychology, we were not the modal student. We probably paid better attention, took better notes, read the textbook, and had more of an innate interest in research. Think back to your classmates' experiences and perceptions of the course. If your experience was anything like ours, most of your classmates tolerated research enough to get the grade they needed and looked forward to taking the more fun, "real" psychology courses.

Even though the traditional methods course may have worked for us, it is important that we do not reflexively mimic our experience and repeat a bad pattern. Because if we're honest, our methods courses were not where our love of research was born. Rather, our love of research came from our experiences actually doing research. Whether working in a lab as a research assistant, completing a project for a course, or doing an empirical thesis, it was the process of asking an intriguing question and following a pathway of discovery that really made us love research.

One Small Step

In the entire psychology curriculum, no course may be better suited for incorporating student-centered techniques than methods courses. A very easy, small step to making a methods course student-centered is to consider students' perspectives in a way that leverages their existing interests. One study sought to determine if placing research concepts in the context of a more applied clinical example would make research more appealing to students (Sizemore & Lewandowski, 2011). All participants read a mini-lesson about confounds in research. However, researchers randomly assigned student participants to one of two conditions. One condition learned about confounds in the context of depression and the other learned about confounds in the context of basic memory processes. For example, participants read, "Imagine a *therapist/researcher* wanted to determine whether positive or negatives images influence *depression/memory*." After reading the brief lesson, participants completed a knowledge quiz about confounds and several measures about their feelings toward research. Results indicated that there was no difference in learning between conditions. However, there were significant differences in students' reported interest in the research topic and general interest in research, with those who read

about confounds in the context of therapy and depression holding more favorable perceptions. If you want to do something similar in your class, ask students on the first day of class which topics in psychology interest them the most and then craft examples and exam items around those topics.

Research 2.0: What a Student-Focused Course Looks Like

If you are ready to upgrade your course to a more student-focused version, there are a number of things you can do. We are happy to share our model in the hopes that you will use or customize it to fit your goals and teaching style. Most importantly, don't be afraid to try something new. The goal is to help students learn research design in the most engaging and active way possible. If any of these ideas seem daunting to create, they don't have to be. We provide information below about where to find resources.

Before introducing a new research design to students, we ask them to read an interesting article that exemplifies that design. This allows students to see how class concepts and designs they read about in the textbook translate into actual psychological research. We have students write a brief summary of the article explaining the purpose, method, and findings of the article, as well as a critique of the study. Naturally, the sophistication of their critiques increases as the course progresses, which is fun to see. We often start class discussing the articles. You could also use these articles to practice presentation skills, assigning students to develop a quick "elevator pitch" that clearly and succinctly summarizes the research (see Schwartz, Powers, Galazyn, & Brooks, this volume, for a description of a scaffolded presentation assignment).

Next, we have students participate in an in-class demonstration of that same research design. You may base this demonstration in psychological theory (e.g., how the misattribution of arousal from giving a speech may influence attraction (Dutton & Aron, 1974) or on students' interests such as a taste test of Coke versus Pepsi. The point is to have students experience the design itself in an interesting context first, before introducing new research terms. Afterwards, students deconstruct the study by identifying key concepts such as the independent variable, dependent variable, and other relevant class concepts (see Brosowsky & Parshina, this volume, for a scaffolded method of teaching students to read research studies). It is even beneficial to present flawed data collection and have students identify the flaws and suggest ways in which to do it better.

To round out this experience, we have students do a team project in which they use the same research design to develop and conduct a small-scale research project. We never used canned projects. Rather, this project is about the process and not the end product. We are not looking for publishable studies based on an in-depth review of the literature. While we give students a general question for these projects (e.g., What influences attraction?), it is important to us that students develop their own ideas. Their ideas are often simple, but the process of creating and implementing a small-scale research study is when they get to apply what they are learning and see its usefulness and value. We also want our students to be personally invested in answering their research question so they are more devoted to the process and curious for the answer. Let their ideas be simple. Let their research designs and implementation of methods be a little messy. That is how they learn. We also have students work in small groups so they can practice collaborative and communication skills. The small group generates ideas, discusses them, makes decisions about the best and most feasible way to proceed, resolves disagreements, and works out how to implement their ideas collaboratively (see Podlucká, this volume, for more on helping students conduct their own research project; see Schnieder, this volume, for more about fostering the development of group work).

For each small group lab project, students follow the same general procedure. They start where every research project starts, with a research question. They then figure out how they want to ethically test their research question, operationally define their variables, develop hypotheses, plan a data collection procedure, and create or find any stimulus and measurement materials they need. They also determine how to record and organize their data. Before sending them out to collect data on campus, we double check to make sure that they are prepared and then turn them loose. The small groups then implement their study by collecting data on a small convenience sample (e.g., 15-30 per group for experiments) and set up a data file and enter their data. Students then determine the necessary statistics to analyze their data and draw conclusions based on their results. Students formally write up their methodology and results, as well as a short APA-style discussion. Students also share the elements of their project, as well as the results, with the class. They repeat this process with each new design throughout the course. Additionally, students engage in a full-scale research study throughout the semester, resulting in a full APA-style research report. It may seem like a lot, but with all the practice they get, students become quite efficient.

Less Lecture, Not Less Content

To make time for the suggested activities, you will need to free up class time, which we accomplished by making methods a semi-flipped course (for more on flipping the class, see Arner, Aldorasi, & Morris, this volume). We didn't remove lecturing entirely, but we unquestionably cut it down and always placed it after a demonstration. We know it can be hard to cut down the lectures you have worked so hard to prepare and relied on for so long. Cutting lecture does not mean you are cutting content. You're just changing the delivery of that content. Your students are still getting their broccoli; you're just hiding it in the brownies. Instead of teaching concepts and providing examples that students passively learn, the Research 2.0 approach gives students the time and opportunity to work with the concepts themselves and create their own examples. Ultimately, we did not omit a single important concept when we transformed our course. The only thing we lost in the 2.0 version of the course was lecturing at students while they copied down definitions.

Does This Work?

You might be wondering if the 2.0 upgrade really works. We did too. So, like the good researchers we want our students to be, we conducted empirical research on these course design changes. We surveyed research methods students about their attitudes toward research, statistics, and scientific writing both before and after the implementation of the 2.0 version of the class (Ciarocco, Lewandowski, & Van Volkom, 2013). Our control students learned about research methods through a very traditional (i.e., Research 1.0) course design, that relied heavily on lecture and involved one full-scale research project throughout the semester. We implemented the Research 2.0 version of the course as described above. Compared to the traditional approach, students in the 2.0 version reported greater APA style efficacy, thought research and statistics were more useful, liked statistics more, and were more confident in their statistical abilities (Ciarocco et al., 2013). Importantly, the (more active) Research 2.0 approach did not compromise students' learning of the concepts. Students learned the material equally well in either approach. Overall, grades in the course also did not change.

However, what did change were student attitudes; they became more positive in a variety of ways. We found a way to teach the content and shift attitudes in a positive direction. Even better, as professors, we had much more fun teaching the course this way. While anecdotal, we also feel that the 2.0 version

of the class has had a long-term impact on our students. Departmental thesis projects have grown in complexity and sophistication. Students are starting these projects at a higher level than before. Moreover, our former students routinely contact us to tell us how confident and prepared they feel in their graduate programs compared to their peers, because they have actually engaged in the full research process so many times at the undergraduate level.

As William Butler Yeats suggests, "education is not the filling of a pail, but the lighting of a fire." Instead of filling the pail as the traditional approach does, we have figured out how to light a fire (Pychyl, 2008). Students view the research process as useful, positive, and as something they can do. That is what really matters. As they find their career paths with an undergraduate psychology degree, we know that most won't be researchers. Instead we hope that they see the utility of the research process, feel like they understand the process, and think scientifically about important decisions in their lives and careers. Some day they may have to decide whether to vaccinate their children or what the best course of therapy is for their clients. When they do, we hope that they will think like a scientist.

Research 2.0 Can Lead to Gainful Employment

Earlier we said that our desire is to help students develop skills that will be useful to them after graduation. While the primary emphasis of the methods course is to develop students' scientific skills, our Research 2.0 course provides opportunities for students to develop and strengthen the skills associated with career success. This is not a trivial consideration, given that Goal 5 of the American Psychological Association's (APA) 2.0 Guidelines for the Undergraduate Major focuses on Professional Development (APA, 2013). This broad goal includes a desire for students to: (1) "Apply psychological content and skills to career goals;" (2) "Exhibit self-efficacy and self-regulation;" (3) "Refine project-management skills;" and (4) "Enhance teamwork capacity." These goals reflect qualities that employers desire in recent graduates, regardless of their undergraduate major (Landrum & Harrold, 2003; Landrum, Hettich, & Wilner, 2010; National Association of Colleges and Employers, 2015). Students who can provide concrete examples of instances where they demonstrated leadership skills, worked successfully in teams, engaged in problem solving, and communicated findings to others will have an advantage when pursuing employment opportunities after graduation. Given that we learn best by doing, our Research 2.0 course becomes a natural setting for students to hone these types of employable skills.

Although students work collaboratively as they design and conduct their small research studies, we have them identify the primary role they will play in their group. For example, one student becomes the "project manager," overseeing and coordinating the team's efforts throughout the research process. Another student organizes the group's data collection efforts. A third student is the primary data analyst, charged with ensuring that the data are correctly analyzed and appropriate conclusions are drawn. A fourth student leads the writing of the final research report. There is intentional ambiguity to each student's specific responsibilities, as all are responsible for the final outcome, similar to what happens in the workplace. We require each student to play a different role for each research project so that they have the opportunity to cultivate the employable skills associated with each one. These experiences allow students to speak with authority during job interviews as to how they have exhibited the skills that prospective employers desire.

Resources for Upgrading Your Methods Course

Overhauling your class to be highly interactive can be daunting and seem like a lot of work, but there is no reason to reinvent the wheel. Just as we rely on others' established measures and manipulations in our research projects, we can also rely on others' activities, assignments, and demonstrations in our courses. The great thing about the teaching community is that it is often happy to share (see Schwartz, Powers, Galazyn, & Brooks for a discussion of crowd-sourcing course preparations collaboratively). For example, finding interesting journal articles that explore different methodological designs can be difficult to hunt down. After all, our library databases don't categorize research based on the type of design or methods concepts used. A few years back, with funding from an Instructional Resource Award from the Society for the Teaching of Psychology (STP), we compiled a collection of articles specifically to share with other instructors along with suggestions for how to use each article in class, including discussion starters and in-class activities (Ciarocco, Strohmetz, & Lewandowski, 2010). You can fully rely on these articles throughout your course or use them to fill in between articles you find for this purpose. At the very least, they can help you get started on a new direction for your class.

As we redeveloped our methods course, it was very much a collaborative effort. We saw such a difference in our students, and ourselves, with our "learn by doing" approach that we want to help others enjoy similar success. We also knew that we were not the only ones out there with fresh and engaging ways of teaching the course. Individually, each of us has a handful of really engaging things we do with students in our methods courses, but we were eager to tap into the collective wisdom of methods teachers from around the globe. We just didn't have an organized way for sharing our ideas. With that goal in mind, we established www.TeachPsychScience.org (see Strohmetz, Ciarocco, & Lewandowski, in press). This website provides peer-reviewed teaching ideas for all three aspects of the research process: methodology, statistics, and writing. The website includes various types of resources, such as demonstrations, activities, assignments, practice problems, and lab projects. Our editorial board continually reviews and posts new resources, meaning that there are always new ideas for instructors to try.

Collectively, there is enormous support for teaching methods courses in a more engaging way. You don't have to start from scratch. Find the techniques and resources that speak to you, as an instructor, and the transition of your current course will be easier than you think.

References

American Psychological Association (2013). *APA guidelines for the undergraduate major: Version 2.0.* Retrieved from http://www.apa.org/ed/precollege/about/psymajor-guidelines.pdf

APA Center for Workforce Studies (2016, February). Datapoint: What are the acceptance rates for graduate psychology programs? *Monitor on Psychology, 47,* p. 16. Retrieved from http://apa.org/monitor/2016/02/datapoint.aspx

Bain, K. (2004). *What the best college teachers do.* Cambridge, MA.: Harvard University Press.

Ciarocco, N. J., Lewandowski, G. W., Jr., & Van Volkom, M. (2013). The impact of a multifaceted approach to teaching research methods on students' attitudes. *Teaching of Psychology*, *40,* 20-25. doi:10.1177/0098628312465859

Ciarocco, N., Strohmetz, D. B., & Lewandowski, G. W., Jr. (2010). *Exemplar studies for teaching research methodology.* Society for Teaching of Psychology. Retrieved from http://teachpsych.org/resources/Documents/otrp/resources/ciarocco10.pdf

Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, *30*(4), 510-517. doi:10.1037/h0037031

Gopnik, A. (2012). Scientific thinking in young children: Theoretical advances, empirical research, and policy implications. *Science*, *337*(6102), 1623-1627. doi:10.1126/science.1223416

Gopnik, A., Meltzoff, A. N., & Kuhl, P. K. (1999). *The scientist in the crib: Minds, brains, and how children learn*. New York, NY: William Morrow & Co. doi:10.1126/science.1223416

Halpern, D. F. (2010). *Undergraduate education in psychology: A blueprint for the future of the discipline*. Washington, DC, US: American Psychological Association. doi:10.1037/12063-000

Landrum, R. E., & Harrold, R. (2003). What employers want from psychology graduates. *Teaching of Psychology, 30,* 131-133. doi:10.1207/S15328023TOP3002_11

Landrum, R. E., Hettich, P. I., & Wilner, A. (2010). Alumni perceptions of workforce readiness. *Teaching of Psychology, 37,* 97-106. doi:10.1080.00986281003626912.

Manning, K., Zachar, P., Ray, G. E., & LoBello, S. (2006). Research methods courses and the scientist and practitioner interests of psychology majors. *Teaching of Psychology*, *33*(3), 194-196.

National Association of Colleges and Employers (2015). *Job outlook 2016: Attributes employers want to see on new college graduates' resumes*. Retrieved from http://www.naceweb.org

National Center for Education Statistics (2015). *Bachelor's degrees conferred by postsecondary institutions, by field of study: Selected years, 1970-71 through 201-2014.* Retrieved from https://nces.ed.gov/programs/digest/d15/tables/dt15_322.10.asp?current=yes

Pychyl, T. A. (2008). Education is not the filling of a pail, but the lighting of a fire: Motivation, procrastination, and Yeats. *Psychology Today Blogpost, 2016*. Retrieved from https://www.psychologytoday.com/blog/dont-delay/200805/education-is-not-the-filling-pail-the-lighting-fire

Sizemore, O.J., & Lewandowski, G. W., Jr. (2009). Learning might not equal liking: Research methods course changes knowledge but not attitudes. *Teaching of Psychology, 36*, 90-95. doi:10.1080/00986280902739727

Sizemore, O. J., & Lewandowski, G. W., Jr. (2011). Lesson learned: Using clinical examples for teaching research methods. *Psychology Learning & Teaching*, *10*(1), 25-31. doi:10.2304/plat.2011.10.1.25

Stoloff, M., McCarthy, M., Keller, L., Varfolomeeva, V., Lynch, J., Makara, K., Simmons, S., & Smiley, W. (2010). The undergraduate psychology major: An examination of structure and sequence. *Teaching of Psychology, 37*, 4-15. doi:10.1080/00986280903426274

Strohmetz, D. B., Ciarocco, N. J., & Lewandowski, G. W. (in press). TeachPsychScience.org: Sharing to improve the teaching of research methods. In R. S. Jhangiani & R. Biswas-Diener (Eds.), *Open:*

The philosophy and practices that are revolutionizing psychological science and education. London, UK: Ubiquity Press.

Chapter 24: Teaching Challenging Courses: Focus on Statistics and Research Methods

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Abstract

Statistics and research methods challenge students, often creating stress that gets in the way of learning. As caring professors, we can alleviate some anxiety by creating rapport with students. By communicating that we care, students see us as a resource with their best interests at heart, and they are motivated to give a strong effort. As a second approach to helping students learn the material, we can integrate statistics and research methods. Students learn material better in context rather than arbitrarily separating analysis from a relevant design. To integrate material, we must rethink topics, order of topics, and the utility of hand-calculations. By streamlining an integrated course, we can focus on helping students learn statistical software (e.g., SPSS) and APA style, valuable tools in psychological science. We can also help students gain an appreciation for empirical research by teaching them the scientific process. Even if our students choose not to conduct research in their future, they can become good consumers of research and better citizens.

Introduction

Students love some psychology courses, they like others, and they worry about a few. Stress-inducing courses typically include statistics and research methods. Why? Statistics includes the dreaded math, and research methods is time-intensive, often requiring competence in APA style in addition to learning the course content, using a data-analysis program, and perhaps running a research project. In this chapter I will offer suggestions for reducing student anxiety by creating a positive class climate. Then I will offer an integrated approach to teaching statistics and research methods to foster student learning.

Building Rapport

Professor-student rapport is useful in any course, but it is particularly necessary in challenging courses such as statistics and research methods. Most students will need help comprehending and applying the material, and they should feel comfortable asking you questions. You are the expert. Students will turn to you for support, seeking your expertise and kindness as you guide them.

Rapport correlates with student motivation, attitudes toward the course and professor, student reports of learning, and even course grades (Ryan, Wilson, & Pugh, 2011; Wilson & Ryan, 2013; Wilson, Ryan, & Pugh, 2010). With so many positive correlates, why not seek to build good relationships with students?

Developing rapport requires caring about students. Genuine caring is hard to fake; students know how instructors feel about them, and they respond in kind (Wilson, 2006). Keeley, Smith, and Buskist's Teacher Behaviors Checklist (TBC; 2006) offers behaviors that communicate positive affect for students,

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including student ratings of an instructor as “sensitive” (e.g., “asks questions to check student understanding”) and “approachable” (e.g., “smiles”). A list specific to communicating immediacy (psychological closeness, a component of rapport) is found in the work of Gorham and Christophel (e.g., 1990; Gorham, 1988), as well as others. Verbal behaviors include using students’ names, talking with students before class, and using terms such as “our” class to communicate inclusion. Nonverbal behaviors include smiling, gesturing while talking, and making eye contact. Nonverbal behaviors often predict positive student outcomes better than verbal behaviors, perhaps because the former actions offer more genuine communication of caring. In other words, it is harder to fake nonverbal rapport behaviors.

As a new teacher, you might also reduce anxiety and build rapport by keeping in mind that undergraduates do not have the same extensive training that you do. Graduate students and other new teachers frequently overestimate what undergraduates know and can do, using themselves as a reference point. When we know a great deal of information on a topic, it can be difficult to remember that others have little knowledge. Motivation likely will also differ. Just because you are highly motivated to understand the nuances of research designs and statistics, you cannot assume an entire class of undergraduates feels the same way. Even if students are highly motivated, they do not have the foundational knowledge that you have, and they need time to process new information. My advice: Slow down. Consider not using presentation software (e.g., PowerPoint or Prezi), and instead opt for the white board. If you are forced to write out everything you are teaching, you will move closer to the pace of students.

Other ways to reduce student anxiety and enhance learning include giving them a math worksheet to complete in class. Regardless of whether you abandon hand-calculations (see the suggestion below), SPSS, a widely used data-analysis program in the social sciences, falls short on at least a couple of key analyses, and students will have to do a bit of math by hand. As one example, calculating effect size for a *t*-test using Cohen’s *d* requires a hand-calculation. Of course parts of the equation can be pulled from the SPSS output, but students still must complete the equation. Enhancing students’ math skill reduces their stress and shows that you care about their comfort.

Let me offer a small word of caution about building rapport. As a new teacher, you will notice that students try to understand your approach to teaching. Are you flexible? Are you friendly? Unfortunately students may mistake kindness for “easy” or as an indication that an instructor is a pushover. Be ready to have firm policies that apply to all students. Bad news can be given in a nice way. For example, at some point in every term a student asks to turn in homework late. I always say no, but I smile and assure the student, “No, I can’t take any late homework, but don’t worry. I drop the lowest two homework grades at the end of the term, so the zero will disappear.” The same is true for quizzes. I drop the lowest two quiz grades from the numerous quizzes I give at the beginning of each class period. After all, the testing effect calls for quizzing often to enhance student learning (e.g., Roediger & Karpicke, 2006). And remember that it never hurts to explain why you are doing something in class. Sharing the research shows that you are a careful teacher with students’ best interests at heart.

As a final caution, consider the research on desirable difficulties (e.g., Bjork & Bjork, 2012). Students may learn best when they are challenged by a struggle to learn, and courses such as statistics and research methods are rife with difficulties. Students will struggle, and allowing them to work for an answer is fine as long as they understand why, and the problem is approached with kindness. Even so,

they will get frustrated, and it may show. Try to be gentle when students are uncomfortable, assuring them that you have faith in them. Lead them as much as you need to so they can find answers and gain confidence. I will also suggest that perhaps a course full of desirable difficulties is not so desirable when you begin your teaching career. It might be best to focus on building your comfort in the classroom before pushing students to learn through struggle. First establish yourself as a caring, dedicated teacher. After you feel confident in the classroom and know how to maintain rapport in the face of challenges, experiment with various teaching techniques.

Integrating Statistics and Research Methods

Students will work hard for an instructor who cares and tries to enhance learning. How might we enhance learning in statistics and research methods? When you consider the topics covered in statistics and research methods, you will notice a great deal of overlap. After teaching both courses for well over two decades, I can tell you that such overlap leads to re-teaching the same material in both courses. You might imagine that repetition is useful to improve retention, but one of the main complaints I hear from teachers is that students do not seem to have any memory of material from the prior course. In my department, we teach statistics before research methods, and students routinely forget how to analyze data by the time they get to research methods. Perhaps repetition in different contexts – often from two teachers using diverse textbooks – is not as useful as another model. Teaching the courses separately is analogous to learning how to hammer and saw but waiting six months to build a table. I will argue below that integration of statistics and research methods offers a better model for student learning. And keep in mind that students do not seek to forget course material; they would prefer to remember! I have found that students are eager to impress an instructor who cares about them, and they can feel frustrated when they make mistakes. Easing some of the content burden through integration should foster rapport as anxiety decreases.

