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INTRODUCTION

DR KAREN SMITH, UNIVERSITY OF HERTFORDSHIRE

Teacher engagement in the research process

Ever since Lawrence Stenhouse's seminal work *An introduction to curriculum research and development* (1975), teachers have been encouraged to actively engage in research to inform their classroom practice. Stenhouse advocated that curriculum research and development should belong to teachers, and rather than passively accepting changes in practice, they should critically test them, seeing their classrooms as 'a laboratory' (1975, p.142). Engagement in research and development can lead to the betterment of schools, but also the betterment of teachers, through progressively increasing understanding of their work and therefore improving their teaching (Stenhouse 1975, p.143). In the ensuing four decades, there has been increasing evidence to suggest that teacher engagement in research is beneficial for teachers, for the schools they work in, and for the teaching profession more generally (see, for example: Hagevik et al, 2012; Hall, 2009)

Teacher enquiry

There are many ways to define teachers' involvement in research, for example: teacher research; classroom research; practitioner research (Borg, 2013). The term that we use here, however, is teacher enquiry.

Teacher enquiry is defined as education research which focuses on the problems that practitioners come across in their classrooms and the actions they take to solve them (Winch et al, 2015). Teacher enquiry involves exploring an area of interest in a systematic way. It is about collecting and reflecting on evidence (including professional knowledge) in order to make changes and bring about positive change. Teacher enquiry is often collaborative, where the sharing of practice and the critiquing of evidence leads to new ways of seeing and understanding issues. Teaching, rather than being ‘a combination of a storehouse of knowledge and a mastery of pedagogy’ is seen as ‘an ongoing enquiry’ (Mason, 209: 206).

Teacher enquiry can then become ‘a way of being' (Winch et al, 2015: 207), an ethos that supports personal, political, and school improvement purposes (McLaughlin 2004).

The importance of engagement in teacher enquiry

There are many benefits associated with engagement in teacher enquiry; the list below highlights some of them (from Elliot and Sarland, 1995: 372):

- Enables teachers to bring about changes in pedagogy and curriculum that ultimately improve students' learning experiences;
- Improves the quality of discussion around educational problems and issues in schools;
- Encourages teachers to work together on curriculum design;
- Improves the use of findings from research in schools;
- Brings research closer to practice and allows teachers to make original contributions to knowledge;
- Leads to the generation of closer-to-practice research methods and methodologies;
Enquiry +

- Allows teachers to develop their own theories that underpin their practice;
- Encourages ongoing professional development;
- Encourages schools to become learning organisations;
- Empowers teachers to respond to external educational change;
- Enables teachers to account for their practice in ways that are open to public scrutiny and debate.

Equally, engagement in teacher enquiry contributes to the development of a professional culture: ‘where teachers read, understand and undertake research themselves [which] is a vital and necessary part of the process of developing teaching as an evidence-based profession’ (Furlong & Salisbury, 2005: 81).

Enquiry + - an initiative to support teacher research

As noted above, teacher enquiry has a long tradition in UK schools; support and facilitation of this kind of practice-based research is sometimes provided by higher education institutions (Greany & Brown, 2015). It has been noted that partnerships between teachers and professional researchers will become ‘increasingly important to ensure a mutually enriching relationship between education research and educational practice’ (Winch et al, 2015: 212).

The University of Hertfordshire has provided support for teacher research for many years. The Enquiry + initiative aims to create and support a community of education practitioners who use enquiry to improve and develop practice in schools.

Our view is that enquiry is research, but it is learning and finding out for a clear purpose – to change and improve practice in schools in a sustainable way. Action is undertaken based on research. Projects are run intelligently, with measured baselines, and a focus on impact. Successful change becomes embedded in school practice through sharing learning within a practitioner’s own school. Collaboration across schools establishes a learning community where learning is disseminated and also sustained over time as more and more practitioners are drawn into the activity.

The University of Hertfordshire supports the enquiry process by offering participants a structured course on practitioner research including sessions on: formulating research questions; data collection methods and data analysis; identifying findings and sustaining project outcomes; dissemination and impact evaluation. In addition, each participant is visited within their school to discuss their projects in more detail and the University hosts a celebration event at the end of the programme to disseminate findings, develop networks, and encourage further collaboration.

The Herts & Bucks Teaching Schools Alliance

Over the last academic year, colleagues have been involved in classroom-based enquiry projects aimed at practice enhancement within KS3. The initiative has been supported by the University of Hertfordshire in collaboration with the Herts & Bucks Teaching Schools Alliance and each of the participating schools has carried out a small-scale research project.

We are pleased to be able to share these research projects with you here in this publication.
Michael Garvey and Julie Jones - St Clement Danes School – share findings on their study into the impact of KS2 pedagogy on KS3 outcomes, particularly in terms of promoting personalization and student independence;

Coral Smith – Queen’s School – provides an overview of a pilot project to replace national curriculum assessment levels;

Gemma Absalom, Alex Carter, Ben Cummings, Tristan Daws, Peter Hambridge and Niamh Lincoln – Parmiter’s School – report on the introduction of a reward system to encourage positive behavior for learning;

Janine Pook – Chalfont Community College – reflects on supporting academic literacy through pastoral intervention;

Jennie Simmonite – The Royal Masonic School for Girls – presents results from a project designed to develop resilience in Year 8 girls;

Jeanette Denton and Brenton Legarda – Chancellor’s School – share their work on assessing the impact of parental awareness of a child’s knowledge gaps in mathematics on a child’s progress.

These projects have all demonstrated impact within their own contexts. We hope that in sharing them, they will inspire others to carry out similar projects and to engage in their own teacher enquiry.

References


STUDIES ON THE IMPACT OF KS2 PEDAGOGY IN KS3 OUTCOMES IN TERMS OF PROMOTING PERSONALISATION AND STUDENT INDEPENDENCE


Introduction

St Clement Danes School undertook this research project to close the gap between KS3 progress and that seen in KS4 and KS5; a focus identified in the School Development Plan. It was designed to build on work completed in 2013-14 where 10 staff visited local Primary Schools to observe successful pedagogy and consider implementing similar strategies at St Clement Danes School. The rationale was also based on the need to assist a student’s ability to learn independently in preparation for a greater focus on linear exams at GCSE and A level.

This issue of relative underperformance at KS3 and the need to address the transition from KS2 is clearly a cause of concern in other successful schools. Esher Teaching Alliance highlighted in a recent research project that “school data showed a stagnation of attainment in literacy in Year 7” (Husbands & Pearce 2012: 17) and “their data showed that students were usually one sub-level lower in writing than they were in reading at the end of KS2” (Husbands & Pearce 2012: 18).

Furthermore, Galton and Hargreaves mentioned students failed to make expected progress in their first year of school after transition and that was accompanied by a decline in motivation towards some subjects with levels of engagement falling by “5% in English, 12% in Mathematics and by 26% in Science” (Galton & Hargreaves cited in Galton et al 1999: 2).

Figure 1: A KS3 English class teacher implementing the revised schemes of work
Galton et al also identified that this downturn in outcomes was due to students not experiencing any new exciting learning experiences, being affected by the impact of the long summer break and ‘the repetition of work from the previous year when pupils expect subject content and teaching and learning strategies to be new and challenging’ (Galton et al, 1999: 2).

Galton et al also suggested that in the early years of KS3, schools disappointed their younger students in terms of limited opportunities for responsibility, despite being older, as opposed to those experienced in the latter end of KS2 (Galton et al, 1999: 2). This was reiterated in another study by Ruddock who noted that Year 8 ‘no longer feel raw and vulnerable: they would like teachers to recognize that they are a year older: they value occasions when they are given responsibility’ (Ruddock cited in Galton et al 2003: 2); students hoped for more responsibility and more trust as they moved into Year 7 and 8.

This negative impact of organizational structures and pedagogical practice was seen in another small-scale research project at Lodge Park Technology College (Nelson et al, 2015). This study focused on the differences in practice related to questioning between KS2 and KS3 and its impact on the students’ creativity, partly because staff in KS3 tended to ask more closed questions. As Hardy commented, there ‘was a perceived differences in the creativity seen in children’s work at the beginning and end of KS3’ (Hardy, 2004:1) and as a result, in terms of Technology, it was believed that ‘pupils arrive from KS2 into KS3 with a greater capacity for creating innovative products than when they leave in KS3’ (Hardy, 2004:1).

