

R RESEARCH REVIEW REPORT

9 research studies from:
St Marks Church of England Academy
Oxford Spires Academy

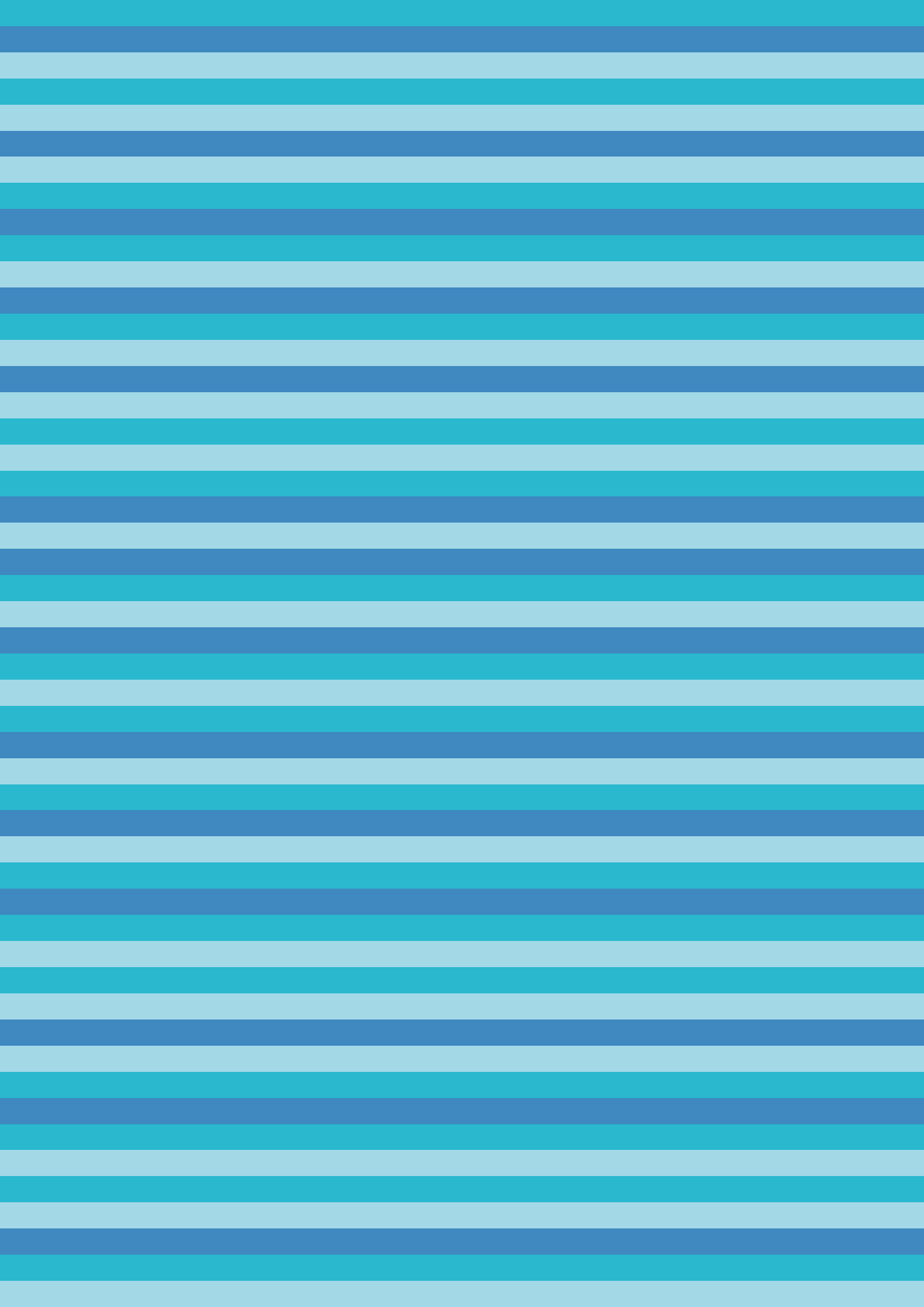
Edited by Rachael Fitzpatrick & Anna Riggall
Foreword by Chris Tweedale

Pedagogy

**Student
attitudes
to learning**

**Middle
leaders**

**Effective
feedback**



Foreword: A comment on the importance of research in CfBT Schools Trust schools



One of the features that sets CfBT Schools Trust apart from other multi-academy trusts is our commitment to evidence-informed teaching. All the schools in the Trust understand that having Education Development Trust as our principal sponsor presents a great opportunity to learn from, and harness, a wealth of education research expertise.

The drive for an evidence-informed approach is enthusiastically embraced by senior leaders in all our schools. Research leads play a vital role in this, helping staff engage in relevant research and providing support in implementing research in the classroom and school level. Teachers as well as support staff are encouraged to choose research topics that respond to the particular needs in their classrooms, their school or the Trust as a whole. Having a research lead in each schools means there is a designated person who is convenor of research activity within the school as well as responsible for making connections with the research activity of other schools in the Trust. The research lead has also been the conduit of support and training on research methods and approaches over the past year. The role has been influenced by three recent Education Development Trust reports, two of which were completed in partnership with ResearchED (see www.educationdevelopmenttrust.com/research for more details). During 2015/16 two secondary schools have produced written reports about their research activity.

- Oxford Spires Academy engaged in a whole-school research project exploring the use of feedback to students and how this embeds learning in addition to research by one teacher who explored the use of literacy in mathematics;
- St Mark's Academy, where middle leaders, teachers, a teaching assistant and a student all engaged in areas of research important to them.

Research activity in school allows staff and students to play a key role in setting and addressing areas for improvement. It is evident in these studies that research also provides opportunities for student voice to be heard, with many of the research pieces using student feedback in their evidence, and one study conducted by a Year 9 student at St Marks.

We believe that all CfBT Schools Trust schools should engage in and with research as part of their approach to school improvement. The capacity of individual schools to do so varies according to their context, and Education Development Trust plays a key role in helping to build this capacity with valuable support and advice for our budding teacher researchers.

Some of the results of that supportive partnership are showcased in this publication which is, I hope, the first of many more to come.

A handwritten signature in black ink, appearing to read 'Chris Tweedale'.

Chris Tweedale
CEO of CfBT Schools Trust 2014 – 2016

Welcome to Education Development Trust

Education Development Trust was established over 40 years ago as the Centre for British Teachers. It later became known as the CfBT Education Trust and is a large educational organisation providing education services for public benefit in the UK and internationally. We aspire to be the world's leading provider of education services, with a particular interest in school effectiveness. Our work involves school improvement through inspection, school workforce development and curriculum design. We collaborate with the UK's Department for Education, local authorities; and an increasing number of independent and state schools, free schools and academies – providing services direct to learners in our schools. Internationally we have successfully implemented education programmes for governments in the Middle East, Sub-Saharan Africa and South East Asia, and worked on projects funded by donors such as the Department for International Development; the European Commission; the Australian Department of Foreign Affairs and Trade; the World Bank; and the US Agency for International Development in low- and middle-income countries. Surpluses generated by our operations are reinvested in our educational research programme. Please visit www.educationdevelopmenttrust.com for more information.

Welcome to CfBT Schools Trust

The CfBT Schools Trust is a large family of schools spread across the East Midlands and Thames Valley regions of England. There are 16 schools in total, made up of 11 primary schools and five secondary schools, of which four are free schools based in London and Reading.

Partnership, peer review and evidence-informed practice play a key part in how our schools operate, and we believe that it is these attributes that are vital in creating a culture of continuous learning and development for all.

Our specialist knowledge means we deliver – and design – effective, far-reaching and sustainable education solutions. All students can benefit from our proven international expertise and commitment to evidence-based education.

Acknowledgements

Thanks go to:

- Research Associate Elaine McCann who worked with the research team to offer support to the school Research Leads during the academic year 2015-16.
 - The Research Leads in each school who worked hard to support research activity in their schools.
- This booklet showcases write ups of a selection of these research projects.



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PEDAGOGY

Links with pupil engagement and attainment

Three studies were conducted in the thematic area of pedagogy. The first report explores a range of techniques for introducing literacy into mathematics teaching; the second looks at strategies for improving outcomes among EAL students in science; and the final report investigates student engagement in physical geography.

Mathematics and literacy: An investigation into the effectiveness of different techniques for incorporating literacy into mathematics lessons

The aim of this research project was to explore techniques to incorporate literacy in mathematics lessons and to find out if this would actually improve students' mathematical attainment.

The research project centred on three broad areas of enquiry:

- What techniques are there for incorporating literacy into mathematics lessons?
- What approaches can be used with students to enable them to interpret the non-mathematical vocabulary that appears in examination questions?
- Should these strategies be taught from an early age or just once students start on their GCSE course?

Why this topic was important to me

I work in a school where over half the pupils speak English as an Additional Language (EAL), and many children have reading and spelling ages below their actual age. In my experience this has a negative impact on mathematics as they often have difficulty

interpreting questions. This interpretation difficulty occurs in two ways: firstly, if children's mathematical vocabulary is poor, they are unable to make links between words (e.g. between pentagon and pentagonal). Secondly, children may encounter words in maths questions, particularly in exams, that are unfamiliar and are not mathematical (e.g. muesli in a question about pie charts). Although they do not need to understand these words in order to answer the question, the sight of unfamiliar words can be confusing.

As the new style GCSE papers do not explicitly state which mathematical process is to be carried out, problems with words can make it difficult for a student to infer what is being asked of them. For example, students may need to find the volume of a flower bed that is shaped like a cuboid and then work out how many bags of soil are needed to fill it. It may be that the word volume will not be mentioned in the question, but words such as *dimensions*, *raised bed* and *compost* will be. Furthermore, the mark schemes for these types of questions often contain marks for the clarity of mathematical thinking making it even more important for students to be

able to interpret and answer the questions clearly using words as well as symbols and numbers. Ofsted are also looking for literacy to be included in every lesson and for every teacher to be a teacher of literacy. However, most professional development sessions on literacy have had little relevance in the application of literacy in mathematics.

What is literacy?

According to Vukovic and Lesaux (2013) there is more recognition that language ability has an important role to play in the development of children's mathematical development. This links to Draper and Siebert's (2004) belief that all teachers should aim for children to be able to read and write within each specific subject studied at school as well as in general. Pugalee (2010) takes this one step further by saying that mathematical literacy is not only important if students are to be able to survive at school but also "to participate in the adult world" (Pugalee 2010, p19). However, Draper and Siebert (2004) go on to say that in their view there is an issue of communication between the fields of mathematics and literacy education and that subject teachers often do not explicitly teach literacy in their lessons as they do not believe it is their job. There is a slight contrast with the view of Friedland, McMillen and del Prado Hill (2011) who believe that teachers are using literacy strategies in their lessons but are unaware that they are doing so. The teachers instead think they are just using good pedagogy; this means mathematics is being taught effectively, but literacy is still not being explicitly taught.

Why the language of mathematics can present a particular challenge to students

According to Friedland, McMillen and del Prado Hill (2011, p.57), "mathematics language presents a particular challenge for students because the language of mathematics is typically used only in a school setting. Moreover, some mathematics terms, such as "*power*" or "*radical*", have a different meaning in everyday English". This is a view that is backed up by Lott Adams (2007) and Schleppegrell (2007), that mathematics is more than just language; students need to be able to cope with symbols and visual representations as well. Matteson (2006) points out that examinations require students to deal more and more with these multiple representations. Matteson's opinion is supported by Friedland, McMillen and del Prado Hill (2011; 57) who think that there is the emergence of a new type of question that requires students to be able to read and write alongside showing off their knowledge



of mathematics: "Instead of 'naked computations', students are presented with words and context packed around numbers".

Lott Adams and McKoy Lowery (2007) argue that given how complex the language of mathematics can be it is vital that students are taught to interpret it effectively, though they do acknowledge that helping students do so can be just as complex as the language itself.

Key issue that may arise for teachers

One of the key points in the literature is that mathematics teachers themselves do not see the importance of literacy. According to Friedland, McMillen and del Prado Hill, (2011, p.58) "data from a recent study indicated that mathematics teachers do not see the literacy specialist as a source of support for more effective instruction, even when teachers see the value of integrating literacy into their classrooms". If mathematics teachers do not see the importance of literacy, then effective strategies will not begin to be implemented in the classroom. However, Adler (1998) offered a different suggestion why literacy

intervention may not occur. Teachers may feel that by explaining mathematical language there is too much focus on explicit teaching and teacher talk. Although Adler found evidence that this helps all learners, she also found that teachers were uncomfortable given the focus in the classroom on reducing teacher talk.

Key issues that may arise for students

Often students can struggle to make sense of all the information in a mathematical problem. O'Halloran (1999) gives the example of a trigonometry problem which uses natural language (the context of the question), mathematics symbolism (the mathematical relationships such as angles and lengths), and graphic representations (the diagram that also provides a real world context). The presence of multiple formats in one question requires students to be able to understand how the different formats interact in order to work out what the question is asking. Added to this there may also be oral language work as the teacher and students discuss the problem. Students therefore have to learn not just how to manipulate symbols but also how



different systems of expressing meaning work together. Indeed, Lemke (2003, p231) says that “too much opportunity for gaining mathematical understanding and intuition, too much practice at learning how to use mathematical meaning in real situations, is lost if mathematics is not taught particularly at the introductory level, as a co-equal partner with language and visual representation”.

Another issue for students is that the language of mathematics is highly technical. The language includes not only mathematics specific words, but also words such as *place*, *borrow* and *product* that have different non-mathematical meanings and this can lead to confusion for students (Schleppegrell, 2007). This problem is further complicated if students have no opportunity to use academic language outside school, especially in the case of EAL students. Abedi and Lord (2001) found that students with EAL score lower on standardised tests of mathematics than students who are fluent in English, suggesting language dependence for success in mathematics.

Lager (2006) further expands on the issues for EAL students by pointing out that even

students with English as their first language compare learning mathematics to learning a second language and therefore learning the language of mathematics in a foreign language is doubly frustrating. This would contrast with the view that mathematics is a universal language. Carter and Dean (2006) mention the problem that students from overseas may face when arriving in the British education system of difference in style of mathematics instruction. Some students may find problem solving difficult, particularly the style of questions mentioned by Friedland, McMillen and del Prado Hill (2011) and Matteson (2006) not because of a language barrier but because in their own country the emphasis is more on computation.

A look at some potential solutions for both teacher and student issues

More interaction between literacy and maths teachers

Friedland, McMillen and del Prado Hill (2011, p58) believe that in order to meet the challenge of the differing styles of examinations “greater communication between literacy and mathematics leaders

is needed”. This is a view that is supported by Draper and Siebert (2004 p.953) who say that in order:

“To facilitate student learning, mathematics and literacy professionals must collaborate to help mathematics teachers develop an awareness that mathematics learning and literacy are inseparably intertwined... and that every mathematics learning event is also a literacy event.”

Hopkins (2007) provides a number of suggestions for incorporating literacy into mathematics lessons. One of these is repetition and constant use of mathematical language, this mimics the way children learn to speak their native language. Hopkins further adds that the process should be fun and engaging as children cannot possibly begin to learn if they are not engaged. A further technique suggested by Hopkins is immersion in mathematical language. Carter and Dean (2006) on the other hand believe that mathematics teachers must teach vocabulary explicitly and should allow students the opportunity to understand how words are conceptually related to each other. Another strategy suggested is teaching students comprehension



strategies to help with problem solving questions.

The importance of the right kind of teacher talk

Schleppegrell (2007) suggests that success in mathematics depends, more than any other subject, on the spoken language explanations of the teacher. Given the multiple systems for expressing meaning that O'Halloran talks about, it seems sensible that according to Veel (1999) teacher talk in mathematics classes is dominant. The teacher's words are vital for students to be able to learn how to interpret the meanings of the graphic and symbolic representations. Veel goes so far as to say that teacher talk "is [...] a powerful agent in the learning process" (p.189). Given the reluctance of teachers to talk that Adler mentioned, it is possible for textbooks to be provided so that students can investigate for themselves. However, as Schleppegrell (2007) points out, textbook explanations can often be dense and even more confusing for students than teacher explanation. This means students will still need help in understanding the symbols, diagrams, and technical language. O'Halloran (2000) agrees with this and believes that drawing students' attention to

the linguistic features of mathematics can help students clarify their understanding of more technical aspects of the subject matter.

Sfard et al (1998) suggest that it is important that teachers are aware of the difference between talk for talk's sake and when talk with an explicit focus on literacy and the language of mathematics can help develop students understanding. If teachers had more knowledge and training in the difference, then this might help them overcome the reticence that Adler mentions.

Maximising the opportunities for student talk

It is also important for students to talk. Adams (2003) suggests that students should be encouraged to talk about mathematics as they solve problems. One suggestion is that students should read a problem and discuss its meaning before starting to solve the problem either individually or in groups. To help students with the technical nature of the language of mathematics Adams (2003) suggests that teachers should highlight and place an emphasis on students using technical language rather than informal language when they are defining and explaining concepts. Adams further suggests that students should be encouraged to develop connections between mathematical language and informal language, in particular for "ambiguous terms, homonyms, and similar-sounding words". Schleppegrell (2007) suggests that the best way for teachers to support students is to deliberately focus on language during a unit of study and that means using both written and spoken language. This is supported by Lemke (2003) who suggests that teachers should translate for students between technical and non-technical language during mathematics lessons. Lemke also says this can be further supported by linking the mathematics studied in the classroom to a real life context which supports Carter and Dean's (2006) suggestion that use of prior knowledge is particularly important in learning mathematics.