Only a few studies provide support for integrating statistics and research methods, offering an area ripe for study in the scholarship of teaching and learning (SoTL). Stranahan (1995) allowed students to self-select into one of three course arrangements: statistics followed by research methods, methods followed by statistics, or statistics and methods taught in the same term. Note that the latter condition did not combine the courses but rather allowed students to focus on both aspects of research in the same term. Students who chose to take statistics and research methods in the same term earned higher grades in both courses at the end of the term, demonstrating how the topics work together synergistically even when not integrated within a single course.

An integrated course in statistics and research methods showed clear gains as well. Pliske, Caldwell, Calin-Jageman, and Taylor-Ritzler (2015) offered students intensive (six contact hours per week), integrated statistics/methods courses and found that the students performed above the national average on items pertaining to statistics and research methods using the Area Concentration Achievement Test (ACAT). In contrast, students performed at the national average for other areas on the ACAT. Barron and Apple (2014) compared students in a combined course to those who took a sequence of statistics followed by research methods across two separate terms. Students who took the combined course earned higher final course grades and scored higher on the ACAT than those who took separate courses in statistics and research methods.

Proposed Organization

If we agree that students may benefit from a combined course, how can we approach course design? First, let us consider the difference between combined and integrated. A combined course means the materials from statistics and research methods are taught during the same term, but usually this approach means referring to a separate statistics chapter in a research methods textbook, as needed. A focus on research design, with statistics offered as an add-on, does not truly integrate the material and illustrate the importance of context for understanding statistical analyses. Integration requires us to rethink the way we have taught or learned statistics and research methods. If we build an integrated course, we must reconsider the order of topics, the use of hand-calculations versus a computer data-analysis program, and the extent to which we build competence in APA style.

In the interest of integration and focusing on what students need to know, we can consider the following order of topics:

1. Foundational Topics
    - The Scientific Method (introduction to APA style)
    - Ethical Research
    - Research Designs and Variables (introduction to SPSS)
    - Learning About a Population from a Sample
2. Categorical Variables and Simple Frequency
    - One Variable with Frequency Data
    - Two Variables with Frequency Data
3. Research Without Grouping
    - Examining Relationships
    - Prediction
4. Grouped Designs with Independent Samples
    - One Variable with Two Independent Groups
    - One Variable with More Than Two Independent Groups
5. Grouped Designs with Related Samples
    - One Variable with Two Related Groups
    - One Variable with Repeated Measures: More than Two Groups
6. Advanced Designs (e.g., two variables with independent samples), as time allows

Notice that foundational topics such as ethics, stating the research question, and probability remain at the beginning of an integrated course (section 1). Such topics set the tone for a strong course steeped in science and empirical data. After building a firm foundation, the first research example should be the

simplest inferential design and collect the simplest data: frequency counts (section 2). Within the same discussion, introduce students to data analysis using the chi square statistic and SPSS software. Finally, students can learn to write in APA style, beginning with this straightforward design and analysis. Their first APA-style results section will build competence and confidence.

Because the two-way chi square provides information about correlation, a transition to a design analyzed by Pearson's *r* is a natural progression (section 3). Students move from examining relationships using simple frequency data to examining relationships using non-grouped data on two variables. Next, designs geared toward prediction can be analyzed using linear regression.

Students must be cautioned that "correlational analysis" is completely different from a "correlational design." The old adage that "correlation does not imply causation" confuses students (Hatfield, Faunce, & Job, 2006). Although a correlational *design* will not allow students to know causation, correlational *analysis* using Pearson's *r* may imply causation, as long as one variable is manipulated. To help clarify this crucial distinction, each relevant design can include an example without variable manipulation and another example with manipulation. For instance, when discussing relationships between ungrouped variables, I offer an example of dollars in students' pockets and their ratings of happiness. Because students come to the study with various amounts of money already in their wallets, the variable is not manipulated, and we have a correlational design. We cannot know cause and effect, but we can learn if the two variables are related using Pearson's *r*. However, if we conduct a study in which students arrive with no money and are given random cash amounts, we can assess happiness and examine cause and effect. Again Pearson's *r* is the preferred statistical analysis, but this time the design is experimental because a variable was manipulated. Within the context of study designs, statistical analysis becomes a valuable and relevant tool to analyze both correlational and experimental designs.

In the next section of the course, we turn to grouped designs with independent samples (section 4). Note that designs relying on *z*-tests and single-sample *t*-tests do not appear in the recommended order of topics. After all, students rarely use either of these analyses, and the time can be spent on more important topics in an integrated course. With independent samples, we have the opportunity to introduce concepts such as random assignment to conditions, outliers within a group, and even true experimental designs (with an independent variable) versus correlational designs (with a quasi-independent variable). Using this approach, we can teach key concepts within relevant contexts rather than asking students simply to memorize experimental terminology. The logic of independent groups easily extends from the independent-samples *t*-test to the between-groups analysis of variance (ANOVA). Each appropriate statistic is integrated with specific research designs, allowing students to see the big picture of scientific research.

Section 5 of the course follows the same grouping approach but with a focus on related samples, including testing the same participants more than once. With related samples, we can integrate concepts such as order effects and counterbalancing. Analysis with the related-samples *t*-test or the repeated-measures ANOVA is covered in detail after each design.

Gains with Integration

A focus on real-life statistics allows us to abandon hand-calculations, a lesson that took me over 20 years to learn. I was one of the last professors in my department to exchange the detail of hand-calculations for the utility of SPSS. I spent years trying to convince other instructors that doing work by hand helped

students learn the theory behind statistics, and I will admit that I never saw any evidence in support of my belief. By turning away from hand-calculations, I found myself with a wealth of time in class. With more in-class flexibility, we had time to cover SPSS examples. Because we do not have the luxury of a large computer lab, my preparation time increased as I prepped several examples of studies, created illustrative data sets, and even analyzed the data. I brought examples to class, discussed the designs and relevant analyses, displayed analyses using SPSS, and asked students to write APA-style results sections while the output was visible. As the term progressed, I moved from showing them how to write step-by-step results to having students work in teams and finally to students writing results on their own. After several class examples of how to analyze data using SPSS, I gave students data sets to analyze for homework using on-campus computers (e.g., in the library).

When I selected examples for students, I had the pleasure of locating publications that students would find interesting, such as a study of self-control after resisting the urge to eat either radishes or cookies (Baumeister, Bratslavsky, Muraven, & Tice, 1998). I shared the reference, explained the study of ego depletion, and described the outcome of persistence in seconds on a frustrating task. Students received a smaller data set that mirrored the study outcomes (Wilson & Joye, 2017), as shown below.

Radishes	Cookies
680	200
755	490
476	510
634	308
725	447
688	380
912	470
560	366
732	592
846	415

Students seemed to enjoy the engaging examples, and I had the opportunity to share empirical research with them. Often I relied on recent publications, but I also included older or even classic research, as long as I thought the studies would increase students' interest in the science of psychology.

On a few occasions, I let student teams collect their own data, analyze the data, and bring a typed APA-style results section to class. Students began to understand the big picture of designing, analyzing, and explaining results. One example of an on-campus activity (with prior approval from the IRB) involved interobserver reliability, in which students unobtrusively observed people in a public place, compared their observations, and analyzed the data using Pearson's *r*. For a complete explanation and handouts for this exercise, please see Wilson and Joye (2017). On another occasion, I wanted students to collect data on campus, but the weather did not cooperate. Instead I asked students to collect data in class using their phones (see Appendix A for details). We used their data to discuss correlation, simple linear regression, and later, multiple regression. Time usually spent analyzing data by hand was used to engage students in the research process, again integrating content with context. Judging by students' laughter and excited responses to data collection, rapport thrived as well. Certainly I never saw students express obvious joy when calculating a standard deviation.

Streamlining research methods and statistics, such as omitting hand-calculations, allowed me to allocate more time to complete research examples. Students were able to focus on designs, analyses, APA-style results, and supportive APA components such as graphs and tables. Although my department separates research methods and statistics courses, I integrated methodology into my statistics course to create context for learning. I wanted students to have the full story of research in psychology. Regardless of curricular details, research methods and statistics can be integrated when either topic is taught.

Conclusions

What do undergraduate students need to know about the scientific approach of psychology? Goal 2 of the APA Learning Goals (APA Guidelines for the Undergraduate Psychology Major 2.0, 2013) indicates that students should know how to design and interpret research. Most professors would agree that courses in statistics and research methods relate with Goal 2. We set a crucial goal to teach students about the science of psychology.

The guidelines provide detailed information about what we want students to know when they complete their baccalaureate degree. But we want more. As a profession, we also want students to be good citizens in a global community. And we want our students to function well with an ever-increasing focus on technology. Information is at our fingertips now more than ever before, and students – and instructors – must reinvent their approach to problems. The Executive Summary of the APA Principles for Quality Undergraduate Education in Psychology (2011) argues that an effective educational system should "provide students with the workplace skills needed in this information age" (p. 1).

Our job is to build rapport with students to enhance their engagement and learning, train them to understand what makes psychology a science, and foster an appreciation for psychology as a means to improve daily functioning. As technology advances and the world continues to evolve, we seek to teach our students to embrace changes that we cannot yet imagine.

References

American Psychological Association. (2013). Guidelines for the undergraduate psychology major. Retrieved from http://www.apa.org/ed/precollege/about/undergraduate-major.aspx

American Psychological Association. (2011). Principles for quality undergraduate education in psychology. Retrieved from http://www.apa.org/education/undergrad/principles.aspx

Barron, K. E., & Apple, K. J. (2014). Debating curricular strategies for teaching statistics and research methods: What does the current evidence suggest? *Teaching of Psychology, 41*(3), 187-194. doi:10.1177/0098628314537967

Baumeister, R. F., Bratslavsky, E., Muraven, M, & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*(5), 1252-1265. doi:10.1037/0022-3514.74.5.1252

Bjork, E. L., & Bjork, R. A. (2012). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In M. A. Gernsbacher, R. W. Pew, L. Hough, & J. R. Pomerantz, (Eds.), *Psychology and the real world: Essays illustrating fundamental contributions to society* (56-64). New York, NY: Worth Publishers.

Gorham, J. (1988). The relationship between verbal teacher immediacy behaviors and student learning. *Communication Education, 37*(1), 40-53. doi:10.1080/03634528809378702

Gorham, J., & Christophel, D. M. (1990). The relationship of teachers' use of humor in the classroom to immediacy and student learning. *Communication Education, 39*(1), 46-62. doi:10.1080/03634529009378786

Hatfield, J., Faunce, G. J., & Job, R. F. S. (2006). Avoiding confusion surrounding the phrase 'correlation does not imply causation.' *Teaching of Psychology, 33*(1), 49-51.

Keeley, J., Smith, D., & Buskist, W. (2006). The teacher behaviors checklist: Factor analysis of its utility for evaluating teaching. *Teaching of Psychology, 33*(2), 84-91. doi:10.1207/s15328023top3302_1

Pliske, R. M., Caldwell, T. L., Calin-Jageman, R. J., & Taylor-Ritzler, T. (2015). Demonstrating the effectiveness of an integrated and intensive research methods and statistics course sequence. *Teaching of Psychology, 42*(2), 153-156. doi:10.1177/0098628315573139

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science, 17*(3), 249-255. doi:10.1111/j.1467-9280.2006.01693.

Ryan, R. G., Wilson, J. H. & Pugh, J. L. (2011). Psychometric characteristics of the professor-student rapport scale. *Teaching of Psychology, 38*(3), 135-141. doi:10.1177/0098628311411894

Stranahan, S. D. (1995). Sequence of research and statistics courses and student outcomes. Western *Journal of Nursing Research, 17*(6), 695-699.

Wilson, J. H. (2006). Predicting student attitudes and grades from perceptions of instructors' attitudes. *Teaching of Psychology, 33*(2), 91-94. doi:10.1207/s15328023top3302_2

Wilson, J. H., & Joye, S. W. (2017). Demonstrating interobserver reliability in naturalistic settings. In J. R. Stowell & W. E. Addison (Eds.), *Activities for teaching research methods and statistics in psychology: A guide for instructors*. Washington, DC: American Psychological Association.

Wilson, J.H., & Joye, S.W. (2017). *Research methods and statistics: An integrated approach.* Thousand Oaks, CA: Sage Publications.

Wilson, J. H., & Ryan, R. G. (2013). Professor-student rapport scale: Six items predict student outcomes. *Teaching of Psychology, 40*(2), 130-133. doi:10.1177/0098628312475033

Wilson, J. H., Ryan, R. G., & Pugh, J. L. (2010). Professor-student rapport scale predicts student outcomes. *Teaching of Psychology, 37*(4), 246-251. doi:10.1080/00986283.2010.510976

Appendix A

Option 1

Go through your phone contacts and pick 10-12 people who interact with you through your phone (text, call, pictures, etc.). For each person, rate your level of intimacy – and by intimacy I mean how closely this person is associated with you or is a part of your life. The scale should range from 1-7, with higher numbers indicating more intimacy. As an example, your mom or dad likely would be rated high on the scale.

Low Intimacy						*High Intimacy*
1	2	3	4	5	6	7

Name of Person	**Rating of Intimacy**

Now count the number of texts, calls, pictures, etcetera for each person. (Pick <u>two</u> categories in addition to texts.) You might look at the last week or month or whatever time period you choose. ***Write in the following blank the time period you chose:*** _____.

Enter all data in the following table. Notice that Intimacy Rating must be entered again in this table on the far right. Simply pull the numbers from the table above and rewrite them.

Name of Person	**#texts**	**#_____**	**#_____**	**Intimacy Rating**

For now, focus only on number of texts and intimacy. Analyze those TWO variables using Pearson's *r* to see if they are related. ***Create a <u>typed</u> APA-style results section for those TWO variables ONLY.*** Bring your data, output, and results section to class so we can review them together.

****

Option 2

Choose 10-12 apps that you use on your phone. Give each app a name to enter in the table below. Next estimate about how many minutes you spend using that app each week, month, or some time period, and enter data in the table below. (*If your phone contains few apps, think about your computer at home and the icons on the screen*.)

Before you continue, write the time period you will use: _____.

Name of App	**Minutes of Use**

Now go into each app, and use a scale from 1-7 to rate three attributes: attractiveness of the app design, clarity of the design to communicate the purpose of the app, and how well the app works (called "utility" below).

Poor						*Great*
1	2	3	4	5	6	7

Enter data in the table below. Notice **Minutes of Use** must be entered again. Simply pull the numbers from the table above and rewrite them in the final column.

Name of App	Attractiveness	Clarity	Utility	Minutes of Use

For now, focus only on utility of apps and minutes of use (the final two columns). Analyze those TWO variables using Pearson's *r* to see if they are related. ***Create a <u>typed</u> APA-style results section for those TWO variables ONLY.*** Bring your data, output, and results section to class so we can review them together.

Chapter 25: Authentic Research Projects Benefit Students, their Instructors, and Science

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Abstract

Authentic Research Projects are course-based research projects where the goal is to share the data beyond the classroom. Whether that results in conference presentations, manuscript submissions, publications, or even just effect sizes, the field of psychology is ready for our students to contribute to our science as they learn their craft. These might include a novel research question or a replication study, as determined by the students or their instructors. However, I argue that instructors should consider including their students in meta-science projects so that their students' data have a bigger impact with less overall cost. This chapter outlines the conditions necessary to introduce these projects into methods or capstone courses as well as the characteristics that distinguish the various meta-science projects.

Introduction

Grahe and colleagues (2012) discuss the potential of "harnessing" the energies of hundreds of thousands of research projects that students complete as part of their psychology major for the benefit of science. In considering this possibility, this chapter is directed toward instructors who are invested in teaching research methods. Casual actors who are teaching the course as part of their duty to the psychology department might find this approach detrimental to other areas of their academic pursuits. However, dedicated instructors with energies directed squarely at inviting students into the world of science and research might find this approach transforming for their students, their scholarship, and science more broadly. For this chapter, I define "authentic research opportunities" as those that occur as part of coursework where the goal is to share the findings beyond the classroom. In addition to providing some current examples and the conditions that facilitate success, this chapter will highlight potential challenges and methods to mitigate them. Beyond authentic research projects where the goal of the project outcome is to be shared beyond the classroom, such as a conference presentation, much of this chapter will focus on crowdsourcing science research projects, which are truly transformative.

As we progress through this new millennium, science benefits from development in modern tools in disparate areas such as communication, experimentation, and data analysis. Communication is enhanced with email, list-serves, and social media, allowing researchers to communicate across laboratories around the world. Online platforms such as SurveyMonkey, Qualtrics, and free and open access OpenSesame (http://osdoc.cogsci.nl/) facilitate not only observational research, but

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Author note: While there is only one author on this chapter, the projects reported here describes the work done by many people working together to change undergraduate educational experiences. There really are too many people to mention here, but want to thanks all my faculty and student collaborators on these wonderful projects.

experimentation for anyone with a computing device and Internet access. Finally, there is ongoing development among online communities to bring easy to use data analysis programs to the user through open access software such as R (https://www.r-project.org/) and JASP (https://jasp-stats.org/). Taken together, these efforts have propelled the frequency of open invitations to crowdsourcing research projects forward since 2002, with varied opportunities listed on The Many Lab (https://osf.io/89vqh/) and the Psi Chi Research Opportunities (https://www.psichi.org/?page=Res_Opps#) webpages, as well as periodically announced via Registered Replication Reports (Simons, Holcome, & Spellman, 2014) and Pipeline projects (Schweinsberg, et al., 2016). For an instructor, these open invitation meta-science collaborations provide an opportunity to entice students into engaging in research. Such opportunities allow students to produce tangible outcomes for graduate school or job applications while making contributions to the larger scientific discourse. For instructors, supporting student engagement in authentic research allows for documentation of outcomes that enhance one's promotion files.

Defining Authentic Research Opportunities

Before delving into the world of large-scale research, a consideration of the characteristics and conditions of authentic research opportunities is warranted. While all classroom research experiences are authentic learning tools, authentic research projects benefit both the student and instructor, with the potential of making major impacts on science more generally. Presently, students in psychology conduct research projects as part of many different courses in the psychology curriculum (Grahe & Hauhart, 2013; Perlman & McCann, 1999; Stoloff et al., 2010) and there are thousands of student research projects across the United States. For instance, using a national random sample, Grahe and Hauhart (2013) estimated that about three-quarters of institutions invite psychology majors to complete capstone courses. Furthermore, about half of those institutions collect empirical data to complete that project (Hauhart & Grahe, 2010). With approximately 114,000 (US Department of Education, 2016) psychology majors graduating last year, maybe 45,000 capstones yielded data of some sort in the 2015-2016 academic year. When considering other research opportunities in the curriculum, a conservative estimate might suggest that nearly 100,000 class projects generate data of some sort in any given academic year, just in psychology alone. Instructors engaging in authentic research opportunities are trying to convert data collected for the purpose of learning into effect size estimates benefitting scientific discourse (Burnette & Wessler, 2013; Wilson, Roberts, Akerlind, & Wilson, 2013).

Table 1 displays a set of ideal target audiences for project outcomes related to course based research. Consider the potential of outcomes for student research projects that range from the least shared (class paper evaluated only by the instructor) to the most impactful (research that is widely cited by other researchers). Students who share their work with their peers learn valuable lessons in communication (Badger, 2010; Persons, 1998). Less is known about the pedagogical value of publishing classroom projects (Linn, Palmer, Baranger, Gerard, & Stone, 2015), yet sharing findings is the natural conclusion in science and greater impact is desired over lesser impact. Class projects, like any research project, yield data presented in oral, poster, or written formats. The typical classroom project has a target audience of the instructor and/or the class. Other projects might get shared at a departmental or institutional level as part of assessment or a local conference. The most advanced are submitted to research conferences or journals, when possible. For data, the outcome for the vast majority of projects is someone's digital or physical file cabinet. This is a natural phenomenon in science and the reason that most data end up in file cabinets is beyond the scope of this chapter. However, authentic project contributors seek to deliver

their data beyond the file cabinet with the goal that it be included in a manuscript for publication, or better yet, cited by other researchers. For project outcomes, to be cited in future work—hopefully many times—is a greater achievement than a single publication.

Table 1. *Grid of Project Outcomes with Distinct Impacts*

		Project Outcome		
Impact	Target	Oral/Poster	Paper	Data Outcome
Local	Instructor	N/A	Grade	File cabinet
	Class	Peer review	Peer review	File cabinet
	Department	Exemplars	Assessment	File cabinet
	Institution	Local conference	Self-published outlet	File cabinet
	Small	Regional Conference	Undergraduate journal	Publication
	Medium	National conference	Low impact journal	Cited
Global	Large	International conference	High impact journal	Cited

Exemplars might be collected for sharing with future student. *Assessments* are collected across years for future consideration. *Local Conferences* are undergraduate conferences hosted by institutions to allow public consumption of student work. Though these are public, their impact is minimal as the consumers are not likely to pursue the research. *Self-published outlet* is an avenue that an institution can use to engage students in publication (Stephens, Jones, & Barrow, 2011).

Conditions Necessary for Authentic Research Projects

Student learning is augmented when they conduct potentially publishable research. The augmentation reflects the deeper learning goals and outcomes that occur when students are required to meet external standards. The weighty significance of working on a project where others depend on the student requires more responsibility and deeper understanding than a project conducted to meet classroom goals. Furthermore, authentic research projects offer accessible assessment artifacts for students to share in graduate school or job applications when their results are posted in a public location. For the instructors, these 'beyond the classroom' outcomes provide documentation of professional development and contributions for review and promotion files. When students and their instructors

engage in these projects, they are benefitting scientific discourse by generating quality data and effect size estimates while answering meaningful research questions. Interested instructors need to be situated at institutions where they can achieve the following conditions: (a) the local IRB is prepared to review student projects, (b) students have access to research participants, (c) the institution values student/faculty research, (d) the instructor values student/faculty research, and (e) there are students dedicated to research projects. What follows are brief considerations of why each of these conditions is necessary and some associated concerns.

Managing Institutional Review Board (IRB) Workload.

IRB approval is required for any research to be publishable, even conference presentations. If the local IRB does not already have a process for reviewing student classroom projects, instructors will likely find challenges to implementation because reviewing student projects is labor intensive and significantly adds to the IRB's workload; the added work for the instructor and the IRB is significant in weighted importance, not statistical likelihood. Interested instructors might need to create an IRB, as I did when I arrived at Monmouth College in 1997, where none existed or they might need to augment an existing system that is not student-friendly. In either case, discussions with upper administration and members of several departments may be necessary.