![Figure 2: KS3 students in a Technology class enjoyed the opportunity to self-select their tasks](image)

However, in a study of over 50 schools other research suggested that so much importance had been given ‘to exits and entrances years than to the years in-between’ (Galton et al, 2003: 92); identifying a Year 8 identity
crisis being worthy of more research. Ruddock noted that whereas Year 7 students were ‘captured by the social novelties of the new school’ (Ruddock cited in Galton et al, 2003: 93), Year 8 was seen as a featureless year with no exams and defined purpose without the excitement of new systems and settings that Year 7 pupils enjoyed.

There has been much research on specific subject-related issues with transition from KS2 and KS3, where the opportunity to maximize learning has been missed. Peacock completed research into KS3 Science and the extent to which technical vocabulary and understanding was not built on effectively in Years 7 and 8 across 65 schools, and in many cases ‘showed marked declines in use’ (Peacock 1999). Similarly, James and Pollard, in terms of Mathematics and Science, noted that ‘the importance of taking into account of prior learning where misconceptions established at an earlier stage create serious barriers to new learning and need to be tackled’ (James & Pollard 2011: 290).

Figure 3: KS3 Maths students problem-solving as part of the new scheme

Kinchin has approached this question in a slightly different angle in terms of promoting effective teacher-student dialogue. In his discussion of ways to help student learning at KS3, he refers to the needs to consider the ‘reorganization of the teacher’s map, using suitable KS2 concepts’ (Kinchin, 2003: 112) in order to increase ‘meaningful communication at the active interface and facilitate students conceptual development through KS3’ (Kinchin, 2003: 111). Clearly, the Project’s main assumption is that ‘ignoring prior learning (whether formal or informal) can put future learning in jeopardy’ (Husbands & Pearce, 2012: 7).

This theme was also discussed by Lord in a NFER analysis of over 300 pieces of research carried out between 1989 and 2005. It established a number of common themes concerning what students believe improved their
learning in KS3. It was clear that ‘pupils in year 7 in particular want more challenge and reduction in the level of repetition from year 6’ (Lord, 2006: 2).

However it was clear that to ensure progress ‘personalised learning [and] individual differentiation are all important here’ (Lord, 2006: 2). Lord also highlighted that there was a preference for ‘active, participatory and collaborative learning [...] and that increasingly older students preferred more individual responsibility in their learning’ (Lord, 2006: 4), which involved more choice and different options. These conclusions supported the aim of this project which was designed to consider how KS2 pedagogical techniques related to personalisation and independence could improve KS3 performance and reverse the dip in motivation and achievement which seems to occur after the transition that Lord identifies.

Research aims

- To assess the impact of learning from KS2 pedagogical methods in a KS3 setting.
- To consider how a greater focus on independent learning in lessons advances student’s learning by promoting tools for independent learning and student confidence to take risks.
- To assess whether more significant opportunities for personalization by NC level/Challenge by task is likely to lead to an improvement in attitude to learning.

Context

St Clement Danes School is an 11-18 all-ability academy in rural Hertfordshire with outstanding results at GCSE and A level in terms of attainment and achievement. The Year 7 cohort are admitted on 10% academic ability and a further 10% on musical aptitude. The very large majority of students live in close proximity to the school and a large proportion of each intake are siblings of current students. The percentage of White British students is above the national average and the percentage of Disability and/or Special Educational Needs (DSEN) and Free School Meals (FSM) is below the National Average. The Project involved analysis of students (n=619) in KS3 classes over the Spring Term 2016.

Methods

The Project’s initial direction was determined by a working party of ten staff who visited five Primary Schools in pairs in the Autumn 2014. The notes of these learning walks were then analysed and synthesized under subheadings of assessment methodology, successful pedagogical techniques and personalization. This preliminary research then formed the basis of the research beginning in 2015-6. Staff were briefed on the main learning points from KS2 and were given INSET in the Autumn term to adjust schemes of work to include some of these KS2 techniques.

The summary of this KS2 analysis considered implementing a range of pedagogy:

- Allowing students to seek appropriate level of challenge and select their own task
- Develop opportunities for more pair and group work.
- Ensuring consistency in access to equipment in each classroom so that rooms become self-contained learning environments.
- The use of Assessment for Learning (AfL) techniques such as teacher-modelling, low/ middle/ high order questioning.
- The promotion of active (and kinaesthetic) learning.
- The consistent use of RIT (Reflection Improvement Time) to support stretch and challenge opportunities.
- A greater consistency in the use and quality of classroom displays, incorporating suggestions on how work should be set out and how it will be assessed.
- A greater emphasis on motivation through prizes and rewards.

As part of these altered schemes, students’ perception were assessed at the beginning and at the end of the project via student survey, comparing whether students felt they had more opportunities in personalisation and independent learning in their curriculum and whether they felt it aided their learning. The questionnaire had 17 questions. There were a blend of open-ended and closed (multiple choice, yes/no, and scale) questions. The response rate for these surveys was 92%, with n=619 students completing the survey.

Staff perception of the extent of success in student progress in the areas of the study was also assessed via a survey at the beginning and end of the project. This questionnaire followed a similar format to the student version so that differing perceptions on these questions could also be considered. The response rate for these surveys was 83%, with n=64 staff completing the survey. The data was summarized in graphs and tables.

Attitude to Learning grades were also used to assess the impact on the students in terms of progress of the altered schemes of work, comparing this year’s and last year’s data over the same period.

Colleagues in the R&D group also carried out a series of learning walks across 12 classes to observe the altered schemes of work in operation and to assess the outcome in qualitative terms. Before each walk, the R&D representative met the classroom teacher to discuss how the altered lesson would demonstrate some of the KS2 pedagogy. The notes from these observations were analysed.

All parents were made aware of the purpose of the research project and that the views of students were being collected on an anonymous basis.

Key findings

Attitude to Learning grades (ATL):
ATL grades across all of Key Stage 3 students (n=619) improved over the period of the altered schemes of work from an average of 1.95 to 1.9 (on a scale of 1(Excellent) to 4 (Poor)). This was a substantial improvement on the average than the same period last year. Clearly there are a number of factors that may have affected these results but they do indicate that the project was a contributory factor in the improvements in ATL grades seen this year.

The student and staff survey (entry %; exit %):
The students were clearly aware of the greater opportunities to work as pairs during the period of the revised schemes and also appeared to willing to take more risks with their work and that they felt that making mistakes were a valuable part of the learning process and less afraid to make mistakes (26.9%; 21.8%), see Figure 5.

In Maths, a student commented that the teachers “help you learn from your mistakes but don’t take it too seriously.” Other students in English valued being told “not to worry about mistakes and to learn from them” and
“not to be embarrassed by our mistakes”. Other students highlighted that “I can make mistakes if I want and that I can learn from them” and students should “not be afraid to ask questions if they don’t understand”. This viewpoint was confirmed staff perceptions of a change in the confidence of students (48.2%; 64.7%); as one staff member noted, their philosophy was “try, even if unsure – it is ok to get it wrong”.

In terms of the altered schemes of work, the students clearly felt more independent in finding their equipment (63.8%; 69.6%) and choosing the topic which they wanted to study or mode of assessment they wish to express their learning (59.4%; 65.5%), see Figure 7.

**Making mistakes**

<table>
<thead>
<tr>
<th>Entry Data</th>
<th>Exit Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>everyone makes mistakes — I...</td>
<td>everyone makes mistakes — I...</td>
</tr>
<tr>
<td>I feel awkward but I make it..</td>
<td>I feel awkward but I make it..</td>
</tr>
<tr>
<td>I don’t like making mistakes</td>
<td>I don’t like making mistakes</td>
</tr>
<tr>
<td>61.9%</td>
<td>62.3%</td>
</tr>
<tr>
<td>45.4%</td>
<td>39.1%</td>
</tr>
<tr>
<td>26.9%</td>
<td>21.8%</td>
</tr>
</tbody>
</table>

*Figure 5: Students feelings about making mistakes (entry and exit data)*

Students commented on a whole range of new techniques which they felt improved their learning (see Figure 6). In History and English, they valued being “trusted with the tablets and allowed to film around the school” and when they “learn certain information and teach it to peers” and “letting us do pair work to improve our work without assistance”. Students commented that the new schemes enabled them to work more “efficiently” and made “the lessons a bit more fun and interactive” and “learn the subject better”.