A classroom investigation

This study looked at two different classes in order to be able to assess if and how literacy strategies could impact the mathematics classroom for students. Each class received a range of new literacy focused interventions in mathematics lessons. The teacher recorded observations from these lessons as well as discussions with pupils about the interventions and their perceptions of mathematics. As background context the starting literacy levels of the pupils were recorded using new tests or existing test data (documenting where relevant reading age, spelling age and comprehension skills).

The first class was a Year 11 class made up of 20 students. Nine of the students had Special Educational Needs and 13 students had English as an additional language, of the latter group four have been in the country less than two years. Six different literacy focused strategies were used with this Year 11 class, which were as follows:

- Nonsense questions
- Maths dictionary
- Rewriting the question
- Crossing out
- Logic puzzles
- Vocabulary starters

The second class was a Year 7 group. There were 16 students in the class of which six had Special Educational Needs and six had English as an additional language. All the students had gained a Level 4 at Key Stage 2 (KS2). They had been grouped together based on this performance and a shared weakness with decimals. Five different literacy focused techniques were used with this Year 7 class. These included:

- Etymology of words
- Recording use of maths words
- Brainstorming
- Correction of mistakes in word usage
- Repetition of maths vocabulary

'Teachers should highlight and place an emphasis on students using technical language rather than informal language when they are defining and explaining concepts.'

TABLE 1: YEAR 11 MEASURES OF LITERACY

Student	Year 9 Reading Age (Years/Months)	Year 11 Reading with Comprehension Age (Year/Months)	Year 11 Single Word Reading Age (Years/Months)	Difference in Reading Age Year 9 to Year 11
A	13/0	9/06	13/03	– 2 yrs, 6 months
B	13/10	11/06	–	– 2 yrs 4 months
C	9/11	12/03	–	
D	10/7	–	–	
E	9/3	11/11	12/00	+ 2 yrs 9 m
F	10/3	–	14/06	+ 4 yrs 3m
G	–	9/06	10/06	
H	13/0	11/06	–	– 1 yrs 6 months
I	11/4	11/0	–	– 4 months
J	–	7/09	9/03	
K	–	6/09	10/0	
L	–	7/08	15/03	
M	10/7	8/05	–	– 2 yrs 2 months
N	8/6	10/03	16+	+ 7 yrs 4m
O	10/7	12/03	–	+ 1 yr 9 months
P	12/0	15+	16+	+ 4 yrs
Q	12/3	11/06	–	– 9 months
R	9/11	10/03	14/0	+ 4 yrs 1 m
S	14/0	12/08	16+	+ 2 yrs
T	11/4	8/08	–	– 2 yrs 4 months

TABLE 2: YEAR 7 LITERACY MEASURES

Student	Year 9 Reading Age (Years/ Months)	Year 11 Reading with Comprehension Age (Year/Months)
1	11/06	14/01
2	n/a	n/a
3	12/08	10/07
4	12/08	9/00
5	9/00	11/04
6	11/11	12/07
7	12/03	14/07
8	10/03	11/10
9	15+	8/10
10	10/03	11/10
11	8/09	9/10
12	10/09	12/07
13	11/06	7/10
14	8/08	14/07
15	10/09	10/07
16	12/08	12/04

Any gaps are where data was unavailable or where pupils were not able to sit the tests during the allotted time.

Pre-intervention testing: Year 11

Year 11 students reading ages were tested through a single word reading and a comprehension test. Both tests were provided by the school's Literacy Coordinator. The single word reading test was aimed at students up to age 16; however the only reading with comprehension test that was available was aimed at students in Year 8. Since the results for the comprehension test are based on the student's raw score and their current age, my results would end up being slightly over estimated as the conversion table provided did not cover 15 and 16 year olds. The testing was carried out over the course of a week of lessons. Students sat the comprehension test under exam conditions during a mathematics lesson. For the single word test students worked with a Teaching Assistant on an individual basis. This test took no longer than five minutes per child.

Table 1 shows the results of both tests in addition to the results of previous tests carried out in Year 9 where these were available. Reading ages ranged from well below actual age to in line with (or over) actual age. In some cases (highlighted blue in Table 1) the reading age of pupils appeared to be worse in Year 11 than it was in Year 9.

Pre-intervention testing: Year 7

The Year 7 class reading and spelling ages had been tested on entry to the school so no additional tests were administered. Over half

the group had reading ages below expected levels. Roughly half had lower than expected spelling ages. There is no data for student 2 as they were a mid-term admission.

Interventions carried out with Year 11

This section explores the interventions carried out with Year 11 and their perceived impact through my observation during literacy in mathematics lessons. This is based on both my observation of student engagement and direct verbal feedback from students.

Nonsense questions

Use of nonsense questions is a strategy that involved taking past GCSE paper questions and replacing words giving context with nonsense words. The examples below show how this is possible to do and still give students a way into answering the question.

*"There are some bimbles in a bag.
18 of the bimbles are gloops.
12 of the bimbles are flobs.
Write down the ratio of the number of gloops to the number of flobs.
Give your ratio in its simplest form."*

In this example the word counter has been replaced throughout with the word bimble. Students do not need to know the meaning of the word bimble to answer the question. The key mathematical term ratio has been

left unchanged. By making the unimportant words nonsense, students can learn to focus on the key terms to help with their comprehension of the problem, and that they did not need to understand all words to answer the question.

Researcher observations

Nonsense questions were used in the one lesson a week. For the first two weeks we worked through two or three examples as a whole class. Once the class had become used to the idea, a nonsense question was set as a starter activity. After each nonsense question had been answered students were shown the original question. When this strategy was first introduced students resisted, with many questioning "what is a bimble?" or "I don't know what a floop is so I can't answer the question". Over time pupils became more confident and less resistant. Humour over the silliness of the question also helped students remain engaged. By the third week students accepted there would be words they did not understand, and that it would still be possible to answer the question. When the majority of students accepted the approach, they often tried to convince their peers of its value: "You don't need to know every word to answer the question". All students spoke of the increased confidence working with nonsense questions had given them. Several students said they would now go back to try and answer questions they previously thought were too difficult to attempt.

Dictionary

This intervention was used throughout terms two, three and four by both Year 7 and Year 11.

The school purchased mathematical dictionaries and one dictionary was placed on each table (shared between four to six students) and every time students asked what a word meant they were directed towards the dictionary.

The dictionary had pictures and students liked the visual representations. It appeared particularly beneficial for those students that were EAL or had a low reading age. An additional benefit to the use of dictionaries was that students were encouraged to become independent learners.

Researcher observations

At the start of the intervention students would need to be handed a dictionary by the teacher or teaching assistant, but by halfway through term three Year 7 and Year 11 were both using the dictionaries of their own accord and were no longer asking for definitions. One student went as far as purchasing her own dictionary to use at home and said she had been recommending them to students in other classes.

Year 11 suggested the dictionaries formed part of plenary activities, for example with the teacher reading the definition and the students giving the term (and vice versa). These were trialled, though there were issues with ensuring whole class participation so it was not continued.

Rewriting questions

In the third and fourth weeks of term four Year 11 were introduced to the idea of rewriting exam questions in order to make the language more accessible. For example:

"Harry and Sally want to keep free range hens. They have a rectangular piece of land that they intend to use for a chicken run. The length of the land is 30m and the width is 10m. Harry and Sally will need to put a fence, with a gate, around the chicken run. They are advised that the least area a free range hen needs is 0.8m². They want to have as many hens as they can. Hens cost £7.50 each. Putting in the fence and gate will cost £9.85 per metre. Work out the total cost of buying the hens and fencing the land."

The question causes a number of literacy focused challenges for students. Firstly, the

question refers to both *free range hen* and *chicken*, students are expected to realise that for the purposes of the question these are the same. Secondly the question uses the word *area*, however perimeter is not mentioned and students are required to infer the need to calculate the perimeter. Encouraging students to rewrite the question meant they could rephrase the question in a way that made sense to them. For some students this involved simply making the question consistent in using the word *chicken* throughout as well as removing any reference to *free range* since that information is unnecessary to answer the question. Other students went a step further changing *they are advised that the least area a free range hen needs is 0.8m* to become the simpler *each hen needs 0.8m* and removing the mention of a *gate* in the line talking about fencing. Some students went further still completely removing all references to chickens and instead made the question about dolphins or hamsters. The reasoning the students gave for this radical change was that these were animals "that are more friendly" and it gave them "something to smile about" when answering the questions and made the "exam more fun".

needed to scan carefully for mathematical terms. This allowed students to simplify mathematical questions that used words so they could focus on the calculation required.

Research observation

A benefit was that students started to see how repetitive exam questions could be. For example, students were able to recognise that a question on VAT was the same as a question from the week before that involved *T-shirts*.

Logic puzzles

This was a strategy introduced to generate pupil talk as they solved problems. The idea was by looking at logic puzzles, such as the game SET or very simple Sudoku, students would get used to mathematical discussion, looking for hidden patterns and putting into words their thought process. These were all skills that would help students when it came to exam preparation. With these types of problems there was also the advantage that students could discuss their mathematical nature without getting caught up in any context based vocabulary.

'One student went as far as purchasing her own dictionary to use at home and said she had been recommending them to students in other classes.'

Researcher observations

On the one hand students became aware of the options to cut out superfluous information to focus on the maths. Conversely, it was taking students up to ten minutes to rewrite questions which would be too long in the exam compared to the number of marks students stood to gain. Other students were getting too distracted in making the questions exciting (for example a question on dolphins in the jungle compared to chickens in a run) rather than concentrating on the maths.

Crossing out words

This intervention was introduced in week five of term three once students had some familiarity with nonsense questions. Students were asked to underline words they felt were irrelevant to answering the question and then to highlight key words. It was made clear that if students were to use this strategy they

Researcher observations

There were several problems that arose. Although some students were very keen to discuss their findings not all students would participate, some would attempt the puzzle and not join the discussion, others would not even attempt the puzzle. I undertook a quick verbal student survey and there was a strong feeling that students could not see how the task was mathematical and vocalised that it was not helping them get a GCSE grade. There was a small group that enjoyed this type of work and could see the benefits.

Vocabulary starters

Vocabulary starters were used over the first four weeks of term three so that from the moment students walked in the room they were clearly aware that they were working on literacy in mathematics. Starters used included card sorts, matching fractions to

names (but sometimes giving three words and four definitions), putting prefixes of measurements in order of size and sketching shapes given their names.

Researcher observations

I found this to be a particularly effective strategy and in some ways this also links to the brainstorming work with Year 7 as that would be another example of a vocabulary starter. Using this intervention invited students to become focused on language from start of lesson. This then enabled me to make links to the work covered in main part of lesson as well as assessing prior knowledge and providing revision of topics covered previously. Vocabulary starters made it very easy to ensure that there was five minutes of literacy in every lesson, however a big disadvantage was that this was probably the most time consuming intervention to prepare. There was also a budgetary consideration as this intervention could also become expensive as some starters required lots of photocopying, though card sorts once produced could be reused each year.

Interventions carried out with Year 7

This section explores the interventions carried out with Year 7 and their perceived impact (based on both my observation of student engagement and direct verbal feedback from students).

Etymology of mathematical words

This strategy was used from the second week of term two onwards. In previous years when teaching polygons I have always explained to students about the Greek or Latin root of each name and made connections to other words in the same family. For example, I linked the eight sided octagon to the eight legged octopus or the ten sided decagon to ten years in a decade.

Researcher observations

Students started to develop an appreciation of Latin and Greek and make connections between words. In our work on algebra students noticed "equal" and "equation" have the same root and could therefore easily remember the difference between an equation and an expression. Out of the work on etymology students were able to start making informed guesses on the meaning of any unfamiliar mathematical words that they came across. The best example is when confronted with an instruction telling them to bisect a line, students were able to reason that bisect is similar to the words bicycle and dissect so guessing that bisecting a line has

something to do with cutting in two.

I had anticipated that this strategy would be most useful when teaching shape and indeed it works particularly well with this topic. I was surprised how well using etymology worked in algebra topics and some number topics too.

Recording use of mathematical words

This intervention was carried out during the first three weeks of term three. Each lesson, one student was nominated to become the literacy monitor and had the responsibility of recording each use of mathematical language by students during the lesson, firstly by writing down the word used and then making a tally mark each time it was repeated.

Researcher observations

There were some issues with this strategy. The literacy monitor often struggled to keep up with writing all the words down, as towards the beginning of the lesson several mathematical words would be used in quick succession. The monitors were also finding it difficult to concentrate on the work they needed to complete during the lesson as they found it hard to focus while they were listening out for mathematical words being used. Another issue arose when some

students started shouting out random mathematical words not related to the lesson in progress and then continually asking if they were being recorded. This was highly disruptive to the lesson and was the reason the brief was modified to say that the mathematical word had to be used in the context of the current lesson. On the positive side the strategy did make students more aware of the language being used in class and how mathematics has its own special vocabulary.

Brainstorming

This strategy was introduced in the second week of term four. Brainstorming involved students creating spider diagrams about everything they knew about a topic including related words. The diagrams below give an example using the words *ratio* and *proportion* and *percentage*.

Research observations

This was an effective strategy as even students who knew little mathematical language could use their language knowledge to give themselves hints or reminders about what the topic involved. I also observed that issues related to misunderstanding key words is perhaps less of an issue with these classes than I had previously thought.

FIGURE 1: SPIDER DIAGRAMS SHOW STUDENTS KNOWLEDGE OF THE TOPICS 'RATIO AND PROPORTION' AND 'PERCENTAGE'

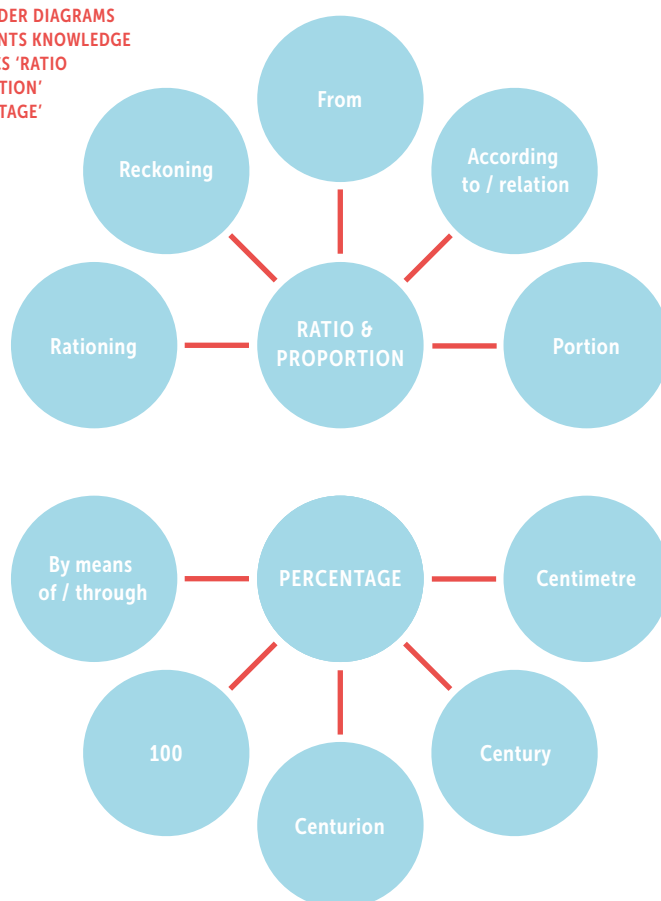


TABLE 3: THE MOST SUCCESSFUL LITERACY FOCUS APPROACHES

Literacy approach	Level of success
Nonsense questions (Year 11)	High – enabled students to realise similarities between exam questions
Maths dictionaries (Year 11 & 7)	High – the pictures and diagrams help support understanding and language used in the definition tends to be simple and easy to understand
Vocabulary starters (Year 11)	Medium – a useful way to reinforce language that students were expected to know and acted as a further revision strategy
Interpreting the questions (Year 11)	Medium – useful for some pupils to help unpick the maths requires to solve the problem
Rewriting the question (Year 11)	Low – this took too long and diverted attention away from maths
Crossing out (Year 11)	Medium – helped to highlight the superfluous information included in word questions but had limited use
Logic puzzles (Year 11)	Low – pupils could not see the connection to maths and thought time was being wasted
Emphasis on using mathematical vocabulary (Year 7)	High – pupils appeared to improve their maths vocabulary
Recording correct vocabulary (Year 7)	Low – the approach taken in implementing this made it difficult for pupils to act as both recorder and complete maths work and it encouraged disruptive behaviour in class.
Brainstorming (Year 7)	High – encouraged and offered opportunity to record learning progress and broaden maths vocabulary
Etymology of mathematical words (Year 7)	High – pupils were more able to infer meaning from words and subsequently solve maths problems

Very often students chose to include their knowledge of etymology on their brainstorm and the brainstorming helped students to make further connections between different topics. On one occasion I heard a student remind his friend that an eight sided shape was an octagon not a pentagon and he should have remembered this because October used to be the eighth month of the year. Another advantage of this strategy is that students can return to their brainstorm at the end of a lesson and in a different colour pen update the diagram with all they have learned during the lesson. This was something that the students found to be a simple and effective way of demonstrating progress.

Correction of mistakes with mathematical terms

The use of correct mathematical language was worked on throughout the intervention process. Once introduced to a mathematical word, students were then expected to use it correctly in all future lessons. One example of this was that students had to always use the words numerator and denominator rather than top and bottom of fraction.

