TEACHER RESEARCH REPORT 2018

ELIP
EAST LANCASHIRE
INCLUSION PARTNERSHIP

TRR 14: Does the application of higher order thinking skills (HOTS) challenge more able KS1 pupils to produce higher quality writing?

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Introduction

Through reading of literature, and based on my own professional judgment, it is evident that Higher Order Thinking Skills (HOTS) have a close relationship with engaging more able learners in cognitive challenge and thus enabling them to make more progress. One of the priorities on the participating school's improvement plan for the academic year of 2017/2018 involved challenging the more able children. This research will look at whether employing cognitive literacy tasks, which engage HOTS in the more able children, challenges them to fulfil their potential, resulting in higher quality writing and better than expected progress. The aim of the project is to help primary school practitioners recognise the importance of employing HOTS tasks within the classroom and to ensure the more able learners are being provided with a stimulating, high quality education.

School setting

This small action research project was carried out in a one form entry primary setting. The school provides mainstream education for children aged between four years old and eleven years old. The school is of average size with a small percentage of pupils supported by pupil premium funding. Four girls and two boys aged between six and seven, from a KS1 class, took part in the writing project over a period of four weeks between February 2018 and March 2018. All six pupils were working beyond age related expectation for their year group at the time of this research project. To protect anonymity they have been assigned pseudonyms. The class teacher, who was familiar with all the participants, led the sessions that took place twice a week and lasted thirty minutes.

Research questions

The principal questions for this research are whether higher order thinking skill tasks increase:

- the motivation of more able learners?
- the quality of the vocabulary used by more able learners in their writing?
- the progress made by more able learners?

Existing Research: More able learners

More able pupils provide teachers and schools with many opportunities as well as a variety of challenges (Clark, 1997). When we refer to 'able pupils', 'more able learners' or 'the more able', we are referring to children who have the capacity to master knowledge and skills quicker (Hanson, 2012) and attain a higher level than the rest of their peer group in their school in any subject (LCC, 2017).

EXISTING RESEARCH: MORE ABLE LEARNERS CONTINUED

A challenging aspect of being a primary school teacher is providing appropriate support for a widening range of abilities in the class (Smith, 2005; Arthur & Cremin, 2010). This is why one important issue in education today is meeting the needs of more able pupils. The topic of more able pupils and their learning has gained a great deal of attention nationally over recent years because, although many more able pupils do achieve above national standards, there is still a large proportion of more able children that do not make expected the progress (LCC, 2017). The Office for Standards in Education (1995) also suggest that even when differentiation is evident across the curriculum, in some schools more able children are still being deprived of sufficient challenge.

Existing Research: Higher Order Thinking Skills

Amongst an abundance of literature associated with more able pupils and their learning, it is repeatedly suggested that to meet the needs of the more able, teachers need to increase the demands and intensify the cognitive requirements of classroom tasks (Kerry & Kerry, 1997). In a recent publication entitled *Meeting the Needs of the Most Able: Guidance for Primary and Secondary Schools* (LCC, 2017), different approaches to teaching and learning for more able children are discussed. This document suggests that when more able learners secure their knowledge of a certain area, they should be provided with opportunities to work in greater breadth and depth (Arthur & Cremin, 2010; LCC, 2017). To gain this breadth and depth, children need to be exposed to tasks that require HOTS allowing the more able learners to engage in cognitive challenge (LCC, 2017); HOTS involve analysis, synthesis and evaluation (Arthur & Cremin, 2010). This originates from Bloom's taxonomy of thinking skills (Bloom, 1956) which was produced as a guide for classifying different forms of learning (Hansen, 2012). The taxonomy, or classification, is split into six main classes.

Simple learning	Knowledge	Comprehension	Application
Complex learning	Analysis ↓ Taking apart and being critical	Synthesis ↓ Making connections and being creative	Evaluation ↓ Judging and assessing

(Bloom, 1956; Arthur & Cremin, 2010; Hansen 2012)

The focus of this research will be on the latter three, analysis, synthesis and evaluation, as these skills are required for complex learning (Bloom, 1956; Hansen, 2012).