**Teacher guidance**

<table>
<thead>
<tr>
<th>Entry data</th>
<th>Exit data</th>
</tr>
</thead>
<tbody>
<tr>
<td>give you free choice as to...</td>
<td>give you free choice as to...</td>
</tr>
<tr>
<td>give you options from...</td>
<td>give you options from...</td>
</tr>
<tr>
<td>tell you which task to...</td>
<td>tell you which task to...</td>
</tr>
<tr>
<td>tell you how to go about it</td>
<td>tell you how to go about it</td>
</tr>
<tr>
<td>14.9%</td>
<td>17.2%</td>
</tr>
<tr>
<td>44.5%</td>
<td>48.3%</td>
</tr>
<tr>
<td>73.2%</td>
<td>73%</td>
</tr>
<tr>
<td>48.9%</td>
<td>41.3%</td>
</tr>
</tbody>
</table>

*Figure 6: What the teacher does (entry and exit data)*
In a number of curriculum areas, students mentioned that they were encouraged to “ask people around you before you ask the teacher” and saw the value in not being given “the answer straight away” to encourage them “try to work it out” for themselves. A number of students cited how they were told to look up the definitions of words in dictionaries rather than told “what a word meant” or use the 4Bs rule (Brain, Book, Buddy, Boss) and saw the value in be given “a ten minute slot when [they] cannot ask questions and have to think for ourselves”. They also valued having “team leaders in our class who manage groups when we work in groups”.

Many students also commented on being given the opportunity to try out certain techniques for themselves after a brief lesson on the basic ideas; “we have to think outside the box so we have to think for ourselves and learn that we can find the answer without the help from the teacher.” Similarly staff noticed a greater independence over this period in terms of finding equipment (56.1%; 70.6%) and in other areas of learning, commenting on how the scheme had prompted them to place on students an increasing “emphasis on the need to find out knowledge for themselves”.

Finding equipment

<table>
<thead>
<tr>
<th>Finding equipment</th>
<th>Entry data</th>
<th>Exit data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding equipment</td>
<td>Always</td>
<td>11.9%</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>51.9%</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>31.9%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>4.1%</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>12.9%</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>56.7%</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>28.1%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Figure 7: Knowing where to find equipment (entry and exit data)

Students also noticed a substantial impact on praise throughout this process, with an increase in the number of students who received merits (31.8%; 45.7%), although the extent to which they valued praise and rewards in this period marginally fell (from 7.36 to 7.11 in ranking scale from 1-10). This may indicate greater student resilience and less need for rewards amongst the student, although further research would need to clarify the reasons for this trend. A parallel process was seen in staff perceptions of student need for praise and reward (7.76 to 7.44). More students felt they were being praised for quality (73.2%; 76.8%) and effort (68.2%; 72.8%) of their work than formerly although this was not evident amongst the staff who perceived that throughout this project, praise was more focused on progress than formerly (85.4%; 87.5%).

Students perceived that assessment was more focused on highlighting the strengths of existing work (59.3%; 63%) than formerly, although the staff perception that feedback was more designed to prompt students to reflect was not seen in the student responses, although there may be a time lag in shifting any possible engrained culture. Staff referred to the value of verbal feedback (“to talk to me”) and the “use of the tablets for visual feedback is very beneficial” and asking students, after circling the mistakes, to “have to work it out for themselves”. A number of students commented on how they valued being prompted to review their own learning through mind-maps “to help my understanding”.

Page 12
The Learning Walks:

Learning walks were completed in 12 classes across different faculty areas in KS3. Staff collected evidence from students and commented on the effectiveness of the altered schemes of work in each class.

In Technology, students were complimentary about the points system employed with the self-selected tasks and valued the reward system associated with this structure. One student noted that, “I like it because you can see how you are progressing with your total points as well as the levels you get each time”. They also commented that “this means that everyone can pick what they need, if they know their level then can get it or they can try to get higher”. The observer also highlighted that students were given questions as feedback to prompt them to self-evaluate their own projects and it had improved outcomes.

In the Humanities Faculty, observers commented on how students were given a choice on which information to collect to answer an historical question, including from books and tablets. Students responded positively and they also valued the opportunity to choose their own plenary activity based upon different levels of challenge. Students were asked about the nature of the written feedback in their books and commented that they found the individual prompt questions useful to improve their work and “choosing how to present what they have found out”. More able students also enjoyed the opportunity to “write their own answers to questions and add their own questions as extensions”.

In Mathematics, the observer highlighted that “students were very engaged” with the altered scheme of work concerning the hypothesis whether boys get more merits than girls, and that it “was noticeable that students were working independently”. In a second visit later into the scheme, the observer noted a sustained level of progress and noticed that students responded positively to the choice students were given how to present their findings. The observer concluded, “teachers all found the experience very positive and very much want them to do similar tasks in Maths again to allow students to improve their skills”.

Figure 8: KS3 Science students enjoying the revised lessons
In English, the observer noted that students enjoyed reading the texts to each other and "making decisions, selecting their task and choosing the language for it". Students were "engaged by the previous lessons" and "could talk enthusiastically" about the work from the revised scheme. A second class valued the "choice of tasks" which included "more scaffolding in one task and more challenge in the other". There was clear evidence of the effectiveness of differentiated questioning to improve student outcomes.

"Everyone can pick what they need, if they know their level then can get it or they can try to get higher" KS3 student

In Creative Arts, students enjoyed being given a free choice on the architectural style they had to research and there was "evidence of students reflecting and acting on personalized advice given by teaching staff" and students improved their work by being encouraged to comment on their partner’s homework and discuss this at the beginning of the lesson.

Conclusions and implications for practice

Conclusion 1:
This research suggests that teacher knowledge of KS2 pedagogy which was gained from the initial visits to primary schools is of considerable use for improving student outcomes in KS3. This was evident from the improvement in student attitude to learning grades across KS3 during the implementation of the revised schemes of work. As evident from the student and staff surveys, students became more independent in their approach to learning when responding to the range of new strategies that were employed. The positive results of the research at Esher Teaching Alliance to some extent paralleled these results at St Clement Danes: ‘KS3 staff have used the work to encourage students; to show students that they know what they are capable of and to start a dialogue’ (Nelson et al, 2015: 20) and ‘it enabled KS3 teachers to understand and incorporate some of the scaffolding that our KS2 colleagues used so successfully’ (Nelson et al, 2015: 21). There should be consideration given to improved links with the main feeder schools in terms of the core subjects to ensure that greater progress is made in KS3 by ensuring a common language and a greater understanding amongst staff of the abilities of KS2 students when they arrive at St Clement Danes School.

Conclusion 2:
Students and staff indicated in the surveys and the learning walks that due to the altered schemes of work, students felt safer to make mistakes, acknowledged the greater emphasis on praise and reward and were more likely to thrive in this new learning environment. Students valued the ability to learn from each other and assess each other’s work. They valued the opportunity to “evaluate a classmate’s work and tell them how to improve” and “to assess their own work and tell them how to improve”. As Leitch concluded, our students also ‘felt most positive about their assessment in classes where they were given positive feedback on what they had done ok or well’ (Leitch, 2008) and ‘positive comments came before any negative ones” and they were not “made to feel embarrassed about their work’ (Leitch, 2008).
Recommendation for Action 1: explore with the main feeder schools opportunities to improve transition arrangements to improve the knowledge of KS2 students amongst KS3 teachers with a more academic as opposed to a pastoral focus. Transition arrangements could build on existing pastoral-based evenings to consider the creation of common portfolios of work by Year 6 students.

Recommendation for Action 2: consider revising all schemes of work across KS3 using this model.

Recommendation for Action 3: consider further research into the idea of the “Year 8 identity crisis” at St Clement Danes School, with particular consideration given to the extent of responsibility given to students in their learning and in other areas of the school.