Researcher observations

To begin with students needed some teacher prompting if they used the wrong words but very quickly I found that students would start to correct first each other and then themselves mid-sentence. This strategy was aided by the short intervention of recording use of mathematical language and like that strategy contributed to students feeling more mathematical and grown up. By the end of the intervention period I felt that always

using the correct mathematical language had become a classroom norm.

Repetition of mathematical vocabulary

Like the use of mathematical dictionaries and the correction of mathematical language this strategy was used throughout the intervention period. In any lesson where there was the opportunity for language links to be made between words and topics, this was highlighted for students so that any connections were reinforced. An example of this would be if the class was working on algebra then when dealing with equations the link to equal would be made but there also might be a reference to equilateral triangles.

Researcher observations

Once again this strategy started with the teacher being the person that made the connections explicit, by the end of term four students started to make connections themselves and were keen to show off their knowledge to any visitor to the classroom. Like with the use of correct mathematical language I felt that by the end of term four this had become a classroom norm.

Final thoughts

Table 3, above, summarises the relative success I think the literacy focus approaches had with the class/es they were used with.

Personal reflection

Literacy does have an important place in the mathematics classroom. I now use literacy in every lesson I teach and have come to understand that literacy means so

much more than just writing sentences or an essay. I have found my own solutions to the problem of students having difficulty interpreting the question and been able to equip students with a range of strategies to use. I have also discovered how easy it can be to introduce literacy in mathematics to students at the start of their secondary school careers. I have picked three techniques that I would like to see more use of across my department.

- Nonsense questions
- Dictionaries
- Making mathematical language explicit. **R**

References

- Abedi, J. & Lord, C. (2001). The language factor in mathematics tests. *Applied Measurement in Education*, 14 (3), 219 – 234.
- Adams, T. L. (2003). Reading mathematics: More than words can say. *The Reading Teacher*, 56 (8), 786 – 795
- Adler, J. (1998). A language of teaching dilemmas: Unlocking the complex multilingual secondary mathematics classroom. *For the Learning of Mathematics*, 18 (1), 24 – 33
- Carter, T.A. & Dean, E.O. (2006) Mathematics Intervention for Grades 5–11: Teaching Mathematics, Reading, or Both? *Reading Psychology Vol. 27* (2-3), 2006 127-146
- Draper, R. J., & Siebert, D. (2004). Different goals, similar practices: Making sense of the mathematics and literacy instruction in a standards-based mathematics classroom. *American Educational Research Journal*, 41(4), 927-962.
- Friedland, E., McMillen, S. & del Prado Hill, P. (2010). Moving beyond the word wall: How middle school mathematics teachers use literacy strategies. *NCSM Journal of Mathematics Education Leadership*, 13(1), 6-18.
- Hopkins, M.H. (2007) Adapting a Model for Literacy Learning to the Learning of Mathematics *Reading & Writing Quarterly Vol. 23* (2), 121-138
- Lager, C.A. (2006) Types of Mathematics-Language Reading Interactions that Unnecessarily Hinder Algebra Learning and Assessment *Reading Psychology Vol. 27*, (2-3) 165-204
- Lemke, J. L. (2003). Mathematics in the middle: Measure, picture, gesture, sign, and word. In M. Anderson, A. Sáenz-Ludlow, S. Zellweger, & V. V. Cifarelli (Eds.), *Educational perspectives on mathematics as semiosis: From thinking to interpreting to knowing*. 215 – 234
- Lott Adams, T. (2007) Reading Mathematics: An Introduction. *Reading & Writing Quarterly Vol. 23* (2) 117-119
- Lott Adams, T. & McKoy Lowery, R. (2007) An Analysis of Children's Strategies for Reading Mathematics *Reading & Writing Quarterly Vol. 23*(2), 161-177
- Matteson, S.M. (2006) Mathematical Literacy and Standardized Mathematical Assessments *Reading Psychology Vol. 27* (2-3), 205-233
- O'Halloran, K. L. (1999). Towards a systemic functional analysis of multisemiotic mathematics texts. *Semiotica*, 124 (1/2), 1 – 29.
- O'Halloran, K. L. (2000). Classroom discourse in mathematics: A multisemiotic analysis. *Linguistics and Education*, 10 (3), 359 – 388.
- Pugalee, D.K. (1999) Constructing a Model of Mathematical Literacy, *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 73(1), 19-22
- Schleppegrell, M.J. 2007. The Linguistic Challenges of Mathematics Teaching and Learning: A Research Review. *Reading and Writing Quarterly* 23(2) 139-159
- Sfard, A., Neshet, P., Streefland, L., Cobb, P., & Mason, J. (1998). Learning mathematics through conversation: Is it as good as they say? *For the Learning of Mathematics*, 18 (1), 41 – 51.
- Veel, R. (1999). Language, knowledge and authority in school mathematics. In F. Christie (Ed.), *Pedagogy and the shaping of consciousness: Linguistic and social processes* (pp. 185 – 216). London: Continuum.
- Vukovic, R.K. & Lesaux, N.K. (2013) The language of mathematics: Investigating the ways language counts for children's mathematical development *Journal of Experimental Child Psychology*, Volume 115 (2), 227–244

Optimising in-class support of English as an Additional Language (EAL) learners in science



I joined St. Mark's Academy in 2013 as a Teaching Assistant in the EAL department. As part of my role I am responsible for providing in-class support for new arrivals in Key Stage 3 (KS3) and Key Stage 4 (KS4) English, Maths and Science. Notably from the admission records, the EAL cohort at St. Mark's Academy makes up more than half of the entire student population. The cohort is composed of learners from Eastern Europe, South America, Africa, and Asia. The EAL department arranges for new arrivals to be interviewed and assessed using specially designed tests for reading, writing and spelling. The results are then used to support learners in a way appropriate to their needs. The outcome from the assessments informs the correct level of support required for each learner.

The learners are then grouped according to their needs and support staff are informed who they need to support. Every member of the support staff is allocated a tailor-made timetable reflecting the support they are to offer each pupil in their care. The department groups learners according to stages of language development as follows:

- **Group 1 Beginners group (Year 7):** Learners who understand/speak little or no English.
- **Group 2 Advanced Beginners (Year 7):** Learners in this year group are developing communication skills with a variety of vocabulary and beginner-students more able to communicate with a variety of vocabulary and syntax.
- **Group 3 Beginners KS3:** This group of learners are diverse; some lack a range in verbal and written English while others are more able to communicate using variety of vocabulary and syntax.
- **Group 4 Advanced Beginners KS3:** A more developed group with advanced skills in spoken and written English.
- **Group 5 EAL KS4:** Mixed-ability learners in Years 10 and 11.

Project background and focus

The study was driven by a desire to explore useful strategies that can optimise support for EAL learners in science lessons. In my personal experience of working with EAL learners I found most require support in basic literacy and numeracy skills. They face even more obstacles while simultaneously trying to learn science in English. This is supported by KS3 attainment data, which shows EAL learners are underachieving in science compared to their peers.

The school improvement plan hopes to increase the percentage of students attaining 5A*– C grades including Maths, English and Science at KS4. The major shift in the school improvement is to set targets towards 4 levels of progress. Focusing on this study on EAL pupils



studying KS3 Science will provide useful information that can help develop the way we support our learners for the next stage of learning.

Methods

I conducted an online survey with 13 newly-arrived KS3 EAL learners admitted between 2014 and 2015. The aim of the survey was to gauge learners' attitudes and perceptions of science lessons in the academy. Participants were emailed five questions and asked them to respond by emailing their responses back to me.

Key findings

Results showed that 12 out of the 13 respondents enjoyed learning science at St Mark's. Interestingly the survey showed these EAL pupils had a greater preference for listening to teachers talk over other approaches to teaching, with nine indicating they found learning science easier during lessons when the teacher was giving verbal explanations. Two pupils indicated they found learning easier when there was a visual element included, with one indicating they had a preference for drawing pictures based on the lesson. The final respondent indicated they had a preference for doing experiments.

Just under half the group also expressed the view that behaviour was an important factor affecting their ability to learn science. Six respondents strongly disagreed behaviour was very good in lessons, with four agreeing it was good and two strongly agreeing. The

remaining respondents neither agreed nor disagreed.

Unsurprisingly the biggest obstacle learners highlighted to learning science was the language. A learner in Year 8, when asked to explain the meaning of habitat, said: "Sir I know but but can't explain it". The participants expressed a positive view about the effectiveness of learning science keywords. Many respondents believed that learning science keywords helped them to understand things easily while others relied on them more to help access new learning and understanding.

Recommendations and future thoughts

The preference for EAL learners towards teacher-led lessons may indicate they are not comfortable working independently or engaging in different forms of activities that require initiative. One explanation for this could be low proficiency in literacy. Strategies that teaching assistants employ to support pupils with EAL are valued by pupils (e.g. the teaching of key words) and teaching assistants continue to be an important resource. The department could look at investigating other methods used to support pupils and the relative importance of different strategies in different subjects. The views of the participants also highlight the importance of good behaviour for learning in classrooms and the impact that poor behaviour can have on EAL learner ability to follow the lesson in topics where language barrier is particularly acute. The EAL department could encourage better understanding of such issues amongst all teachers and students. **R**

Investigating student engagement in physical geography

St Mark's Academy is a multi-cultural secondary academy in South London with 800 students on role. The school and surrounding catchment is located within a dense urban environment with limited access to many aspects of physical geography and until recently there has been limited funding for fieldwork opportunities. Students have limited opportunity in their lives outside school to experience rural locations, visit coastlines or see mountains – all of which are physical geography experiences.

Another perceived barrier to learning physical geography is the high proportion of children with English as an Additional Language (EAL) and the proportion of pupils with a low reading age at St Mark's. As physical geography requires an understanding of a large amount of specialist terminology, children with lower reading ages find it difficult to fully understand topics and therefore do not engage in lessons.

In my current role as geography teacher at St Mark's, I have observed a lack of engagement among pupils learning physical geography, which is also reflected in pupils underperforming in their physical geography exams particularly when compared to human geography. Inman (2006) states that "there is evidence of poor understanding and lack of confidence as well as motivation among students with regards to physical geography". This research is based on the premise that engagement within lessons is important and has a direct relationship with student understanding and attainment (Marks, 2000), school retention and favourable lifelong outcomes (Taylor and Nelms, 2006) as well as social and psychological wellbeing (Goldspink and Foster, 2013).

Method

The purpose of this research was to explore the preferred pedagogical practices of students to help inform future teaching practices within the geography department with a view to improving student engagement.



TABLE 1: RESEARCH LESSONS

	Lesson 1	Lesson 2	Lesson 3
Pedagogical approach	Teacher-led	Student-led	Fieldwork
Topic	Weathering and Erosion Processes	Coastal Features, Wave Cut Platforms	Investigating coastal features
Activities	Teacher led tasks; fill in the blanks and textbook diagram based study.	Student led investigation, using angel cake to create their own Wave Cut Platform in groups two, with one student cutting the cake and the other student writing down their observations.	Fieldwork to the Dorset coastline. Field sketches and measuring Long Shore Drift.

The research was conducted in two parts. The first part was a preliminary study that helped inform what different pedagogical practices could be used during my main investigation. It consisted of teacher interviews and Year 9 lesson observations of physical geography and science. Science was chosen due to links in the curriculum to physical geography, and the similar use of specialist terminology. Using the findings from these interviews and observations, I implemented three different pedagogical approaches categorised here as 'teacher-led, student-led and fieldwork' (see figure 1). All participating students were asked to complete a survey after each lesson. One focus group was conducted with five students to expand on survey questions, comprising a range of different ability levels. I also observed two pre-selected students within each class to focus on how the students engaged with the lesson activities.

Key findings

The findings from the first stage of the investigation are discussed (teacher interviews and Year 9 observations), followed directly by findings from the second stage (pupil focus group, observations and questionnaire).

Key finding 1: Specialist terminology, combined with textbook based learning, is perceived to be a barrier to student engagement

Teacher interviews and lesson observations during phase one of the investigation showed a link between the use of specialist terminology and textbook activities in lessons and low student engagement in lessons. Teachers attributed this to two factors: poor literacy levels and a lack of basic knowledge carried forward from primary school. One teacher said it was difficult to "accurately teach all of the physical processes" as a result of the low literacy levels. Another teacher indicated physical geography was "taught poorly at primary school" if at all, resulting in "students

struggling to grasp some of the most basic concepts". This was confirmed through observations.

Analysis of the data from questionnaires and focus groups also suggested that the 'teacher-led' lesson (See Table 1 for description) did not engage students. Some students commented this lesson was "boring", only 65 per cent of pupils believed they had concentrated in this lessons compared to 81 – 85 per cent in the following two lessons (which used different pedagogical approaches). One student stated their lack of concentration was because they "did not like reading lots of text and writing a lot". Interestingly, the higher ability students interviewed identified that "the comprehension task was easy because all the answers were there", and that they were "just happy to get on with it". This suggests engagement levels could be associated with literacy levels.

Key finding 2: Allowing students to become 'active learners' through group work or active learning tasks increases student engagement

During Phase 1 teachers of science and physical geography stated the most effective ways of engaging students were through 'active learning tasks' that involve students becoming animated in the lesson. For example, moving to collect information from posters, or through completing scientific practical activities that promote student investigation and questioning. Teachers believed student's preferred these lesson types, with a teacher of science stating that students prefer "lessons which have lots of practicals" because they can investigate what happens for themselves. There is some agreement for the literature; Watkins, Carnell and Lodge (2007) suggest that "when teachers are more supportive and less controlling, students demonstrate higher levels of intrinsic motivation and self-determination". With this in mind, the second lesson in this investigation involved students learning about wave cut platforms through eroding an angel cake.

Student questionnaires showed an increase in reported engagement between the first teacher-led lesson and the second student-led lesson, with a 15 per cent more pupils saying they were engaged. The questionnaire also showed that after the coastal cake lesson pupils were keen to learn more about coasts. This ties in with Brophy (2004) who stated that it is possible for students to "become motivated to learn from an activity whether or not they find its content interesting". One of the students in



the focus group said: "I felt very involved as I was the one 'eroding' the cake away while another person in my group was writing down what we found". Another student stated: "it gave us something to remember. I'm going to remember cutting a cake instead of writing stuff down. It helped us imagine it".

Although physical geography does not initially appear to 'lend itself to enquiry', it can be generated through the use of small-scale models of geographical features in real life. This requires teachers to think

2001). These lessons show a link between situational interest and engagement, identified by Ainley (2012) as a "core psychological process energising and directing students' interaction with specific classroom activities" (Ainley, 2012).

Key finding 3: Fieldwork makes physical geography more relatable to student's lives

The importance of fieldwork was highlighted by teachers in phase 1. They believed that it generates greater

showed particular enthusiasm when "[they] discussed how the different features were formed themselves" and "generated their own questions to answer about the location".

Reflection and recommendations

This investigation found that within St Mark's there are several challenges to student engagement in physical geography, and other science subjects which require an understanding of specialist knowledge. This investigation explored how self-reported and teacher-observed student engagement levels change when different pedagogical approaches were used. The lowest level of engagement, particularly among students with lower literacy levels, were evident in teacher-led lessons. In order to increase engagement, teachers should move students from being 'passive' to 'active' learners where possible using a variety of pedagogical approaches in and outside the classroom. Teachers can achieve this through creating situational interest, either through practical experiments or fieldwork. **R**

'Observation of field work showed this was an important way of making physical geography more relatable to students. All students who responded to the questionnaire enjoyed the fieldwork and felt engaged throughout.'

outside the box when it comes to modelling. Through the techniques proposed by Inman (2006), geography can be brought to life in student's imaginations (Trend; 2008). Teachers can facilitate lessons where students discover and investigate through "use [of] conversation to develop their own thoughts" (Zwiers and Crawford,

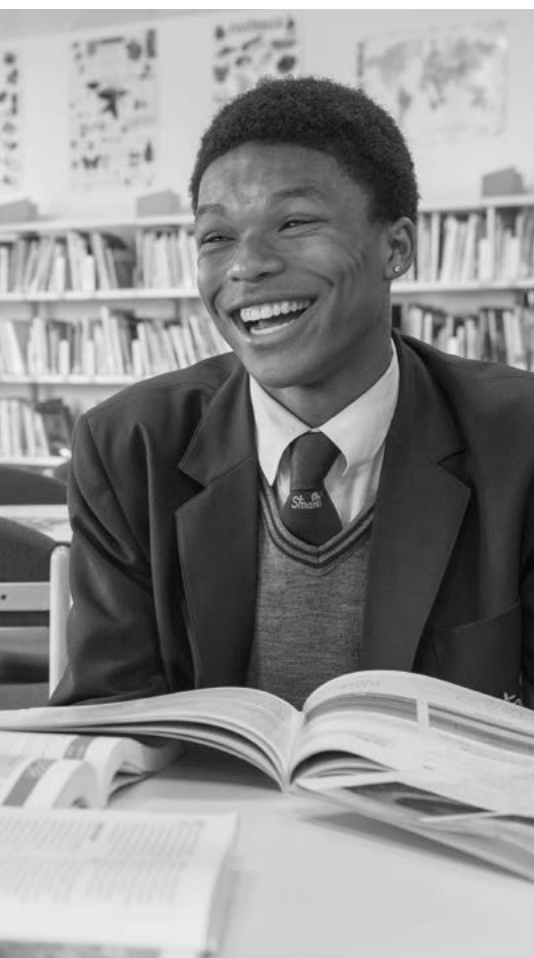
engagement and interest in topics: "the best way to increase engagement about a particular topic is to be able to organise and run exciting field trips which can help the students put what they are learning into perspective". This is supported by the literature which suggests "local fieldwork investigations can positively impact upon student experience" and in turn improve their "opinion of geography as a subject" (Kilford, 2013). Bolye (2007) believes that fieldwork should engage pupils on an emotional level, promote confidence and positive relationships and encourage deep learning.