INTRINSIC MOTIVATION

According to Lumsden (1994), pupils motivation has a link with their wish to engage with the process of learning, however, they may have different sources of motivation. An intrinsically motivated individual takes part in the learning process for their own benefit, to learn more, for enjoyment and for the accomplishment, showing a preference for more challenging tasks (Lumsden, 1994). This would suggest that intrinsically motivated learners prefer to engage higher order thinking skills in more complex tasks. In contrast, an extrinsically motivated person takes part in the learning process to gain a reward or avoid negative consequences and display preferences for tasks that have a lower level of difficulty (Lumsden, 1994), thus requiring lower order thinking skills.

Research Methodology

To carry out this research, selected pupils participated in an interactive writing project. The project was described to the children as small group work sessions aimed at supporting them in their writing journey to become more superior writers. After having completed the study, the writing project for the participants of this study has continued and has also been scheduled to be put into practise within another year group where more able pupils would benefit from further challenge. The structure of the project has been successfully used previously in studies with primary aged children by Corden (2003) and Jasmine and Weiner (2007). Using this structured process, the following steps were employed:

Research process

Step 1 - Identify HOTS tasks

Appropriate HOTS tasks were identified for use in this action research, linked to objectives that had not yet been achieved by the students. The objectives were taken from the Writing Learning And Progression Steps (LAPS) document produced by Lancashire County Council.

Step 2 – Pre-project Discussion

A focus group discussion took place with the participating students before beginning the project to collect information about their attitudes and feelings towards writing tasks they had taken part in within the classroom setting.

Step 3 - Cold write

Students completed a short writing task on a specific genre without any expert input.

Step 4 - Writing project

Students took part in a three-week writing project. Each week had two sessions focusing on a feature of HOTS. One week focused on analysis, one week focused on synthesis and one week focused on evaluation.

Step 5 - Hot write

Students completed another short writing task based on the same genre to see if they applied some of the skills acquired through the project.

Step 6 – Post-project Discussion

A focus group discussion took place with the participating students to collect information about their attitudes and feelings towards the different tasks they had taken part in.

Discussion questions

- What have you enjoyed about the writing 'project'?
- Have you tried to use any new skills in your last piece of writing that you didn't use in your first piece of writing?
- Why did you try to use these in your last piece of writing?
- Which tasks have you enjoyed the most and why?
- Which tasks did you enjoy the least and why?
- Was there anything you found difficult?

Writing Project

<table>
<tr><th colspan="2">WEEK 1 – ANALYSIS</th></tr>
<tr><td>SESSION 1
- Allow children to read the text.
- Begin with a Positive, Minus, Interesting features (PMI) discussion (De Bono, 1986; Mant et al. 2007) about the text. This is where children say something good about the text, something they find interesting and something that they would change or improve.
- Discuss (What features has the writer used and why?).
- Discuss any other writing features (which have not already been mentioned) and why the writer may have used these.</td><td>SESSION 2
- Analysing a text.
- Odd One Out discussion (Mant et al. 2007). Give children 3 or 4 texts with one being a different genre/possessing different skills. Children discuss which they think is the odd one out.
- Repeat session 1 with a different setting description.
- Can the students identify an increased number of features?</td></tr>
<tr><th colspan="2">WEEK 2 – SYNTHESIS</th></tr>
<tr><td>SESSION 1
- Short stand-alone tasks allowing children to experiment and engage creatively with the new skills.
- Work together to improve example ‘boring’ sentences using some of the new skills looked at in the previous sessions.
- Children have a go and then use PMI to discuss as a group how effective their new sentences are and why.</td><td>SESSION 2
- Shared write.
- Provide a picture stimulus of a setting.
- Model writing a description of the setting using the features analysed in the previous sessions.
- Children discuss which skills to use and where.
- Encourage the selection of vocabulary/sentence structures etc. through a discussion amongst the group.
- Children to suggest ideas, again utilise PMI.</td></tr>
<tr><th colspan="2">WEEK 3 – EVALUATION</th></tr>
<tr><td>SESSION 1
- Guided write - Children follow the model to write their own setting description.
- Use think, say, write, check and then discuss.
- As a group, use peer assessment through PMI discussion.
- What features have they used in their sentence and why?</td><td>SESSION 2
- Independent write
- Discuss the genre and skills being focused on.
- Come up with a child led Success Criteria.
- Provide children with a different picture stimulus of a setting
- Children write their own setting description independently.</td></tr>
</table>

Results

Do HOTS tasks increase the motivation of more able learners?