For an effective, augmented system, I recommend a tiered review process for student projects to limit the workload impact. The system that exists at Pacific Lutheran University provides a workload compromise. All projects are submitted through the regular IRB process. For student projects intended for public dissemination (conference or manuscript submissions), the regular IRB review process continues. However, for those only intended for the classroom, a department representative provides feedback to the IRB chair who forwards that feedback back to the contributors and instructors. The instructor then assumes the responsibility for ensuring ethical compliance. To further minimize impact from students: instructors try to reduce common errors from applications, the IRB provides student-specific instructions to guide novice researchers, and students complete a CITI ethics course before authoring an IRB proposal. Further, students are discouraged from asking research questions that would require full board review (exempt and expedited review is much quicker and less intensive). In this way, all students experience the process of learning how to submit an IRB application, but only projects that need review are added to the IRB workload. This system allows students in research methods or capstone courses to conduct research to share publicly (or just share with the class). Further, they are introduced to the ethics of research at many levels.

Attaining Sufficient Samples.

For students to contribute data to the larger scientific discourse, the samples need to meet minimum size standards. For some levels of dissemination, sample size expectations are less intensive. For submissions to conferences and even to some journals, getting as many participants as possible before the semester ends might be sufficient. However, one current methodological problem is that too much published research is under-powered (Simonson, 2015; Wicherts & Bakker, 2014). So, to avoid continuing the errors of the past, instructors should try to model ideal research conditions in their classroom by attaining sufficient samples when evaluating phenomenon. Modeling open science principles for the next generation of scientists further benefits the instructor because the stages of documenting hypotheses, materials, data collection, and analysis procedures provide ideal steps for classroom assessment as well.

Modeling open science transparency can even be easy for instructors who require their students to use the Open Science Framework (OSF: https://osf.io) to manage class projects. However, attaining a sufficient sample size is difficult for single location projects because sample size can be limited by many factors locally. Samples of 30–40 respondents might be sufficient for a class project with a 2 X 2 between-subjects design, but not for publication. Instructors conducting authentic research on their own will need to explore creative methods for attaining sufficient volunteers such as recruiting from the larger student population or region using raffle incentives to minimize cost. For online surveys, students can randomly sample from their social network of friends and make direct email requests for participation. This provides exposure to random sampling, while potentially inviting a more diverse population than is typical in an Introduction to Psychology subject pool. Another alternative would be for instructors to collect smaller samples across multiple semesters.

Crowdsourcing of research projects achieves sufficient power by distributing the sample size requirements across many locations. In this case, the contributor needs to meet some standard to receive project benefits as the following examples demonstrate. The student focused Collaborative Replications and Education Project (CREP; Grahe, Brandt, et al., 2014) requires contributors to collect as much data as was published in the original study (up to $N = 100$) to be eligible for their research award. The CREP includes useful instructions that can be adopted by instructors for their own use in documenting projects using the OSF on their Instructions to Contributors Component (https://osf.io/stdgm/). The Emerging Adulthood Measured at Multiple Institutions project (Grahe, Faas, et al., 2016) invited contributors to generate samples ($N > 80$) of a certain size in order to access the larger data set and be first author on a submission to a special issue of the *Emerging Adulthood* journal. These requirements are consistent with expectations for other projects that were not developed specifically for students, but where students could participate with faculty supervision (Many Labs 1, Klein et al., 2014; Many Labs 2, Klein et al., 2016; Many Labs 3, Ebersole et al., 2016; and the Reproducibility Project, Open Science Collaboration, 2015). In all these cases, data collection meeting certain standards equaled authorship. This expectation of a certain minimum sample size provides the overall project with sufficient power without exceeding locally available resources.

If a methods class currently averages 24 students and each project involves 3 student collaborators, then 8 projects emerge per class. If each project involves collecting data from a small sample (8 projects with $N_{project}$ = 30–40 yield N_{total} = 240–320), converting all projects to authentic research (8 projects with $N_{project}$ = 80–100 yield N_{total} = 640–800) could more than double the number of participants required. Even converting half the projects increases participant costs substantially, and instructors need to be careful not to conduct research unsustainably. One solution is to collect data with multiple groups (2 or more groups each recruiting 40 participants) or across multiple semesters (interested students continue as independent researchers the next semester or the instructor finds new students to continue the research in the next course offering). In any case, there are options, even for very small institutions.

Valuing Student-Faculty Collaboration. If an institution already has the first two conditions in place (IRB reviews student projects and students have access to participants), then the institution probably also values student/faculty research collaborations. At most US institutions, faculty members are evaluated for tenure and promotion on teaching, scholarship, and service. Local expectations about what constitutes individual success and the relative weighting of these criteria range widely across institutions. Ideally, institutions should reward engaging students in meaningful research opportunities. While it is likely the exception rather than the rule, I dream of a future where citations of student

research projects provide evidence of impactful contributions in faculty promotion files. Because review criteria are so variable, early career instructors must weigh benefits of instituting novel research approaches with the risks of not satisfying peers in the department or other decision makers in the review process such as deans or provosts. Organizations such as the Council for Undergraduate research provide resources that faculty can use to help explain the value of undergraduate research experiences for the institution (Karukatis, 2010; Ramirez & Dickson, 2010).

Where faculty/student collaboration is already valued, there might be local opportunities. On multiple occasions, colleagues invited my students to ask questions related to a construct related to a scale in development. Students each added a small set of their own questions to a larger shared survey and pooled their recruiting resources. Each project yielded one or more student authored conference presentations, as well as a manuscript with student coauthors (Ward, Johnson, Griswold, & Grahe, 2017), a student first-authored publication (Nelson, Grahe, & Ramseyer 2016), and work presented in a book (Hauhart, 2016; see chapter 11). These locally grown collaborations provided students with authentic research opportunities and yielded successful outcomes, but even at institutions that appropriately value the important contributions of engaging students in authentic research outcomes, there are reasons why instructors might not be inclined toward participation in these opportunities.

Guiding authentic research opportunities requires instructor resources that might not be available. The psychological distance between completed data collection, finished results, and a completed manuscript ready for publication changes based on student and instructor goals. The first question for students who express an interest in publishing their class project should be, “Who will write the manuscript?” It is only the rare student who is able to author manuscripts worthy of publication, even in student friendly journals like the *Psi Chi Journal*. Further, students who graduate are not likely to have the extra time necessary to complete high quality writing while working one or more jobs as they transition into the workforce. Even motivated students taking a gap year in order to prepare for graduate school might find completing a manuscript challenging without additional support from the instructor. Thus, the first major challenge to this type of model is finding appropriate writing resources. For this reason, I prefer the model where students author posters and they provide their sample to a larger project where their work is used as part of a meta-analysis and cited. The citation recognizes the value of the student’s work and the student does not have to garner resources necessary to produce a manuscript for publication.

Other impediments to widespread inclusion of authentic research opportunities is that project oversight might require learning new computer software or a novel literature. There might be competing research questions from the instructor’s own research line that require too much attention. The same advice given to students when they choose a topic applies here, “Choose a research question or meta-science project that inspires passion; choosing research projects for the wrong reasons can lead to frustration and disappointment.” Frankly, instructors that do not hear the call of creating authentic research opportunities for their students have likely already moved onto the next chapter in this book. Those who are still reading likely want to change the way psychology is taught by increasing the meaningfulness of classroom projects and enhancing the documentation of the research work done by methods instructors in the classroom context.

There are many students who will find authentic research opportunities appealing. For instance, students might conduct research to demonstrate their interest in a topic for a graduate or career application. With IRB approval, they can present their findings at a conference, report findings in a

repository such as PsychFileDrawer.org, maybe even publish in an undergraduate research journal. They can certainly document their work in completing the research cycle. Other students might be recruited into another department member's research lab. This is a great authentic research opportunity, and discussion of such arrangements discourages confusion about the student or faculty mentorship expectations. Finally, for motivated students, larger crowdsourcing science projects are appealing because their learning experience takes on greater meaning. The project is not simply a required activity anymore. Flexible instructors can offer authentic experiences rather than require them. After five years of offering research opportunities to my class, about half the students selected those opportunities instead of generating their own research question.

This suggests that even when all conditions are met, not all students will be passionate about these opportunities. Some students are not motivated to engage in the research project. The project is a requirement and any extra work is perceived as that, extra. Students' anxiety and fear of statistics coupled with the workload associated with conducting research might be a source of anger and frustration toward the class generally or the instructor specifically. These student experiences are not novel to authentic research experiences and instructors will find many approaches are necessary to engage them (Bos & Schneider, 2009; Brinthaupt, 2004; Massiello & Skipper, 2013; Russell, 2008).

Choosing the Right Project for Student Involvement

If this list of necessary conditions seems long, rest assured that many already exist at some institutions and can be facilitated where they do not. However, converting a course into one that offers authentic research opportunities might require conversations with a department chair or beyond. Instructors can avoid creating challenges by engaging in conversation with interested parties early and before making any major changes in course requirements. Other department members might wish to join in the collaborative fun or there may need to be some negotiation over how to allocate resources in utilizing the participant pool. For the dedicated research methods instructor, the biggest decisions concern which projects are best for the students rather than whether or not to employ authentic research opportunities in the classroom.

Students and instructors might select their own research questions. Frank and Saxe (2012) encourage instructors to engage in direct replications, and Calin-Jagerman and Caldwell (2014) provide an example of this type of effort. This is particularly interesting because they present findings using the ESCI computer program from Cumming and Calin-Jagerman (2016) which allows for simple computation and visual representation of effect sizes, confidence intervals, and meta-analyses. In any case, ideas can come from the instructor or the classroom. These locally grown authentic research projects are valuable and should be pursued when the questions present themselves.

However, the number of open invitations for participation in open science research projects has exploded since 2014. These projects take advantage of the increasing numbers of researchers interested in participating in something larger than what they can accomplish individually. When I started the Collaborative Undergraduate Research Project (CURP: Grahe, 2010) as a pilot test for an open invitation collaborative research project, there were no other options. I wanted to provide a list of questions that students taking many different research methods courses might pursue. Alan Reifman organized two similar efforts at the early turn of the millennium (The School Spirit Study Group, 2004; Reifman & Grahe, 2016) by inviting research methods instructors to coordinate a common method and then try to get their collective work published. Those projects both employed surveys and I wanted to see my

students' experimental samples achieve destinations beyond the file cabinet. If adequate power is beyond the reach of a sample from a single institution, why not combine many small samples across many institutions (Grahe et al., 2012)? The piloted CURP morphed into the Collaborative Replications and Education Project (CREP) in collaboration with Hans IJzerman and Mark Brant. Instead of surveys, students conduct experiments and, with the assistance of the Open Science Framework (https://osf.io), students share their methods (including a video of the procedure) and results with the CREP team.

The CREP review process minimizes inter-sample variability to increase the quality of the contributed data. It also offers students an opportunity to experience a review process. Further, as students work collectively with other students at institutions across the country or world, their projects can benefit science by testing the generalizability of published effects. However, this is not the only choice of open-invitation crowdsourcing research projects anymore, and in recent years I have started picking and choosing from a list of options. In Table 2, I have listed specific undergraduate related crowdsourcing open-invitation meta-science project types and provided brief descriptions of how these projects differ in common characteristics (Invitation, Questions, Selection, Requirements, Project Support, and Potential Contribution). This list is neither exhaustive nor detailed enough to fully differentiate these various programs. However, future open-invitation, meta-science projects inviting contributions from the crowd are likely to share some of these characteristics critical to determining the best fit for the instructor and a given methods class.

Invitation Determines Who Can Participate?

Some projects are open to anyone, others are open to qualified researchers; some are developed specifically with undergraduates as the primary contributor as suggested in the Invitation column of Table 2. Students working with me contributed to multiple Many Labs projects (2, 3, 4, & 5), but these were not designed for students, they needed more direct supervision. As such, the students involved in these projects were my assistants. For most of these project types, students can only make contributions through the proxy of another researcher. There are advantages to this model since students benefit from participating in meta-science while learning the details of scientific methodology. These projects also yield higher impact outcomes.

However, The CREP team argues that students learn even more by being the primary contributors. Not only do students benefit from participating in meta-science while learning the details of science methodology, they also experience leadership and project management directly rather than having it modeled by their instructor. All of these types of research projects work in the methods course, so an instructor needs to choose the best fit with regard to their goals for the course as well as their professional goals.

Table 2. *The Variety of Open-Invitation Projects and Their Variety*

	Invitation	Question	Selection	Requirements	Project Support	Contribution
CREP	Students/ Instructors	Replication	Impact & Feasibility	In Lab Experiment Feasible for Undergrad	Review Team/Tutorials $300 – $500 Awards	Undergraduate Training
EAMMi2	Students/ Researchers	Replicate/ Novel	Theoretical	Online Survey	Organizing Committee Raffle for Recruitment	Many Publications Author Diversity
ISP–US	Psi Chi/Psi Beta Members	Replicate/ Novel	Theoretical	Online Survey	Primary Contributor	Some Publications Undergraduate Training
Many Lab	Varied by Project	Varied	Varied	Varied	Primary Contributor	High Impact Publication Author Diversity
ML1,2,3, 4,5,…	Researchers Students by Proxy	Replication	Theoretical	In Lab Experiment Create or Administer	Center for Open Science (COS)	High Impact Publication …Authorship
RP–P	Researchers Students by Proxy	Replication	Randomly	In Lab Experiment	COS Small Research Grants	High Impact Publication …Authorship
RRR	Varied Students by Proxy	Replication	Varied	In Lab Experiment Intensive Methodology	Primary Contributor(s)	High Impact Publication …Authorship
Pipeline Project	Researchers Students by Proxy	Novel	Theoretical	In Lab Experiment	Collaborative	High Impact Publication …Authorship
PsycFile Drawer	Open	Replication	Contributor	Experiment Varied Methods	Contributor	Citation in Meta-Analysis

Open to All, Open to Qualified, Closed Partnerships; Replication or Novel; Top-Down vs. Bottom Up Determination; Random, Theoretical, or Convenient Method, (monetary, methodological, manuscript),Top Tiered Publication vs. Online Documentation

Note: *Invitation*, who is invited to participate; *Question*, focus is replication or novel; *Selection*, study identification methods; *Requirements*, expectations of the contributors; *Project Support*, resources from sponsor; *Contribution,* potential impact for science.

CREP, Collaborative Replications and Education Project; EAMMi2, Emerging Adulthood Measured at Multiple Institutions 2; the ISP-US, International Situations Project – US Extension; the Many Lab, Website where researchers can post calls for collaborators; ML1, Many Labs 1, through ML5, Many Labs 5; RP-P Reproducibility Project: Psychology; RRR, Registered Replication Report; Pipeline Project; PsychFileDrawer;

Question Selection. If the students are qualified, they should choose a research question that best fits their personal interests, so it is important to determine the types of questions available in a project. Much of the crowdsourcing movement involves replication, though more projects are emerging where the goal is to address large scale and novel questions. The EAMMi2 and Pipeline Projects are current examples. Instructors and students can choose from a variety of projects to match their own needs.

When the projects are replication-focused, a further characteristic is *who* selected the target studies and *what procedure* did they employ. Early criticisms of the Replication Science movement included the notion that some targeted certain authors or certain effects out of spite (Meyer & Chabris, 2014). It is refreshing to be able to reassure students and colleagues with regards to the reasoning behind study selection. For instance, at the CREP, we select the top four cited articles from three years prior with students and faculty rating them for feasibility for undergraduates to replicate. Further, contributors are invited to complete a "DIRECT+plus" replication where they add some additional measure(s) to be administered after the original replication materials or additional condition(s) to be added through random assignment. In contrast, Many Labs projects emerge from specific research questions from previous versions (noting that Many Labs 5 is a response to criticisms of the Reproducibility Project: Psychology) and the projects do not include flexibility for individual researchers' questions to be added. Whichever is a best fit, instructors will have no difficulty avoiding research that unfairly targets certain effects.

Requirements. After finding a project to join, students and instructors need to identify the costs of contribution before committing. On the Many Labs site (Ebersole, Klein, & Atherton, 2016), project leaders are asked to state expectations or any known benefits of contributors so that full consideration can take place before making a commitment. At the least, contributors will be expected to achieve some specified minimum *N*. For some projects, sample or methods requirements for full contributions might not be possible for smaller institutions or in the allotted time frame.

Furthermore, some projects are better suited for early or later methods students. For instance, the EAMMi2 survey or the ISP-US Extension provided ideal class projects for early methods students because their roles did not require sophisticated training. The long list of variables in these projects included nominal, ordinal, and ratio options, which allowed students to address a broad range of statistical examples and many different research questions while working on different projects. For the CREP, there are multiple studies with varying levels of challenge for the students to consider, with increasing challenge from the DIRECT+plus option for students with advanced experience. There are plenty of options for varied and rich opportunities for a diverse population of students and their instructors.

Project Support. The Psych File Drawer project (http://psychfiledrawer.org/) is a passive project in that researchers post their findings from replications conducted for any reason. Though there is the "Top 20 List of Studies Users Would Like to See Replicated," researchers can post any scientifically sound replication study for other researchers to explore and use. Thus, there is no project support from the organizers; the contributor is responsible for all resources necessary to conduct the study. In contrast

the Center for Open Science (COS) sponsors projects such as the Reproducibility Project: Psychology and the various Many Labs (1, 2, 3, 4, 5, …, ∞) projects. Because the organization has obtained millions of dollars in grants and hires full-time staff, these projects often include some support. Reproducibility Project: Psychology researchers applied for small grants. Many Labs researchers receive the experimental protocol with detailed procedural instructions, even apparatus (e.g., computer tablets, Inquisit licenses) when necessary. CREP offers a different type of support with its team of reviewers providing guidance on a contributor's materials and requiring a video of procedures before data collection as a method to increase experimental control; successfully completed projects also receive CREP Research Awards ($300-$500) sponsored by Psi Chi and the COS. As instructors investigate the range of available options, knowing what type of support, if any, is provided by the principal investigators is integral to deciding if it is a feasible project for the classroom.

Potential Contribution.

The final characteristic to consider is the potential impact of the contribution. In comparison to a class project that is destined for oblivion in an electronic file cabinet, any impact beyond the classroom is likely an improvement. However, depending on the instructor's career stage, the pedagogical needs in a classroom, the instructor and student intrinsic ambition, institutional expectations, or other unforeseen motivators, project selection might be focused on likelihood of publication or authorship potential. For the Reproducibility Project: Psychology and Many Labs projects, the outcome is very likely to be a high impact publication with the individual contributors represented as a "…" in a list including dozens or hundreds of coauthors. The Reproducibility Project: Psychology has been cited over 200 times and Many Labs 1 almost as many. In contrast, the CREP project has not yet yielded a single article publication, but other outcomes abound. Students have presented more than 10 conference posters (see CREP-Researchers and Findings; https://osf.io/m8et3/), a group authored one manuscript submitted for publication, and contributors who replicated a study by Elliot et al. (2010) are being cited in a meta-analysis in progress whose authors discovered the CREP contributors through the publicly available OSF pages. Across the available open-invitation projects, the potential impact of the findings range widely and, though no one can guarantee high impact, let alone a publication, instructors and students should consider their goals and the likely project outcomes in order to match desired and expected outcomes.

Course-Related Considerations

These projects are *scaffolded research opportunities* for students because there are clear guides to the reason to conduct the study, the primary hypotheses, the methods, and the planned analyses. Rather than developing hypotheses and materials from scratch, students start with a valid set of materials. Further, these projects provide scaffolding for the instructor with a common set of readings to reference. By removing ambiguity from the research question and methods, both the student and instructor can focus more on exacting the rationale, methodology, and analyses. Brandt and colleagues (2014) provide a set of criteria in their "Replication Recipe" that can be a useful guide for researchers just beginning to conduct replication science. Motivated instructors need to consider questions about their classroom application. First, the instructor must decide how much choice students will have in study selection. In the least restrictive classroom, students can choose any project to fulfill class requirements, and in the most restrictive, instructors select the course projects. When students have a choice, they will experience more ownership of the project (Hauhart & Grahe, 2015; Vander Schee, 2011). However, instructors need to recognize varying motivations of students because some students might choose these projects for the wrong reasons. They might select a project to try to curry favor with

the instructor or because they believe the project will be easier to complete because the methods are already "known." Both reasons can lead to students failing to complete high quality research, or worse, failing to learn critical aspects of research. Whatever level of choice the instructor selects needs to be explained to students clearly and students' choices need to be separated from other performance assessments.

For many of these projects, a complete contribution might require more time than is available in a typical semester. Alternatively, unforeseen complications could alter a project timeline, making work completion infeasible in a specified term. For instance, unexpected approval delays in both the Many Labs 4 and 5 projects changed timelines so neither project started data collection before November 2016. For students in a fall term, these projects became very challenging to fit in with other class-related deadlines. A slight variation on this limitation is related to the minimum *N* requirements of CREP that might exceed subject pool resources in a single semester. In both situations, the simple solution is to distinguish course project expectations from external project requirements. If the minimum *N* = 100 and students only collect *N* = 30 in the available time, the instructor needs to determine if *N* = 30 is appropriate for a typical class project. Contributing to meta-science is a privilege, not a right. If students cannot meet the minimum criteria in a given semester, they could continue the project for independent research credit (or no credit) the following semester. Even if they never complete the contribution, they still benefit from the process of working with an external entity to complete a course research project.

In contrast to early criticisms I received for these projects claiming that student learning would be constricted because there is no hypothesis generation, students will likely find that completing a project to meet external standards is more challenging than completing a typical research project. Even beyond the sample size requirements, these projects require students to master materials rather than merely learn to use them. These projects could require more complex designs or analyses. Finally, writing a justification for a replication or a study that is part of a larger whole requires that students consider not only the basic conceptual argument but also larger meta-science issues such as questionable research practices (John, Loewenstein, Prelec, 2012), researcher degrees of freedom (Simmons, Nelson, & Simonsohn, 2011, Wicherts & Bakker, 2012), and advanced analysis issues such as the appropriate use of effect sizes, confidence intervals, and meta-analyses (Cumming, 2013; Cumming & Calin-Jagerman, 2016).