Observation of field work showed this was an important way of making physical geography more relatable to students. All students who responded to the questionnaire enjoyed the fieldwork and felt engaged throughout. Students commented they "liked being in a different place", that "seeing the arch in person let me think about how it was made" and "[they] felt involved just by being there because we could see what [they] have learnt in lessons in real life".

Overall, the 'hands-on' experiences emphasised the importance of student investigation in physical geography. Interest was generated, motivation increased and engagement improved as a result. A teacher observing the fieldwork noted that students

References

- Ainley, M. (2012) Students' Interest and Engagement in Classroom Activities in S.L. Christenson et al. (eds.), *Handbook of Research on Student Engagement*. Springer. P283-302.
- Boyle, A., Maguire, S., Martin, A., Milson, C., Nash, R., Rawlinson, S., Turner, A., Wurthmann, S. and Conchie, S. (2007) Fieldwork is good: The student perception and the effective domain. *Journal of Geography in Higher Education*, 31. 2. P299-317.
- Brophy, J. (2004). *Motivating students to learn*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Goldspink, C. and Foster, M. (2013) A conceptual model and set of instruments for measuring student engagement in learning. *Cambridge Journal of Education*. 43. 3. P291-331.
- Inman, T. (2006) Let's get physical, in D. Balderstone (eds.), *Secondary Geography Handbook*, Sheffield: Geographical Association.
- Kilford, A. (2013) The impact of local fieldwork investigations on student experience in geography. In Elwick, A. and Riggall, A. (2013) *Action research at St Mark's Academy 2013*. CFBT Education Trust.
- Marks, H. M. (2000). Student engagement in instructional activity: Patterns in the elementary, middle and high school years. *American Educational Research Journal*. 37. 1. P153-184.
- Ofsted (2011) *Geography: Learning to make a world of difference*. Ofsted ref: 070044. Accessed: 11/05/2015. Link: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/413723/Geography_-_learning_to_make_a_world_of_difference.pdf
- Ofsted (2015) *School Inspection Handbook*. Ofsted. Accessed: 22/02/15. Link: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/391531/School_inspection_handbook.pdf
- Taylor, J., and Nelms, L. (2006) *School engagement and life chances: 15 year olds in transition*. Life Chances Study stage 7. Fitzroy, Vic: Brotherhood of St Lawrence.
- Trend, R. (2008) *Physical Geography (secondary)*. Geographical Association. Accessed: 12/12/2014. Link: <http://www.geography.org.uk/gtip/thinkpieces/physicalgeographysecondary>
- Watkins, C., Carnell, E. and Lodge, C. (2007) *Effective Learning in Classrooms*. London: Sage Publications.
- Zwiers, J and Crawford, M. (2001) *Academic Conversations- Classroom Talk That Fosters Critical Thinking and Content Understanding*. Stenhouse Publishers, Portland, Maine.







STUDENT ATTITUDES TO LEARNING

Assessment of student engagement and strategies to increase positivity to learning

This section contains two studies. The first explores the perceived impact of a Year 12 reading mentor programme on Year 7 pupils. The second study is student-led piece that looks at girls' attitudes towards PE and ways of increasing motivation and enjoyment of the subject.

What impact does a Year 12 reading mentor programme have on Year 7 attitudes to reading, writing, speaking and listening skills?



St Marks has experienced many changes within the SEN team. One change has been the way in which it supports reading for pupils transitioning from primary school. On entry to St Marks, Year 7 students undertake reading and spelling tests. If the results demonstrate that a student's reading age is below their chronological age intervention strategies are put in place. Some students receive focused intervention either in the form of small groups or 1:1 support. One intervention strategy is the 'Shared Reading' programme.

The shared reading programme has been used by the Academy because it encourages peer teaching and learning. Students are divided into pairs or threes and take turns reading aloud to each other. Students can have the same reading ability or be mixed ability (for example combining a more fluent reader with a less fluent reader). Each student reads and then receives feedback about their own and their partner's reading skills from their reading mentor.

Historically, the Academy's shared reading programme has been delivered by Teaching Assistants (TAs). TAs acted as the reading mentors. Changes to the structure of the SEN department meant they were unable to deliver the programme. To overcome this, St Marks introduced sixth form reading mentors to read with students identified as having a low reading age.

Research aims

Research suggests that mentoring can help develop positive '... behaviour... and attitudes to learning' (Clutterbuck, 2012). The aim of the research was to explore if and how Year 12 reading mentors supporting the development of positive attitudes to reading, writing, speaking and listening skills of Year 7 pupils.

The reading programme

In order for the Year 12 students to deliver the reading programme they received a short training programme about the reading process. The training covered phonics, word recognition, grammatical knowledge and knowledge of context. During the Phonics session, we discussed the fact that some students need to be supported with the sounds of letters. *Word recognition* reminded the reading mentors that some students may not recognise key words in the story therefore may never be able to speculate meaning when reading a story. *Grammatical* theory reminded the mentors that knowledge of grammar helps us to make sense of what is read. Finally, discussing knowledge of *context* reminded us that we use our knowledge of how books and other written texts work to help us make sense of what we are reading. The aim of the training was for the sixth formers to be clear about what their area of focus could be when mentoring Year 7 students in their reading.



The training was delivered during three, 50-minute enrichment lessons. During this time Year 12 students were also trained in how to record progress made during the reading sessions they had with their mentees. The Year 12 students also attended a safeguarding course.

Methodology

Fourteen Year 7 students were invited to join the reading programme. The students were divided into pairs or small groups. They read with their mentor for approximately 15 minutes per day, twice a week. Chronologically age appropriate books designed to suit the students' reading age were made available for students to select. In order to explore if and how the programme supported Year 7 students to develop positive attitudes to reading, writing, speaking and listening skills a range of sources of data were collected and analysed.

Student questionnaire and group interviews

Students were given questionnaires and interviewed. Questionnaires asked a combination of open and closed ended questions to allow respondents the opportunity for extended comments (Bell, 1993). The questionnaire was completed by nine out of 14 students who attended the reading programme. It was divided into three sections. Section one focused on exploring the relationship the student had with their mentor and the behaviour management strategies that were employed. Students were asked to rate given statements from one to four, one being excellent and four unsatisfactory. In section two,

students were asked questions about their reading, writing, speaking and listening skills. Section three asked about their enjoyment of the reading programme.

Semi structured interviews were used as another method to collect data to find out if, and in what ways, the Year 7 pupils thought the Year 12 pupils helped them to develop their reading skills. However, I was also aware that the responses could be swayed because of the group dynamics. There were strong personalities who tried to control the conversation and also those who were reluctant to speak (Wilson, 2013 p.70). Students were interviewed in their reading groups in an attempt to mitigate against this. They were asked if and how the reading programme helped them to develop their reading writing, speaking and listening skills.

Key findings

Positive reports and improvement in reading ages

The findings from this research suggest the Year 12 reading mentor programme is having a positive effect on the Year 7 students taking part. The research participants believed that the Year 12 reading mentors have helped to improve their confidence in reading, writing, speaking and listening skills. In addition, the mentor programme has contributed to the improvement of some students' reading ages. A reading assessment was carried out nine months after the students started the programme. The results showed that in most cases the reading and spelling age increased between six and 12 months over

an eight-month period; two students reading age remained the same. While these improvements cannot be linked directly using the methods employed in this study the correlation is interesting.

Relationships between mentor and mentee

Students were questioned about their relationship with their reading mentor. Seven out of nine students questioned said they had an excellent relationship with their mentor, one stated it was 'good' and another 'satisfactory'. Overall, students were positive towards having sixth form students as mentors opposed to teachers.

"Yes it was fun because: we got stickers, we read epic books like 'Killer crock'. I'd prefer to read with sixth formers because she's fun and very, very, very reliable!"

While the research identified how much the students appreciated the time spent with their mentors, it also highlighted the disappointment experienced by pupils when the mentors did not arrive or arrived late. When one student was asked if he would recommend the Year 7 reading programme to Year 6 students he responded:

"I would recommend it. They need a reliable person to read with. Sometimes my mentor did not come to get me."

This comment stresses the importance of the relationship between mentor and mentee. A relationship built on trust and reliability is a vital ingredient in the reading mentor programme.

Behaviour

Anecdotal evidence revealed that the reading mentor played an important role with regards to behaviour. Year 12 students were observed questioning mentees if they were seen outside of the classroom during a lesson.

Seven out of nine students questioned said behaviour during the reading programme was 'excellent' with the remaining two suggesting it was 'good'. This shows that whilst the young people struggled with reading they were able to remain engaged; any behaviour issues were quickly rectified or managed by the Year 12 mentor.

Reading, writing, speaking and listening

The young people were asked if the shared reading programme had

helped them develop reading, writing, speaking and listening skills. This area of questioning links with Government guidelines which suggest that, particularly for underperforming pupils, these skills should be a focus for inspectors. All students questioned said that the reading programme had helped with their reading. Students commented:

"My confidence has grown. I am happy to read books in class. I've been buying books. I'm buying two new ones. I am buying books I would not expect to read. I read with my family and friends, school and class."

"I used to stutter a bit on some words because I was nervous. Now this does not happen."

"When a teacher is speaking she may say a word that I have come across in a book I have read."

Five out of nine students questioned responded to the question about how reading helped with their writing by saying that their writing skills had improved. Further questioning demonstrated the impact of the reading programme on mentees. One student responded to further questioning: *"In primary school I read a lot, in secondary school it helps me to write stories. I write words I don't know down, look them up and use them in my story – e.g. 'baffled' "*

Another said: *"Reading has helped me learn new words and better writing."*

Reflection

The study has shown that the use of Year 12 students to act as mentors to Year 7 pupils on a shared reading programme has had a positive effect on the reading, writing, speaking and listening skills of the group involved. Re-testing of Year 7 students reading age demonstrated that most had improved. **R**

References

- Clutterbuck, D. (2012). <https://books.google.co.uk/books?id=Q0sEupdVh20C6pg=PA204&dq=sixth+form+reading+mentors&hl=en&sa=X&ved=0CC8Q6AEwAGoVChMio5GgyvTaxglVwRgeCh1W0QfL#v=onepage&q=sixth%20form%20reading%20mentors&f=false>. Retrieved 07 Tue, 2015, from Google books:
- Bell, J. (1993). Doing your research project (4th ed.). Buckingham: Open University Press.
- Wilson, E. (2013). School-based Research. London: Sage.



Pupil perspective: How to improve girls' attitudes towards physical education

I have been a student at St Marks Church of England Academy for the last three years and I am now going into my fourth year. Throughout these three years it has come to my attention that a lot of girls in my year (Year 9) do not enjoy Physical Education (PE) and try to avoid taking part. I have always wondered why as I enjoy it so much.

Most girls would just not turn up to the lesson, some would not bring kit and some would simply refuse to take part. These avoidance tactics would disrupt the other students from their PE lesson, as teachers had to deal with these students. As a student who loves PE and sport in general, it is my aim to get girls more involved in it. This research aims to gain a better understanding of how to develop girls' involvement and attitudes towards PE.

Methodology

I created a survey with a series of open and closed questions. This gave me qualitative and quantitative data on what the girls thought of PE. I gave it out to 20 girls in my year. They were all of a different ability in sport, so that I could get a better understanding from people with a range of different views about PE. The survey asked the girls their opinion on how mixed groups (boys and girls in one group) had an impact on their participation in their lessons, if they enjoy PE currently, what would make them enjoy PE more and what are the top three sports they have enjoyed doing so far.

I also asked the three PE teachers questions on what they thought the cause of the problem was and also what things could be done to improve girls' attitudes towards Physical Education. These questions were posed to all three members of staff at the end of this year. The PE teachers were asked if they noticed a lack of enthusiasm and effort from the girls they teach; what they think are the causes of any issues noticed; whether they think all-girl groups are better for

girls' engagement in the subject; what sports girls enjoy most and what else can be done to engage girls in PE lessons.

Conducting this study in Year 9 is particularly interesting because the students get put in different groups. Some girls are in an all-girl group and others are in a mixed group. This allowed me to investigate which groupings would motivate girls to take part in PE and enjoy it the most.

Key findings

A total of 17 out of 20 girls preferred to be in an all-girls class rather than being in a mixed class. Girls often worry about getting criticised by the boys due to their ability in sport and that they feel more comfortable doing PE around girls. Typical responses were about feeling more comfortable with girls and less criticism: *"I feel more comfortable and I don't get criticised...and...it gets too rough"*.

The PE teacher's views showed agreement. All said that the majority of girls are enthusiastic about PE, when they are in single sex classes. Staff felt that mixed groups are not effective in Years 10 and 11. One teacher commented: *"They feel more comfortable in older years [to be in all-girl class]; although in Year 7 and 8 it works well having mixed classes."* The girls who took part also expressed a preference for having female PE teachers and having a say in the sports they do during lessons.

Reflections

Based on this small survey the school could consider its policy regarding the groupings for PE lessons and extend the option for all-girls PE lessons to all year groups. In addition, the school could consider bringing female sports leaders into the school, so that the girls have a sports role model to look up to. It would also be good to experiment with letting the girls choose their sport to make them look forward to PE. **R**



MIDDLE LEADERS

Professional development and the role of middle leaders in increasing attainment

Three studies place focus on the role of middle leaders. All reports accept middle leaders have a part to play in increasing attainment by working together and working with teachers in their respective departments. The first report looks at strategies that help increase attainment in Year 13 through the use of data. The second study investigates a professional development programme for middle leaders and the final study focuses on exploring the role of middle leaders to reduce within-school variation in pupil outcomes.

What strategies help to increase the attainment of students in Year 13?

In 2012, Ofsted stated that “the sixth form is good. Numbers of students are low but continue to grow. Students’ achievement is good” (Ofsted, 2012. p.2). In 2013 – 14, the attainment of the sixth form decreased significantly. Only 70 per cent of students achieved an A*– E grade at A2 and 22 per cent attained A*– C in A Levels or equivalent qualifications such as L3 BTECS. A total of 22 students were in Year 13 in 2014.

I was appointed as Vice Principal in charge of sixth form in May 2014 following a one year secondment to the leadership team. Once appointed, I set out my vision to transform provision, raise the attainment of learners and improve student destinations.

Methodology

This research aims to explore and develop a better understanding of how middle leaders can increase the attainment of students in Year 13. It also involved the development

and implementation of a consistent approach to the way middle leaders reflected and acted upon data to ensure that pupils made progress.

In order to understand how to raise attainment in Year 13, I implemented three different strategies. These all involved the use of data. The perceived impact of each intervention was measured through middle leader perceptions of the usefulness and effectiveness of each strategy. Year 13 examination results were used to identify whether improvements in attainment took might have taken place, though it is not possible to attribute any such improvements specifically to the strategies evaluated in this study.

The strategies

The first strategy involved me delivering a whole school professional development session every six weeks following a whole school data submission period. St Mark’s asked staff to enter a professional prediction for every student in Key Stage 5 (KS5) every six weeks. I wanted to make sure that sixth form data was shared frequently. It was important to me that data was in a format that staff could understand. I communicated the percentage of students predicted by their teacher to



achieve A*– C grades and A*– E grades in each subject against the overall targets. By breaking it down by subject, I was able to provide each department with a bespoke and detailed list of targets and predicted attainment in their area. The six-week data collection periods also offered opportunity for tracking pupil progress against predictions and targets. During the professional development session, I highlighted which students were underperforming and therefore needed intervention. At the end of the professional development session, Heads of Department (HoD) were asked to complete a 'response to data' task. See figure 1.

The second strategy I embedded was the use of student intervention plans called 'finger on the pulse' sheets. Students highlighted as underachieving were to be placed on one of these plans in each subject. The subject teacher was responsible for setting the targets and actions. See figure 2.

The final strategy I used was one-to-one data meetings with each HoD. Here I asked subject leads to present their *response to data*, *finger on the pulse sheets* and *intervention plans* for each student underperforming. I also used this time to offer my support to every HoD in the form of time or resources. See figure 3 which shows how these were structured.