Analysis of the responses gained from the discussion before and after the project (pre- and post-project discussion) provided evidence that by giving them more focused, challenging tasks the writing project did increase the motivation of more able learners. Consequently, the pupils spoke more positively about their work and focused more on the lexical content.

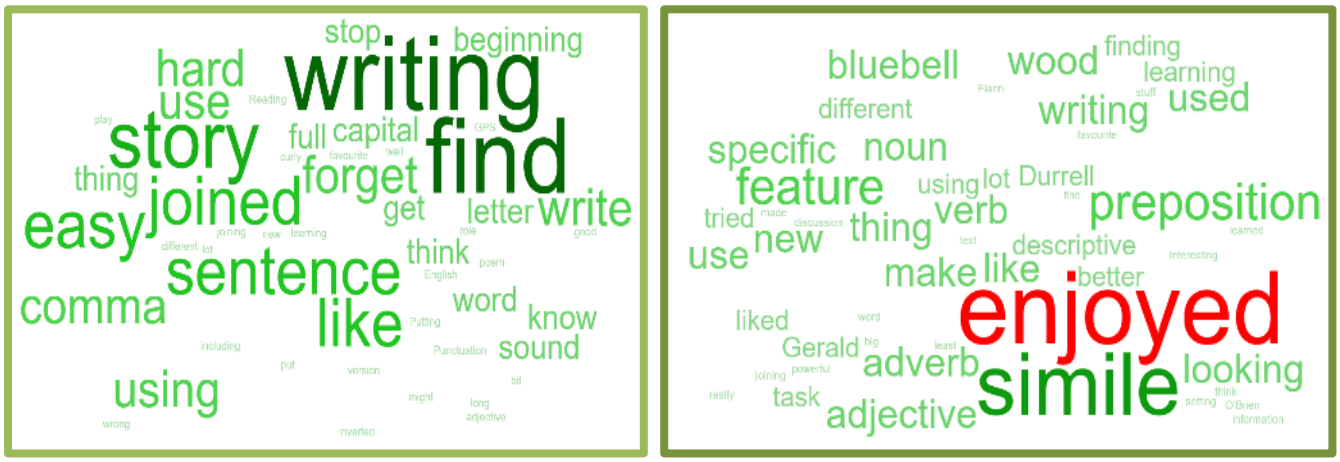

Figure 1: Figure 1: Word clouds highlighting keywords used in the pre-project discussion (left) and the post-project discussion (right)

Initially, looking at the word cloud from the pre-project discussion responses, the pupils focused heavily on their handwriting and presentation of their work as well as their use of punctuation. It appeared that they believed if they had written neatly and used capital letters and full stops, they had produced a good piece of writing. There was also some negative terminology (hard, forget, wrong) used within the responses showing an air of concern for making mistakes or 'getting things wrong'. In contrast the responses during the post-project discussion 'enjoyed' was the most common word used. Children's intrinsic motivation is often linked with their desire to engage in a learning process (Lumsden, 1994) so they can experience the enjoyment that new learning provides and the sense of accomplishment they feel after (Lepper, 1988).