For all these considerations, resolution is improved with clear communication. Project expectations for class requirements should be clear and distinct from any external requirements. Students' notions that replication research is just doing what someone else did already needs to be dispelled early. If students will work in groups, there should be clear roles and expectations within the group. Finally, students should feel free to communicate with the instructor or even project leaders when inevitable questions arise that might threaten the validity of findings.

Integrating Authentic Research Projects with Professional Development.

Undergraduate research experiences include numerous benefits for students (Kinzie, 2012; Lopatto, 2004; Russell, Hancock, & McCullough, 2007; Withers & Detweiler-Bedell, 2010), but they can be costly for the faculty who oversee the research (Sharobeam & Howard, 2002). In this chapter, I introduced examples of research projects that include some increased costs but argued that the benefits outweighed those costs. The authenticity of sharing findings beyond the classroom benefits students by providing direct experience in actual science. These benefits extend to the instructor in increased alignment between professional

goals of scholarship and teaching. As a methods instructor, I might oversee 12-18 research methods projects and 4-6 capstone projects a year. Guiding these projects meets professional teaching goals. To the degree that these projects are published, they meet professional scholarship goals. If students are coauthors on published research, I am further exceeding expectations in teaching goals by exposing students to professional experiences and publicizing my institution. The larger the potential impact of those research projects, the more I succeed at both teaching and scholarship.

This alignment of goals also works well for an instructor pursuing an individual research agenda who has the patience to work with student coauthors and the time to collect samples across years. However, I argue that goals are further enhanced when participating in crowdsourcing projects where various researchers' strengths are combined to produce more powerful studies. Presently, these crowds employ scientific practices that model idealistic and transparent methods. Young and motivated instructors can direct young methods students to these revolutionary projects. Then both students and instructors can benefit from them as they contribute to science.

References

Badger, K. (2010). Peer teaching and review: A model for writing development and knowledge synthesis. *Social Work Education, 29*(1), 6–17. doi:10.1080/02615470902810850

Bos, A. L., & Schneider, M. C. (2009). Stepping around the brick wall: Overcoming student obstacles in methods courses. *PS: Political Science and Politics, 42*(2), 375–383. doi:10.1017/S1049096509090519

Brandt, M. J., Ijzerman, H., Dijksterhuis, A., Farach, F. J., Geller, J., Giner-Sorolla, R., ... & Van't Veer, A. (2014). The replication recipe: What makes for a convincing replication? *Journal of Experimental Social Psychology, 50*, 217-224. doi:10.1016/j.jesp.2013.10.005

Brinthaupt, T. M. (2004). Providing a realistic course preview to students. *Teaching of Psychology, 31*(2), 104–106. doi:10.1207/s15328023top3102_6

Burnette, J. M., & Wessler, S. R. (2013). Transposing from the laboratory to the classroom to generate authentic research experiences for undergraduates. *Genetics, 193*(2), 367-375. doi:10.1534/genetics.112.147355

Calin-Jageman, R. J., & Caldwell, T. L. (2014). Replication of the superstition and performance study by Damish, Stoberock, & Mussweiler (2010). *Social Psychology, 45*, 239-245. doi: 10.1027/1864-9335/a000190

Cumming, G. (2013). *Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis*. London, England: Routledge.

Cumming, G. & Calin-Jagerman, R. (2016). *Introduction to the New Statistics*. London, England: Routledge

Ebersole, C. R., Atherton, O. E., Belanger, A. L., Skulborstad, H. M., Allen, J. M., Banks, J. B., …, & Nosek, B. A. (2016). Many Labs 3: Evaluating participant pool quality across the academic semester via replication. *Journal of Experimental Social Psychology, 67*, 68-82. doi:10.1016/j.jesp.2015.10.012

Ebersole, C. R., Klein, R. A., & Atherton, O. E. (2016, June 22). The Many Lab. Retrieved from osf.io/89vqh

Elliot, A. J., Niesta Kayser, D., Greitemeyer, T., Lichtenfeld, S., Gramzow, R. H., Maier, M. A., & Liu, H. (2010). Red, rank, and romance in women viewing men. *Journal of Experimental Psychology: General, 139,* 399-417. doi:10.1037/a0019689

Frank, M. C., & Saxe, R. (2012). Teaching replication. *Perspectives on Psychological Science, 7*(6), 600-604. doi:10.1177/1745691612460686

Grahe, J. E. (2010, November*). Revolutionizing capstone courses: Using undergraduate research to advance theoretical research*. Poster presented at the American Association of Colleges & Universities Conference: Creativity, Inquiry, and Discovery: Undergraduate Research in and Across the Disciplines. Duke Campus, North Carolina.

Grahe, J. E., & Hauhart, R. C. (2013). Describing typical capstone course experiences from a national random sample. *Teaching of Psychology, 40*(4), 281-287. doi:10.1177/0098628313501040

Grahe, J. E., Brandt, M. J., IJzerman, H., Legate, N., Wagge, J., Weisberg, Y. J., … Wiggins, B. J. (2016, November 9). Collaborative Replications and Education Project (CREP). Retrieved from osf.io/wfc6u

Grahe, J. E., Faas, C., Chalk, H. M., Skulborstad, H. M., Barlett, C., Peer, J. W., … Sylaska, K. (2016, October 27). Emerging adulthood measured at multiple institutions 2: The next generation (EAMMi2). Retrieved from https://osf.io/te54b/Grahe, J. E., Reifman, A., Herman, A., Walker, M., Oleson, K., Nario-Redmond, M. & Wiebe, R. (2012). Harnessing the undiscovered resource of student research projects. *Perspectives on Psychological Science, 7*, 605-607. doi: 10.1177/1745691612459057

Hauhart, R. C. (2016). *Seeking the American dream: A sociological inquiry*. London, England: Palgrave McMillan

Hauhart, R. C., & Grahe, J. E. (2010). The undergraduate capstone course in the social sciences: Results from a regional survey. *Teaching Sociology, 38*, 4-17.doi:10.1177/0092055X09353884

Hauhart, R. C., & Grahe, J. E. (2015). *Designing and teaching undergraduate capstone courses*. San Francisco, CA: Jossey-Bass Publishers.

John, L. K., Loewenstein, G., & Prelec, D. (2012). Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological Science, 23*(5), 524-532. doi:10.1177/0956797611430953

Karukstis, K. K. (2010). Multiple approaches to transformative research. In K. K. Karukstis & N. H. Hensel (Eds.), *Transformative research at predominately undergraduate institutions* (pp. 21–34). Washington, DC: Council on Undergraduate Research.

Kinzie, J. (2012). Optimizing high-impact practices in the senior year. In M. S. Hunter, J. R. Keup, J. Kinzie, & H. Maietta (Eds.), *The senior year: Culminating experiences and transitions* (pp. 25–28). Columbia, SC: National Resource Center for the First-Year Experience and Students in Transition, University of South Carolina.

Klein, R. A., Ratliff, K. A., Vianello, M., Adams Jr, R. B., Bahník, Š., Bernstein, M. J., ... & Cemalcilar, Z. (2014). Investigating variation in replicability. *Social Psychology, 45*, 142-152. doi:10.1027/1864-9335/a000178.

Klein, R. A., Vianello, M., Hasselman, F., Adams, B. G., Adams, R. B., Alper, S., … Friedman, M. (2016, August 13). Many labs 2: Investigating variation in replicability across sample and setting. Retrieved from osf.io/8cd4r

Linn, M. C., Palmer, E., Baranger, A., Gerard, E., & Stone, E. (2015). Undergraduate research experiences: Impacts and opportunities. *Science, 347*(6222), 627-633. doi:10.1126/science.1261757

Lopatto, D. (2004). Survey of undergraduate research experiences (SURE): First findings. *Cell Biology Education, 3*(4), 270-277. doi:10.1187/cbe.04-07-0045

Massiello, L. and Skipper, T.L. (2013). *Writing in the senior capstone: Theory and practice*. Columbia, SC: University of South Carolina National Resource Center for the First-Year Experience and Students in Transition.

Meyer, M. N., & Chabris, C. (July, 2014). Why psychologists' food fight matters. *Slate*. Retrieved from http://www.slate.com/articles/health_and_science/science/2014/07/replication_controversy_in_psychology_bullying_file_drawer_effect_blog_posts.html

Nelson, A. A., Grahe, J. E., & Ramseyer, F. (2016). Interacting in flow: An analysis of rapport-based behavior as optimal experience. *Sage Open,6*(4). doi:10.1177/2158244016684173

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science, 349*(6251), aac4716.

Perlman, B., & McCann, L. I. (1999). The most frequently listed courses in the undergraduate psychology curriculum. *Teaching of Psychology, 26*(3), 177-182. doi:10.1207/S15328023TOP260303

Persons, O. S. (1998). Factors influencing students' peer evaluation in cooperative learning. *Journal of Education for Business, 73*, 225-229. doi:10.1080/08832329809601635

Ramirez, J. J., & Dickson, S. R. (2010). Promoting supportive environments for transformative research at predominantly undergraduate institutions. In K. K. Karukstis & N. H. Hensel (Eds.), *Transformative research at predominately undergraduate institutions* (pp. 13–21). Washington, DC: Council on Undergraduate Research.

Reifman, A., & Grahe, J. E. (2016). Introduction to the special issue of Emerging Adulthood. *Emerging Adulthood, 4,* 135-141. doi:10.1177/2167696815588022

Russell, S. H. (2008). Undergraduate research opportunities: Facilitating and encouraging the transition from student to scientist. In R. Taraban & R. L. Blanton (Eds.*), Creating effective undergraduate research programs in science: The transformation from student to scientist* (pp. 53–80). New York, NY: Teachers College Press.

Russell, S. H., Hancock, M. P., & McCullough, J. (2007). Benefits of undergraduate research experiences. *Science, 316*(5824), 548–549. doi:10.1126/science.1140384

Schweinsberg, N., Madan, N., Vianello, M., Sommer, S., A., Jordan, J., Tierney, W., Awtrey, E., …, Uhlmann, E. L. (2016). The pipeline project: Pre-publication independent replications of a single laboratory's research pipeline. *Journal of Experimental Social Psychology, 66*, 55-67. doi:10.1016/j.jesp.2015.10.001

Sharobeam, M. H., & Howard, K. (2002). Teaching demands versus research productivity. *Journal of College Science Teaching, 31*(7), 436-441.

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science, 21*(11), 1359-1366. doi: 10.1177/0956797611417632

Simons, D. J., Holcombe, A. O., & Spellman, B. A. (2014). An introduction to registered replication reports at perspectives on psychological science. *Perspectives on Psychological Science, 9*, 552-555. doi:10.1177/1745691614543974

Simonsohn, U. (2015). Small telescopes: Detectability and the evaluation of replication results. *Psychological Science, 26*(5), 559-569. doi:10.1177/0956797614567341

Stephens, R. P., Jones, K. W., & Barrow, M. V. (2011). The book project: Engaging history majors in undergraduate research. *The History Teacher, 45*(1), 65-80. Retrieved from http://www.jstor.org.ezproxy.gc.cuny.edu/stable/41304030

Stoloff, M., McCarthy, M., Keller, L., Varfolomeeva, V., Lynch, J., Makara, K., … Smiley, W. (2010). The undergraduate psychology major: An examination of structure and sequence. *Teaching of Psychology, 37*(1), 4–15. doi:10.1080/00986280903426274

The School Spirit Study Group. (2004). Measuring school spirit: A national teaching exercise. *Teaching of Psychology, 31*, 18-21. doi:10.1207/s15328023top3101_5

U.S. Department of Education, National Center for Education Statistics. (2016). Digest of education statistics, 2014, (NCES 2016-006) Chapter 3. Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=37

Vander Schee, B. A. (2011). Let them decide: Student performance and self-selection of weights distribution. *Journal of Education for Business, 86*(6), 352–356. doi:10.1080/08832323.2010.540047

Ward, D., Griswold, K., Johnson, K., & Grahe, J. E., (2017). Beyond pathways and agency: Validating a four-factor theory of hope. *The American Journal of Family Therapy*. doi: 10.1080/01926187.2016.1277803

Wicherts, J. M., & Bakker, M. (2014). Broken windows, mediocre methods, and substandard statistics. *Group Processes & Intergroup Relations, 17*(3), 388-403. doi:10.1177/1368430213502557

Wilson, A., Howitt, S., Roberts, P., Åkerlind, G., & Wilson, K. (2013). Connecting expectations and experiences of students in a research-immersive degree. *Studies in Higher Education, 38*(10), 1562-1576. doi:10.1080/03075079.2011.633163

Withers, G., & Detweiler-Bedell, J. (2010). Using transformative research to enrich science curricula and enhance experiential learning. In K. K. Karukstis & N. H. Hensel (Eds*.), Transformative research at predominately undergraduate institutions* (pp. 35–46). Washington, DC: Council on Undergraduate Research.

Chapter 26: Students as Junior Colleagues: How Research Transforms the Student Experience

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Abstract

Research is a challenging domain for many psychology students. They often fear that it will be uninteresting and irrelevant, they have misunderstandings about how research takes shape, and they may wonder whether they can even do it. Social and behavioral researchers have paid considerable attention to means of fostering a positive attitude and helping students built research skills. In this chapter, we review some of the concerns that faculty have about teaching research and offer three views from students who have had intense undergraduate research experiences. The students appear to have attained knowledge and developed skills that research faculty value.

Introduction

Students often decide to study psychology, declaring that they want to be able to help people. Naturally, such desire speaks well for students, but it reflects some misunderstanding of the discipline. For example, although clinical and counseling psychology are oriented toward amelioration of people's lives, it seems that psychologists (nearly universally) fail to acknowledge that basic research can be the first step toward helping people.

Beyond generating direct benefits, however, psychology is an ideal discipline for fostering the development of critical thinking skills and scientific literacy (Holmes & Beins, 2009; Keith & Beins, 2016). Achieving such literacy is an important goal according to the National Academies of Science because it entails "knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity" (National Research Council, 1995, p. 22). Others have also commented that knowledge of research is a "critical asset" for civic engagement among the general public (Nind, Kilburn, & Luff, 2015, p. 456). So a major question arises as to how psychology teachers can uncover these hidden dimensions and shift student attitudes about research toward the positive side of the affect continuum.

Teaching research courses and generating positive affect for research is challenging for a number of reasons. Students often fail to see the relevance of research to their lives, feel anxiety about learning the technical skills needed to understand and generate research, and have misconceptions about the research process (Amsel & Kay, 2008; Earley, 2014; Rand, 2016). Furthermore, the prospect of forming an empirical question, identifying existing research on the topic, conducting the study, analyzing the results, and producing a manuscript within the period of one semester is daunting. Unfortunately, that is typically the reality of student research. So it is no surprise that students can feel anxious about the research process. Although successful completion of such a project is possible (Keith, Meerdink, & Molitor, 2007), there is little leeway for overcoming unanticipated hurdles.

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Even with cautious students, various instructors have discovered ways to improve student outlook. One effective approach includes active learning, which can take numerous forms. Essentially, having students engage in some behavior to awaken their imagination can induce positivity. Particular incarnations of active learning involve problem-based learning and service learning (e.g., Marek, Christopher, & Walker, 2004; McDermott & Dovey, 2013; Purdam, 2016), in addition to research in unusual locations, such as zoos (Altman, 2008). However, improved attitude does not necessarily equate with improved learning (Allen & Baughman, 2016).

When the pedagogy is successful, students in research courses benefit on a personal level through the enhancement of scientific literacy (Thieman, Clary, Olson, Dauner, & Ring, 2009), development of a scientific disposition, gains in self-efficacy, and, potentially, career clarification (Kardash, Wallace, & Blockus, 2008). Beyond such gains, students can develop useful workplace skills like problem solving, tolerance of ambiguity, and oral and written communication skills (Koch, 2008).

One effective approach in moving students into a positive research mindset is through the junior-colleague model in which faculty and students form collaborative partnerships, as opposed to a top-down model in which the professor dictates the activity to the student. In the junior-colleague approach, students take a vital role in establishing research questions. The research that the team has pursued resulted from considerable discussion of potential topics, leading to a wide range of topics in the psychology of humor, as indicated in Table 1. As described by Davis (2007, p. 16), "research collaboration is a two-way street; students bring the willingness to assist, learn, and contribute, whereas the faculty contributes expertise and guidance. However, both students and faculty must make meaningful contributions and avoid problems and unnecessary confrontations for this commitment to work effectively." As such, the collaborative model includes more than a small commitment to students and to the research projects (Woody, 2008).

The Psychology Department at Ithaca College uses a three-semester research experience model for all psychology majors where they work on a research team led by a faculty member, a structure that has been described in detail elsewhere (Beins, 1993; Beins, 2008; Beins & Wann, 2010; Holmes & Beins, 2011; Holmes, Miller, & Beins, 2011). At Ithaca College, the department devotes significant faculty resources to this team-based approach, with nine faculty members leading a team that conducts original research (http://www.ithaca.edu/hs/depts/psychology/researchteams/).

The structure of the Ithaca College research team described here began in 1987 and was led by one of the authors of this chapter (BCB). This team has studied the psychology of humor since 1994, and comprises first-, second-, and third-semester students who learn from one another as they determine research questions and plan the research methodology. In addition, students may (and often do) complete a fourth semester of research if they want to continue beyond the standard three semesters. Students earn course credit for their work, and advisement of the team constitutes part of the faculty's teaching load. Since the inception of the team, students have authored or co-authored well over 100 conference presentations. Sample titles addressing the diverse questions that students have generated appear in Table 1. Other research teams have a more faculty-directed approach because of the nature of their research. These teams also have notable success in engaging students.

The Humor Research Team generally conducts a main study during the course of the semester, although it is not unusual for there to be another study running in the "background." Since students are on the

team for three semesters, they are not constrained to develop and complete a study within the confines of a single semester.

Table 1. *Examples of research projects developed by the Ithaca College Humor Research Team.*

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*Cardwell, M., *Smith, A., *Suarez, J., *McGuane, A., *Marshall, M., *Krauss, M., *Lauser, C. & Beins, B. C. (2016, October). *Laughing at me, laughing at you, and interpersonal traits: Gelotophobia and Katagelasticism*. Poster session at the annual convention of the New England Psychological Association, Worcester, MA.

*Cipriano, A., *Rebholz, S., *Krauss, M., & Beins, B. C. (2015, October). *Approaches to laughter and the dark triad*. Poster session at the annual convention of the New England Psychological Association, Fitchburg, MA.

Beins, B. C., *Rebholz, S., *Cipriano, A., *Lara, A., *Bacher, E., & *Jones, A. (2015, March). *Ego threat and approaches to humor*. Poster session at the annual convention of the Eastern Psychological Association, Philadephia, PA.

*Lara, A., *Cipriano, A., *Ryan, B., *Schlag, L., & Beins, B. C. (2015, March). *Development of a simple mood-induction technique for group testing*. Poster session at the annual convention of the Eastern Psychological Association, Philadelphia, PA.

*Lara, A. *Cipriano, A., *Reid, G., *Geller, A., *Grady, J., & Beins, B. C. (2014, March). *Fearing and using laughter: Personality characteristics, instrumental use, and avoidance*. Poster session at the annual convention of the Eastern Psychological Association convention, Boston, MA.

Beins, B. C., *Grady, J., *Geller, A., *Mendes, N., *Leibel, D., & *Lara, A. (2013, October). *Humor styles and self-reflection*. Poster session at the annual convention of the New England Psychological Association, Bridgeport, CT.

Beins, B. C., *Doychak, K., *Ferrante, P., *Herschman, C., & *Sherry, S. (2012, October). *Jokes and terror management theory: Humor may not help manage terror*. Poster session at the annual convention of the New England Psychological Association, Worcester, MA.

*Sherry, S., *LeFebvre, J., *Johnson, B., *Albowicz, C., & Beins, B. C. (2012, March). *Taking offense: Personality and gender-based jokes*. Poster session at the annual convention of the Eastern Psychological Association, Pittsburgh, PA.

Note. Students are indicated with asterisks.

The team functions as a collaborative group, in which every student can provide input not only in the nature of the research question addressed, but in every aspect of the methodology. Since students are only beginning to learn the realities and practicalities of research, guidance is needed to keep the research aims manageable, so the professor is “first among equals.” Given that generating meaningful research questions that are also manageable can be difficult because of the limited breadth of knowledge by undergraduates, this approach lets the faculty set the general parameters for a project but allows students latitude in establishing the details. As such, students have considerable input on the

research without generating so-what projects or the supposedly gigantic breakthrough project (Smith, 2007).

The team generally requires several weeks to develop its methodology after deciding on the questions it will address. Naturally, it would be quicker and easier to have a faculty-driven question, but one purpose of the team is to help students learn to make decisions. Consequently, students read research articles and report on them to the team (sharpening their oral communication skills in the process), identify potential materials to help address the question, and negotiate with one another regarding the specifics of the research. This team-based approach means that the project will not include some students' preferences; this provides practice for such negotiations in graduate school or in the workplace. After this discussion and debate, students become stakeholders in the project, which also fosters learning (Purdam, 2016; Rand, 2016); students come to recognize that for research to succeed, "working at a C level is not enough" (Singelis, 2006, p. 561).

An important question is whether this research team experience actually achieves the desired goals. To help answer that question, three students from the Humor Research Team generated statements about their experience and the perceived outcomes from their semesters as participants on the team.

One author, Kendra Doychak, is currently a doctoral student in clinical psychology at the City University of New York. The other two authors, Marissa Cardwell and Maris Krauss, are currently on the team (see Figure 1). They are all exceptional students, so their experiences differ in detail from students who are less motivated. They have all made conference presentations and acquitted themselves admirably. At their presentations, psychologists from other institutions queried them about their research and praised these students on their knowledge, poise, and professionalism. These reports were universally positive and glowing. So even though other students may not gain as much from a research team as these students, the possibilities of this model are quite striking.

Figure 1. Left to right: Marissa Cardwell, Maris Krauss, and Kendra Doychak (right) presenting their research at a NEPA convention.

The research team students' thoughts appear according to ascending experience in research. Marissa Cardwell has participated on the team for two semesters; Maris Krauss is completing her third semester; and Kendra Doychak is finishing her doctoral work.

These statements detail their attainment of goals and skills that research is designed to foster and that have been noted previously as areas of interest or concern by faculty: confidence, enjoyment of research, ability to make decisions and problem solve, ability to transition to a new environment, written and oral communication skills, and independent and critical thought.