References


Acknowledgements

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A PILOT STUDY ON REPLACING NATIONAL CURRICULUM ASSESSMENT LEVELS AT KS3

CORAL SMITH, QUEEN’S SCHOOL

Introduction

The removal of assessment levels at KS3 left an opportunity for schools to develop their own system better designed for on-going formative learning. The challenge was to develop a system that was focused on student progress, allowed progress to be monitored and could be reported to parents and other parties in an accessible format. The introduction of a new system offered the potential to remove some of the problems that were present with the old National Curriculum (NC) levels, namely (Oates, 2010):

- Pressure on teachers to move rapidly through the subject material encouraging a “tick list” approach.
- A lack of clarity about what should and should not be included in the core of the curriculum.
- Assessment that has a detrimental impact on teaching and learning.

Assessment research shows the corrosive nature of numerical levelling on learning. It has been shown that students motivation is undermined by the receipt of grades in comparison to task-related evaluation of the work completed (Butler & Nisan, 1986).

What we wanted to know is, can we come up with a language of assessment to develop motivation and a Growth Mindset (Dweck, 2016) in students? Can we remove the comfort blanket of a numerical value to track progress and report to parents, moving to an approach where we focus on identifying what the student has a concrete understanding of and what parts of their learning are only burgeoning? So it is now time for a different approach. However, with schools in the unusual situation where they have the freedom so select their own method of assessment without the tight constraints of an imposed government strategy, it is easy for schools to be unsure of which direction to take. It is important for schools to develop an approach that keeps student progress at the centre but avoids as many pitfalls from old regimes as possible, which is what this project aimed to do.

Research aims

The aims of this research project were:

- Primarily to focus on developing methods of assessment that encourage students to focus on how they can move their learning forward and fosters a growth mindset.
- To develop assessment that informs students, teachers and parents about what students are competent at and what skills and knowledge they need to develop.
- Develop an approach that would allow students’ progress to be monitored within the school.
- Produce an assessment approach that could be reported to parents in a way that would allow them to understand how their child is progressing without reporting grades or levels.
Context

Queens’ School is a large mixed comprehensive school with a range of students of all abilities but with the majority of students of average ability or higher. The School, as a whole, is still using national curriculum levels this year with the exception of the year 8 groups that are involved with this project. The majority of the schools in the teaching schools alliance are in a similar position using this academic year to develop their new system of assessment and there is agreement across the schools that systems are currently less than ideal.

The three subject areas selected for the project were Geography, Music and Science. These were chosen as they have quite different approaches to assessment and pedagogy, given the variance in the practical and theoretical components of each; it was felt that this would provide a broad base of knowledge on which other subject areas could develop their assessment after the completion of the research. Each subject area selected a small group of year 8 students to work with; as class groupings vary across the subjects the specific students involved varied in each subject area.

Methods

The method used to evaluate the students initial views of assessment was by a student questionnaire. There were 8 closed questions using a 5 point Likert scale and 3 open ended questions. The data from the Likert questions was summarised in pie charts and the open ended questions were coded to allow for identification of common themes. This was then repeated after we used the new assessment methods to allow for comparison and the data was processed in the same way. The number of students varied per subject project with a minimum of 30 respondents per subject.

Within science the teachers were also provided with a questionnaire in a similar format to that of the students, with 8 questions using a 5 point Likert scale and 4 open ended questions. This was again repeated after the new assessment methods and results were presented as pie charts and open ended questions coded. In the initial survey there were 8 respondes and in the later survey only 3, which may have effects the validity of the results.

The parents of 32 year 8 students were also surveyed by questionnaire. They were asked to rank how important the reporting of 8 aspects of learning were to them. These results were converted into bar chart and summarised in a table. Questionnaires for all participants were optional and therefore respondent rates did vary. No personal data or data that might lead to indentification of the respondents was collected.

In terms of the projects themselves, each department broke down the learning into key knowledge and skills needed and related these to GCSE outcomes. They produced a set of “I can statements” for the areas of learning being covered in a format that best suited the needs of the subject. These “I can statements” were then used to feedback to students on what they had achieved and what they needed to work on next. As the students would continue to learn the same curriculum materials as other students it was felt that this was an ethical approach. Students who were not part of the study would still receive feedback on their work and targets to focus on but this would continue to follow the NC levels format and grades would be given in addition.

In relation to tracking progress the students were placed into bandings: foundation, developing, secure and advanced. The allocation of these bandings varied for the purpose of the study with science using the KS2 NC levels and mean CAT scores as the basis for allocating the band, music using an initial teacher assessment and Geography using KS2 NC levels only. The “I can statements” were linked to these bandings with certain skills and knowledge being considered indicative of attainment at that standard. It was then possible to identify if students had achieved the skills and knowledge expected, exceeded it or fallen short. It was
decided that this could be reported to students and parents as: below target (T-), minimum threshold for target met (T), upper threshold for target met (T+), or target exceeded (T++). This method of reporting is clear whilst avoiding grading. Students and parents were not informed of their allocated band. This was in order to encourage a growth mindset focused on pragmatic targets linked to the “I can statements” and avoid the negative effects of numerical grading on morale and motivation.

**Key findings**

The Assessment Model

Research amongst schools within the teaching schools alliance showed two main approaches: a threshold model and a GCSE 1-9 model. Schools within the teaching schools alliance are introducing a number of variants on both styles. When attempting to foster a growth mindset culture within the school it was clear that a threshold model was the best approach for our students. Having a pilot study and KS3 Assessment group allowed for clear discussions and adaptations made before launching the model with all staff. These discussions formed an important part of the change management process. Staff members had widely differing views on the subject of assessment and providing an open forum for discussion and three different examples of success that worked within the same model supported the introduction of the final assessment system. One significant, but anticipated, challenge was trying to wean teachers and students away from grades/levels. The ultimate decision was to ensure that no grades/levels were given to students or parents but in order to allow for large scale monitoring of progress across a year group a numerical value could be recorded within the department.

Parental Views

The results of the parental survey showed that half of parents ranked effort as the most important piece of information they would want reported (see Figure 1 and Table 1). Progress against age was considered the next most valuable piece of information. The parental views on the reporting of grades was rather ambivalent. These findings support the plan to move towards the reporting of progress over grade/level.

![Figure 1: ranking of 'level of effort in class' and 'indication of progress against age'](image)
**Students views**

As a result of the changes to assessment students felt that they better understood how their teacher assessed their work although this did not translate into an improvement in students knowing how to improve their work. In the open questions when asked “What do you need to do to make more progress?” students often responded with vague notions that referred to working harder or exam technique as opposed to identifying specific targets.

> “I need to improve my exam technique and detail in my answers as I rarely state my point I need to make sure I read the question”

> “I need to revise and practice more. Do harder work”

Students had mixed responses in terms of understanding how well they were progressing in the absence of levels; in music and science students felt confident that they knew how well they were doing (music 64%, n=71; science 65%, n=33) but in geography students (67%, n=34) felt they lacked clarity in knowing how well they were doing with the new assessment, with 71% (n=36) of geographers preferring to be given levels.

**Summary of findings**

- *It will take time for many stakeholders to acclimatise to the move from levels to the use of “I can statements” and the new style of monitoring and reporting progress.*
- *“I can statements” need clarity in order for students to feel confident in identifying the next steps in their learning.*
- *Lack of formal assessment also lowers student confidence in identifying their learning goals.*
- *In isolation, “I can statements” will take time to become part of effective teacher practice.*
- *Parents valued effort and progress against expectations over a grade or level.*

**Conclusions and implications for practice**

Assessment methods that encourage students to focus on how to move their learning forward may be possible but they take time to embed. Collaboration, moderation and standardisation of KS3 work is important. Teachers need to become assessment experts and work together to identify the key skills and knowledge...
within their subject area to form the basis of the “I can statements”, link them to the new GCSE framework and use them to monitor progress in relation to the students band within the threshold model.