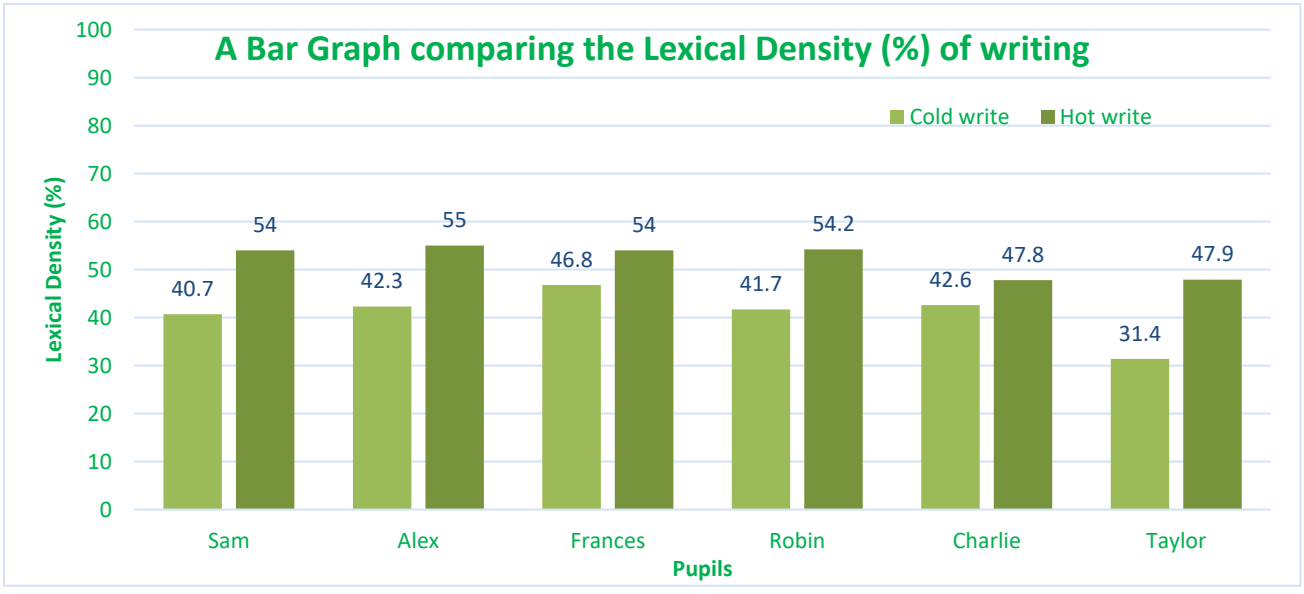

Figure 2: A Bar Graph comparing the Lexical Density (%) of writing

Lepper (1988, p.298-299) argues that, *"Students who are intrinsically motivated are more likely to value and to employ more effortful, but "deeper" and correspondingly more effective, strategies for studying."* The findings from this small-scale study suggest that when pupils are enjoying a task, their intrinsic motivation is increased encouraging them to employ greater effort in the task, thus facilitating their HOTS.

Furthermore, the post-project word cloud shows the pupils giving more attention to the lexical features of writing rather than punctuation. This demonstrates that exposing children to higher level vocabulary through HOTS tasks stimulates their learning and encourages them to remember the new skills and terminology. These findings concur with Lumsden (1994) who suggests that intrinsically motivated individuals show a preference for more complex tasks as they demand more effort and enables them to process their learning at a deeper level.

The final important observation from the discussion comparison is that pupils mentioned 'trying new things' and 'making their writing better' after the project, thus emphasising the need to constantly stretch more able pupils to keep up their level of intrinsic motivation towards learning. Additionally, this highlights how the writing project has been successful in increasing their motivation to learn. If teachers strive to employ this strategy, there are potentially many benefits (Lumsden, 1994).

Overall, more positive terminology was employed in the post-project discussion in comparison to the pre-project discussion suggesting the pupils enjoyed the sessions. Their intrinsic motivation appeared to be stimulated as evidenced by the pupils' keenness to try new things and engage with more complex skills within their writing.

Do HOTS tasks increase the quality of the vocabulary used by more able learners in their writing?

When comparing the writing produced in the 'cold' writes prior to the project and the 'hot' writes completed after the project, a variety of data were analysed. This included: lexical density; Flesch reading ease scores; lexical diversity; and key learning objectives achieved.