Marissa Cardwell

As an undergraduate student, I have had the opportunity to participate in several research opportunities that have transformed my view of not only the discipline of Psychology, but of academia as a whole. My research experience began as a Junior Psychology major at Ithaca College, where I joined Barney Beins' Humor Research team as a part of my required coursework.

Going into research, I expected to be working in a lab wearing a white coat and dealing with complicated machinery. I was not very keen on the idea, however, I was pleasantly surprised to find that I couldn't have been more wrong. As part of the team, we were constantly brainstorming ways to investigate humor styles, gender implications in joke telling, and much more falling under the humor umbrella. As a part of this research team, we spent weeks reworking, debating, and researching just how to get at what we were truly looking for in our studies.

It is there that I learned one of the first, and most valuable, lessons of research. This is the idea that when you create and conduct a study from scratch, there is a multitude of directions one could go, and it is your job as a researcher to make the judgment calls as you see fit. This revelation not only forced me to be more contemplative and precise, but it also forced me to have more confidence in myself as a student researcher. Beyond just personal growth, this lesson in particular also taught me how to be more critical when reading any sort of research report or journal article, because the procedure and judgment calls made by the researchers have the potential to change the meaning of the results, no matter how they are presented. I think this knowledge is valuable for any and all undergraduate students.

Continuing on in my undergraduate career, I realized that research was exactly where I wanted to be. This was never a thought that crossed my mind before being exposed to it at Ithaca College. As I moved on to the summer after my Junior year, I applied to a summer REU (Research Experiences for Undergraduates) program via NSF and got a position in Nebraska. There I spent the summer within the sociology department, and I was tasked with coming up with my own project entirely, with a few small guidelines.

My time on team prepared me to make difficult decisions and come up with a project that was meaningful. My research experience in Nebraska, however, taught me more about networking professionally. As a part of this REU experience, I was able to meet and collaborate with several members of the department who were doing their own research, and I got the opportunity to get a taste of what graduate school research would be like. Here I worked with a mentor, and I collaborated with many other students from undergraduate and graduate levels on other projects. I also learned how to make a poster and present it at a conference, which would become useful to me in the future presenting at NEPA in the fall of 2016 for the IC humor research team. When presenting at the New

England Psychological Association (NEPA) conference in Worcester, Massachusetts, I worked hard to make sure that I had a command of the research and that my presentation was not in any way misleading. At NEPA I also got the opportunity to speak with several current psychologists and researchers, which is always helpful when you're in the process of deciding what to do after college.

Thinking back on my time as an undergraduate researcher has made me realize the true impact that this research experience has not only had on my career trajectory, but on the ways in which I go through life and process information. As a psychology major and researcher, scientific literacy is so important, but this skill goes beyond the classroom or laboratory. I am confident now in my ability to evaluate choices in an objective way, and come to conclusions based on evidence. Likewise, I am able to be critical of the judgments made my politicians, authorities, and everyday friends and family.

Knowing about how we come to evidence has allowed me to better understand what we can and cannot know as scientists. This knowledge has allowed me to confidently move through important decisions and choices, especially in the context of the past year's election. I can confidently say that in the future, as I continue to work for a career in Sociology research, I will always look back on and use the skills I gained conducting undergraduate research.

Maris Krauss

When I first chose a research team at Ithaca College, it was out of necessity. Our psychology program requires three semesters of participation in a research team, and I had no idea how I could contribute to research as an undergraduate. Research seemed like a far-off idea in our classes when we were asked to analyze journal articles and comprehend their research questions. I did not know how I could, as a student, contribute to research and methodology with what I thought was limited knowledge of the overall process. The way we learned about research throughout my undergraduate career, however, proved to aid my understanding of this process more than I initially realized.

In our program, every student must take Research Methods in Psychology before participating in a research team. In this class, we learned not to take any study at face value, to always look to the methodology of a study before believing its claims, and to be critical of pop psychology. This is a skill I carry with me everywhere now. The Internet makes it easy for people to share what they think are credible studies, but I now have the knowledge to evaluate and critique every study from a scientific perspective. When my friends share articles on Facebook claiming revolutionary new discoveries, I always look to the methodology to see if the study was an experiment or if it was based on correlational data.

The importance of writing in APA style was integrated into the Research Methods class and our work on the humor research team, a skill necessary for being able to communicate professionally. My knowledge of citation rules expanded, as did my overall writing ability. Learning APA style helped me learn how to write for a particular audience, which is important no matter what career in psychology I decide to pursue. The skills I developed (and continue to develop) in the team have increased my overall professionalism and my understanding of the research process.

The path of assembling the different skills associated with research was gradual but continuous. We started slow in our team research: first deciding on a question, then brainstorming possible ways to answer it, and putting these ideas into action. Breaking the process down in this way made it easier to digest and I began to gain confidence in my ability to conduct and create research. I polished my

professional skills in the team as well. We were instructed not to use words such as “like” and “um” in the classroom. These rules forced us to express our ideas clearly and without filler words, in an attempt to train us for presenting data in a professional setting. I soon became conditioned to make an effort to exclude these words from my vocabulary in a professional setting. I now feel more confident in presenting myself in a clear way, and I have used this skill in interviews and during my poster session at the NEPA conference in the Fall of 2015.

Presenting at NEPA was a learning experience of its own. As a team, we conducted research with undergraduate psychology students at Ithaca College, and a few of us were selected to present our work at the conference. I worked with a fellow student to compile our data into a poster. We rehearsed our presentation, making sure we were ready to explain any concept to someone who was unfamiliar with our terminology. We presented one poster on behalf of a student who had graduated, so we had briefed ourselves on her study as well. Looking at the way this student had incorporated the research she had done on the team with her own ideas inspired me to pursue my own project, and I created an independent study for credit the next semester.

My experience with creating research from the ground up gave me the courage to seek out an independent project at Duke University over the summer. I reached out to professors whose research interested me, and after a successful Skype interview, I had secured an internship. I worked on compiling a data report for a longitudinal study, using the skills I had learned in the humor research team to synthesize data and present it in a clear way for non-psychologists. This was a process we talked about in the team often: when we were discussing a concept, we had to explain it in layperson’s terms. This skill was useful over the summer and continues to be useful. I was also given access to a dataset at Duke and was free to make hypotheses and analyze the data as I pleased. My work in the team prepared me for this task, as I was able to understand the data and make reasonable hypotheses. I would not have had the confidence and knowledge to create this summer research experience for myself had it not been for my time in the humor research team.

Kendra Doychak

As an undergraduate student, I spent three consecutive semesters as a member of a research team under the guidance and mentorship of a faculty advisor. In addition to coursework in research methodology and statistics required of all undergraduate students, I was exposed to the process of research and the development, administration, and analysis of empirical studies as a member of this team. This hands-on experience fostered the development of a number of skills that continue to enrich my learning experiences and research projects as a graduate student. These skills included the expansion of practical knowledge, such as learning how to administer a study to other students, interpret statistical tests and output (e.g., significant results, correlations, factor analysis, etc.), and translate numerical results into interpreted findings. However, this experience also cultivated the development of applied skills, which included but were not limited to, the confidence to engage in research, the ability to collaborate effectively with peers, to think critically about research ideas and design, to organize and present important findings in professional settings, and to situate findings within the relevant theory and literature.

After completing my undergraduate degree, I completed a Master’s thesis, obtained an MA degree in Forensic Psychology, gained admittance to a doctoral program in Clinical Psychology, and began my dissertation. As I reflect on my experiences with research, I am able to see a pattern of growth,

improvement, and specificity that I do not believe would have been attainable had it not been for my early exposure to and engagement with empirical study.

My undergraduate research team comprised a faculty advisor, senior students, and junior students. Therefore, the ways in which we learned were not only top-down from the faculty mentor (who facilitated our learning and growth tremendously), but also laterally and reciprocally through our peers. This type of learning fostered a set of transferrable communication and collaboration skills that still help to improve the way I relate to and communicate with peers in professional and academic group settings. On a team of seven to ten students, the integration of ideas and opinions was essential for successful and effective team functioning. We engaged in rich discussions to explore relevant theory, literature, and research ideas, as well as to develop questions and construct our studies. Having the experience of learning to integrate a range of complex questions and ideas, as well as finding resolutions to disagreements related to theory or design, has been pivotal in my graduate level research and my ability to coordinate and oversee my current research lab.

Engaging with the process of research taught me to think critically about design and development, choose and run the appropriate statistical tests, and formulate coherent interpretations of the findings. Team research exposed me to statistical software early on in my education; it also enabled my ability to think conceptually about statistics—as it relates to design and analysis—in a way that I would not have been able to were it not for the experiential learning offered in the research team setting. For example, working with factor analysis exposed me to both the numerical and conceptual elements of statistics. We learned how to understand the numbers in the output and simultaneously worked collaboratively to interpret the meaning of those numerical findings.

One of the biggest challenges after interpreting statistical analyses is articulating important results and distilling relevant findings without relying too heavily on jargon or field-specific language. As a graduate student, most of my research currently focuses on abuse and power dynamics operating in various victim-abuser contexts (e.g., intimate partners/domestic violence or sex trafficking). Often, these dynamics are studied across disciplines (e.g., psychology, anthropology, sociology, etc.). The skills I took away from my time on the research team, including the ability to discuss research and share findings in language accessible to those from all fields, continue to enhance my discussions about research today. Ultimately, this enriches my work because it allows me the ability to gain others' expertise, opinions, and input concerning my research in ways that might have previously remain unexplored.

Though I was unaware of the impact and long-term relevance of this learning at the time, I grew increasingly aware of its important and utility as I advanced through my education. As a result of my time on the team, I excelled in my graduate statistics and research methodology courses. I was also able to explore more advanced or complex methodology in my MA thesis, which was of mixed-method design and included a community sample. Similarly, my dissertation is taking shape in my first semester of the doctoral program and will involve a three-part study consisting of panel discussions with experts in the field, in-depth qualitative interviews, and measurement development and validation. Without the foundational knowledge and skills I developed in undergraduate research, I would not have had the opportunity to explore the types of questions I was interested in and to utilize complex design and research in graduate study.

It is the experience of seeing research from its earliest stages to its final presentation (i.e., manuscript or conference presentation) that cultivated a familiarity, comfort, and confidence with the process of doing

research. Rather than beginning my graduate career without experience and needing to learn those applied skills during the completion of my MA degree, I began with the foundational knowledge necessary to expand upon and enhance the complexity of the types of projects I was capable of doing. Further, I acquired the competencies necessary for overseeing the development and maintenance of various projects for my faculty advisor. Finally, with the skills I acquired as a result of team collaboration, I am able to work with peers, undergraduate students, and even other faculty members to produce quality research.

The research team structure fostered student development in various ways across my three semesters of participation. Each semester brought new students and new ideas for ways in which to explore humor and the various phenomena that relate to it. With the freedom allotted by our advisor, the team was able to shape the direction and content of our projects from start to finish. As team members, we developed original questions for our survey instruments and worked collaboratively to determine the content of those instruments, as well as to organize the order of administration and the composition of experimental and control groups. Throughout the research process, we were required to draft papers (i.e., introduction, method, results, and discussion sections), as well as run analyses and present findings at professional conferences. Discussing findings related to humor and other bodies of literature required an in-depth and comprehensive understanding of our projects, why they were relevant, and what they added to the field. It also required a thorough understanding of why particular statistical tests were chosen and what the results of those tests suggested.

The research team experience fostered an ability to not only engage in research, but to successfully understand and disseminate results. The skills acquired as a result of being a member of a collaborative research team are those that transfer from project to project and continue to augment our abilities to do effective and sound research. Overall, these experiences instilled the competencies necessary to engage in research and laid a foundation for approaching empirical study well beyond our undergraduate careers.

Conclusion

Students often show more interest and appreciation of practitioner issues in psychology than in research (e.g., Holmes, 2014). A perennial dilemma involves how to generate positive affect for research as the students undertake research activity. As Ciarocco, Lewandowski, and Van Volkom (2013) demonstrated, active participation and scaffolding can generate desired student attitudes about research.

The research team experience at Ithaca College promotes skill building and student investment in their research through such an approach. As one sees in the reports here of students at various stages of learning about and conducting research, the benefits of engaging students as junior colleagues are powerful and persistent.

The Ithaca College students report attitudinal changes in their confidence and enjoyment in doing research. What started as a potentially mysterious process became a means of building practical research skills, but also improved communication skills. In addition, students see themselves as more independent and critical thinkers after being involved in the decision-making process in creating research projects.

The team approach also allows the students to collaborate in groups and to learn from one another. This model lets them recognize that they can actually succeed in research because they see their peers succeeding. In the end, they become colleagues in the research process, gaining experience that carries forward beyond the undergraduate years.

References

Allen, P. J., & Baughman, F. D. (2016). Active learning in research methods classes is associated with higher knowledge and confidence, though not evaluations or satisfaction. *Frontiers in Psychology, 7*, 279. doi:10.3389/fpsyg.2016.00279

Altman, J. D. (2008). Research at a local zoo. In R. L. Miller, R. F. Rycek, E. Balcetis, S. T. Barney, B. C. Beins, S. R. Burns, R. Smith, & M. E. Ware (Eds.), *Developing, promoting, & sustaining the undergraduate research experience in psychology* (pp. 151-155). Retrieved from the Society for the Teaching of Psychology Web site: http://teachpsych.org/ebooks/ur2008/ur2008.php

Amsel, E., & Kay, T. (2008). After introductory psychology: The next course preparing psychology freshmen and sophomores for undergraduate research. In R. L. Miller, R. F. Rycek, E. Balcetis, S. Barney, B. Beins, S. Burns, R. Smith, M. E. Ware (Eds.), *Developing, promoting and sustaining the undergraduate research experience in psychology* (pp. 104-107). Available at http://teachpsych.org/ebooks/ur2008/index.php

Beins, B. C. (1993, August). Research team: Bonding, enjoyment and programmatic research. In L. M. Jones (Chair), *Undergraduates as Scientists: Successes in a Research-Based Curriculum*. Symposium conducted at the meeting of the American Psychological Association, Toronto.

Beins, B. C. (2008). Creating research groups in an undergraduate psychology curriculum. In R. L. Miller, R. F. Rycek, E. Balcetis, S. T. Barney, B. C. Beins, S. R. Burns, R. Smith, & M. E. Ware (Eds.), *Developing, promoting, & sustaining the undergraduate research experience in psychology* (pp. 111-115). Retrieved from the Society for the Teaching of Psychology Web site: http://teachpsych.org/ebooks/ur2008/ur2008.php

Beins, B. C., & Wann, P. (2010). Research teams: Developing a capstone experience with programmatic research . In D. S. Dunn, B. C. Beins, M. A. McCarthy, & G. W. Hill (Eds.). *Best Practices for Teaching Beginnings and Endings in the Psychology Major* (pp. 207-230). New York: Oxford University Press.

Ciarocco, N. J., Lewandowski, G. W., Jr., & Van Volkom, M. (2013). The impact of a multifaceted approach to teaching research methods on students' attitudes. *Teaching of Psychology, 40*, 20-25. doi:10.1177/0098628312465859

Davis, S. F. (2007). Student-faculty research collaboration: A model for success in psychology. In D. S. Dunn, R. A. Smith, & B. C. Beins (Eds.), *Best practices for teaching statistics and research methods in the behavioral sciences* (pp. 15-23). Mahwah, NJ: Lawrence Erlbaum.

Earley, M. A. (2014). A synthesis of the literature on research methods education. *Teaching in Higher Education, 19*(3), 242-253. doi:10.1080/13562517.2013.860105

Holmes, J. D. (2014). Undergraduate psychology's scientific identity dilemma: Student and instructor interests and attitudes. *Teaching of Psychology, 41*, 104-109. doi:2048/10.1177/0098628314530339

Holmes, J. D., & Beins, B. C. (2009). Psychology is a science: At least some students think so. *Teaching of Psychology, 36*, 5-11. doi:10.1080/00986280802529350

Holmes, J. D., & Beins, B. C. (2011). Student engagement in undergraduate research. In R. L. Miller, E. Amsel, B. M. Kowalski, B. C. Beins, K. D. Keith, & B. F. Peden (Eds.), *Promoting student engagement* (Volume 1, pp. 114-117). Retrieved from the Society for the Teaching of Psychology Web site: http://teachpsych.org/resources/e-books/pse2011/index.php

Holmes, J., Miller, R. L., & Beins, B. C. (2011, October). *Incorporating undergraduate research experiences into the introductory psychology course*. Presentation at Best Practices: Teaching Introductory Psychology, Atlanta, GA.

Kardash, G. M., Wallace, M., & Blockus, L. (2008). Science undergraduates' perceptions of learning from undergraduate research experiences. In R. L. Miller, R. F. Rycek, E. Balcetis, S. Barney, B. Beins, S. Burns, R. Smith, M. E. Ware (Eds.), *Developing, promoting and sustaining the undergraduate research experience in psychology* (pp. 258-263). Available at http://teachpsych.org/ebooks/ur2008/index.php

Keith, K. D., & Beins, B. C. (2016). *The Worth expert guide to scientific literacy: Thinking like a psychological scientist*. New York, NY: Worth.

Keith, K. D., Meerdink, J. & Molitor, A. (2007). Upper division research methods: From idea to print in a semester. In D. S. Dunn, R. A. Smith, & B. C. Beins (Eds.), *Best practices for teaching statistics and research methods in the behavioral sciences* (pp. 173-183). Mahwah, NJ: Lawrence Erlbaum.

Koch, C. (2008). The value from the perspective of the workplace/community. In R. L. Miller, R. F. Rycek, E. Balcetis, S. Barney, B. Beins, S. Burns, R. Smith, M. E. Ware (Eds.), *Developing, promoting and sustaining the undergraduate research experience in psychology* (pp. 276-279). Available at http://teachpsych.org/ebooks/ur2008/index.php

McDermott, H. J., & Dovey, T. M. (2013). Strategy to promote active learning of an advanced research method. *Psychology Learning and Teaching, 12*, 92-95. doi:10.2304/plat.2013.12.1.92

Marek, P., Christopher, A. N., & Walker, B. J. (2004). Learning by doing: Research methods with a theme. *Teaching of Psychology, 31*(2), 128-131.

National Research Council. (1996). *National Science Education Standards*. Washington, DChttp://dx.doi.org.ezproxy.ithaca.edu:2048/10.1080/00986280802529350ional Academy Press. Retrieved from http://www.nap.edu/catalog/4962.html

Nind, M., Kilburn, D., & Luff, R. (2015). The teaching and learning of social research methods: Developments in pedagogical knowledge. *International Journal of Social Research Methodology: Theory & Practice, 18*(5), 455-461. doi10.1080/13645579.2015.1062631

Purdam, K. (2016). Task-based learning approaches for supporting the development of social science researchers' critical data skills. *International Journal of Social Research Methodology: Theory & Practice, 19*(2), 257-267. doi:10.1080/13645579.2015.1102453

Rand, J. (2016). Researching undergraduate social science research. *Teaching in Higher Education, 21*(7), 773-789. doi:10.1080/13562517.2016.1183621

Singelis, T. M. (2006). Active learning in aging research. *Educational Gerontology, 32*(7), 553-564. doi:10.1080/03601270600723742

Smith, P. C. (2007). Assessing students' research ideas. In D. S. Dunn, R. A. Smith, & B. C. Beins (Eds.), *Best practices for teaching statistics and research methods in the behavioral sciences* (pp. 59-27). Mahwah, NJ: Lawrence Erlbaum.

Thieman, T. J., Clary, E. G., Olson, A. M., Dauner, R. C., & Ring, E. E. (2009). Introducing students to psychological research: General psychology as a laboratory course. *Teaching of Psychology, 36*(3), 160-168. doi:10.1080/00986280902959994

Woody, W. D. (2008). Collaboration: Faculty perspective. In R. L. Miller, R. F. Rycek, E. Balcetis, S. Barney, B. Beins, S. Burns, R. Smith, M. E. Ware (Eds.), *Developing, promoting and sustaining the undergraduate research experience in psychology* (pp. 215-219). Available at http://teachpsych.org/ebooks/ur2008/index.php

Chapter 27: Student-Directed Research Collaborations between Higher Education and K-12 Classrooms

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Abstract

Experiential learning approaches have become increasingly popular in the past few decades across a range of disciplines. While this type of learning is often enacted through required research projects, other, less resource-heavy models, may be similarly effective. This chapter reviews the concept of experiential learning, focusing on Kolb's model. The authors then discuss how to utilize collaborations with nearby elementary or high schools to create mutually beneficial curriculums that integrate research through student-led activities. The emphasis is on undergraduate students' mastery of the material, so that they can take on a leading role in presenting the applied content to younger students. The authors discuss three course designs they have utilized that incorporate experiential learning, describing the strengths, weaknesses, and student feedback in relation to each design. Although the authors offer means for accomplishing each technique without an outside collaborator, the chapter ends with suggestions regarding how to approach elementary and high school teachers for similar collaborations.

Introduction

In the stereotypical undergraduate course, the student is a passive learner as the professor lectures in an auditorium. Although this class structure exists across the country, numerous researchers have found that educational practices that apply class concepts outside the classroom result in increased rates of student retention and student engagement (Kuh, 2008). The opportunities for involvement differ by discipline (e.g., 94% of business programs offer internships; Weible, 2010), but there is a recent push to provide these types of experiences for all students. In fact, New York Governor Andrew Cuomo included a provision in his executive budget that requires students to complete some form of experiential learning at all schools within the City University of New York and State University of New York systems prior to their graduation (Skelding, 2015).

However, the push for applied learning opportunities is juxtaposed with decreased enrollment and budget deficits that call for larger, consolidated classrooms and fewer faculty members (Mitchell, Leachman, & Masterson, 2016). Twigg (2003) hypothesized that the failure rate in large-class settings is a substantial contributor to institutional drop-out rates between the first and second years. Given the relationship between applied learning and student retention, this chapter will present means to increase active learning that can be applied in both small and large class settings (for a longer discussion of increasing participation in large class settings, see Panjwani & Cipollina, this volume). Our theory is to give all students a scaffolded experience of applied concepts. We aimed to teach undergraduate students how to build a sense of mastery by teaching and mentoring younger students in relevant topic areas.