Assessment focused on what students can and can’t do can also be used to effectively monitor and report progress without resorting to grades. In fact a more tangible method of reporting progress can be offered in the absence of levels; is the student achieving the standard expected or are they above or below the level of expected progress. Teachers will need to change some of their language in the classroom as the comfort blanket of levels is removed from staff and students. However, this opens the door to incorporate language that fosters a growth mindset where students focus on effort and developing the next skill rather than a number. Some staff worried over the lack of attainment language and early reference to GCSE predicted outcomes, with a great “reveal” in Y9 options process. It will not be possible to assess the effect of this until the first cohort following the threshold model has completed their GCSE exams. However, other schools have introduced a no grades approach while maintaining the same high standard of academic achievement (NAHT, 2014).

The implications for this on practice are

- Collaboration, moderation and standardisation of assessment is important. “I can statements” should focus on the key skills and knowledge that students are expected to acquire and be linked to the GCSE grades to ensure students are following a learning pathway that will allow them to succeed at GCSE level.

- A shared language for discussing learning and progress is needed to replace the language of grades and levels, to allow staff, students and parents to communicate effectively how well students are progressing and what their next steps in their learning are.

- Assessment should focus on moving the learning of students forward but should also allow for monitoring of student progress to ensure they are achieving their potential.

References


IMPROVING THE KS3 (YEAR 8) REWARD SYSTEM TO ENCOURAGE POSITIVE BEHAVIOUR FOR LEARNING

GEMMA ABSALOM, ALEX CARTER, BEN CUMMINGS, TRISTAN DAWS, PETER HAMBRIDGE AND NIAMH LINCOLN, PARMITER'S SCHOOL

Introduction

Parmiter’s School is a high-performing secondary school with many students doing extremely well in their public examinations at Key Stage 4 (GCSE results 2013-15 – 89% A*-C in English and Maths and 92% A*-C overall) and Key Stage 5. There are a number of factors that contribute to this success including the partial selection of students (25% of the cohort) entering Year 7 via an entrance examination. There is also high quality teaching across all subject departments. One area, however, that we felt could be both improved and updated was the School’s reward system. More specifically, there was a clear recognition that there was a lack of provision when looking to reward positive behaviour for learning amongst the students. Whilst, in stark contrast, poor behaviour was consistently sanctioned largely using the school detention system.

The School’s Behaviour Policy speaks of “an ethos of encouragement, praise and celebration of success” being central to the promotion of good behaviour at Parmiter’s. A cogent reward system can be used to underpin this ethos. An article by Beresford (2003:122) states, “all teachers prefer to rely on their students’ intrinsic motivation to encourage them to come to school, do their homework, and focus on classroom activities, but many supplement the internal drive to succeed with external rewards.” This certainly linked to our School’s ethos. It appeared to us that students had become disillusioned with the existing rewards system. When the students were asked about this at a focus group session one stated that they were disinterested in the reward system due to the lack of “exciting and enticing” rewards. The reward system has been based on students earning merits for positive behavior, both academic and pastoral. These merits appear as stickers in their student planners and result in certificates being issued and special pens being awarded when a certain number is reached (25, 50, 75 and 100 merits). Whilst this system had been in place with some success for a number of years it has become clear that changes were needed.

Shreeve et al. (2002:242) assert that, “creating optimum conditions in classrooms for students, particularly those who are disaffected, to learn effectively and achieve their potential is a prime aim of schools and part of the rationale behind systems of rewards and sanctions.” To ensure that the changes we would make could maximise the support available to the students in striving towards their full potential we took the time to discuss our research aims and design a multi-faceted method that had the students at its heart.

Research aims

We started out with four over-arching research aims:

- To gain an understanding of how much staff and students value the current reward system;
- To explore possible improvements to the reward system with pupil dialogue;
- To trial an improvement to the reward system;
- To analyse the impact of the change on pupil behaviour for learning.
**Methodology**

We used a multi-faceted approach that followed the model of action research to ensure that all stakeholders were involved in the process and in order for us to gather as much information as possible. Our method is outlined below:

- **Pre-trial pupil and staff questionnaires.** These were distributed and the results analysed in order to provide us with baseline data and an initial viewpoint at the outset. The questionnaire was completed by 40 students and 40 members of staff.

- **Data analysis of questionnaires and focus groups.** This was a very important element of the methodology as the students’ views would inform the shape of the project and the resultant changes to the reward system. The group met on two occasions and each time the same 15 students were in attendance. To begin with the group were given some leading questions by the staff members running the session and after this the dialogue flowed.

- **Consultation on possible improvements to rewards system.** Involving the staff and students on this was integral to the success of the trial and any potential long lasting change in the reward system. This took place during several meetings with staff and during the second student focus group meeting.

- **Implementation of trial system.** Post-consultation phase, it was decided that lunch passes would be the reward and that they would replace the pens for the trial period.

- **Monitoring of the trial system using SIMS and rewarding students.** As well as leading to the students actually receiving the rewards which they had achieved this also helped us monitor how many merits and rewards were being awarded. This would support the project by informing our conclusions.

- **Post-trial pupil questionnaires for comparison.** This enabled us to see if the students had changed their attitudes towards the reward system. This questionnaire was completed by the same 40 students who completed the first one.

- **Ethical considerations** related to the methodology: all students were given the opportunity to opt out of the process at any point. This was made very clear to the students and their parents within an official letter sent home.

**Key findings and conclusions**

The data collected was analysed and the questionnaire responses were compared using a graphical form (see Figure 1 and Figure 2):
Merits as a reward for achievement

Boys

Before Project

After Project

Figure 1: The extent to which boys value merits as a reward for achievement in school

Girls

Before Project

After Project

Figure 2: The extent to which boys value merits as a reward for achievement in school

- Boys were much more positive after the trial - with some suggesting they were working harder to achieve merits than was previously the case. This is supported by a study conducted by Ching (2012) which found that boys could be motivated by “material gains.” Whereas, the girls’ attitudes towards the reward system changed very little. This is an area we are keen to explore further.

- The teachers who completed our questionnaire were more negative than pupils about the existing rewards system. Despite 93% of teachers (n=37) believing that students enjoyed being rewarded, only 50% (n=20) of them felt that merits encouraged the students to consistently show a positive outlook.
• The students who were consulted wanted merits to result in ‘meaningful’ rewards such as lunch passes. One student said during a focus group session “Currently the incentive for earning merits (a free pen) is not worth it.”

• Staff using SIMS (a school management information system) to record merits instead of stickers was a major flaw in the trial. Not enough of the staff added the merits awarded to the students onto SIMS. Having discussed why this was the case with staff it was clear that it was the extra time it took to upload the merits onto SIMS that caused this. This would need to be explored further to improve the rewards system.

Implications for practice

• The trial was limited in its impact due to it not running for long enough and it would have potentially been more reliable if completed over an academic year.

• An extension of the trial to all of KS3 over a year would be very useful and would allow a more in-depth analysis of the impact of any further changes to the reward system.

• Dialogue with girls is required to ascertain why there was little positive reaction to the trial. This could then lead onto a possible change to the system that was gender neutral or potentially a different reward for the girls.

• Staff training and dissemination of the project and its findings is needed to help staff further understand the project and actively take part in it. This is vital for the smooth integration of changes to the system moving forwards. It will also help inform the style of the system and the type of rewards given to the students in the future.

References


Introduction

As a deputy head of year I am very aware of how students can struggle to access a range of subjects across the curriculum and often these are the heavily literacy based subjects such as English. There has been significant evidence in recent years that support my anecdotal evidence of poor literacy in some students for example by the OECD (Organisation for Economic Co-operation and Development) who analysed 22 countries and found a gap of 12.6% for literacy in England and Northern Ireland (2015). This evidence clearly demonstrates how literacy is at an unacceptable level for many of our school leavers and is supported by the Literacy Trust (2015) who stated that only 62% of secondary students achieve a minimum of a grade C in English at GCSE level. If students are not leaving school with significant literacy levels then they are unlikely to improve on their own in the future. The 2013 CBI Education and Skills survey found that 32% of employers felt that the literacy level of their employees was not of the required level (Taylor, 2014). Therefore it was felt in our College that literacy was a vital area to explore.

A real passion for me is that of Pupil Premium students. In education there is a key phrase that is repeated consistently by governments and by Ofsted, 2013 (The office for standards in education): “Closing the gap”. The gap is between students who come from a low socioeconomic background and those who come from a high socioeconomic background ie. the rich and the poor. This gap between these two groups is not a new phenomenon however those from a poorer background are achieving roughly 40% worse than those from richer ones (Gove, 2008).