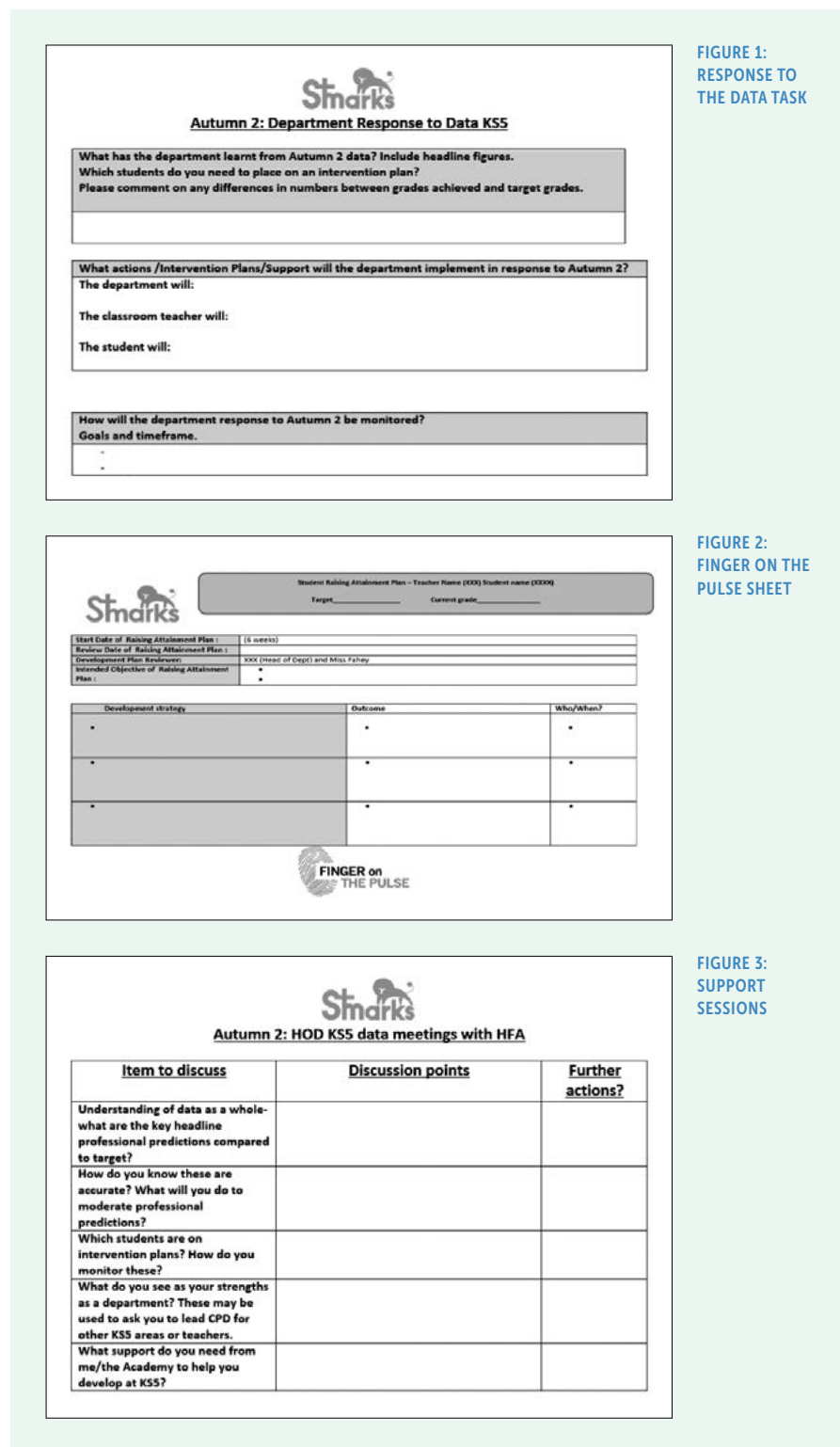
In order to gain insight about which of these strategies (or the combination of strategies) were effective, and how, I asked staff to complete a questionnaire. The questionnaire included closed and open ended questions and allowed me to gather both quantitative and qualitative data. A total of 10 members of staff completed the questionnaire. Finally, I was able to use the exam results in 2014 to assess results at KS5 and see if any improvements could be seen that may be correlate with the strategies implemented. As mentioned earlier the methods used in this study do not allow any causal relationships to be established even if correlation is evident.

Findings

Whole School professional development

All members of staff (10/10) were positive about the professional development sessions that made data more visible to them. The majority of staff explained that these sessions made it is easy to visualise student progress and gain an awareness of who needed intervention. One colleague stated;

"The data meetings are always very informative and by giving us a global view of student performance, we can see what it is we need to



do subject by subject, class by class, student by student to drive progress. Over time we can then see if the gap closes or stays the same and analyse reasons why this is the case."

Similarly, another explained:

"I was able to clearly identify which students required intervention and how close they were working to their targets. It provided me with an oversight into the whole class and where I needed to focus on key skills for students."

Finger on the pulse sheets

All members of staff thought the 'finger on the pulse sheets' had some impact on their ability to raise attainment. Six staff stated that these had a 'considerable impact' on their practice. Staff shared that these provided an opportunity for teachers and students to spend valuable time together setting relevant goals to increase attainment and progress. One colleague explained;

"I was able to clearly express and identify what skills and topics students needed to work on. I was able to communicate this

to student and set clear SMART goals with them."

Four HoDs stated that these intervention plans had a little impact on their practice. One colleague stated:

"The finger on the pulse sheets are excellent in theory but when I spoke to students and discussed them, the majority had not used them effectively. This tells me that staff are not using them effectively and so from September, we need to make this part of the teacher's toolkit and higher profile."

This shows that there was inconsistency among staff when it came to using these plans to raise attainment. Having reflected on the questionnaires it is evident that time was an issue for some colleagues. For example, some staff had over 10 students in their class on intervention plans. This may have affected the time available for each one and subsequently limited the quality and perceived impact.

One-to-one data meetings with Heads of Department

One of my aims was to involve HoDs in the process of raising attainment in Year 13. When asked about the impact of the 'one-to-one data meetings' all colleagues stated that they had a 'considerable impact' on their ability to raise attainment. The main reasons were linked to the opportunity to talk about areas of concern. As well as this, it allowed a more in depth look at underperformance. Finally, it also gave each HoD a chance to ask for support if they needed it.

One HoD explained;

"This meeting gave me the opportunity to go back to the department and really look closely and work with the team on the areas



that were of concern. I was able to go away and change some of the target grades and speak to students about this area. HFA was very helpful and supported my decisions with the Enterprise department."

Improvements in results

Over the year there was a dramatic increase in attainment (see figure 4) and although not proven, it seems likely that these results are related to the strategies and use of

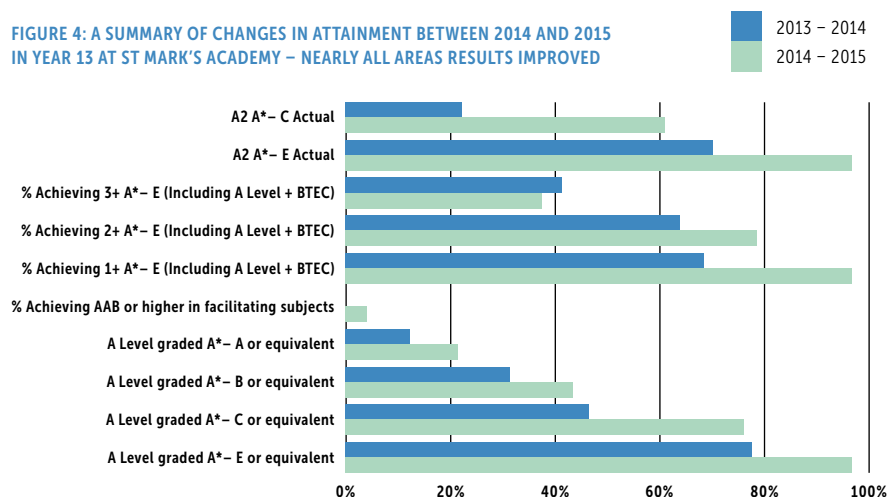
data employed. This model for sharing and responding to data is one that should be adopted again with continued evaluation and impact tracking.

As a final question, I asked staff what else they believe we need to do to raise attainment in Year 13. Several responses centred on the idea of introducing personal learning checklists in sixth form. This is something I will be working with the Vice Principle in charge of assessment on this year.

Reflection

The research has been useful and allowed a structured reflection on the new strategies implemented. The strategies employed all showed promise in terms of supporting improved attainment in Year 13. All were well received overall but require some amendments and greater consideration to the time available for staff to really use them fully with students. [R](#)

FIGURE 4: A SUMMARY OF CHANGES IN ATTAINMENT BETWEEN 2014 AND 2015 IN YEAR 13 AT ST MARK'S ACADEMY – NEARLY ALL AREAS RESULTS IMPROVED



References

Ofsted (2012) St Marks Church of England Academy Inspection Report, 3rd October.

Assessing a bespoke offering for Continuing Professional Development

St Mark's Academy is a 'good' school – the Ofsted report from the 2012 inspection made reference of the need to; "increase the efficiency of the Middle leaders by sharpening their ability to self-evaluate, with clear measures of success for their department". This research looks at the bespoke Continuing Professional Development (CPD) offer for all Heads of Department, Middle leaders and Teacher and Learning Responsibility (TLR) post holders, to gain a better understanding and appreciation of how best practice can be shared and disseminated across St Mark's.

The Joint Practice Development (JPD) offer allows colleagues the opportunity to work collaboratively in trios to share strengths, techniques and strategies that enabled them to complete their job most effectively. This in turn, should have a positive impact on pupil progress, teaching and learning and classroom practice as colleagues would find the best way of working to fulfil their role in the classroom and beyond. The intention was also to develop the quality of middle leadership to ensure that best practice was common place across all areas of the Academy.

The most recent staff survey showed that staff identified their colleagues and the working relationships they have as the most important contributor to staff well-being. JPD has been a key part of the CPD cycle at the Academy for a number of years – but traditionally with a specific focus on teaching and learning. The aim for this research was to explore JPD as mechanism for modelling good practice across departments as well a CPD offer. The development of

leadership at every level continues to be a priority for the Academy and strategies such as this could enable the strengths of highly skilled practitioners to be harnessed and shared.

Methodology

Creating trios

At the start of the programme twenty participants were asked to complete a 'skills passport' that would identify their key areas of strength in their job role that they would be able to offer other colleagues, as well a self-identified area of development. Trios were then matched as closely as possible according to what support could be offered as well as gained from the grouping.

Programme structure

It was an expectation that all trios would meet at least three times, so that each member could be supported using whatever strategy was deemed most appropriate to help them meet their intended outcome. A number of suggested strategies were given to support the initial planning process such as creative problem solving or planning without the practitioner, but trios could also come up with their own to meet the needs of all the participants and their specific job role.

An example strategy

One participant who was a Head of a Department responsible for numerous subjects beyond their own specialism, wanted to develop ability to manage people outside of his own subject area. The strategy adopted was to interview another Head of Department who was already successfully managing a large number of subjects so that key actions could be implemented and transferred to his own area. His intended outcome was for; "improved leadership of the new area and the successful utilisation of time." Through the use of an interview





strategy he wanted to; *look at the expertise in understanding the structures, content and resources needed for better leadership of the area. Also looking at how time is managed with regards to this.*" Through the use of his structured questions he would then be able to make a highly specific action plan to enable his department to be taken forward to successfully incorporate the new subjects which was indeed his intended outcome.

Each of the 20 participants was asked to complete a questionnaire at the end of programme. The questionnaire asked how successful they felt they were at achieving their intended outcome as well as identifying the barriers they had encountered. Of the 20 participants, 17 questionnaires were completed and returned.

Key findings

All the participants agreed that they were at least 'fairly successful' at achieving their intended outcome, with one trio reporting that they had been 'very successful.' Participants believed that time restraints and the difficulty in arranging a suitable, mutually agreeable time to meet as being the most common barrier in preventing a more successful outcome.

"There was just no shared free periods or a common time after school when we could all meet."

Most participants found that it was virtually impossible to meet as a trio, so they would often meet in pairs and communicate via email, which impacted on the nature of the collaboration. One group also struggled when a key group member left before the programme ended and again prevented them from being 'very successful' with their outcomes. Eight of the participants said they perceived there to

have been a 'considerable impact' on at least one aspect of their job role and another eight said there had been 'some impact.' Only one participant claimed to have felt no impact.

"This has helped me to develop my practice in an area that I felt uncomfortable and not confident with."

The participants were asked to consider what strategies or techniques they found most beneficial and the vast majority of people said 'it was the opportunity to collaborate with colleagues. This took the form of collaborative meetings, joint planning sessions or simply the opportunity to meet and share ideas. 16 participants said they were 'likely' or 'highly likely' to participate in JPD in the future. The one participant who disagreed explained that this was because they were leaving their job.

Reflection

JPD is clearly a well-regarded CPD opportunity for middle leaders and TLR post holders at St. Mark's. The vast majority of colleagues positively bought into the programme but some felt frustrated by factors that prevented the programme from being fully successful. Noticeable barriers included time constraints and the inability to find a suitable opportunity for all members to meet. All but one participant felt they could gauge the positive impact on their ability to carry out their role as a direct result of the programme. Colleagues identified that having the opportunity to meet and collaborate with one another, was by far the most important strategy to help develop them in their job role and as middle leaders. More time needs to be taken to group colleagues more effectively, taking into account not only the skills that they can offer but what opportunities there are for them to regularly meet. **R**

Reducing within-school variation: How can middle leadership help?

Writing in October 2011, William Stewart explained that, "it is the differences in performance within schools, rather than those between them, that are key to raising education standards" (Stewart, 2011). In 2002, the Organisation for Economic Co-operation and Development (OECD) revealed that 80 per cent of the variation in pupil outcomes from school students in the UK comes from within schools (OECD 2002). This is four times more than the variation between different schools, contributing to the UK education system's high level of variation in pupil outcomes, which is one of the highest of the world's developed nations (Stewart, 2011).

This research aims to explore the role of a Head of Department in relation to reducing within-school variation, with the goal of finding strategies that Heads of Department

can use to improve attainment in their subject areas and close the gap with other subjects. The research explored five examples where Heads of Department successfully improved Key Stage 4 (KS4) attainment, across two different schools. This case study approach was used to analyse different factors that affect attainment at the department level.

In 2009, the National College for School Leaders (2009, p.6) provided a list of five important factors that they outlined as contributing to a whole school approach to reduce within-school variation. These five factors were:

- The effective use of data
- The role of the Head of Department
- Teaching and learning
- Student voice
- Standardising procedures

This research has used this list by exploring each of the five factors at the Head of Department level, in order to investigate which factors a Head of Department could most successfully employ.

Context

St Mark's Academy has developed considerably as a school since it opened in 2006. Faced with the challenge of transforming the negative image of the previous school, St Mark's used its Christian ethos and values to drive positive change. After being given 'notice to improve' in its June 2009 Ofsted inspection the academy was graded 'satisfactory' in September 2010 and then 'good' in October 2012. The academy is now driving towards its goal of being recognised as an 'outstanding' school.

One potential barrier to achieving this is that KS4 attainment is not consistent between different subjects. In 2014 GCSE results varied from 85 per cent of students achieving a C or above in French, and 72 per cent in English, but only 14 per cent of students achieving a C or above in Geography. In 2007 Reynolds spoke of 'pockets of excellence in schools', which others can learn from. As the incoming Head of Humanities, it was evident that there were excellent practices elsewhere in the academy, and also in other schools, that could potentially support improvements in attainment in humanities subjects.

The number and prior attainment of the students in the different subject groups varied, but the key indicator in table 1 was the difference between the target and the achieved grade in different subjects. This demonstrated a considerable variation between subjects and departments.

A second school (School X) was also chosen for this. School X was chosen because it had successfully introduced initiatives to reduce within-school variation in the past, and there were three established heads of department who were willing to share strategies and challenges they had overcome in order to improve KS4 attainment in their department.



Methodology

This research used an interpretive approach to examine two case studies where middle leaders have contributed to the reduction of within-school variation. Primary research was carried out in two different schools. Every element of the research was focused on the key question: *What are perceived to be the most effective strategies for a Head of Department to use to reduce within-school variation?*

The selection of participants was based on potential individuals who were believed to be best suited to the particular research question. However, this leaves the potential for bias or subjectivity, the participant selection process outlined by Ritchie, Lewis and Elam (2003) was used to select the most useful and reliable participants, who would generate the most valuable data.

In addition to the five interviews with Heads of Department (two within St Mark's and three

TABLE 1: TABLE TO COMPARE GCSE PERFORMANCE OF DIFFERENT DEPARTMENTS AT ST MARK'S (RESULTS FROM 2014)

Subject	English	Maths	Religious Education	Geography	Sociology	History	French	Business Studies	Sports Studies
Department	English	Maths	Humanities	Humanities	Humanities	Humanities	MFL	Business & Enterprise	PE
Target	73%	81%	75%	50%	87%	94%	91%	58%	48%
% of students achieving A*– C in 2014	72%	58%	52%	14%	66%	52%	85%	19%	0%
Difference to target	–1%	–23%	–23%	–36%	–21%	–38%	–6%	–39%	–48%
Student numbers	151	151	137	21	29	49	33	21	23
National picture: % of students achieving A*– C	62%	62%	72%	69%	49%	68%	70%	65%	70%

Highlighted boxes include those subjects that I became responsible for in 2014 (the four humanities subjects studied at GCSE in St Mark's)

in School X), interviews were also carried out with school leaders in both schools, and the data officer of School X. In total, eight semi-structured interviews took place, all with a focus on middle leadership as a method of reducing within-school variation.

'The two most important features in terms of rapidly improving attainment and reducing in-school variation were reportedly the role and effectiveness of the Head of Department and the collection and use of data.'

Key findings

The Ofsted publication of 2011 stated: *"Headteachers and senior managers provide the vision but middle managers effect the long-term changes, which will raise standards and improve the quality of education"* (quoted on Teaching Leaders; 2016) is a good contextual statement that describes the actions taken by the five heads of department that took part in this study. Senior leaders in both schools set the parameters and the whole-school inspiration for positive change, but the heads of department made a critical difference at the department and classroom level. There was a clear difference in the overall approaches of St Mark's and School X to tackling within-school variation. Typical of schools in challenging environments with a history of low attainment, initiatives at St Mark's tended to be more top-down, with less room for Head of Department initiative and even less for teacher-led initiatives. Here, Heads of Department had to fulfil Morley and Hosking's description of 'continuous negotiation' in order to be able to achieve any changes (Morley and Hosking, 2003).