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Experiential Learning Theory

David A. Kolb's model of experiential learning has received substantial support from researchers and educators (McLeod, 2013). The model has been used in multiple disciplines including education, management, computer science, psychology, medicine, nursing, accounting and law (Kolb et al., 2000). The model is based on the work of Dewey, Lewin, and Piaget (Kolb, 1984). In his theory, Kolb (1984) defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (p. 41). The theory is based on six propositions of learning including: 1) learning is a process rather than outcome; 2) learning is best facilitated by integrating new concepts with students' preconceived notions; 3) learning is driven through reconciling dialectically opposed modes of adaption to the world; 4) learning represents holistic adaptation; 5) learning results from synergetic transactions between an individual and environment, and; 6) learning is the process of creating knowledge rather than transmitting existing ideas to learners (for a similar approach, see Vianna & Stetsenko discuss Transformative Activist Stance, this volume).

The theory describes a dialectic approach between concrete experience and abstract conceptualization that informs how individuals come to grasp information. Concrete experience refers to immersion in a tangible reality, and abstract conceptualization relies on analyzing and processing the information gathered from that experience. Kolb, Boyatzis, and Mainemelis (2000) used an example to clarify these concepts: while driving a car can be conceptualized as a concrete experience, analyzing the driver's manual is abstract conceptualization. The two modes of transforming the experience are reflective observation and active experimentation. In reflective observation, the focus is internal; individuals watch others or develop observations about their own experience. This can be done in class by providing information in a lecture-format, or by asking students to generate written or verbal reflections on their own experiences. In contrast, active experimentation is externally focused as individuals use knowledge to solve problems or make decisions. Holistic learning incorporates elements of concrete experience, abstract conceptualization, reflective observation, and active experimentation. When experiential learning is applied to an undergraduate course, each of these techniques must be combined. We present three examples of course designs that integrated experiential learning into an undergraduate curriculum.

Implementation of Experiential Learning

Design 1: Course-Required Research Projects with Students as Researchers.

In the spring of 2015, Rebecca, one of the chapter authors, taught a research-intensive course in Learning and Memory at John Jay College, City University of New York. Students were required to learn about the basic paradigms and current research in learning and memory, as well as develop the skills required to conduct relevant research. In the same academic year, Polly, another chapter author, covered research methods in her sixth-grade science classes. The content of Polly's year-long course, focusing on experimental design, data analysis, and the role of bias in experimentation, overlapped significantly with that of Rebecca's college course, covering many of the same foundational scientific research concepts, albeit with Polly's course covering these topics at a more basic level. The two instructors collaborated on all aspects of an interconnected course design, from constructing a PowerPoint presentation template (that was available to all students) to the class requirements and expectations. As their culminating assessment, students in both schools were required to create and carry out original research projects in groups (for further discussions of guiding students in conducting research, see also Podlucka;

Lewandowski, Ciarocco & Strohmetz; Wilson, this volume). Furthermore, students at both schools were encouraged to use students from the collaborating school as research participants. Thus, both course designs utilized Kolb's model. All of the students actively engaged in the research process (concrete experience) with guidance that allowed them to process what they learned (abstract conceptualization).

The undergraduate course consisted of a large-section class (enrollment limit: 120) that employed two teaching assistants as well as the professor. The students had already taken a course in statistics, and 90% had already taken a course in research methods. The first two weeks were devoted to a review of research methodology (with all examples pertaining to learning and memory). Early in the semester, Rebecca conducted a *highlights* class that consisted of a brief review of topics that would be covered throughout the semester. In the highlights class, Rebecca focused on topics that could be easily operationalized such as depth of processing and models of working memory. Additionally, students had access to a folder on an online Blackboard Course Site called *Inspiration for Research Topics* that included both empirical and popular articles about relevant topics (e.g., a New York Times article about gender differences in math and science; Miller, 2005). Students were encouraged to create discussion threads on Blackboard about topics of interests. Many students self-selected into groups of five through these conversations, and the remainder were assigned into groups, while ensuring that the majority of students in each group had completed the research methods course.

Throughout the semester students completed scaffolded assignments to encourage comprehension of research topics. Following several lessons reviewing research design, students were required to systematically evaluate one of three provided empirical articles, each of which described a study related to concepts covered in the textbook. The assignment is based on a method by Morling (2014), where students are required to evaluate a study design based on four types of validity: external, internal, construct and statistical. The types of validity were reviewed in the lessons on research methodology, and the requirement to consider multiple types of validity forced students to think beyond simple considerations of sample size and generalizability and incorporate more complex considerations, such as the limitations inherent in making abstract psychological concepts concrete and measurable.

After completing the above assignment, the remainder of the written assignments were group-based work regarding the research projects. A significant portion of the class grade was related to detailed research proposals. Students were provided with rubrics for all assignments including segments devoted to feasibility. Assignments were reviewed by all instructors, including the two teaching assistants who worked particularly closely with groups in developing their data analysis plans. Each group provided multiple drafts for each step of their research-related plan and product. Each draft was graded, and groups needed to incorporate the feedback they received for the following assignment. First, groups were required to submit their research question, hypotheses and operationalized dependent and independent variables. Groups then needed to complete a brief methodology section, including measures and data analysis plan. Once their methodology plan was approved, they completed full research proposals. They had an opportunity to regain lost points by submitting revised drafts of certain sections. In fact, the undergraduate students were not allowed to move forward (and meet the sixth-graders) until they had ethical, feasible, and approved plans. After completing the research project, groups created PowerPoint presentations describing the background research, methodology, results and implications of their research projects.

Several examples of the topics covered in the review, as well as samples of how the undergraduate students operationalized the concepts in a research project are provided in Table 1. The students were encouraged to use empirical articles they read as templates, and some readers may recognize similarities between the student projects and seminal studies. Of course, the student projects were simplified for logistical reasons – which was deemed acceptable for class purposes, as long as students could articulate how their shortcuts impacted their research.

Table 1. *Students Application of Textbooks Concepts in Research Designs*

Textbook Content	Research Question	Operationalized Study
Priming / Suggestibility of Memory	Will a key word impact an evaluation of individuals' memory?	Sixth-grade students were separated into two groups and shown a brief clip of a comedy. One group was asked to rate the degree to which the clip was *funny*. Another group was asked to rate the degree to which the clip was *hysterical.*
Phonological Loop / Limits of Auditory Working Memory	Will auditory distraction impair individuals' ability to store auditory memories?	Sixth-grade students were separated into two groups, both of which were asked to memorize lists of vocabulary words that were read to them. One group heard the list in relative silence, the other heard music playing softly in the background.
Emotions & Memory / Yerkes-Dodson Arousal Law	Will a higher level of arousal decrease individuals' ability to recall information?	Sixth-graders were separated into two groups. Each group was given a short quiz on vocabulary terms they had covered in class. One group was told it would be counted towards their grade, the other was told it would not count towards their grade.

By the end of the semester, each group successfully created and tested research hypotheses. After data collection and analysis, the undergraduate groups presented their PowerPoint slides describing their research to their research participants, the sixth-graders. The sixth-graders were on a delayed schedule (since their academic calendar had an additional month) and so they had the opportunity of seeing the undergraduates' presentations before collecting data for their own end-of-year research studies. Because of the similarities in formatting and requirements, the undergraduate presentations allowed the younger students to see models of completed projects while they were completing their own. The primary difference between the presentations was that the undergraduates needed to use inferential statistics, while the sixth-grade students used only descriptive analyses.

Review of Course Design 1. The instructors felt that the course design was successful, and all student groups completed their research projects. The undergraduate students provided generally positive feedback at the end of the semester, and the course evaluation scores were above departmental and institutional averages. In addition to the standard course evaluation, undergraduate students were surveyed during the course and prior to the authors writing this chapter. Again, the reviews were positive and two students specifically noted that serving as research participants for the sixth-graders engaged them in the research process. While rewarding and feasible, this style of course design was time consuming, and the design was largely reliant on our intensive collaboration. For instructors considering a similar course design, we want to emphasize the importance of numerous, scaffolded assignments. Ironically, this decreased the workload for all involved, since it allowed us to redirect students whose projects required revision as early as possible. It also allowed the two instructors to continue to adapt to the needs of both sets of students.

When asked about the course, the undergraduate students brought up two concerns. The first was mentioned during the class, rather than in any surveys. The undergraduate students were required to complete relevant research projects, but also had three exams covering general theories and research in learning and memory. Many students were concerned about their ability to do well on the exams, given the amount of time they devoted to their projects. The balance between textbook content and applied content was one of Rebecca's primary concerns prior to the class. However, the class average on two of the exams was not significantly different than that of prior years, and the average score on the third exam was significantly higher (by just a few points) in the research-intensive course. The differences in scores were largely due to the lower end of the bell curve. Fewer students failed each exam in the research-intensive version, and roughly the same numbers achieved scores in the A range. Predictably, individual students tended to excel on test items relating to their specific research topics, but no one exam was correlated with a majority of the research hypotheses.

The second, and more pressing issue, was related to group dynamics. While only problematic in a few cases, one might anticipate that some students would have difficulty working together in a group. Rebecca had created a class policy around this: each group chose a group leader who assigned tasks and maintained an internal early deadline for each of the scaffolded assignments. Therefore, if a student in the group did not make their deadline, the group needed to discuss it. If they were unable to resolve the issue, they needed to inform the professor two weeks before the external deadline listed in the syllabus. The professor would then step in to work with the group. If a student were still unable to meet his or her obligations, that student would receive a lower grade than the rest of the group. Notably, in the groups who followed this policy, most were able to resolve their concerns, and the very few students who did receive lower grades accepted the situation gracefully and apologized to their group (for a longer discussion of methods to facilitate successful teamwork, see Schnieder, this volume). The problems occurred in groups who did not follow the policy (which is admittedly complicated), and did not inform the professor until after assignments were completed. These situations often involved conflicting stories and little evidence. Although very rare, these cases were emotionally charged for the students and frustrating for all involved. Perhaps due to fears of similar difficulties related to group work, many instructors may be reluctant to implement experiential learning in large classrooms. However, the experience of working in a group is an important learning process in and of itself. It is applicable to professional development, and requires skills that will be necessary once students join the work force. This is an advantage that can and should be clearly explained to students participating in

similar course designs. In fact, experiential learning can easily build a level of engagement that can be harder to attain in large classrooms. Additionally, requiring students to complete individual projects, in a smaller class, may have its own drawbacks. Without the benefit of a group to allocate specific responsibilities, some of the undergraduate students would not have been available to complete the project for logistical reasons (i.e., no scheduling availability to travel to the elementary school). A colleague recently suggested a policy for grading groups that has more promise: during the presentation of the research project, each student in the group is randomly assigned to present one section (e.g., background, methodology, results, discussion), and is graded based solely on the presented material. Therefore, each member needs to be prepared to present any of the sections.

Additionally, it is notable that many of the students' experiments did not produce significant findings. Given the logistical limitations and potential confounding factors, the common lack of significant results is unsurprising. It can and should be used as a learning tool. The students may be comforted with a reminder of Kolb's first proposition of learning: learning is a process, not an outcome (1984). The act of research, the operationalization of concepts and an understanding of limitations are all crucial aspects of the process. In fact, research must always be seen in light of its limitations, and students can consider both theoretical flaws with their hypothesis (maybe it isn't true) and flaws with the conceptualization of their study (maybe it wasn't tested well). They should consider threats to internal and external validity, as well as statistical validity. Even a perfectly designed study is unlikely to produce significant results in a small sample size. These concepts are relevant for all students, even those less likely to pursue careers related to research or psychology. When students understand these concepts, they become better consumers of research, a crucial skill in our ad-driven lives.

Lastly, it was likely relevant that the course was offered just as the college utilized a new online system and 97% of the class did not view the course description prior to enrolling. Therefore, the vast majority of undergraduate students were unaware they had signed up for a research-intensive version of the course. As biases associated with self-selection are one of the most common critiques of undergraduate research experiences (Linn, Palmer, Baranger, Gerard, & Stone, 2015), this course provided some insight into the possible success and general applicability of these types of courses. Still, instructors who consider a similar design may be thoughtful about course advertisements.

Alternate versions of Course Design 1. Undergraduate students can complete research projects using their own or other undergraduate classes to recruit participants. This is a common design, often utilized for courses on research methodology. Students could also conduct online surveys utilizing social media platforms.

Design 2: Students as Teachers of Empirically Informed Study Techniques. In the fall and spring semesters of 2014, Rebecca included several extra credit options in her Learning and Memory class, although students could participate in only one. In one option, the undergraduates were required to present applied content to the sixth-grade classroom at East Side Community School. Students worked individually or in pairs and created presentations that utilized class content (i.e., learning- and memory-based techniques). They described three empirically-based study techniques and demonstrated at least one. When relevant, the demonstrations utilized vocabulary terms that were part of the sixth-graders' curriculum. For example, one group choose to discuss the concept of *depth of processing* with the sixth-graders, a general idea based on the work of Craik and Lockhart (1972) that states that more meaningful information is more likely to be remembered than less meaningful information. The students briefly

explained relevant research that supported this idea, and then utilized it with the sixth-grade class. They asked the sixth-grade students to remember a list of vocabulary terms that were presented on a slide. Then, they provided the students with a new list of words and asked the sixth-graders to associate the words with provided images, and again tested the students on the words. For example, the word microscope was paired with a picture of a cartoon scientist looking through a microscope. The sixth-grade students found it easier to remember the words associated with images, a result that demonstrated depth of processing. The motto presented to the sixth-graders was: *work smarter, not harder.*

Students interested in presenting lesson plans to the sixth-graders were required to sign up within the first two weeks of class. The hope was that students who signed up for this type of extra credit did so because of interest, rather than fear of a low-class grade. A far later deadline for an extra credit paper that was worth an equivalent amount of additional points was available for all students who had not already participated in extra credit.

Notably, this course design also included intensive collaboration between the two instructors (for further suggestions on strategies for collaborating with other instructors, see Schwartz, Powers, Galazyn & Brooks, this volume). The undergraduate students completed drafts of their lessons well in advance, and both instructors assisted with several stages of revisions. These revisions addressed every aspect of the presentation, from the relevance of the supporting literature to the font color and style. The instructors ensured that the presentations were both free from mistakes but also written at the appropriate level. The undergraduate students needed to not only sift through and create applied examples of relevant literature, but to also translate the information without the benefit of hiding behind discipline-specific jargon. After students presented, Polly provided each student or student group with a review of their lesson. Their extra credit grade was based on their lesson plan, materials, and conduct in the classroom.

Reviews of course design. Because only a small number of the undergraduate students participated in this option, this opportunity was not reflected in course surveys. However, it appeared to be a highly successful design. There were far fewer interpersonal difficulties in this design, likely due to the fact that undergraduate students who signed up for this option were self-selected and highly motivated. There was a limit to how many students were allowed to present lessons to the sixth-graders, and Rebecca had to create a rarely utilized waiting list. The numerous revisions to the lessons were crucial, and the intensive feedback contributed to the learning process for the undergraduate students. The undergraduate students were responsive to feedback, and made dramatic improvements. By the time they presented their lessons, they were able to relate the techniques to experiences that were relevant to sixth-graders. One group compared massed versus spaced practice in the context of training for a basketball game. The undergraduate students incorporated information Polly had sent to them in advance, so that their presentations fit within the general sixth-grade lessons. The sixth-graders had many questions, which the undergraduates were able to field. The success of the lessons was evident, as the sixth-graders were able to recapitulate the techniques described by the undergraduates in their own work.

The instructors purposefully did not provide a list of topics that undergraduate students could use in their sixth-grade lesson plans. The students came up with the topics and applications on their own, forcing them to engage in the holistic adaptation described by Kolb (2000). However, it's notable that

the course content is easily relatable for all students, whether they attend college or elementary school. Within their role of *student*, all students need to memorize and understand course content. Additionally, from the first day of the semester, the undergraduate students had seen applications of the content in their textbook, Learning and Memory (Gluck, Mercado, & Myers, 2016). The textbook authors do a wonderful job of applying the content to students' social and academic lives throughout the text, which is particularly stated in sections called Learning and Memory in Everyday Life (e.g., "How Does Amazon.com Know What You Want to Buy Next?" p. 220). This was further emphasized in class. Rebecca reviewed the applications provided by the textbook, provided additional examples, and asked students to think of their own applications. In class, students reviewed a dating advice column that describes techniques to spice up a relationship and were asked about the role of habituation and sensitization in the material (although of course the author never mentions those concepts directly). The students were then asked to come up with additional techniques based on learning mechanisms that could be helpful for maintaining long-term relationships. Additionally, the students were asked to consider how their textbook authors directly applied the textbook concepts in the formation of their textbook, such as how numerous subsections in chapters make use of the primacy and recency effect, or how the applications discussed above utilize depth of processing. In fact, Rebecca occasionally uses a short answer question on exams asking about one way the authors directly applied a textbook concept in the formation of the textbook. Therefore, while the students were responsible for coming up with the idea and application for the sixth-grade lesson, they had seen this technique modeled numerous times throughout the course.

Alternate versions of this course design. As long as the lessons focus on empirically supported study techniques, this course design could be utilized with any student audience in mind. A similar presentation might be useful for incoming undergraduate students, particularly at institutions where many incoming students are the first generation to attend college (for suggestions on supporting first-generation college students, see Kreniske & Todorova, this volume). It is also notable that this course design can be used for courses other than those based within cognitive psychology. While textbook content based on learning directly and easily applies to all students, many other undergraduate classes could yield a helpful and interesting short lesson for other students. A course on health psychology or abnormal psychology could inspire a short lesson on ways to cope with anxiety or how to maintain a healthy lifestyle.

Design 3: Students as Mentors Teaching Research Design.

In the fall and spring semesters of 2014, students from Rebecca's class had an additional extra credit opportunity relating to East Side Community High School. They were able to serve as presenters or mentors for eleventh grade students. The eleventh graders were conducting performance based assessment tasks (PBATs) in their science classes. The PBATs represent an alternative to high-stakes testing that is utilized by a coalition of high schools across New York State. The methodology includes active, individualized learning and has been found to meet or exceed the standards required by the New York State Regents exam. In science classes at East Side Community High School, this includes conducting an original research project.

The undergraduate presenters worked in pairs, and created PowerPoint slides and worksheets that focused on research-related topics. The topics were decided upon by the eleventh-grade teacher in collaboration with Rebecca based on what would be most helpful for both sets of students. In Fall 2014, one undergraduate pair created a short lesson on general research methodology options and terminology, and the second pair provided a detailed explanation of operationalization of variables. The

timing of the presentations was based on the eleventh-grade students' schedule. Before presenting to the high school students, the presenters revised their slides based on recommendations from the professor and eleventh-grade teacher, and practiced their presentations in front of other undergraduate students who had signed up to mentor the eleventh-grade students. The mentors attended a training session with the eleventh-grade teacher, and then went to the high school 4-5 times, for an hour each time. They rotated among the eleventh-grade groups working on research projects, heard about each project and the students' progress, and answered questions about the scientific method.

Reviews of Course Design 3. Once again, only self-selected students were able to participate in this option, making it difficult to evaluate the impact of their experience. However, the undergraduate students did indicate in their survey that the experience was positive. Notably, this option is less time-intensive for the professor, but does put pressure on the undergraduate students. They need to have a firm grasp of research methodology to be helpful for the younger students. Particularly, regarding the mentors, it was somewhat more difficult to evaluate the success of the mentorship, since the substance of what occurred was verbal and not always observed by the instructor, as many groups and mentors were working at once. Still, for capable undergraduate students, this is wonderful way to build self-efficacy, particularly when the undergraduate student is not engaging in an applied class setting themselves. While a knowledgeable mentor is helpful for the mentees, research has supported numerous benefits for mentors including professional satisfaction, performance and organizational commitment (Ghosh & Reio, 2013). While researchers have primarily focused on faculty mentors, the role will likely provide similar benefits for student mentors (for more on peer-mentoring, see Gillespie-Lynch et al., this volume).

Alternate versions of Course Design 3. Of the three course designs discussed in this chapter, this option is most reliant on the collaborating institution. However, a similar presentation and/or mentorship model might be useful for undergraduate students conducting their first research project. At many colleges, undergraduate students complete research projects during a research methodology course. In this case, the mentors would be advanced undergraduate students, who could present short lessons and/or mentor the less advanced undergraduate students. Potentially, the undergraduate mentors could act as teaching assistants in a research methodology course.

How to Find Collaborators

We would like to encourage new professors to reach out and collaborate with other institutions whenever possible. Most readers can already attest to the responsibility and power of teaching as a learning tool. Although empirical literature is limited, researchers have found that students who taught material outperformed those who simply studied it (Fiorella & Mayer, 2015). The impact of teaching as a strategy to promote deeper understanding is likely to be particularly true when teaching younger students. Generating explanations for the 6th graders required that the undergraduates fully understand the concepts themselves, and helped to enhance learning by forcing the undergraduate teachers to confront and address their own potential lack of clarity. Such collaborations, furthermore, are mutually beneficial.

Primary and secondary education has experienced a widespread shift toward student-centered, constructivist, experiential approaches, and toward learning experiences that allow for the application of content in authentic, real-world contexts (McLeod, 2013). Educators who value these approaches, however, are often constrained by limited resources, limited support, and limited expertise. As a result,

such educators are likely to be receptive to – and, moreover, to enthusiastically embrace – any meaningful opportunity to collaborate with institutions of higher learning. These collaborations are likely to be viewed by school teachers and administrators as opportunities to reinforce course content, to increase student engagement, and to allow students to grasp the real-world significance of their learning and apply this learning authentically. Given the college-bound emphasis of many primary and secondary school missions, such collaborations are also likely to be valued for the window they offer into college life, providing the opportunity for younger students to engage with college students in both academic and personal capacities, to gain access to, familiarity with, and confidence around college-level learning, and potentially to visit a college campus and participate in an undergraduate class. Students for whom college may be an abstract, intimidating, distant concept can thus benefit greatly from the interactions that spring from such collaborations.