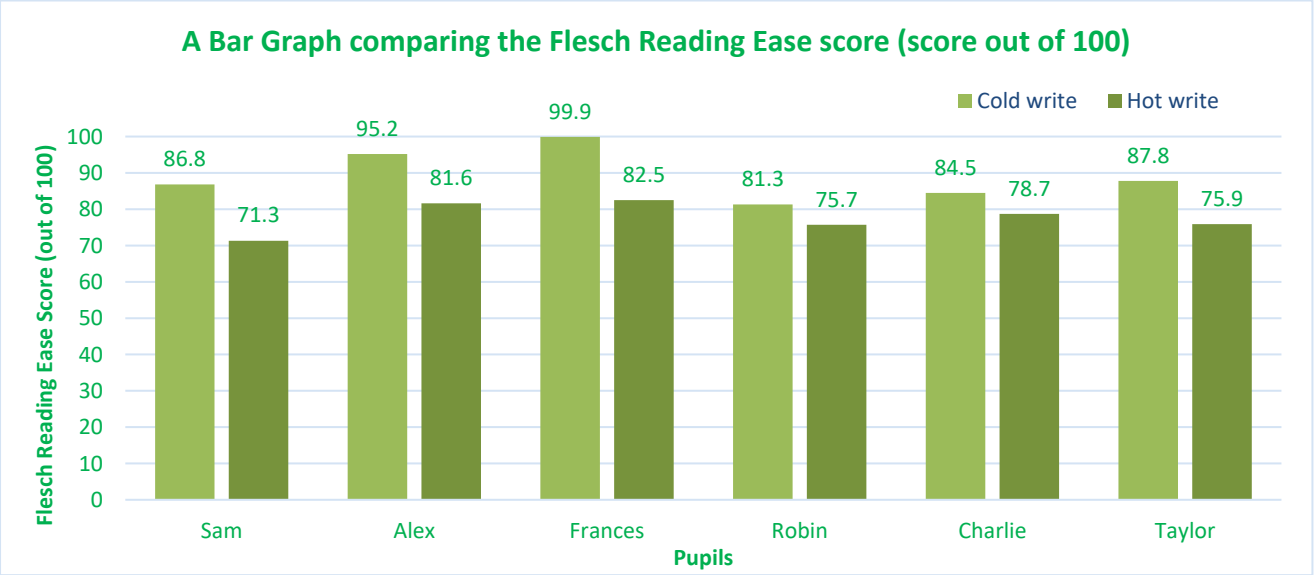

Figure 3: A Bar Graph comparing the Flesch Reading Ease score (score out of 100)

DO HOTS TASKS INCREASE THE QUALITY OF THE VOCABULARY USED BY MORE ABLE LEARNERS IN THEIR WRITING? CONTINUED

LEXICAL DENSITY refers to the proportion of lexical content words, such as nouns, verbs, adjectives and adverbs, to the total number of words. A text with a larger amount of lexical content words is said to contain more information or meaning than a text with more function words, such as prepositions, pronouns, conjunctions and count words (Johansson, 2008). As seen in figure 2, the lexical density percentage has increased in all participants' writing by an average of 11.25%. An increase in lexical density demonstrates the use of more lexical content words making the pupils' writing more complex and meaningful and suggesting higher order thinking has taken place.

THE FLESCH READING EASE SCORE is a score given out of 100. The lower the Flesch Reading Ease score, the more difficult the text is to understand. Figure 3 evidently shows that the Flesch Reading Ease scores have decreased for all participants by an average of 11.6, thus demonstrating the increase in complex features used in their hot writes, completed after the writing project, resulting in a more complex passage of writing. This seems likely to be due to the employment of higher order thinking skills. Lexical diversity is a measure of how many different words are used in a text (Johansson, 2008). By inputting the 'cold' and 'hot' writes of each pupil into word clouds, (see examples figure 4), it is noticeable how the hot writes are lexically richer than the cold writes.