Therefore this research aimed to look at two key areas where there are achievement gaps: literacy and pupil premium students. By supporting both areas it was hoped that an increase, no matter how small, could be made in the chosen students’ subjects, particularly those with a heavy focus on literacy.

Research aims

- To discover the impact of extra school time on literacy at KS3
- To research how KS3 students can improve in literacy based subjects
- To measure the impact of intervention on success in literacy based subjects

Context

The Chalfonts Community College is a mixed, non-selective secondary school for ages 11-18 in a selective area with the 11+ test. Our school has 1700 students of varying socio-economic and ethnic backgrounds that travel from within a radius of 10 miles to attend school.

As a deputy year leader for year 8 I am naturally interested in the success of KS3, with a key interest in year 8. Year 8 is when our students choose their GCSE options and so is a vital year at the College and so it was decided that this would be the year group that our research initially focused on. The students chosen to take part were majority pupil premium and from varying areas of our catchment area.
Methods

- I ran an after school homework club for 15 students in year 8. It was intended that more students were involved but it was a challenge to get support from some parents to keep their students after school and there was no provision available within the school timetable. Each parent was called and a letter sent home with a reply slip needed to confirm attendance.

- I facilitated a meeting with the RWCN (reading, writing, communication and numeracy) working party at the College to brainstorm ideas of how we could best support the students in their literacy. It was decided that I would track their progress across three key subjects which are literacy heavy: English, Citizenship/RE and History, as these are key areas where students appear to struggle in our College in regards to literacy. I was provided with some online tools to support the students eg. Samlearning.

- Over the daily homework club I supported students in completing homework as well as allocating English based tasks on samlearning. I also encouraged students to use more creative language in their writing and to not just complete the bare minimum.

Key findings

Lack of parental engagement
Using majority pupil premium students came with some challenges. Of the 20 students we originally invited only 7 immediately returned reply slips; instead phone calls had to be made to encourage attendance and once those phone calls were made there were still only 15 students who attended the homework club. This lack of parental engagement with the research was frustrating and prevented us from having a strong impact on some students who we particularly wanted to work with and support. However, it could also be argued that this lack of parental engagement is the very reason why we needed to support these students in their homework and literacy.

Achievement in literacy based subjects
It was difficult to accurately measure the impact of the research project; mainly due to its small scale. However, all of the students who took part in the project showed an increase of at least a sub-level in the literacy based subjects that were measured. Particularly in English, history and citizenship. The key issue here is that this progress would be expected over an academic term regardless of intervention. For this research, at this level, the key thing for me was to hear anecdotal evidence. Teachers reported that homework was of a higher standard, better presented and literacy mistakes were fewer or corrected accurately. These changes in pastoral support and indeed valuable, even if they cannot be accurately measured and quantified.

A surprising discovery
When starting with this project I expected for those who attended the homework club the most to have the biggest improvement in their literacy. This was not the case. In fact those students who reported to only attend the club when they knew they had a difficult or high stakes piece of work to hand in made more progress and had better reports from their teachers than those who attended every day. It seems that the reason for this was that those who attended every day used the club as more of a routine and social space whereas those who were more independent used the club for the support it was intended for, therefore helping them to achieve.
Conclusions and implications for practice

The main conclusion to be drawn is that more needs to be done to support our students with their literacy at all stages of their education. As a secondary school teacher I rarely receive the levels of my new year 7s until well in to the first term and so am unable to accurately differentiate or support them. More collaboration needs to be done with feeder schools in order to better support academic transition.

This project will hopefully be rolled out on a wider scale during the next academic year in order to gather more data but also to better support as many students as possible in both their literacy and their behavior patterns. This should then gain more support from staff and more awareness from parents so that the uptake is more consistent; therefore having a bigger impact on the students and their academic achievement.

In larger terms it would be beneficial for the school day to be extended so that students receive the benefits that wealthier students often achieve in private school. By adding an extra lesson at the end of the day staff would have time to run extra-curricular activities ranging from sports clubs to chess and it would also allow those who need literacy or numeracy support to receive it much earlier in their education than the intervention we now rush to implement in year 11 when it is often too late to have an impact. This would indeed be radical but would also prevent our students from setting up to fail as so often the students who do not hand in their homework or struggle with academic literacy have little support at home so instead of perpetuating the cycle surely it would be more beneficial to stop it in its tracks?

References


DEVELOPING RESILIENCE IN YEAR 8 GIRLS- CAN WE TEACH YOUNG PEOPLE TO BE MORE EMOTIONALLY RESILIENT?

JENNIE SIMMONITE, THE ROYAL MASONIC SCHOOL FOR GIRLS

Introduction

As a Head of Year for the last five years it has become increasingly apparent that mental health issues are becoming ever more prevalent in young people. General positive well-being is also a theme that has been highlighted both in our school and across a range of media, and increased emotional resilience is a significant factor in the promotion of this. The Big Lottery Fund launched a Well-being programme in 2005 and has worked with the New Economics Foundation (nef) and the Centre for Local Economic Strategies (CLES) to implement projects aiming to improve mental health, healthy eating and physical health (nef, 2012). Mental health issues are now frequently highlighted in the media - particularly those amongst adolescents - and it is an area several political parties pledged to focus on in the last General Election, given the demands that are continually placed on the Child and Adolescent Mental Health Service (CAMHS) service. Murphy and Fonagy (cited in Department for Health, 2015:21) have stated that ‘over half of all mental ill health starts before the age of fourteen years, and seventy-five per cent has developed by the age of eighteen’, thus highlighting the importance of early intervention and care in the teenage years. These issues manifest in a variety of ways; from depression, anxiety, eating disorders to Obsessive Compulsive Disorder (OCD). Indeed Bedell (2016) has reported that ‘rates of depression and anxiety among teenagers have increased by 70 per cent in the past 25 years’. As many of these more serious conditions seem to come to the fore during Key Stage 4 we thought it would be worthwhile to stage an early intervention project with Key Stage 3 to ascertain whether it is possible to prepare young people for the challenges they face later on and whether or not we can ‘teach’ skills of mental resilience to better equip young people in facing what life has to throw at them.

Cox (2015) has defined mental resilience as ‘the ability to mentally represent themselves and others without distortion, a positive view of the self which enables the individual to develop a range of personal strengths to cope with life’s adversities’ and Spencer (2016:19) has noted how resilience can, in part, encompass ‘the ability to develop appropriate coping strategies when dealing with stress, conflict, pressure and difficulties’ and ‘the ability to bounce back after the problem is over’. This formed the backdrop of the project; to promote positivity within girls and develop their coping mechanisms for dealing with life’s challenges. Nef’s dynamic model of well-being (2012) highlights how personal resources such as resilience, optimism and self-esteem are paramount to the promotion of general good feeling and the satisfaction of needs; hence positive well-being. With this in mind, it was very much our view to embed skills of resilience and focus on the range of positive skills that attribute to this all-round emotional resilience.

Research aims

Our aims when carrying out this project were the following:

- To ascertain what the current levels of resilience are through a Strengths and Difficulties questionnaire asking pupils to indicate how well they felt they could deal with the world around them.
- To investigate and trial whether or not such skills could be ‘taught’ to students to equip them for the future and make them more resilient.
Context

The Royal Masonic School (RMS) is an all-girls school in Hertfordshire. We are inclusive and take in girls from a variety of backgrounds. We have a number of boarders, including some from overseas. We pride ourselves on offering outstanding pastoral care and support, and motivate girls to achieve their very best. It is within the framework of the pastoral system that the increased awareness of mental health issues stem from; support is garnered on both a high level, critical platform as well as the ever-increasing lower level support that is frequently offered. Cox has stated that ‘girls are much less psychologically robust than males in terms of emotions’ (2015) and as such this would go some way to explaining why these problems seem to be ever more present in a girls’ school. Bedell reported (2016) that ‘a Girl Guides’ attitudes survey found that mental health was one of the most pressing concerns among young women, with 62 per cent of those surveyed knowing a girl their age who has struggled with mental-health problems. Therefore, this is quite clearly an issue that needs urgent attention.