Though the demand for collaboration with institutions of higher learning undeniably exists, making these connections with primary and secondary school educators may seem like a daunting task. How might these connections be established? One must have a sense of both where to look for collaborators, as well as how these potential collaborators should be approached. As a first step, one might tap into one's current network. Inquire amongst friends and colleagues about connections to local schoolteachers and administrators. Personal connections are helpful in identifying the types of schools and teachers most likely to value collaboration, and most likely to be interested in investing the time and resources that such collaboration demands. Absent such personal connections, one might seek out local organizations that attract driven, growth-minded, philosophically-aligned schools and teachers as members. For example, in New York City, college instructors might reach out to any of the 28 public schools that comprise the New York Performance Standards Consortium (listed on performanceassessment.org), all of which utilize performance-based tasks, rather than standardized testing, as their primary form of assessment. Curriculums at these schools tend to be more flexible, and their faculties particularly committed to experiential, outside-the-box teaching methods. Beyond this consortium, many other high schools have begun to incorporate research projects into their curriculums. In particular, Rebecca has been contacted by high school students requesting a mentor for research projects from Stuyvesant High School, Bronx High School of Science, and Saint Francis Preparatory School.

Organizations like the National Science Teachers Association (nsta.org) and Math for America (mathforamaerica.org) are potentially useful resources as well. Both are national organizations whose teacher members are self-selecting; in these organizations one might find a high concentration of teachers who value professional development, flexibility in instruction, hands-on teaching methods, and professional collaboration. Furthermore, their organizational missions emphasize collaboration, research, and professional growth. Leaders of each organization, and other similar organizations, may be contacted through their respective websites. Proposals for collaboration might then be disseminated through organization message boards and vast teacher networks.

In proposing collaborations, professors must be sure to be mindful of the various scheduling, time, administrative, and curricular constraints confronted by school teachers. The most successful collaborations involve advance planning, a nuanced understanding of each instructor's teaching environment and school population, open and frequent communication between instructors, and regular cycles of feedback. It is helpful to define roles and responsibilities, as well as shared goals and expectations, from the outset. For example, to what extent will the schoolteacher assess and provide

feedback to undergraduate presenters and mentors? How will this feedback be communicated? How much class time is each instructor willing to devote to the collaboration? How flexible is each instructor's curriculum? What will the timeline look like? First-time collaborators might choose to begin with less involved collaborations to allow time to become familiar with one another's teaching styles and curriculums, before moving on to more elaborate collaborations. The authors, for example, began with the 'Students as Teachers' model (Design 2), before moving on to the much more involved and reciprocal 'Students as Researchers' model (Design 1).

Conclusions

Hoyle and Deschaine (2016) discussed collegiate business internships from the point of view of three stakeholders: the university, the student and the employer. We conclude with a similar format, and discuss the impact the course designs described above can have on the college, students, and collaborating schools. Faculty and administrators at the college level are currently experiencing an active push to include experiential learning in their course curriculums (Skelding, 2015), which is largely empirically supported. However, this provides additional requirements for faculty who may already feel overloaded. A collaborating institution can relieve some of the pressure while potentially improving student outcomes. The preponderance of research supports the impact of experiential learning for students (e.g., Kuh, 2008), which is applicable for students at all levels of education. Undergraduate students can benefit from the mentorship role, and the learning inherent in the process of teaching (Fiorella & Mayer, 2015). The younger students can benefit from the information provided by their mentors, but also indirectly through growing familiarity with students obtaining advanced degrees. Given that the collaboration is likely to be perceived positively by the collaborating institutions' administration, the creation of a mutually beneficial curriculum that incorporates experiential learning in likely to benefit each of the stakeholders.

References

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal behavior, 11*, 671-684. doi:10.1016/S0022-5371(72)80001-X

Fiorella, L. & Mayer, R. E. (2015). Learning by teaching. In L. Fiorella & R. E. Mayer. *Learning as a generative activity: Eight learning strategies that promote understanding* (pp. 151-166). New York, NY: Cambridge University Press.

Ghosh, R., & Reio, T. G. (2013). Career benefits associated with mentoring for mentors: A meta-analysis. *Journal of Vocational Behavior, 83*, 106-116. doi:10.1016/j.jvb.2013.03.011

Gluck, M. A., Mercado, E., & Myers, C. E. (2016). *Learning and memory: From brain to behavior* (3rd ed.). New York, NY: Worth Publishers.

Hoyle, J., & Deschaine, M. E. (2016). An interdisciplinary exploration of collegiate internships: Requirements for undergraduate and graduate programs. *Education + Training, 58*, 372-389. doi:10.1108/ET-10-2015-0098

Kolb, D. A. (1984) *Experiential Learning*. Englewood Cliffs, NJ: Prentice Hall. Retrieved from http://academic.regis.edu/ed205/kolb.pdf

Kolb, D. A., Boyatzis, R. E., & Mainemelis, C. (2000). Experiential learning theory: Previous research and new directions. In R. J. Sternberg & L. F. Zhang (Eds.), *Perspectives on cognitive, learning and thinking styles* (pp. 227-248). NJ: Lawrence Erlbaum.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.

Linn, M. C., Palmer, E., Barabger, A., Gerard, E., & Stone, E. (2015, February 6). Undergraduate research experiences: Impacts and opportunities. *Science, 347*, 628-633. doi:10.1126/science.1261757.

McLeod, P. L. (2013). Experiential learning in an undergraduate course in group communication and decision making. *Small Group Research, 44*, 360-380. doi:10.1177/1046496413488217

Miller, C. C. (2005, February 7). How elementary school teachers biases can discourage girls from math and science. *New York Times, A13*. http://www.nytimes.com/2015/02/07/upshot/how-elementary-school-teachers-biases-can-discourage-girls-from-math-and-science.html

Mitchell, M., Leachman, M., & Masterson, K. (2016, August 15). Funding down, tuition up: State cuts to higher education threaten quality and affordability at public colleges. *Center on Budget and Policy Priorities.* Retrieved from http://www.cbpp.org/research/state-budget-and-tax/funding-down-tuition-up

Morling, B. (2014). Guide your students to become better research consumers. Observer, 27, Retrieved from: http://www.psychologicalscience.org/observer/teach-your-students-to-be-better-consumers#.WGp7bVyrL20

Skelding, C. (May 5, 2015). CUNY plans for 'experiential learning' requirement. PoliticoNewYork. Retrieved from http://www.politico.com/states/new-york/city-hall/story/2015/05/cuny-plans-for-experiential-learning-requirement-021877

Twigg, C. A. (2003). Improving quality and reducing cost: Designs for effective learning. Change, 35(4), 23-29. Retrieved from: https://www.learntechlib.org/p/97328

Weible, R. (2010). Are universities reaping the available benefits internship programs offer? Journal of Education for Business, 85, 59-63. doi:10.1080/08832320903252397

Chapter 28: Fostering Effective Teaching Using Strategies Developed by Peer Mentors for Autistic and Non-Autistic Undergraduates

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Abstract

Peer mentors of autistic college students can help instructors develop strategies to effectively teach autistic and non-autistic students. In this chapter, peer mentors in a mentorship program for autistic college students and those with other disabilities share strategies that they developed to educate their mentees. Key recommendations emerging from the mentors' accounts include: 1) demonstrating respect for the uniqueness of each student, 2) adapting instruction to student needs, 3) providing multiple ways for students to learn and demonstrate competence, 4) helping students to synthesize past information and plan ahead, and 5) encouraging students to actively co-construct their learning experiences. By listening to students who mentor their peers, instructors can more effectively engage the increasingly diverse population of students who are enrolling in college.

Introduction

In order to develop effective teaching methods, we must learn from our students. Peer mentors of autistic college students are an invaluable source of information about effective teaching strategies because they bridge the roles of student and teacher in order to guide peers who may appear quite different from them. Through the process of forging mutually respectful relationships with autistic peers, mentors often develop deep insights about the process of education that instructors can use to help them develop teaching strategies that are consistent with the principles of Universal Design—designed to effectively reach a broad range of diverse students by engaging learners with different strengths and weaknesses through inclusive learning opportunities (McGuire & Scott, 2006).

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Artwork credit: David Shane Smith.

In this chapter, peer mentors in a mentorship program for autistic college students and students with other disabilities at the College of Staten Island (CSI), Project REACH (Resources and Education on Autism as CUNY's Hallmark), share strategies they developed to educate their mentees. The authors (the program director, coordinator, and mentors) derive themes from the mentors' insights that instructors can use to effectively reach the increasingly diverse population of students who are enrolling in college.

Why Should Instructors Listen to Peer Mentors of Autistic Students?

It is essential that instructors develop strategies to effectively teach autistic students because the number of autistic students who are enrolling in college is increasing (Van Bergeijk, Klin, & Volkmar, 2008). Autistic students exhibit highly diverse learning styles (Grandin, 2011). Thus, flexible supports that are designed according to the principles of Universal Design may be needed to help them succeed in college. Beyond the obvious benefits for educators of developing the skills needed to educate autistic students, each and every mind is unique (Walker, 2012), so teaching methods designed to reach autistic students are also likely to help other students (Bublitz, Wong, Donachie, Brooks, & Gillespie-Lynch, 2015).

Autism is associated with strengths that can help autistic students succeed in college, including intense interests, attention to details and patterns, memory skills, and sincerity (Gobbo & Shmulsky, 2014; Van Hees, Moyson, & Roeyers, 2015). However, autistic students often face challenges adapting to college due to difficulties interacting, self-regulating, and engaging in self-advocacy, mental health issues, and stigma (Cai & Richdale, 2016; Gillespie-Lynch et al., 2015). Despite these challenges, there are almost no evidence-based supports to help autistic college students (Barnhill, 2014). In fact, autistic people often *lose* supports that they previously received when they enter college. The few specialized programs for autistic college students that do exist typically include peer mentors. Opportunities to develop trusting relationships with peers may be helpful for autistic students as difficulty relating to others contributes to many of the challenges they face (Van Hees et al., 2015). Therefore, we developed a peer mentorship program at CSI as part of Project REACH, a CUNY-wide initiative designed to support autistic college students: http://www.cuny.edu/about/administration/offices/sa/services/disabilities/ASDandProjectREACH.html.

Project REACH Mentorship Program

CSI's branch of Project REACH is a collaboration between the Department of Psychology and the Center for Student Accessibility. Students with disabilities are invited to participate in weekly hour-long mentor-led group meetings with a standardized curriculum and/or weekly hour-long individualized, one-on-one meetings with a mentor. Twenty to thirty mentees enroll in the program each semester, with approximately two-thirds of whom are autistic. The group curriculum, which focuses primarily on self-advocacy, social-communication, and academic skills, is developed in response to student feedback and reflects the principles of Universal Design by providing multiple means of representation (e.g., multiple modalities), action and expression (e.g., options for physical action, communication, and executive functioning), and engagement (options for recruiting interest, sustaining effort, and self-regulation; National Center on Universal Design for Learning at CAST, 2014). Currently, a doctoral-level program coordinator leads group meetings assisted by an undergraduate peer mentor (the "games master") who develops games to help students interact. Examples of group curriculum are available on ResearchGate (https://www.researchgate.net/publication/294261324_Building_Bridges_for_Autistic_College_Students_Project_REACH_Summer_Transition_Program_Manual; Gillespie-Lynch et al., 2015).

All mentors complete an online autism training (Gillespie-Lynch et al., 2015) and an hour-long, in-person training designed to help them encourage their mentees to develop clear goals, monitor their progress towards goals, and seek out resources. Mentors are provided with a script for their initial one-on-one meeting, but are also encouraged to individualize sessions through discussions, role-plays, goal setting activities, guided academic work, and by exploring campus together. One-on-one mentors send a weekly log describing each mentorship session to the program coordinator/director to receive ongoing feedback.

Mentees are encouraged to become mentors and are then provided with scaffolding to facilitate this transition. Scaffolding can include opportunities to act as an assistant mentor in group meetings and a "triangulation approach" wherein a transitioning mentee is paired with an experienced mentor who sits in on his/her one-on-one meetings with his/her mentee and provides constructive feedback after each meeting. Participation in Project REACH has been associated with decreased autism symptoms and anxiety and increased academic self-efficacy, self-advocacy skills, and autism knowledge (Bublitz et al., 2015).

Mentors' Insights

One-on-One Mentorship

Vincent Wong joined Project REACH as a mentor at its inception, examined how mentorship impacts mentors and mentees for his honors thesis, and is currently a medical student. Actively listening and relating is essential for becoming a good mentor. Actively listening allows the mentee to feel valued and creates an opportunity for the mentor to be accepted by the mentee as a peer, rather than acting as a lecturer seeking only to command. It is important to adapt to different mentees. For example, if a mentor uses humor well, the mentee may view the mentor as competent, which will draw the mentee and the mentor closer. However, humor, even if used appropriately, can create divisions between the mentor and the mentee if the mentee is not receptive to the mentor's humor.

Mentees are not the only ones who benefit from Project REACH; mentors are able to develop their leadership, academic, time management, and interpersonal skills. I learned how to be more fluid in my thinking. Some jokes worked well with some mentees and were terrible with others. When developing a program like Project REACH, teamwork is of utmost importance. Having team members invested in the well-being of others creates an enduring bond. Structured curriculum and opportunities for mentors to receive consistent training and feedback are also essential.

Ben Cheriyan joined Project REACH at its inception as a mentee. Vincent was one of his mentors. Ben became a mentor and did his honors thesis on mentorship and test anxiety. A key component that makes the mentorship partnership successful is establishing commitment between the mentor and mentee by showing responsibility, respectfulness, and reliability (Jones & Goble, 2012). This includes understanding one's responsibilities, respecting the mentor/mentee's time, and communicating effectively. When mentors and mentees communicate effectively, the bond between them grows as the mentor and mentee depend on each other to learn.

Mentoring partners should take time to socialize and enjoy each other's company by participating in extracurricular events and meeting in sociable areas on campus, such as the library, to make mentorship feel more free and easy. If the mentor focuses solely on academic needs, the mentee will lose interest in the relationship. Role-playing is a fun way to teach social skills. For example, a mentee may be struggling

with asking a professor about testing accommodations. The mentor can pretend to be the professor so the mentee can practice self-advocating before reversing roles so the mentee can experience the professor's perspective.

The most difficult aspect of being a mentor is adapting to the different personalities of each mentee. It took a while for me to realize that each mentee is different; what worked for one student might not work for another. Adapting my approach to mentorship to fit each unique personality has helped me improve my people skills. Being a mentor has also forced me to express myself; now I am more confident doing this outside of mentorship.

Miranda Alicea joined Project REACH at its inception as a mentee. Ben was one of her mentors. She became a mentor, graduated, and is now a mentor for autistic youth. When I was a mentee, Project REACH was in its first couple of years. I realized that not only was I learning to become a self-advocate, I was my own self-advocate all along but did not know it. I was the one who took it upon myself to gain the opportunity to have my own mentor to guide me and support me with my schoolwork. I even started to become more social and step out of my comfort zone. What I also gained from becoming a mentee, before I became a mentor, was learning to listen to advice because your mentors want you to be confident.

During the spring semester of my senior year, I decided that I was ready to be a mentor. One of my peers (Ben) helped me transition into being a mentor. One of the most important things that I learned as a mentor was patience and understanding; I realized that I was guiding someone else for the first time and I wanted to know how to help them. It is not by being a dictator and doing things your way all the time. The person who you are helping is telling you what they want to know how to do. They depend on you for guidance. What you really need to do to set a positive example is practice patience. There might be times where your student might be stressed; you have to stay calm and talk to them without being demanding. If the student wants to do something a certain way, you can either give them an option or encourage them to see how important it is to let someone help. Weekly mentor logs, or reports, that I would create after each meeting with my mentee, helped me mentor by giving me a routine to follow and making me stay on top of my priorities. I always received feedback on what I did right and what I could do differently with my mentee.

What I would recommend to other schools that want to host a mentoring program, is to prioritize helping the students and advocating for them, but also to listen to them and let them provide you with feedback. Staff members should work together as a team, stay focused on what is important, communicate effectively, and reach out to others for support. But no matter what, always focus on the students and the importance of developing self-advocacy within themselves.

Enes Kilman joined Project REACH at its inception as a mentee. She is currently mentoring a freshman with support from another mentor. When I entered Project REACH, I was not sure what to expect or whether I was going to like it enough to stay with it and eventually become the mentor I am today. As a mentee, I was mentored on a one-to-one basis. I believe that being mentored helped me gradually overcome certain issues and become a better student and person overall.

During my first semester transitioning into becoming a mentor, I completed weekly checklists, evaluating whether key curriculum points were conveyed during group meetings and provided my thoughts about what did and did not work that week. During my third semester transitioning, I worked

with a freshman on a one-to-one basis using the "triangulation approach." My mentee had asked to be paired with someone like me who had experienced the challenge she was facing of learning to function more independently in college after relying on a paraprofessional in the past. I practiced actively listening to my mentee and giving her clear feedback on her progress. After each meeting, I wrote mentor logs in which I outlined my mentee's perspective on her concerns and strategies we came up with to assist her in transitioning to the college world, such as reaching out to her professors with questions. Learning about self-advocacy and then sharing this information with a younger student was very important to me in relation to my own history of being advocated for. I was able to practice and model essential self-advocacy skills (e.g., communication and leadership) as a mentor.

Corinna Kostikas wrote her honors thesis about the Project REACH Summer Transition Programs. As a mentor for three different mentees, I learned a lot about the process of mentoring. When I first began, I thought a general agreement on goals would be enough to start a change, but I became aware that getting my mentee to agree on goals was not always enough. Mentees would say that they knew what they needed to do, but would return with no signs of progress the following week. Making specific goals for every meeting proved to be more successful. Eventually, I made a point of having my mentee write out the goals for the week as we made them; I kept a copy of this list.

Although I initially saw casual conversations as a waste of the limited time we had, I eventually saw the less obvious benefits of chatting. Oftentimes mentees may have problems that they do not think to mention when asked, but they may bring them up in casual conversation. I was forming a relationship with my mentees; like with any friend a person makes, my mentees would walk into the room with a smile on their faces as if they were happy to see me after a whole week. Soon they began starting conversations by volunteering information about events, feelings they were dealing with, or something cool that they learned. Meetings became more productive and enjoyable. When I ran into my mentees in the middle of the week, one of the first things they would share with me was something they did to get closer to the goals we set.

In the beginning, I felt as though I was being annoying and babying my mentee by always sending reminders about our meetings and asking about progress. I eventually learned that whether it came off as annoying or not, it was what many of my mentees needed. With repetition, what I said did a better job of sticking. I learned that each mentee is different. Some mentees responded better to my checking in on them, while others saw check-ins as added pressure. Some mentees did not want to volunteer information, while others loved sharing so much that they needed to be told when it was time to focus on the less fun topic of working on goals. Some mentees needed to write plans of what exactly to do each day of the week in order to reach their goal, while others just needed to know what should be accomplished.

The lesson that took me the longest to learn, and was possibly the most important, was that the only problems that matter are the ones the student sees as problems. While it might seem to you that your mentee could use some help making friends, your mentee may be more than happy with how they come off to others and the number of friends they do or do not have. As a mentor, you have agreed to focus on the mentee's concerns. You are not molding them into the person you think they would benefit from being, but instead helping them to become the person they themselves want to be.

Sabrina Bragerton-Nasert helped her mentee reach his dream of starting a Disney Club and wrote her honors thesis about the Broader Autism Phenotype. Being a mentor in Project REACH was not a small task. As in any case when you wish to become a part of someone's life, especially an influential one, you must try to create a bond with the individual. Why would a person care what you have to suggest if they do not like you first? Every individual is different, especially those on the spectrum. They respond better to some things than others. My mentee had a special interest that he tried to bring up as often as possible. I bonded with him over his love for Disney.

My first couple of meetings with him I tried to get to know him better. I began sessions recapping how his week went. After asking a question related to his interests, I shadowed one of his stories with a related story of mine. I then moved into his goals for the session, what he needed help with and how I could help. He responded well when I gave him examples from my own experience. We both had strengths and weaknesses when it came to succeeding in college; I shared my strategies for preparing for tests and not letting stress get in the way of achieving goals. I always ended the session with what we were both planning to do in the coming week. These chats increased his conversational skills, which he struggled with. My mentee loved schedules so I kept this routine every time we met. Towards the end of my mentorship with him, he picked up on some of these social cues on his own which was a big step for him since he was used to being rigid and getting to the point of things.

One goal that remains difficult for my mentee is making and maintaining friendships. This, in particular, was aided by me and Project REACH group sessions. During his Disney Club meetings, I gave small verbal cues about how to address those who showed up since sometimes he would jump right into presenting his PowerPoint. I encouraged him to ask how everyone was doing and maybe play a game instead of presenting a PowerPoint, which helped increase his social skills. Project REACH group sessions included role-plays about small talk/joining groups, which helped him understand the dynamics of conversation. Role-playing was beneficial because he was able to actively observe and practice reciprocal interactions with people.

I thoroughly enjoyed being a peer-mentor. It gave me great insight into how to form trusting relationships. Even though I am not currently a mentor, I still meet up with my old mentee and we hang out because we became good friends. If I had never tried to be his friend before trying to be his mentor, we would have never accomplished his big goals together such as starting the Disney Club, passing an assessment test, making new friends, and gaining a 3.5 GPA. Mentorship taught me that I had value to share and could forge a beautiful relationship with someone I had never met before. Our minds may work differently, but our hearts still beat the same. As corny as that sounds, it is true because we both had the same fears of failure, ideas of success, and anxiety about our future.

Rayan Arab and her mentee are helping develop a video game (the focus of her honors thesis) to teach autistic people collaboration skills. Throughout my three semesters mentoring, I have had the opportunity to create a co-working environment in which I can teach as a mentor and also learn from my mentee. I have developed many tactics including the Past Present Future (PPF) Model wherein mentees and mentors discuss past, present and future dynamics (see Figure 1).