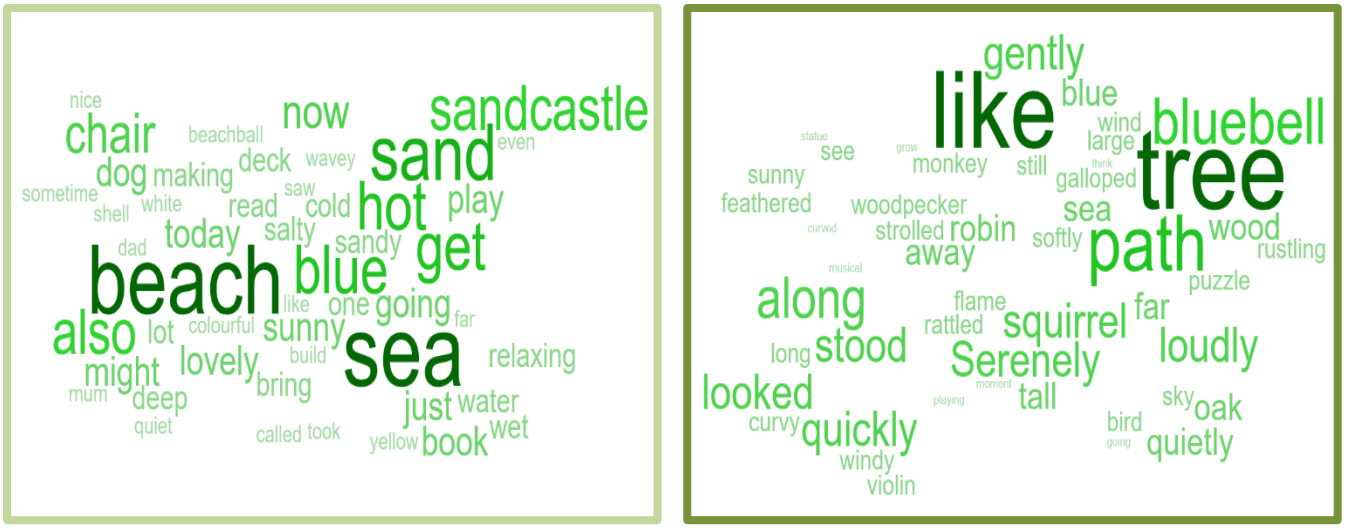

Figure 4: Word clouds comparing the vocabulary used in the Cold writes (left) and Hot writes (right)

Within the 'cold' write, pupils tended to use more nouns, verbs and adjectives but very few adverbs, prepositions and there was no use of similes apparent. In comparison, in the hot write, pupils were actively using more specific, complex nouns, powerful verbs, adjectives, adverbs and prepositions. Similes were also noted during the 'hot' write. This increase in lexical diversity can be seen more clearly in figure 5.

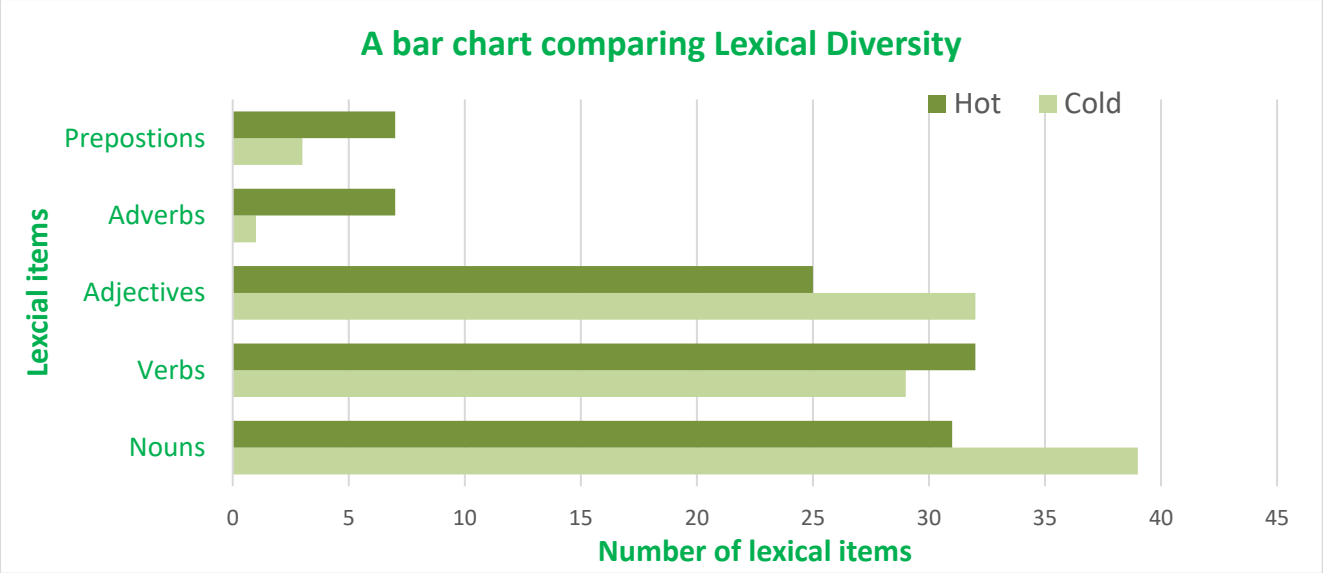

Figure 5: A bar chart comparing Lexical Diversity

An increase in lexical diversity demonstrates an increase in the variety of vocabulary used within the sample of writing (Johansson, 2008), thus implying another positive effect of the HOTS tasks employed within the writing project.