The two examples of Heads of Department at St Mark's saw them playing the role of being, *"a buffer, bridge and broker, in order to ensure the overall culture of integration... without appearing to undermine the position of their subject colleagues"* (Bennett, 2006:13). In terms of senior leadership views both departments had been able to embed new ideas effectively, and had successfully managed to keep teachers in their departments onside, whilst also fulfilling all of the school's expectations (e.g. in terms of regular observations, data analysis and rapidly improved attainment).

Both departments had created an atmosphere of 'teamwork and collegiality' (as outlined by Morley and Hosking, 2003), which created an environment of stability within the department, as well as opportunities for professional dialogues and a shared approach

teaching, and standardising procedures) were seen as important but not among the most important factors. This table is based on the author's interpretation from interview data, and not on a ranking scale given by the Heads of Department themselves.

Role and effectiveness of middle leadership (Head of Department)

Of the five strategies, participants thought that the most powerful was the role and effectiveness of middle leadership (the particular Head of Department). Given that all participants were Heads of Department this is perhaps not surprising. In all five examples the Head of Department gave accounts that suggested the way they managed their department had been critical in determining the success of the department. Each Head of Department demonstrated a strong sense of identity within their department and managed relationships well with colleagues at all levels. They drew a direct link between these actions and the successes in terms of attainment.

Collection and use of data

All five Heads of Department spoke about how valued the effective use of accurate data is. The analysis of this and the subsequent appropriate interventions implemented were thought to have been important in improving their departments' KS4 attainment. It is important to note that although the way in which the five individuals used data and embedded it in their day-to-day practice varied slightly, they all agreed on its ability to reduce within-school variation, or a further improvement in attainment.

Quality of teaching and learning

The quality of teaching and learning, perhaps surprisingly, was not thought to amongst the

to challenges that presented themselves (Bennett, 2006). Despite working in a challenging environment, these two heads of department successfully has managed to make a positive change and raise attainment significantly in their departments.

Table 2 summarises which factors the five middle leaders perceived to be the most important in reducing within-school variation, as identified by the 2009 NCSL report. According to the participants in this study all had played a part to a greater or lesser extent.

The two most important features in terms of rapidly improving attainment and reducing in-school variation were reportedly the role and effectiveness of the Head of Department and the collection and use of data. Listening and responding to student voice was the least widely used and thought to be the least effective. The other two areas (quality of

TABLE 2: TABLE TO SUMMARISE THE IMPORTANCE OF DIFFERENT FEATURES AS A PRIORITY FOR RAISING ATTAINMENT FOR THE FIVE DEPARTMENTS EXPLORED THROUGH THE CASE STUDIES

NCSL recommended feature for reducing within-school variation	Collection & use of data	Role & effectiveness of middle leadership (Head of Department)	Quality of teaching & learning	Standardising procedures	Listening & responding to student voice
St Mark's – Dept. 1	4	5	3	3	2
St Mark's – Dept. 2	5	5	4	5	2
School X – Dept. 1	5	5	4	3	1
School X – Dept. 2	5	5	4	4	1
School X – Dept. 3	4	5	4	2	2
Total Score	23	25	19	17	8

Scale Explanation at the department level (author's interpretation)

5	Top priority in the department as a strategy to raise attainment; this is effective and has had a significant impact
4	Very important as a strategy to raise attainment; this has had an impact in raising attainment
3	Clearly seen as beneficial to raising attainment, but not as significant as other features especially in the short-term
2	This is seen as having some impact, but is low priority and seen as more time consuming than vital for the time being
1	This is barely mentioned, and is not put forward as a strategy for raising attainment

most important strategies for reducing within-school variation. There is evidence suggesting that there is a correlation between excellent teaching and learning and high attainment of students (see for example Hattie, 2013). All five Heads of Department agreed with the fundamental importance of high quality teaching and learning but perhaps did not see this as a distinct and unique aspect of their role and responsibility. In both schools there was a whole-school strategy that addressed teaching and learning. In St Mark's this was a top-down approach, which involved regular observations and feedback, whilst School X took a peer-to-peer approach where individual teachers worked together to disseminate good practice. In both cases, the role of the Head of Department was not directing and therefore did not feature in their accounts as something within their control in the quest to raise attainment in their departments.

Standardising procedures

Analysis of the participant's views on standardising procedures showed the greatest disagreement between the five middle leaders. One Head of Department valued this highly, with all teachers teaching the same schemes of work and introducing the same assessments on a fortnightly cycle. This standardisation was thought to be a key driver of the department's success. This example came from the schools which had experienced the most recent difficulties and perhaps it can be argued

that the standardising of procedures is more important in challenging schools where a rapid improvement is required. Standardising procedures enables good practice to be shared and closer monitoring to occur, although it was also liked with stifled creativity. Participants thought that Heads of Departments in schools where attainment is high and consistent can place less emphasis on standardising procedures, confident in the knowledge that the teachers in the department know how best to achieve successful results and operate best with the freedom to do this as most suits their teaching characteristics and the nature of their class and students.

Listening and responding to student voice

Although none of the five strategies were viewed as unimportant by the heads of department, it was evident that some were valued less highly than others. The least commonly used strategy, according to the five middle leaders, for raising KS4 attainment was the use of student voice. Their comments suggested that while this was useful it was less important than other strategies, and was often, therefore, side-lined in favour of more pressing needs in the school.

Reflection

The original aim of this research was to explore different strategies that five successful Heads of Department have used to reduce within-school variation, and to provide

strategies that could be used elsewhere. The following points are highlighted by the analysis of participant views:

The head of department role is thought to be critical in improving attainment at the department level

Heads of Department have a challenging, and balancing role, which involves diplomacy skills as they take attempt to be, *"a bridge, a buffer and a broker"* (Bennett, 2006 p.13), particularly in challenging environments. It has been argued that when this is managed, a strong Head of Department has the potential to have a considerable influence over attainment in the department. There is scope for further research into different characteristics that Heads of Department display, and different leadership styles. This could help other Heads of Department to identify strengths or areas for development, and it could also assist senior school leaders as they develop middle leaders in their schools.

The effective use of data is an important strategy

Other Heads of Department could use this conclusion to evaluate the effectiveness with which they use data in their own roles. Further research could explore this in greater detail, with the possibility of drawing out specific methods of using data at the department level that have been shown to be effective.

In terms of informing me, as a new Head of Department in a challenging school, the key lessons that can be learnt are to use data effectively and to carefully examine my own role and effectiveness in relation to raising attainment across the different subjects within the department. **R**

References

- Bennett, N. (2006). *Making a difference: a study of effective middle leadership in schools facing challenging circumstances*. National College for School Leadership, Nottingham UK.
- Hattie, J. (2012) *Visible Learning for Teachers: Maximising Impact on Learning*. Routledge.
- Morley, I. E. and Hosking, D. (2003) *Leadership, learning and negotiation in a social psychology of organizing*, in Bennett, N. and Anderson, L. (eds) *Rethinking Educational Leadership*, London, Sage, 43-59.
- National College for School Leadership (NCSL) and Training and Development Agency for Schools (TDA) (2009) *Reducing in-school variation: Making effective practice standard practice*, National College for School Leadership.
- Organisation for Economic Co-operation and Development (OECD) (2002) *Performance and Engagement Across Countries: Results from Pisa 2000*. Accessed at < <http://www.oecd.org/edu/school/programme/forinternationalstudentassessment/pisa/33690904.pdf> >.
- Reynolds, D. (2007) *Schools Learning From Their Best (the within school variation project)*, National College for School Leadership.
- Stewart, W. (2011) *In-school variation is the bane of British education*, in *TES Magazine* (published 28 October 2011). Accessed at < <https://www.tes.co.uk/article.aspx?storycode=6124276> >.
- Teaching Leaders (2016) Accessed at <http://www.teachingleaders.org.uk/who-we-are/mission-and-values/why-middle-leadership/>





EFFECTIVE FEEDBACK

What makes effective feedback?

The final theme is based on a school-wide research project that looked into effective feedback. This research involved teachers across all subjects, in addition to a school-wide survey of 500 pupils.

School-wide research: What are the features of effective feedback?

The focus of this small-scale research project was to investigate the characteristics of effective feedback. It reviewed the current academic literature and detailed the small-scale exploratory research project undertaken at Oxford Spires Academy between September and November 2014.

Oxford Spires Academy opened in January 2011 on the site of Oxford School and is one of a growing number of CfBT academies. Oxford Spires serves the East Oxford Community and a richly diverse student body. Approximately half of the students at the school speak English as an additional language. Oxford Spires is a highly aspirational school. It achieved a 'good' in the most recent Ofsted inspection (2013) and is moving towards 'outstanding'.

Literature review

The issue of teacher feedback has received considerable focus in contemporary teaching pedagogy; a wealth of research

studies heralding its impact on learning have been published during the last 50 years (Butler and Nisan, 1986; Bangert-Drowns et al, 1991; Kluger and DeNisi, 1996; Black and Wiliam, 1998). Feedback is now generally regarded to be crucial for improving knowledge in educational contexts (Shute, 2008).

Feedback and its facets may be well defined as "information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning" (Havnes et al, 2012) and is considered to be a primary component in formative assessment (ibid). There is now a weight of evidence to suggest that, where used effectively, it can promote progress, motivation, engagement and reinforce cognitive processes such as restructuring understanding. In a meta-analysis of feedback research undertaken by Hattie and Timperley (2007), it was found that of all the influences on student progress, feedback produced the greatest effect (0.79). This was contrasted to commonly debated areas of pedagogy such as homework (0.41) and reducing class sizes (0.12).

Historically, views of effective feedback evolved from heavily quantitative methods - with a reliance on grades to assess and track student performance. Acceptance of a constructivist learning theory, where the learner is at the heart of a knowledge assembly, has changed teaching pedagogy to value written and constructive feedback (Bruno and Santos, 2010). Grading places an emphasis on the task and is too 'ego-involving' (Tanner and Jones, 2005, p.65); it may promote self-image but ultimately lead to deteriorating performance. For the poorly motivated - termed 'helpless children' (Black, 1998) - who believe that if they fail there is nothing they can do about it, the assigning of a grade with little or no guidance on how to progress could reasonably be demotivating. Butler and Nisan (1986) demonstrate this effect through research to consider the effect of feedback, grades and no feedback on motivation. A total of 261 students from the sixth grade in American schools, with a mean age of 12.3 years, were recruited to the three intervention groups. In support of their hypothesis, there were significant differences in levels of intrinsic motivation. Performance was benefitted by task-related feedback and harmed by both grading and no feedback. Whilst caution must be exercised in generalising results from a limited American middle-class sample, they do add weight to the support for high quality feedback in teaching.

Despite this evidence many students still receive little or no meaningful feedback on their work (Lassonde, 2008). This may be the result of many factors, such as the appropriacy of feedback, timings and examination pressures. However, progress and learning in schools is not maximised as a result. In reviewing the available literature, Hattie and Timperley (2007) found that, whilst mentioned frequently in research, there is little focus on the meaning of feedback in classrooms. Literature is often conflicting and there are few consistent results (Shute, 2008), making application to the classroom subjective and unclear, and causing variations in feedback practice between both schools and teachers within schools. There is much anecdotal evidence regarding the merits and de-merits of having a whole school marking and feedback policy but little available literature.

During a two-year intervention project in Norwegian secondary schools by Havnæs et al (2012), student and teacher interview data was collected from three core subjects during a period of school development





planning to assess the effectiveness of current feedback methods. Researchers found increased emphasis in educational policy to incorporate robust feedback models, however it was not consistently the case that feedback in its current form led to positive results. Indeed, all of the schools were identified as having a poor culture for formative assessment. Voerman et al (2012) goes further to claim that the amount of feedback in schools currently is very low, perhaps only amounting to seconds each day. Furthermore, where it is used it is often overly positive with little constructive content.

What makes effective feedback?

The question of what makes effective feedback has been extensively reviewed in contemporary literature. When beginning an evaluative process, teachers must first assign clear and relevant criteria for success. In an

early literature review by Natriello (1987), setting criteria that will assure that students are not evaluated on aspects of their work that were not covered during instruction is advocated. In order for students to appreciate and make use of the feedback they receive, they must have had adequate opportunity to demonstrate their current ability (Rudman et al, 1980; Linn, 1983). Failure to do this may result in non-specific and meaningless feedback and create a poor school atmosphere for formative assessment and progress (Voerman et al, 2012). Whilst Natriello (1987) acknowledges that teachers must often assess aspects that are not linked to instruction, such as effort and conduct, they should consider whether this is entirely appropriate or be of benefit to the learner.

Hattie and Timperley (2007) echo these findings in their report on meta-analyses conducted in the field. They state that 'feedback has no effect in a vacuum' and

must be in relation to specific learning outcomes to be successful. There must be a learning context to which feedback is given, and can only come second to the tasks engaged with following the initial instruction. Failing to do so may be threatening to students, undermine the feedback process and have little effect on criterion performance – where students fail to relate the evaluation to what is already understood. To overcome this, Hattie and Timperley (2007) suggest a three-stage model for structuring high quality feedback; the concept of specific objectives relates closely to the first aspect of feeding-up. This should tell the student 'where am I going?' through use of such clear objectives. Next, a constructive evaluation is built by identifying a student's current level through feeding-back. Finally, clues are given that identify how to fill the gap between this and the desired level – termed feeding-forward. This model is both logical and simple to follow, however,



requires further elaboration to guide classroom teachers into an effective process of application.

Task vs. individual feedback

Successful feedback should be firmly focused on the task and not the individual. In a meta-analysis by Kluger and DeNisi (1996), it is found that the effectiveness of feedback decreases as its focus moves along the hierarchy towards self and away from task. It is when the review of performance becomes too tied to the individual that it does more to promote self-esteem or self-image than it does progress. Whilst it is counter-argued that feedback must not be overly negative if teachers are to maintain motivation and a positive learning environment (Burnett, 2002; Brookhart, 2007) Kluger and DeNisi (1996) advocate treading the fine line carefully between these two such that the benefits of both are retained.

In example of this, Kluger and DeNisi (1996) review the early 20th century feedback process termed the 'Law of Effect'. This holds that good performance is associated with reward and poor with punishment. The authors conclude that this is too heavily weighted towards extrinsic motivation for the feedback to be truly internalised by the student.

Voerman et al (2012) draw on the psychological and managerial literature base to help provide a clear guideline for teachers on enacting this advice. Again, a balance between positive and negative review of current performance is recommended. However, they suggest that the most easily internalised feedback for students should still be largely positive. Where negative comments are given, defensive responses are elicited. Not only does this reduce the willingness of individuals to heed advice but also the likelihood of them remembering the feedback they are given Baumeister and Cairns (1992, cited in Voerman et al, 2012). It is concluded that the most effective feedback is based on a positive to negative comment ratio of at least 3:1 and should not exceed 11:1. In an empirical study of this recommendation as applied to educational environments, Voerman et al (2012) found that of the 78 teachers recruited from eight Dutch secondary schools, 44 per cent did not utilise a ratio similar to that suggested. The authors conclude that whilst there is some support for the 3:1 theory, more research is required to ensure applicability in the classroom.

There is a growing body of evidence which supports the value of dialogic feedback for students. Dialogic feedback is defined as *"a process of purposeful communication demanding engagement from staff and students"* (Coxon, 2012). This method involves both parties in the action of providing feedback and is active as opposed

to passive writing on a page. The anecdotal and early evidence suggests that as students are involved in this feedback, they hone vital skills as opposed to becoming obsessed with individual assessment criteria. Hughes argues that facilitating feedback which focuses upon progress of an individual learner as opposed to the achievement of assessment criteria ensures that feedback is more meaningful for students and therefore makes them more likely to engage with it (Hughes 2013).

Specificity

In determining the nature of feedback given, a literature search and review by Shute (2008) draws on educational research to formulate a list of helpful and unhelpful approaches in fostering quality feedback. It is suggested that feedback must first be specific, clear and succinct; students must be able to both hear and access the comments they are given in order for them to internalise and comprehend their next move. If students see feedback as non-specific, it may lead to frustration and a view that it is useless (Williams, 1997, cited in Shute, 2008) and require more involved information processing on the part of the learner in order to understand. It is a primary intention of feedback that students should come away from the process with a clear idea of where they need to improve and how they can go about it. If feedback lacks this clarity then there is a risk that the uncertainty will lead to reduced motivation to approach it (Shute, 2008). This notion is echoed by Brookhart (2007), who goes further to say that teachers must prioritise their targets; trying to correct everything will demotivate and reduce clarity. Instead we must identify the aspects most relevant to the learning goals. Shute (2008) advises, however, that the concept of what constitutes 'specificity' is itself not very specific in the literature and could lead to confusion for practitioners on implementation.

'It is suggested that feedback must first be specific, clear and succinct; students must be able to both hear and access the comments they are given in order for them to internalise and comprehend their next move.'

Furthermore, in a study by Phye and Sanders (1994), students were assigned to either a general advice or specific feedback intervention. They found that those given specific feedback were more beneficial to progress in a task involving retention of new learning. However, they advised caution in using specific feedback on so called transfer-tasks, where students move on to a new activity and where no significant difference was gleaned from use of specific comments. It is more likely that specific feedback is beneficial for only some learning outcomes.