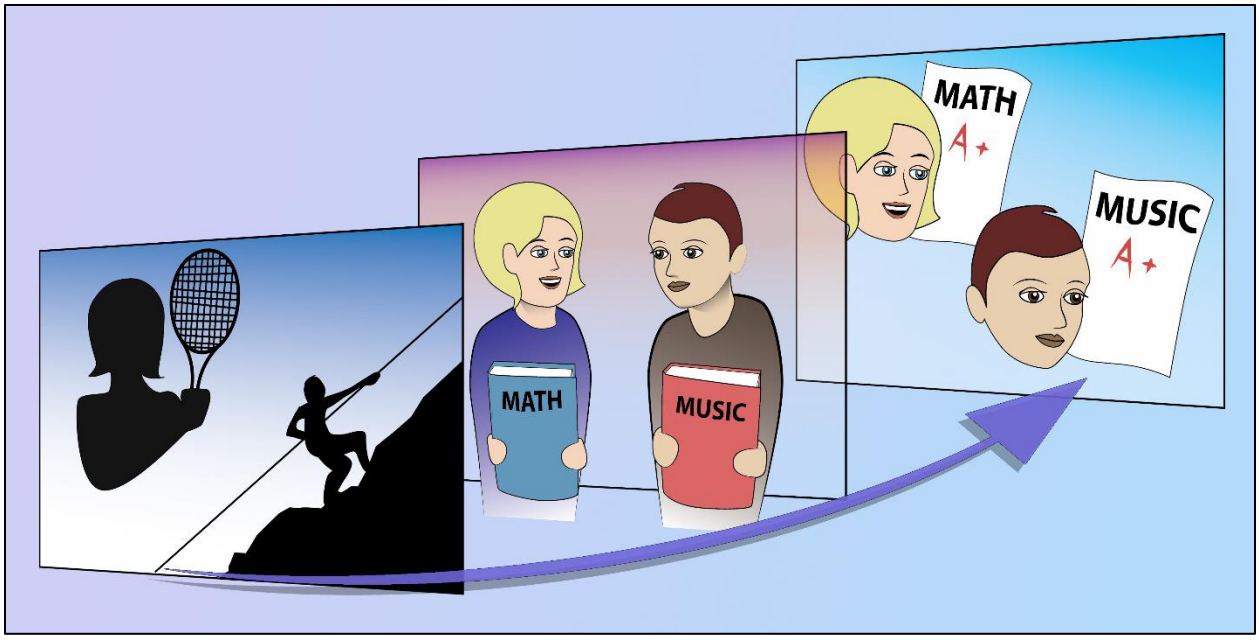

Figure 1. The Past Present Future model.

When mentees and mentors share their experiences in the past week (the past aspect of the model), both parties gain insights about what has happened up until their meeting that contributes to a calmer interpersonal environment. Exchanging present emotions, needs and wants (the present aspect of the model), creates understanding of both individuals' states of mind and allows for better communication by allowing the mentee and mentor to cross a bridge from the past to the future together, while making each party aware of how the other will be throughout the meeting. Lastly, sharing goals for the coming week (the future aspect of the model) increases the probability of achieving goals. When you take time to set goals for the coming days, you set standards that are easier to meet since they are organized with a clear sense of direction.

Another cooperative strategy that we have developed is consistent routines; each week, I help my mentee rehearse strategies that we learned in the past, including highlighting unknown words and important facts, brainstorming by creating webs, and reviewing context clues. I also assign homework to help my mentee practice using the skills we practice together (e.g., highlighting) independently. This encourages him to develop persistence.

I have learned a lot from my experience as a mentor. I have learned that some strategies work for most individuals, but not all. Some mentors or mentees may not be able to confide in one another or may have difficulties recognizing their emotions or preparing for the future. This would result in them not being able to communicate the past, present, or future. As a twenty-year-old college student in NYC, there are a lot of things you come across through the same lenses as everyone else. However, through mentoring, I have viewed experiences through a different lens. I have learned how the same picture can truly hold different values to someone else and how certain challenges can be complex to some, but not to others. I have strengthened my communication skills while helping to improve my mentee's skills.

Ariana Riccio, a doctoral student, is the first Project REACH mentor to provide one-on-one mentorship to a student at Hunter College. My mentee has unique strengths and challenges relative to many of the students in Project REACH. In the first few weeks of mentorship, I tried adapting existing curriculum from the Project REACH group meetings for our one-on-one meetings. He did not seem engaged by this. Indeed, the Project REACH curriculum focuses primarily on basic social, self-advocacy, and academic skills and my mentee seems to be able to handle these aspects of college well. He can effectively write emails to his advisor and converse with professors about his diagnosis, but it takes many reminders before he does so. He struggles with taking initiative and scheduling is incredibly difficult for him. Throughout our first semester working together, we used two different digital calendars, the web-based Google Calendar, and the iPhone-based Tiny Calendar. We started using e-mail "check-ins" mid-week, which prompt him to check his email and school accounts and report back to me. Making scheduling more habitual is an ongoing goal of our mentorship.

At the beginning of the semester, I set social integration as a mentorship goal because his only goal was to succeed academically. However, he seemed reluctant to get involved with activities at Hunter College or to speak to other students. I noticed increasing irritation whenever I suggested he join a club so I tabled that goal for now. Instead, I now use casual and open discussions at the beginning of each session so that he feels comfortable and social. After this, we go over the results he has gotten back in the past week. I make a point to celebrate his successes. Finally, we make a plan for the upcoming week and focus on developing a skill, such as note taking strategies to make his reading more purposeful.

He is currently taking only two classes, both of which are about topics that he is intensely interested in. This adjusted course load was a smart decision; he is able to manage both classes easily. I will encourage him to register for at least one course he is passionate about each term. Working with my mentee has been an exercise in flexibility and problem solving. I am still refining strategies that I think have contributed to his academic success so far. I hope to develop our mentorship further to help him reach his full social and academic potential.

Danielle DeNigris helped develop and run a summer transition program and has been the doctoral level program coordinator of Project REACH for three semesters. Autistic and non-autistic students alike often struggle with writing. During one-on-one mentorship, I scaffold my mentee's writing by giving him feedback on drafts and by encouraging him to develop confidence in his writing skills. As a freshman, he was taking a required English composition course and found it challenging to incorporate personal thoughts, opinions, and emotions into his writing. Oftentimes, he believed that he would be unable to meet page requirements and expressed a genuine dread of writing that caused significant stress. Each meeting, I reminded him that most college students feel overwhelmed about writing papers, especially in classes where papers are less fact-based. Reminders that his feelings are shared with many and that he is quite capable of learning effective writing strategies have been key to his continued success.

Initially, I asked him to consider the paper topic and instructions and create a thesis statement. Then, based on the requirements and his thesis, we worked on creating an outline. However, he struggled with creating an outline almost as much as writing a draft. This was unexpected, as outlining is typically a first step suggested by writing professionals. I modified my approach by looking for a tool that would serve a similar purpose without the stress that outlining caused. This took some time, but eventually we found a solution thanks to a rubric provided by his instructor. Rather than providing the paper requirements in statement form, the professor listed questions to answer within the essay. I asked my

mentee each of the questions and he wrote down his responses. His responses varied in detail; I asked for elaborations where needed and provided my own interpretations when appropriate. Once he had a full set of responses, we set out to organize them into an "outline." Since this strategy was successful, for future assignments I helped my mentee turn requirements into questions that he could answer.

The next step was for him to turn an outline into a rough draft on his own. Initially, he brought a draft that consisted of completed body paragraphs (lacking transitions) and no introduction or conclusion. We worked together on connecting paragraphs. I provided tips such as turning his thesis statement into an introduction through elaboration and writing a tentative conclusion that could be changed after writing the rest of the paper. We consulted online resources like the Purdue University Online Writing Lab (OWL; https://owl.english.purdue.edu/owl/) and the Writing Center at UNC-Chapel Hill (http://writingcenter.unc.edu) websites.

Eventually he was able to bring in completed drafts that we edited together. To help develop his editing abilities, I used the "two-thirds method," wherein I provide feedback on two-thirds of the paper to allow him to receive feedback while practicing editing one-third of the paper independently. By the end of the semester, my mentee came to our meetings not only with a full draft, but having already made edits for us to explore together. He appears to be more confident in his writing and has needed my support less and less throughout the semester; he is internalizing the skills that we have been developing together.

Kristyn DiCostanzo is a student in CSI's Advanced ASD Certificate Program and mentor. My mentee is Deaf. However, many of the challenges she faces are strikingly similar to the challenges that her autistic peers face. For example, she exhibits pronounced difficulties using language precisely and identifying what writing prompts are asking for, as well as challenges understanding others' perspectives, honing in on the main points in lectures, and planning. Similarities in the challenges that people with different disabilities face provides support for a key premise of Universal Design, that services developed for one population (e.g., autistic people) will likely be helpful for other people too (e.g., Deaf people; McGuire & Scott, 2006).

One day I noticed that the things she was saying about her writing were much clearer than her actual writing. I pointed to words that were disrupting the flow of her writing and asked her why she had used them. She stated that she wanted to use "fancy" words for papers and had consulted a thesaurus to replace the simple words she knew with "fancy" words, which were supposed to be their synonyms but which she did not know. She displays tremendous strengths as a visual learner that guided me when developing strategies to help her write more clearly, such as distinguishing between the connotations and literal meanings of words, using a whiteboard to map out synonyms of words and their definitions (which allows students to see firsthand how words may be synonyms, but have subtly different meanings), and cross-checking (or using the dictionary to make sure that the definition of words one finds in the thesaurus match the simpler words one originally used). I also encourage her to self-advocate within and outside of the classroom.

Katie Fitzgerald wrote her honors thesis about interview skills among autistic college students and is currently a graduate student. One of my mentees (the aforementioned Deaf student) would forget deadlines or wait until the last minute to complete assignments. When the semester began, we wrote down goals to achieve by the end of the semester and developed strategies to reach them. We used her syllabus to schedule important deadlines. Throughout the term, we practiced writing down deadlines

and tasks as soon as they were received. I also helped her seek out tutoring and we wrote down concepts she did not understand on one side of a flashcard with a visual depiction on the other side.

Understanding your mentee's interests and long-term goals is essential. However, not every student has long-term goals. Sometimes students need guidance in order to develop goals. Goals that are related to employment should be discussed thoroughly to develop a well-structured course of action. My mentee wants to become an educator but was not sure how to achieve this. I showed her employment opportunities I had found and how I found them and encouraged her to find other opportunities to discuss at subsequent meetings. It is important to show mentees the steps you took to discover information and allow them to search on their own to encourage them to take initiative in developing career plans.

Group Mentorship

Anthony Massa has been "games master" since the summer of 2015. His honors thesis focuses on potential anti-stigma benefits of a play that he is writing and directing with autistic actors. Originally, I started using the introductory games portion of Project REACH group meetings like a college orientation, focusing on games that I learned through Outward Bound (Hattie, Marsh, Neill, & Richards, 1997). I assumed that icebreakers would help students get acquainted with one another and begin to form lasting friendships. However, most icebreakers became dominated by students who were very enthusiastic about expressing their ideas. Although I very much appreciated these students' contributions, my goal was to get everyone involved. I hoped that if I continued to use these icebreakers, students who were shy would see them as an integral part of Project REACH's meetings and begin to take part in the games. Unfortunately, I continued to struggle to reach some of the shyer students. Games that effectively got everyone up and moving included "Where the Wind Blows" (http://www.greatgroupgames.com/where-the-wind-blows.htm), a "get to know you" game where people try to discover if other people share their interests, and "Heads Up" (https://itunes.apple.com/us/app/heads-up!/id623592465?mt=8), a game that gets everyone focused on accomplishing a task quickly. I think these icebreakers worked well because they are competitive in nature; Where the Wind Blows requires students to run to their spot before they are left standing in the center of circle and Heads Up requires the team to finish guessing their team's cards before the other team completes the task.

To better include students who chose not to participate in games initially, I began using activities that I learned within my Theater and Therapy Course with Professor George Sanchez, which featured *Playing Boal: Theatre, Therapy, Activism* (Schutzman & Cohen-Cruz, 1994) and games from *Games for Actors and Non-Actors*, by Augusto Boal (2002). I used "The Great Game of Power" and "The Object Transformed," wherein you display everyday objects, like a chair, book, etc., and ask students to associate them with a personal image of power. They are then asked to use their imagination to either change the object (Transformation of Objects) or rearrange the objects to represent their personal definition of power (The Great Game of Power). When we share interpretations, we discover that others interpret the structure differently according to their own personal way of thinking. These games, since they are played in a judgment-free playing space, allow students who are shyer to express and engage with different perspectives.

As games master, I have developed my ability to actively listen and adapt, being aware of each student's limits and trying not to overstep them. Students differ in their ability to engage with games through

movement, interpretation, and communication. A facilitator should understand what each student brings into the classroom and will need to choose when to leave those extra things at the door or when to address them within the games. Being able to adapt is key because students may be warming up at one moment and then decide they would rather not participate, which is fine. It just takes a bit of maneuvering when the game needs to be shifted to meet their personal needs, as well as the group's overall needs. Before working on these skills as games master, I never had the opportunity to work with so many intelligent and charismatic students who are willing to address disability in such insightful ways. My previous exposure to autism was mainly through classes and friends who had autistic relatives. The opening of my worldview through Project REACH has helped me build on the students' positivity while developing my own self-awareness.

In addition to acting as a one-on-one mentor, Vincent Wong ran group meetings with another undergraduate peer mentor. He emphasized the importance of executive functioning skills for effective group leadership. As a group leader, knowing what to prioritize is critical for finishing every meeting on time while maintaining its core messages. Understanding how to coax collaboration/discussions is essential; discussions enable mentors and mentees to digest the lesson effectively (Hamann, Pollock, & Wilson, 2012). However, if the discussion is too long, precious time is lost.

Danielle DeNigris currently runs group meetings as the doctoral level program coordinator. I help develop curriculum and am the instructor during group meetings. Talking with students about the challenges they face and their goals during pre-testing and throughout the term helps us align the curriculum with the needs of each cohort of students. Establishing group rapport and building relationships with students is critical to their success. By creating an open and safe space where students can communicate about any topic, I can foster an environment of inclusion.

Perhaps my best insights about teaching diverse students come from failed attempts at group facilitation, as they have allowed me to question my assumptions and adapt my instructional style. The "traditional" strategy of lecturing while students sit quietly and take notes does not work in Project REACH groups. Although students in general college classrooms also tend to zone out when they are not actively engaged, this lecture strategy is even less effective with autistic students who may have difficulties with self-regulation and attention. By utilizing the principles of Universal Design, we can engage a broad range of learners. In Project REACH groups, we use mini lectures, video/audio clips, games, discussions, group activities, role-plays, and student presentations to share information in multiple ways so that students remain engaged, challenged, and interested in the material.

Perhaps the most important principle of Universal Design that I have learned to apply successfully in groups is providing multiple means of action and expression. When the module is overly content-based and text-heavy, students lose interest and stop participating. Students are most engaged when they are able to actively express themselves. The most helpful form of expression is often role-plays. It is one thing for students to hear tips for successful interviews. It is another for them to pretend to be an interviewee or interviewer and act out successful and unsuccessful strategies. Not only do they get to view their peers practicing these skills, they get to practice skills themselves in a safe space where the stakes are low. Students do not only practice successful strategies, they also demonstrate unsuccessful ones. This lightens the mood in the room (becoming a comedic outlet for some students) and lets them point out things that are unsuccessful. By exploring unsuccessful techniques, students learn through trial and error *why* something does not work.

Challenges facilitating group, strategies to overcome them, and lessons learned. In general, group sessions are relatively easy to facilitate because the students who attend them are genuinely motivated to learn and have created an environment of acceptance. However, there are some obstacles that we are still trying to overcome, such as managing such a diverse group of students who all have different skills and challenges, particularly students who need more one-on-one help self-regulating. Another barrier is the need to find balance between different presentation techniques and participation modes in order to allow each student an opportunity to actively engage with the material. It can be difficult to make sure that each student remains engaged when we split off into smaller groups, as some students tend to zone out during this time. One effective technique is to make sure that there is a mentor, or a particularly active/participatory student, in each group to act as a leader.

With only one hour per week dedicated to group sessions, it can be difficult to provide the individualized feedback that each student needs. We compensate by asking students to spend some time at the end of the meetings writing down something that they want to focus on in a future meeting. This gives them a voice in designing the group curriculum; no one is better able to tell us the supports that they need than the students themselves.

My experience mentoring students through Project REACH has expanded my knowledge of Universal Design; as an adjunct instructor, I now make materials accessible for students who use text-to-speak and literacy software and use multimodal strategies during instruction and assessment. I have learned that diversity encompasses more than just cultural, ethnic, socio-economic, or disability status. It involves the consideration of how individuals think, learn, and express themselves. I strive to apply what I've learned to implement more effective and inclusive teaching strategies that increase the overall quality of the college experience.

Conclusions

A central theme that emerged from the mentors' accounts is that educators should recognize that each student is unique and then engage in ongoing dialogue with students in order to adapt instruction to their needs and interests. This dialogue could include ice-breakers, opportunities for students to provide feedback about the course throughout the term, and student-led discussions/presentations. Instructors should demonstrate that diversity is respected by consistently modeling constructive feedback, by providing opportunities for students to learn and express themselves through multiple modalities, and by creating opportunities for students to explore diverse perspectives through role-plays, debates, field trips, external speakers, and opportunities to constructively critique and revise their own and others' work.

In this chapter, mentors highlighted benefits, including skill and relationship development, of learning from "failed" attempts and the discussion of shared challenges with their mentees. Therefore, educators should provide their students (and themselves) with opportunities to learn through trial and error. Opportunities to learn by doing also allow students to actively link course materials to their interests, while providing alternative modes of expression to students who may struggle to express themselves through writing. Instructors can also provide opportunities for students to develop their literacy skills indirectly through spoken word, art, and theatre (see Dunn, 2001 for creative strategies for promoting literacy).

Instructors should demonstrate the executive functioning skills that they expect of their students. Mentees and mentors often ask for help deciphering syllabi that provide insufficient or conflicting details. Instructors should design syllabi and rubrics carefully, consider doing class activities to ensure that students understand them, and break longer assignments into smaller assignments to help students plan. Instructors could adapt the Past Present Future model by helping students review topics from prior classes (Past), exploring the present topic (Present), and foreshadowing the topic for the next class (Future). By documenting if specific learning objectives are delivered and retained and the modalities that were used to deliver them, instructors can develop curriculum that is consistent with the principles of Universal Design iteratively. Perhaps the most essential insight that emerged from the mentors' accounts is that teaching is most transformative when the teacher is always learning from the student. "Although the teachers or the students are not the same, the person in charge of education is being formed or re-formed as he/she teaches, and the person who is being taught forms him/herself in the process" (Freire, 1998, p. 31).

References

Barnhill, G. P. (2014). Supporting students with Asperger Syndrome on college campuses: Current practices. *Focus on Autism and Other Developmental Disabilities*. Advance online publication.

Boal, A. (2002). *Games for actors and non-actors*. London, England: Psychology Press.

Bublitz, D., Wong, V. Donachie, A., Brooks, P., & Gillespie-Lynch, K. (2015). Applying Universal Design to build supports for college students with autism spectrum disorder. *Progress in Education, Volume 36,* Hauppauge, NY: NOVA Science Publishers.

Cai, R. Y., & Richdale, A. L. (2016). Educational experiences and needs of higher education students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 46*(1), 31-41. doi:10.1007/s10803-015-2535-1

Dunn, P. A. (2001). *Talking, sketching, moving: Multiple literacies in the teaching of writing*. Portsmouth, New Hampshire: Heinemann.

Freire, P. (1998). *Pedagogy of freedom: Ethics, democracy, and civic courage*. Lanham, MD: Rowman & Littlefield.

Gillespie-Lynch, K., Brooks, P. J., Someki, F., Obeid, R., Shane-Simpson, C., Kapp, S. K., ... & Smith, D. S. (2015). Changing college students' conceptions of autism: An online training to increase knowledge and decrease stigma. *Journal of Autism and Developmental Disorders, 45*(8), 2553-2566. doi:10.1007/s10803-015-2422-9

Gillespie-Lynch, K., Shane-Simpson, C., Obeid, R., DeNigris, D., Siller, E., Hotez, E., & Pickens, J. (2015). *Building bridges for autistic college students: Project REACH summer transition manual.* Retrieved from https://www.researchgate.net/publication/294261324_Building_Bridges_for_Autistic_College_Students_Project_REACH_Summer_Transition_Program_Manual

Gobbo, K., & Shmulsky, S. (2014). Faculty experience with college students with autism spectrum disorders: A qualitative study of challenges and solution. Focus on Autism and Other *Developmental Disabilities, 29*(1), 13-22. doi: 10.1177/1088357613504989

Grandin, T. (2011). *The way I see it: A personal look at autism & Asperger's*. Arlington, TX: Future Horizons.

Hamann, K., Pollock, P. H., & Wilson, B. M. (2012). Assessing student perceptions of the benefits of discussions in small-Group, large-group, and online learning contexts. *College Teaching, 60*(2), 65-75. doi: 10.1080/87567555.2011.633407

Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure education and Outward Bound: Out-of-class experiences that make a lasting difference. *Review of Educational Research, 67*(1), 43-87. doi: 10.3102/00346543067001043

Jones, M. M., & Goble, Z. (2012). Creating effective mentoring partnerships for students with intellectual disabilities on campus. *Journal of Policy and Practice In Intellectual Disabilities, 9*(4), 270-278. doi: 10.1111/jppi.12010

McGuire, J. M., & Scott, S. S. (2006). Universal design for instruction: Extending the universal design paradigm to college instruction. *Journal of Postsecondary Education and Disability, 19*(2), 124-134.

National Center on Universal Design for Learning, at CAST (2014, July 31). *What is universal design for learning?* Retrieved from http://www.udlcenter.org/aboutudl/whatisudl

Purdue University Online Writing Lab (OWL). (2017). Retrieved from https://owl.english.purdue.edu/owl/

Schutzman, M., & Cohen-Cruz, J. (Eds.). (1994). *Playing Boal: Theatre, therapy, activism*. New York, NY: Routledge.

Van Bergeijk, E., Klin, A., & Volkmar, F. (2008). Supporting more able students on the autism spectrum: College and beyond. *Journal of Autism and Developmental Disorders, 38*(7), 1359-1370. doi:10.1007/s10803-007-0524-8

Van Hees, V., Moyson, T., & Roeyers, H. (2015). Higher education experiences of students with Autism Spectrum Disorder: Challenges, benefits and support needs. *Journal of Autism and Developmental Disorders, 45*(6), 1673-1688. doi:10.1007/s10803-014-2324-2

Walker, N. (2012). Throw away the master's tools: Liberating ourselves from the pathology paradigm. In *Loud hands: Autistic people, speaking* (pp. 225-237). Washington, DC: The Autistic Press.

The Writing Center at the University of North Carolina at Chapel Hill. (2014). Retrieved from http://writingcenter.unc.edu