Do HOTS tasks increase the progress made by more able learners?

Finally, to assess the impact of the HOTS tasks on the progress made by more able children, the cold and hot writes for each individual pupil were marked and assessed according to the key learning objectives achieved from different year groups. Table 1 breaks down the objectives achieved in the cold writes and the objectives achieved in the hot writes. Objectives have been taken from the Lancashire Assessment and Progression Steps (LAPS) document produced by Lancashire County Council.

Cold writes			Hot writes		
Year 2 objectives	**Year 3 objectives**	**Year 4 objectives**	**Year 2 objectives**	**Year 3 objectives**	**Year 4 objectives**
- Select, generate and effectively use nouns. - Select, generate and effectively use Adjectives - Use of subordination for time and reason			- Select, generate and effectively use verbs - Identify, select and use noun phrases	- Select, generate and effectively use adverbs - Generate, select and effectively use prepositions for where *e.g. above, below, beneath, outside, beyond*	- Create and use sentences with an adverb starter - Generate, select and effectively use prepositions for where *e.g. above, below, beneath, outside, beyond* - Create fronted adverbials for *where*

Figure 6: Lancashire Assessment and Progression Steps (LAPS) Cold and Hot writes

DO HOTS TASKS INCREASE THE PROGRESS MADE BY MORE ABLE LEARNERS? CONTINUED

Due to the HOTS tasks, many more complex objectives from year groups above the participants' Age-Related Expectation (ARE) were achieved. Many of these objectives have also been applied in participants' independent writing which has taken place outside of the writing project. This shows that, when provided with the opportunity to engage in HOTS tasks in a relaxed, focused environment which is suggested to encourage enjoyable and effective learning (Wai-shing, 2008), more able pupils should be able to achieve more complex objectives within a shorter period. This implies that they should make more progress than the standard one term; however, a longer study would be needed to confirm this.

Conclusions

In conclusion, this project has identified that more able children display a greater level of engagement and motivation in tasks that require them to use higher order thinking skills. Through these more challenging tasks, an improvement was noted in the quality of the vocabulary they use in their independent writing with the skills gained from the project also being applied in their writing outside of the project, especially in their cross-curricular writing. Through use of the LAPS objectives, it was evident that the participants demonstrated more objectives from other year groups in their writing, after having taken part in the project for a short amount of time. This suggests that prolonged participation in the project would have a positive impact on the progress they make. It should be noted that this was a small-scale action research project therefore, a longer study would need to take place to justifiably assess the impact on the participants progress.

PRACTICAL APPLICATION

Some of the steps taken in this small action research project could be rolled out informally across other year groups within the mainstream primary setting. In a similar way to the project used in this research, writing projects could be set up for the identified more able pupils within other year groups to boost their progress and quality of their writing. This could provide further support for the findings of this research project and provide further evidence towards the projects resulting in the more able making accelerated progress.

Further research

The findings from this small-scale action research suggest it would be beneficial to challenge the more able with 'interventions' to allow them time and space to engage in HOTs to accelerate their progress. However, this research is only hypothesis generating due to only being based on small number of participants therefore the following ideas could be followed up as further research:

- Do HOTS writing projects over a prolonged period (1 whole term/1 whole year) show accelerated progress amongst more able pupils?
- Can the writing project be extended across other year groups/other schools and does it have a similar impact on more able pupils?
- Are HOTS being encouraged in both KS1 and KS2 classrooms? What does this look like?
- What impact does a 'challenging' intervention have on the progress made by more able pupils – how often should this take place? Is this already happening in some schools? What effect have they found?

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