Shute (2008) also recommends that feedback should be goal-directed. In helping students to bridge the gap between current and expected level, goals that are perceived to be achievable do much for improving motivation and progress. Such goals must be meaningful and followed-up to guide the learner towards their attainment (Malone, 1981, cited in Shute, 2008). In pedagogical theory, goals can be classified as either learning or performance orientated; students may either be motivated by an intrinsic wish to increase competence and will persevere in the face of challenge – consistent with a view of intellect as changeable – or a desire to demonstrate competence and impress others. The latter is more consistent with a view of intellect as innate and can lead to withdrawal if the learner is unable to meet their goals. (Dweck, 1986). Knowing your students and tailoring goals to them accordingly may improve the success of feedback. Research has shown that using scaffolded feedback which motivates the learner's personal interest in the task, makes the task more manageable, clearly demonstrates the difference between current and desired work and reduces frustration and risk may target such differences and refine constructive feedback efforts (Bransford, Brown and Cocking, 2000).

Communication

Linking to the former point, feedback must be appropriate in terms of language and complexity and should have a clear goal. For feedback to be effective, it must be able to be clearly understood by both parties. "Firstly, tutors need to know how to give good quality feedback and secondly students need to be able to make use of good quality feedback" (Canning 2004.)

Timing

Brookhart (2007) argues that the timing of feedback is entirely dependent on the task involved. For example, instruction of facts

or concepts is likely to require immediate information about the accuracy of their answers and understanding before more complex tasks of application, synthesis and evaluation can take place. For learning that takes place over a longer period time – namely skills-based aptitudes – teachers should wait until they have enough information about the methods of the students work to make useful comments and targets (Brookhart, 2007). As Havnes et al (2012)

'Science is one such subject where immediate feedback may be more useful than delayed, and there is a relative dearth of research to explore the meaning of effective feedback in this area.'

advocates, feedback is likely to subject rather than school-dependant; it is unlikely that a prescriptive policy would work in all areas of the curriculum and should instead be adopted by specialist teachers who best know the demands of their subject.

Science is one such subject where immediate feedback may be more useful than delayed, and there is a relative dearth of research to explore the meaning of effective feedback in this area. In one study by Chin (2006), the use of immediate feedback on questioning was explored. Year 7 science lessons were audio and videotaped in Singapore schools to assess different styles of teaching. It was discovered that there was a common traditional triadic dialogue used (IRE); *initiation* of a typically closed, lower order question, *response* from the student and *evaluation*. However, the evaluative feedback was usually limited to praise or correction. Instead, like delayed feedback, evaluation should lead to a similar supportive dialogue and avoid grading or correcting. Teachers should consider whether they are prompting thinking or further questioning through their responses. Whilst skills acquisition and delayed feedback is utilised in science, the need for immediate feedback is a more common occurrence and overlooking this skill may significantly detriment progress (Chin, 2006). To remedy this, the author recommends that questioning in science should be teacher-led but not teacher-dominated; any input from the teacher should guide the learner into self-evaluation and improvement.

Bruno and Santos (2010) echoed this concern in science in their study of 8th grade, Portuguese students across the biology, chemistry and physics syllabus. Case studies, interventions and interviews were used to establish the current climate for feedback. They found that effective evaluation was seldom used by teachers in favour of a reliance on grading for tasks requiring immediate feedback. The authors made recommendations that comments should not reveal the answer

but instead promote student reflection. Where written comments can be used, they are likely to be more effective – allowing teachers more time and a better understanding of the work presented. Furthermore, whilst there will be variation between subjects on how easily this can be achieved, feedback quality is superior to its quantity; too many comments should be avoided but students should be given clear and revisited guidance on how to progress.

The conflicts in the evidence base regarding delayed or immediate feedback may not be incompatible; whilst delayed feedback may be superior in promoting transfer of learning and development of skills, immediate feedback may better support procedural skill acquisition in mathematics and science. Shute (2008) concludes that despite the great inconsistencies in evidence, it could be reasonably drawn that there are advantages to both methods so long as they are applied sensitively to the task being assessed. It is the responsibility of teachers to decide how feedback can be best delivered and received by students; immediate response is important in order to ensure secure understanding before advancing to the next level of instruction. This must not undermine efforts to provide high quality written feedback. It is a commonly voiced concern that the demands of this on teaching time make the use of such individual feedback impractical. Emmett et al (2009) investigated one method of providing succinct and 'fast-feedback' in a research study using 15-16 year olds in the Netherlands. Individual evaluation was provided through

teacher circulation. The authors found that student engagement and learning benefitted from the process. However, teachers did not always engage adequately with the proposed method. There must be freedom for teachers to decide how best to feedback to students in volume. The method of Emmett et al (2009) put significant demands on teacher time and I would suggest that its applicability may not extend to the target sample of secondary schools; leaving classes to be self-directed whilst individual discussions can be held may not benefit the engagement of all.

Conclusions from literature review

"Feedback is seen as the twin of assessment." (Canning, 2014). It can, therefore, be formulaic and given in the same method to all students. Conversely, the literature tells us that the best feedback is that which is regular, pertinent, timely, and specific and clear. Therefore, we may conclude that the most useful feedback of all is that which is personalised, communicated via a method which ensures understanding and valued by both the teacher and the student. Namely, the best feedback is personalised.

Methodology

This research focused on exploring correlations between the quality or type of feedback given to a student by a teacher and the student's subsequent progress in that

subject. This study is potentially significant as we believe that the quality of feedback, given in an accessible form to a student is vital for their progress and examination success.

The methodology has been primarily utilised to generate and analyse research data adopting a mixed methods approach; both qualitative and quantitative

The research respondents

The Oxford Spires feedback research group

A group of eight teachers representing different areas of the curriculum formed a research group to evaluate our preliminary research question on *"the importance of the quality of feedback in determining subsequent student progress"*. The colleagues involved in this report had various levels of teaching experience. Usefully, we had many Heads of Department who could also share how their department as a whole gave feedback. In addition to this, we had experienced teachers and Newly Qualified Teachers (NQTs) at the beginning of their career. Colleagues represented the following subject areas:

- English, (Head of Department)
- Mathematics, NQT
- Art, (Head of Department)
- Science, NQT
- Business Studies, (Head of Department and Experienced Teacher)
- Psychology (Experienced Teacher)
- Drama (Head of Department)
- MFL (Head of Department)

The preliminary meetings discussed how we approached giving feedback to students and later meetings focused upon the importance of how we communicate that feedback to students, and therefore our research question was amended to include the *accessibility* of that feedback to students. All teachers in the research group shared how they gave feedback in their particular subject area and then were given specific questions and provided case studies and information either face to face or written, as deemed appropriate by the participant that could be reviewed by other teachers. Finally, teachers self-evaluated how they gave feedback and wrote a self-reflective narrative so that a useful comparison of how feedback is given across the school could be usefully evaluated.

These case studies, teacher narratives regarding their use of feedback and interview findings are included in the Findings section of this report.

Whole staff participation

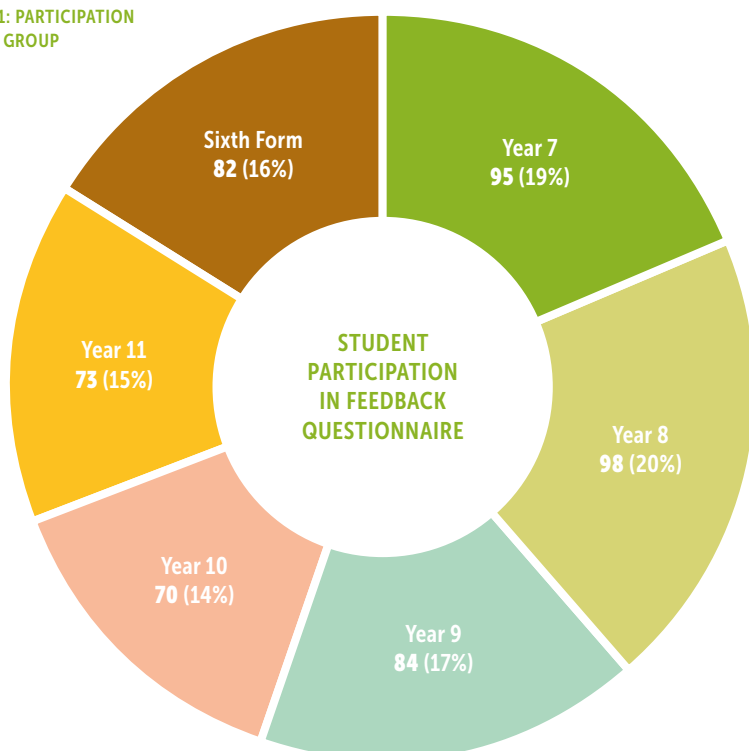
As part of our whole school Teaching and Learning initiative; all staff were invited to take part in aspects of this research. All teaching staff were invited to trial three specified methods of giving feedback to their students and to respond as to their usefulness in lessons. Staff gave their feedback both in person and via email. The purpose of inviting all staff to but secondly it was hoped that it would enable them to have the opportunity to reflect upon their own practice of giving feedback.

Whole student participation: student questionnaires

The whole school body was asked to complete an electronic questionnaire to discover their thoughts, feelings and opinions about feedback; namely the two areas our research group was most interested in, the quality and accessibility of feedback. The students were asked eight questions and the vocabulary was kept deliberately simple to enable all students aged 11 – 18 to access them. I was particularly aware of the needs of our EAL (51 per cent percent of our student body) and SEN members (23 per cent) of our student community.

Five hundred students at Oxford Spires Academy responded to a questionnaire designed to elicit their thoughts and feelings regarding the feedback they are given across their different subject areas. They answered questions posed on an online (Google docs) questionnaire.

FIGURE 1: PARTICIPATION BY YEAR GROUP



Additional external sources of information for this report

In addition to the interviews and questionnaires detailed above; the Literacy Co-ordinator provided additional information regarding the whole-school marking policy. A visit was made to an East London comprehensive whose current focus is feedback and a teacher at a school with a very prescriptive marking and feedback policy gave her opinions upon its usefulness in giving students a platform from which to make further progress. This information was presented to the Feedback group.

Ethical considerations and issues of access

The Headteacher authorised this research, the questionnaire and the interviewing of staff. The feedback group at the Academy comprised of adult teachers who participated of their own volition and have agreed to publication of their names, roles and responses in this report. All students were asked to take part in a questionnaire to ascertain their thoughts and feelings regarding feedback. All data from students is held securely on a password protected account and students only gave their names so that interesting comments may be followed up in future research.

Limitations inherent in this research

This research will necessarily contain several limitations. Firstly, not all teachers have been involved in its production and therefore it may be possible that some very good feedback practices have thereby been omitted. Secondly, similarly, not all students were interviewed following the whole-school data collection. However, the whole staff and student body have had the opportunity to participate in this report in addition to the external research which has been undertaken.

This project would lend itself to a larger-scale project in which further research was undertaken with reference to factors such as a student preferred learning style, SEN, EAL status and ability level.

Findings from the feedback research group and staff evaluation of feedback methods

The evidence presented draws on the data obtained from the interviews, self-reflective narratives and conclusions of the Staff Feedback Group; as detailed previously.

It also contains information from other colleagues regarding the employment of three distinctive marking policies. All teachers across the school were invited to critique these three different ideas for giving feedback as a springboard for pedagogical discussion and to trial with our own students. The selected methods are all policies which are currently advocated in contemporary research into effective feedback. These policies were: Dot Marking, Traffic Light Marking and The Use of Symbols.

The main purpose of this phase of work was to ascertain how staff in different curriculum areas give feedback to students and how this feedback impacts upon these students and their progress in a given subject. The group shared pedagogical ideas and noted similarities and differences in their own feedback practices and those of their colleagues. The responses from Oxford Spires staff highlighted a wide range of feedback methodologies and a teacher's *raison d'être* for the employment of these. The responses and subsequent investigations also allowed colleagues to communicate where they were already using the same effective practices across



the school but were not aware of this fact. This allowed for useful discussions about student progress and the evaluation of ideas pertaining to while school marking policies.

From the data elicited; I have chosen to detail the research findings into areas which I believe to be most salient and those which I wished to discover by conducting this research: namely the questions of the quality of feedback which is given, the accessibility of that feedback and a students' subsequent progress are fundamental to this research.

Different types of feedback are given across the curriculum; but largely fell into some distinctive areas. I have attributed the authors' comments to themselves in the case of classroom teachers. However inferred departmental-wide policies for those respondents who lead departments can also usefully be drawn.

Key Finding 1: The type and timing of feedback given to students is very important

The type of feedback which a student receives and the timing of their receipt of it influences their ability to use this information to help progress.

In drama, this was found to be very important. "The key factor was that a performer should be able to go away and work on a section immediately – instant progress is based on instant feedback." (Head of Drama). It was felt

functions; either formative or summative. (Head of English). Formative feedback is required whilst students are drafting work. Furthermore, verbal feedback was found to be more useful at this stage than written

'Maths feedback is also very useful when students are working on a problem, given that the method used is often more important than simply reaching the correct answer.'

that if a student didn't gain timely feedback, then certain incorrect practices may become ingrained and more difficult to eradicate. "The idea is that students should get and respond to feedback quickly – this doesn't allow them to keep making the same mistakes over and over again until they become a habit." (Head of Drama).

Feedback generally takes two forms – written and verbal – and usually has two

feedback. At this drafting stage, "One to one responses (for students) are highly effective as the teacher is intervening at the point of composition or analysis." (Head of English). Verbal feedback is given every lesson to enable students to improve all skills" (Modern Foreign Languages).

Maths feedback is also very useful when students are working on a problem, given that the method used is often more important than simply reaching the correct answer. "I go around the class giving feedback and use feedback marking exercises for Year 12 while they are working to help them to reach the correct conclusion." (Mathematics NQT).

Key Finding 2: Dot marking is useful for students of all abilities who are less confident in their abilities or worry about making mistakes

Dot marking was trialled with a bottom set Year 11 class who are anxious about making mistakes and not confident of their ability, but are aspirational and hope to achieve C plus. Walking around the classroom and placing a small dot next to an error allowed a student to correct that section without having any negative marks on their book and allowed them to take ownership of their progression. (Experienced English Teacher).

Dot marking is also anecdotally useful for A, G and T students who are upset by any negative markings on their books as they wish to always produce perfect work. (Feedback Group discussion).

It was not useful in subjects or for topics where answers are not right or wrong. "This is not a useful strategy for art. Art work is not right or wrong; it can be endlessly developed." (Head of Art).



Key Finding 3: Traffic Light feedback was felt to be highly effective for both teacher and peer assessment; with the caveat of it being differentiated to meet the exact needs of the subject and student.

This system was unanimously liked by the feedback group. It was decreed to be useful across the curriculum areas included in this report. The key in ensuring its success was in utilising its key principles whilst differentiating it to meet the specific needs of a particular subject area.

Business studies and Economics were already successfully employing this technique and extending it as required to allow for A,G,T students to be given "two or three questions, written for them specifically and based on their work," (Head of Business Studies). In sixth form, a slightly differentiated version which allowed for peer assessment was utilised with the colours indicating "purple perfect", "wobbly yellow" and "pink pants." (Experienced Business Studies Teacher). This version engaged students and was something they liked to use which did not lead to their feeling worried about making mistakes. A level students made tangible improvements by using this technique and "found it useful". (Experienced Psychology Teacher). Students who used this technique and who "made responses and referred to them in future, did improve." (Experienced Psychology Teacher).

It was useful in Maths. "The traffic light rating system helped my Year 11 intervention class to see the difference between what was completely correct and which sections still needed to be worked upon" (Mathematics NQT). In science, the method was useful for the engagement of a quiet group who were reluctant to work together or share ideas. This group "engaged very well and really understood what was required of them. It helped them to be more independent" (Science NQT).

The system does have its limitations - "traffic lighting alone is not effective enough for students to produce an improved response" (group discussion).

However, it is a very flexible technique and can be used in a wide variety of ways. "Traffic lighting is useful for students in terms of grades as it allows students to see where they are in terms of the grade boundaries and comments which relate to these boundaries can be made in red, amber and green." (Head of Art). Similarly, in Drama, this technique was employed but differentiated to meet the needs of the subject. "We put the traffic light methodology into a verbal context to

best suit the needs of drama students. Green showed students what was very good and should be kept, amber lead to modifications and red highlighted that a section needed to be removed completely"(Head of Drama).

Key Finding 4: Symbol marking was not found to be useful; with the exception of the employment of the Whole School Literacy Green Pen Policy.

This strategy was felt to be the most difficult of the three and teachers were concerned about symbols meaning different things in different lessons and therefore confusing students. This was the consensus of the Feedback Research Group with the conclusions that "continuity was the key" (Al West) when using any marking symbols. The

'Students appreciate individual feedback and like different approaches such as traffic lighting and peer assessing which have the added advantage of being time savers once students are used to their methodology.'

group agreed that the whole school policy which is already in place was useful, but the opportunity to confuse our students by using this policy was very great. The group felt that the fact that over half of our cohort are EAL would exacerbate this even further.

Key Finding 5: Students being in charge of improving their own work is key.

Inherent in this finding, is that students should feel that the feedback is their own. The Feedback group anecdotally cited many occasions on which students have compared written feedback or report comments and found them to be the same or so similar that they are disengaged from the pursuant findings.