Along with the support of our Senior Teacher for Pastoral Care, Mrs Cathy Bomford, we decided to see if this was an issue that could be tackled at an earlier age. I opted to focus our work on Year 8 as this can often be a ‘forgotten’ year group past the settling stage of Year 7, but not quite up to the importance of GCSE selecting that occurs in Year 9. By embedding some skills in Year 8, it would then leave the door open to continue with the work going into Year 9. Cox (2015) has also highlighted that ‘[girls’] expectations of future success are affected by past or present failures more than successes. They globalise failure and blame themselves more than boys do’, demonstrating the impact that early intervention has the potential to provide and, hence, an important reason to intervene as early as possible. This is further supported by the Government’s Future in Mind publication (2012) which highlighted that the promotion of good mental well-being and resilience, early identification and intervention are all crucial to fighting the mental health epidemic we are currently facing.

At RMS we already have a very successful ‘My Learning’ programme, developed since 2007, that has embedded the ‘Four R’s – the skills with which we develop independent learners. Therefore, we felt that these ‘Four R’s’ of Resilience, Reciprocity, Resourcefulness and Reflectiveness could also be used in a pastoral and emotional sense, as well as an academic one. This would also be an effective way of introducing the programme to the girls as they are already familiar with the Four R’s in an intellectual capacity and if these skills can be developed and nurtured in the academic world, then it stands to reason that these could also be applied to emotional development. Spencer (2016: 19) has commented that ‘resourcefulness, good communication skills, hope, and the ability to manage strong feelings and emotions are also linked to resilience’ and so it inextricably shows how these skills correspond with one another.

A sample of how these skills are currently embodied and promoted within the school are here (Figure 1):
As the project was a holistic one, aiming to improve the well-being of girls, we felt it fair to include all girls in Year 8.

Methods

As this project was based on 'soft' data, the girls' views on what they felt were their strengths and difficulties rather than anything more tangible or numeric it always going to be more of a challenge to gather. Indeed, Sedghi (2015) reported on ‘the difficulty in assessing the state of mental health among young people and identifying trends is partly attributable to a lack of “concrete data”’.

I launched the project to the whole staff body during Inset in September 2015. I encouraged staff to voice their interest and desire to be involved. I held a meeting with staff who had volunteered and discussed the concept with them, along with amalgamating some of their experiences and ideas for tasking the project further.

I developed a survey for girls to take which analysed their Strength and Difficulties. Michaelson, Mahony and Schifferes’ guide on this (2012) was most useful in refining questions as was the support of Dr Karen Smith at the University of Hertfordshire.
A sample question from this was:

**I try and deal with problems myself**

- Never
- Sometimes
- Often

In addition:

- I then planned a series of form time lessons, to fit in with the Year 8 form time program. I introduced the plan to Year 8 form tutors to win over their support.

- I launched the plan with Year 8 girls; informing them of what they would be required to do (take the survey) and the types of things they would be looking at over the coming months. Positivity and enthusiasm was the key to winning the girls over.

- The girls completed the survey and this data was then collated to get an overall picture of the year group. Girls had been reassured that their answers were anonymous and they would not be identified from their responses.

- Over the next term and a half various lessons were taught to Year 8 girls. These focused on the skills of resilience such as flexibility, accuracy of thinking skills, optimism and developing a positive mental attitude. Spencer (2016:19) has noted that ‘Resilience is linked to other traits like confidence and self-esteem. Importantly, it is linked to how supported we feel, and also to the boundaries we have been given as to what is acceptable and how to behave’. This helps to explain why resilience has to be taught over a space of time and focuses on a wide range of different skills.

  - I developed these lessons with the support of the Building Resiliency in Young People Guide (2012), which was designed for an Australian curriculum but has a number of useful hints for lessons and inspirational activities, which could easily be adapted.

  - Girls were asked to work individually in some instances, but also collaboratively within a pair or within larger group discussions with the rest of the class. The discussion elements were heavily encouraged so that girls could learn to look at events from different perspectives and see there were alternatives to what they might have first thought was the answer.

  - Girls were also encouraged to participate in a poster competition, by designing a motivational poster that could be used to encourage a positive mental attitude in others.

An example of one lesson activity is overleaf:
How can you be more optimistic?

• Write down three things happening in your life in the next couple of weeks that might be causing you concern or worry. There are some examples below.

• Then, try and think about them in a more positive way—what could you tell yourself instead? (I have filled in the first one to give you a clue)

<table>
<thead>
<tr>
<th>I have a Maths test today, I feel nervous about it.</th>
<th>I can only do my best. I have revised and that it is all I can do. It is not the end of the world if it goes wrong.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I’m not going to get invited to the birthday that everyone else has been invited to…</td>
<td></td>
</tr>
<tr>
<td>I have to do my Art homework and I don’t have enough time to spend on making it as good as it could be as I have other work to do too.</td>
<td></td>
</tr>
</tbody>
</table>

• The girls completed the original Strength and Difficulties questionnaire again so that research could be analysed for differences during the one and half term gap. Changes would not necessarily be attributed to the programme, as outside factors are of course significant—not to mention increasing levels of maturity—however they would provide an insight as to whether the general consensus was moving towards the girls becoming more emotionally independent and resilient.

• A focus group of Year 8 girls met; I selected a cross-section of girls from all forms in the year group as they might have experienced slightly different approaches to the lessons. I chatted with the girls to see how they felt their own levels of resilience were.

Key findings

Looking at the differences in the answers from the Strengths and Difficulties questionnaire, the following can be deduced:

• In the Resilience and Reciprocity sections of the survey there were some encouraging trends to be noted. More girls were finishing tasks that they started showing greater determination to succeed and equally they were making an effort to be kinder to one another and work together (Reciprocity).

• In terms of Resourcefulness more girls know who to ask for support—both in and out of school and more girls have used this support and are increasingly sharing their problems with others. 72% are talking to their friends about issues, compared with 66% in the first survey. By the second survey 93% stated that they knew an adult they could turn to if they had a problem outside of school, compared with 87% in the first survey (see Figure 2).
In the Reflectiveness area of the survey there was a general increase (55% up to 69%) of those feeling 'happy and content' (see Figure 3).

This question had an increased positive response rate of 7% as 88.7% of girls stated they knew who to ask for support in the second survey (as shown on the left).

There is more consideration of actions as girls appear to be more Reflective. There has been slight increase in those answering 'yes' and 'sometimes', shown in the overall chart below (see Figure 4).
Not all responses showed improvements; for example a small percentage of girls are getting frustrated more often. However, we cannot expect all results to be positive trends and the programme would need to be carried out over a longer expanse of time to see positive upward trends across as many categories as possible. Equally, changes in trends tend to be small and often incremental. However, the general consensus seems to be of increasing awareness of support and girls becoming more comfortable in dealing with life’s issues.

This was a view further supported by a focus group of girls from across the year group. They commented that they feel well-supported and know who they can call on in times of need. They happily talk to friends and are becoming more aware of the different avenues of help available to them. The girls spoke of their fears of the outside world and this is a theme worth pursuing in the future. Indeed, our prefect team is currently pursuing their agenda of looking at life ‘outside the bubble’ which could effectively filter down to the younger age groups.

‘There is a lot to be afraid of’ Year 8 girl

The girls were positive about the programme and willing to engage. They enjoyed the poster competition and produced some creative ideas. Here are two such examples (Figure 5):

**Figure 5: poster competition entries**
Conclusions and implications for practice

Looking to the future we aim to introduce more tasks to support the development of resilience and will incorporate this into the Year 8 and 9 form time programmes. The project and focus on resilience links in with the wider school projects we are also completing and with our school ethos, and as such will be part of our bigger vision going forward. I have spoken about the project at a ‘Life Skills’ evening for parents, as part of a talk delivered on Emotional Resilience, which tied into the overall event which was on Well-being. Increasing awareness, particularly amongst staff and parents, will be another step forward in continuing with the project.

This will correspond with a related study we have recently completed on assessing ‘Mental Toughness’. This was a survey taken by Year 9 and 12 girls and has since produced detailed results on how ‘mentally tough’ our girls are. This data can now be used to coach girls on their strengths and areas for development as they aim to become emotionally and mentally tougher.