Business studies overcomes this problem by "posing them questions individually which are based on their work." (Head of Business Studies). "The principle is that (all feedback) is given to enable the students to develop and improve their work." (Rebekah Finch). With disengaged or very quiet groups, involving them in their own feedback and subsequent improvement enables them to take ownership of their own studies and "helps them to become more independent". (Science NQT). Tim Thompson's use of

humour and peer assessment for a low ability Year 12 group has enabled them to make progress by involving and engaging them in that process. "Year 12 really liked the opportunity to use their own version of (the traffic lighting system) to improve and peer assess. (Experienced Business Studies Teacher).

Feedback Group Conclusion

Students benefit most from the employment of the type of feedback which most enables them to progress in the intended manner as rapidly as possible. Verbal feedback is as valid to students as written feedback; and in some cases, even more so. Students appreciate individual feedback and like different approaches such as traffic lighting

and peer assessing which have the added advantage of being time savers once students are used to their methodology; which allows teachers to also provide more timely feedback. Students should be encouraged to see progression as their responsibility and be guided towards increasing independence. The use of symbols is useful in a whole- school context; but can prove confusing if used sporadically and inconsistently across different departments.

Findings from student questionnaires

Student understanding of feedback

Over half of the students who responded indicated they understood the feedback they received (278, 55 per cent), with 18 per cent (90) indicating they did not understand, and the remaining 27 per cent (134) selecting 'other'. The majority of students understood how to improve their work after looking at their feedback all the time or most of the time. Only 3 per cent (16) of students indicated they did not understand how to improve their work after looking at their feedback, with 17 per cent (86) suggesting they understood 'some of the time'.



FIGURE 2: DO PUPILS UNDERSTAND HOW TO IMPROVE WORK AFTER LOOKING AT FEEDBACK?

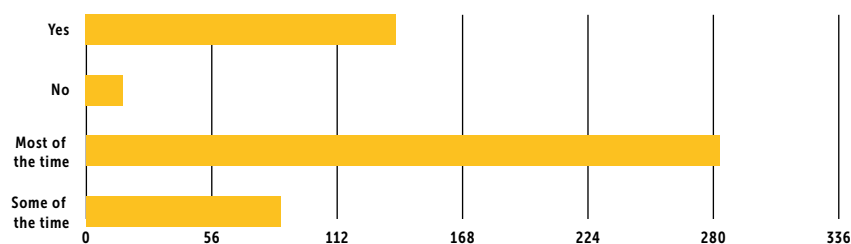
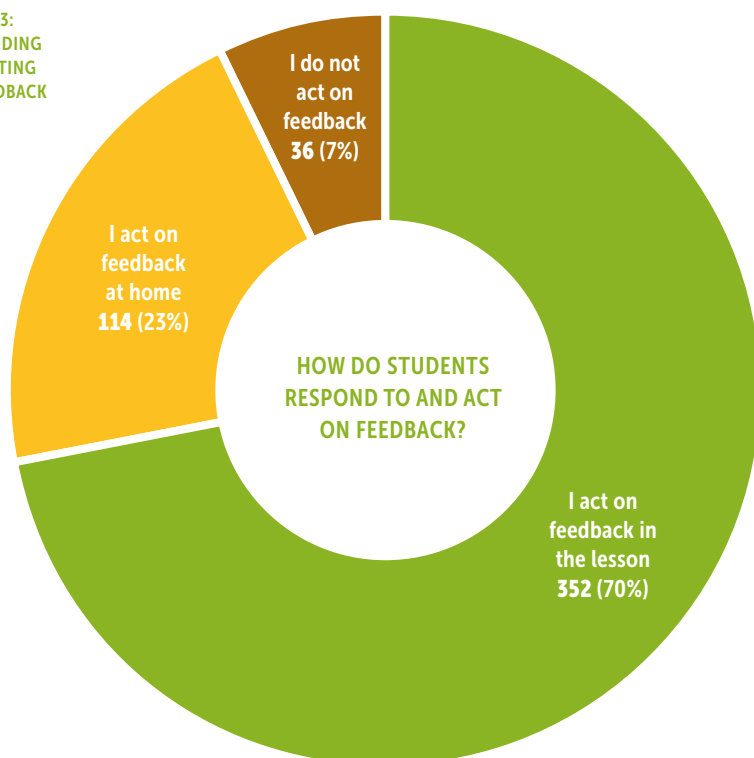


FIGURE 3: RESPONDING AND ACTING ON FEEDBACK



Students also indicated they liked to receive a grade or mark with their feedback and found it useful, with only 8 per cent (41) of 500 students indicating they did not find this useful.

How does feedback help students?

Students were very positive in this section and the vast majority of comments (78 per cent) indicated that students found the feedback which they currently received from their teachers to be useful. Most students commented that feedback "helps me to improve" and "motivates me" and "makes me achieve my target grade." Many students felt that feedback helped them to avoid making the same mistake again by highlighting clearly the areas for improvement: "It helps me to avoid making the same mistake again." Students highlighted that they did use feedback: "It gives me a clear pathway to improve my work". The student responses

revealed some very independent learners using their feedback highly effectively "it pushes me to progress", "I can create criteria for success from my feedback". Students clearly linked good feedback to improved grades "(feedback) helps me to achieve the best grades possible".

The remaining 22 per cent of student respondents were less positive or were not entirely sure if feedback helped them or not. They cited reasons such as the fact that only "certain teachers make sure I can understand the feedback" and that some feedback wasn't aspirational, so "what's the point?" Students particularly valued feedback which was seen to be specific "it helps me to improve specific things". Generalised feedback was found to be unhelpful, "sometimes it helps me - but if it just says good work; I don't understand what to improve", "the comments were too

vague". Some students in this grouping didn't like to receive what they found to be negative feedback and suggested that "more guidance before the task would have been better." The final comments for this minority of students simply replied that they "didn't know".

How do students respond to and act on feedback?

The majority of students (351, 70 per cent) believe they have enough time to respond to/ act on feedback, with the remaining 34 per cent suggesting they do not have enough time. Students were also asked when they act on their feedback, with the majority suggesting they do so in lesson time (352, 70 per cent), 23 per cent (114) suggesting they do it at home, and the remaining 7 per cent (36) indicating they do not act on their feedback.

How could feedback be improved to help students more?

In response to this question, Students overwhelmingly expressed the desire for teachers to speak to them about their work. They want a teacher to "sit down and explain



where I went wrong”, “by meeting with me and checking I’ve understood”. Students often expressed that verbal feedback was of more value than written feedback to them. “I would prefer that feedback got spoken to me rather than written directly in my book”, “it is easier if the teacher explains it to me.” Students also expressed the desire for clear handwriting from teachers in written feedback. “The handwriting of teachers could be clearer”, “sometimes I can’t read the handwriting of the teacher.” They wanted feedback to also be clear in terms of language usage which could be seen as especially pertinent as over 50 per cent of our cohort is EAL. “I’m just trying to learn English”, “use words that are easy and that I can understand.”

Students want time to act on feedback “teachers could give us more time in class”, “tell me during the topic or I have no time to act on the feedback”. “In general the feedback is fine but it would be better if we got more time to act on it and correct our work using our feedback.” Students would

‘Students overwhelmingly expressed the desire for teachers to speak to them about their work. They want a teacher to “sit down and explain where I went wrong.”’

particularly like the opportunity to use feedback in class rather than at home so that they can check that they are using it correctly. “If they gave you 10 or 15 minutes to respond to the feedback so that then you can ask questions if you don’t understand the work.” Finally, students want feedback to be personal for them. “Make the comments personal to me”. “Tell us specifically what we need to do”, they also like a teacher to use feedback as a dialogue and method of their continuing to improve their work “go back and check if I have acted on the feedback and it encourages me to do it.”

Conclusions from the student questionnaire

- Students want more verbal communication in conjunction to their written feedback to help them to make progress and ensure that they have understood what is required of them to improve.
- Students want written feedback to be presented clearly and often have trouble reading a teacher’s handwriting.
- Clear, simple feedback without sophisticated (often seen as confusing) vocabulary is preferred.



- Students need time to act on feedback and improve work (preferably straight away) and have these improvements confirmed by the teacher.
- It is important for feedback to be personalised for students and their individual learning needs.

Conclusions from research and literature

Discussion of literature, findings and small-scale study

Feedback is an issue which is currently of prominence in pedagogical discussion. For this reason, there is an emerging body of literature surrounding the topic.

Students appreciate individualised, specific feedback which is related to their progression. Students want time in a lesson to act upon the given feedback and ensure that they understand and are making progress.

Students respond positively to feedback which has been designed for them personally and is not simply generic or formulaic. Students need to be able to access their feedback as many students struggle to understand either a teacher's writing or their vocabulary. Written feedback needs to be legible and in a language which may be accessed by the recipient. The ideal method for giving feedback therefore appears to be bespoke and a hybrid of written and verbal feedback; with an emphasis on the latter. Indeed, the feedback which appears, from this study, to have the most impact upon students' progress and may be shared via a medium which is readily accessible to

students is that embodied by the Oxford Tutorial system. The feedback system employed at this prestigious University enables its students to become independent, reflective and high-achieving; the goals of giving meaningful feedback.

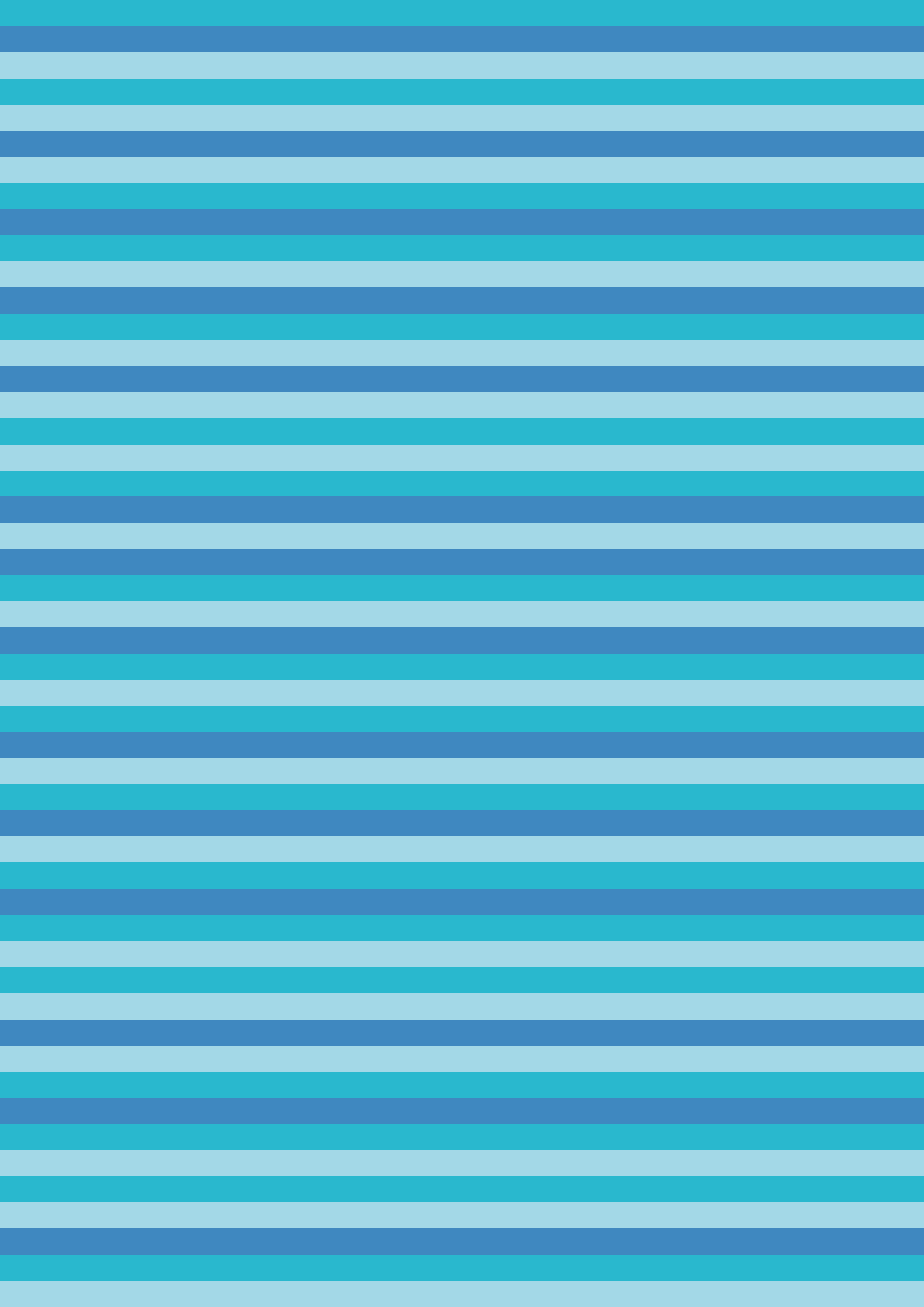
Platform for further research

Further research could usefully study a cross section of students who responded to this questionnaire in addition to tracking their progress after employing the feedback methodology identified in this research as being effective in the promotion of such progress. **R**

References

- Bangert-Drowns, R. L., Kulik, C. L., Kulik, J. A., and Morgan, M. T. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research*, 61 pp.213-237.
- Bell, J. (2005) *Doing Your Research Project*. Open University Press: Berkshire.
- Black, P.J. (1998) *Testing: Friend or Foe? Theory and Practice of Assessment and Testing*. London: Falmer.
- Black, P.J. and William, D. (1998) 'Assessment and classroom learning', *Assessment in Education: Principles, Policy and Practice*, 5(1) pp.7-13.
- Bransford, J. D., Brown, A. L. and Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academies Press.
- Brookhart, S. (2007) 'Feedback that fits', *Educational Leadership*, 65(4), 54-59.
- Bruno, I. and Santos, L. (2010) 'Written comments as a form of feedback', *Studies in Educational Evaluation*, 36 pp.111-120.
- Butler, R. and Nisan, M. (1986) 'Effects of No Feedback, Task-Related Comments, and Grades on Intrinsic Motivation and Performance', *Journal of Educational Psychology*, 78(3) pp.210-216.
- Burnett, P.C. (2002) 'Teacher praise and feedback and student's perception of the classroom environment', *Educational Psychology*, 22(1) pp.5-16.
- Canning, P. 'Getting the most out of feedback', *Studies in Higher Education*, University of Southampton, 1 pp1-3.
- Chin, C. (2006) 'Classroom interaction in science: teacher questioning and feedback to student's responses', *International Journal of Science Education*, 28(11) pp.1315-1346.
- Coutts, P.M. (2004) 'Meanings of Homework and Implications for Practice', *Theory into Practice*, 43(3) pp.182-189.
- Dweck, C. S. (1986). 'Motivational processes affecting learning', *American Psychologist*, 41 pp.1040-1048.
- Emmett, K., Klaasen, K. and Eijkelhof, H. (2009) 'Fast Feedback in Classroom Practice', *Physics Education*, 44(3) pp.246-252.
- Faulkner, J. and Blyth, C. (1995) 'Homework: is it really worth all the bother?', *Educational Studies*, 21(3) pp.447-454.
- Hattie, J. and Timperley, H. (2007), 'The power of feedback', *Review of Educational Research*, 77(1) pp.81-112.
- Havnes, A., Smith, K., Dysthe, O. and Ludvigsen, K. (2012) 'Formative assessment and feedback: making learning visible', *Studies in Educational Evaluation*, 38 pp.21-27.
- Hughes, G. (2011) 'Towards a personal best; a case for introducing ipastive assessment in higher education', *Studies in Higher Education*, 36 (3) pp.353-367.
- Kluger, A.N. and 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 pp.254-284.
- Lassonde, C.A. (2008) *Current Issues in Teacher Education: History, Perspectives and Implications*. Illinois: Charles C. Thomas.
- Linn, R. L. (1983). 'Testing and instruction: Links and distinction', *Journal of Educational Measurement*, 20 pp.179-189.
- Marshall, C., and Rossman, M, *Designing Qualitative Research*. Sage: London
- May, T. *Social Research Issues, Methods and Processes*. Open University Press: Berkshire.
- Natriello, G. (1987) 'The impact of evaluation processes on students', *Educational Psychologists*, 22(2) pp.155-175.
- Phye, G. D. and Sanders, C. E. (1994). 'Advice and feedback: Elements of practice for problem solving', *Contemporary Educational Psychology*, 79(3) pp.286-301.
- Robson, C. (2002) *Real World Research*. Blackwells: Oxford
- Rudman, H. C., Kelly, J. L., Wanous, D. S., Mehrens, W. A., Clark, C. M., & Porter, A. C. (1980). *Integrating assessment with instruction: A review (1922-1980)*. East Lansing, MI: Michigan State University, College of Education, Institute for Research on Teaching.
- Shute, V. J., (2008). 'Focus on formative feedback', *Review of Educational Research*, 78 pp.153-189.
- Tanner, H. and Jones, S. (2005) *Marking and Assessment*. Continuum: London.
- Voerman, L., Meijer, P.C., Korthagen, F.A.J., Simons, R.J. (2012) 'Types and frequencies of feedback interventions in classroom interaction in secondary education', *Teaching and Teacher Education*, 28 pp.1107-1115.







Education Development Trust Highbridge House, 16–18 Duke Street, Reading, Berkshire RG1 4RU

T +44 (0) 118 902 1000 E enquiries@educationdevelopmenttrust.com W www.educationdevelopmenttrust.com

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