This year ‘GRIT’ has been successfully embedded into academic practice- GRIT stands for Good Judgement, Responsibly, Initiative and Tenacity and again these are skills that we wish to transfer to the pastoral world as well as the academic one. Girls have become accustomed to using GRIT time during lessons- this gives them adequate time for Guided response and Reflection Time, which allows them to reflect on their own work and develop their independence as learners.

As we are already in the process of working towards greater emotional resilience across the whole school it will make it easier to embed these skills and make such lessons a regular part of form time programmes and assemblies. Many of the lessons I have developed this year will be useful for the upcoming Year 8 and I have also adapted many of these activities for use in Key Stage 4 form time. I have also developed assemblies such as a recent Year 10 one based on weakness and failure. Such programmes can equally be rolled out or implemented in stages across other schools in the Alliance. Spencer (2016:19) has noted that ‘the good news is that resilience is a trait which can be taught and nourished’ and that ‘Resilience is a process.. We develop the toughness we need to cope, in part at least, from experience’ and therefore we shall continue to ‘teach’ these skills as best we can. Events in the outside world are scary and the challenges faced by adolescents today are vast, but we cannot bubble-wrap young people. We cannot control these events and nor should we want to, but we can equip our pupils with the tools and skills to be able to deal with such eventualities in the best way they can.

References

Bedell, G. (Saturday 27th February 2016), Teenage mental-health crisis: Rates of depression have soared in past 25 years. The Independent, available online at: https://www.independent.co.uk/life-style/health-and-families/features/teenage-mental-health-crisis-rates-of-depression-have-soared-in-thepast-25-years-a6894676.html


DOES PARENTAL AWARENESS OF GAPS IN KNOWLEDGE OF A LIMITED NUMBER OF MATHEMATICS SKILLS LEAD TO GREATER IMPROVEMENT IN STUDENTS’ UNDERSTANDING?
JENNETT DENTON AND BRENTON LEGARDA, CHANCELLOR’S SCHOOL

Introduction

The Government introduction of Assessment Without Levels (DfE, 2015) provided an opportunity to review the Scheme of Work and assessment procedures for Year 7. Nick Gibb (2015) outlined the advantages with this approach and pointed out, “Wroxham Primary School in Potter’s Bar - with a demanding, mixed intake - doesn’t and hasn’t used levels as it has made its journey from ‘special measures’ to repeated judgments of ‘outstanding’.” This opportunity was not taken lightly. In fact, the researchers combined their experiences from across two continents and were keen to try the progress sheets shown by a teacher from the Wroxham School to create an easily adaptable scheme of work that allowed teachers to record and show how students were making progress.

Having worked with the National Curriculum for over 10 years, it seemed clear that teachers were being asked to report on far too many topics and, consequently, departments devised the only manageable way to assess, nothing more than a mark on a test. Students needed some control over their learning and to do this they needed to be aware of the specific skills that they are to be assessed on. Thus giving students a real chance of developing into independent learners. In order to allow this to happen at Chancellor’s School the 100 (or more) topics from the National Curriculum were reduced to 22 fundamental concepts. These topics were classified into eight themed units. No less mathematics has been done over the year, but there has been a greater emphasis on depth and application.

For the purposes of this research project, data was collected on three units of work. At the beginning of the unit every student was given a pre-test to establish a baseline level of understanding. Their results were recorded on the assessment sheet in Appendix A (a version of the assessment sheet introduced to us by The Wroxham School). At the end of the unit the students did a post unit test and again their results were recorded on the same assessment sheet used for the pre-test. Class progress was very easy to see, it takes a little more effort to see individual progress. However, all teachers managed to do this with relative ease.

Following the pre-test each student chose two topics that they would focus on and try to master. This informed us in our planning over the course of the unit. All the topics were covered in normal lessons, but in addition all students were made aware of extra resources to help with their learning. Letters were sent to the parents of the two experimental classes to reiterate the information given in class to all students. Sending parental letters involves a lot more work so it was important to find out if it was worth the effort.

Although the changes implemented were largely based on professional experiences and professional judgments, further inspiration was drawn from educational authors such as Jo Boaler (2015), Carol Dweck (2006) and David Williams (2011). Using pre and post unit test which looked very similar, would give the students an opportunity to see their progress more clearly (Williams, 2011). Providing each student with two targets at the end of the pre unit test, specific to their needs, and supplying independent learning resources promoted the idea that success was achievable for all students (Dweck, 2006). A large part of the scheme of work was dedicated to investigation and project work to allow students to explore mathematical concepts, providing them with the opportunity to develop a deeper understanding of key ideas (Boaler 2015).
Research aims

The project aimed to determine the following:

- Whether Year 7 students are capable of working independently of their teachers and parents;
- Whether reducing assessable elements and targets has an impact on the progress students make;
- If removing levels on formative assessment improves students’ confidence in a subject.

Context

Chancellor’s School is a comprehensive school of approximately 1000 students, including Sixth Form. The research project was based upon a new scheme of work designed to improve the quality of teaching and learning of Year 7 Mathematics Students. Specifically, the department felt that the previous scheme of work was not flexible enough to provide support or challenge were necessary. Furthermore, it did not provide enough opportunities for students to spend time exploring mathematics through projects or investigations. The scheme of work was also designed with new assessment to allow assessing and reporting without National Curriculum Levels.

When students arrived at Chancellor’s School they were given baseline tests for all core subjects. The results of which, along with Key Stage Two data, were used to place students in to sets. There were two parallel groups of three sets. The top and bottom sets (sets one and three respectively) were used as control groups, while the middle sets were the experimental groups. Conveniently we had the middle sets. Great efforts were made to ensure that this project was run ethically, and that all students had access to the same resources. The only difference between the control and experimental groups was that the parents of the experimental groups were informed about the targets their son or daughter had received, and were directed to the independent learning resources that their son or daughter were shown in lessons.

In the creation of a new way to record and monitor progress, the Mathematics department took inspiration from Wroxham School. Wroxham School is a feeder primary school for Chancellor’s school. Over the last decade it has made the transition from a school judged by OFSTED as “Inadequate” and placed in special measures (2003), to a school judged as “Outstanding”, first in 2009 and in every inspection since. On a joint INSET day, a teacher from Wroxham shared a recording grid which she used to track the progress of individual students. This initial grid was then adapted to our scheme of work and used in pre and post unit tests (See appendix A).

Methods

Pre-test and Post testing

The pre-test for all three units in this research were completed under test conditions. The pre-test was used to establish a base-line for the students and to inform teachers’ planning. Once the pre-test had been marked each student received individual feedback in the form of two targets to focus on throughout the unit. Students had some say in selecting these targets. All students were then directed to independent learning resources which were accessible on ‘Show my Homework’. It is also worth mentioning that parents had access to these resources as well.
For two of these units a letter was sent home after the pre-unit test to two out of the six classes to inform parents of their son/daughter’s targets and the location of the independent learning resources. The third unit, where no letter was sent home, was used as a control unit. At the end of each unit a post unit test was completed under test conditions. This provided information about student progress to teachers and gave students the opportunity to see how they have progressed in the unit. The data were analysed using a chi-square test. A chi-square test compares the ‘observed’ values for each variable with the ‘expected’ value. If the test statistic is greater than the critical value there is a significant difference between the two variables (Diamond & Jeffries 2001: 184).

Progress was measured using the new threshold system introduced across the whole school. The Mathematics faculty decided on which topics fitted in to each threshold and overview of which can be found in appendix B.

**Student Survey**

It was noted by the Year Seven Teachers that there was a reduced anxiety around assessment. So, it was decided that a student survey would help quantify this intuition. The survey was taken by 100 pupils and it aimed to determine the following:

1) Levels of anxiety around pre and post testing
2) Whether targets students received helped them improve their understanding
3) Whether it was clear to students that they had or had not made progress in a unit of work
4) The proportion of students who received help from their parents on their classwork and/or homework
5) The proportion of students who accessed the independent learning resources
6) How engaging students found the investigations and project work

Qualitative data was also used to add more detail and provide more clarity on the findings from the survey.

**2014 vs 2015 Intake Data**

To determine whether the changes to teaching, learning and assessment had an impact on student progress, the current cohort and previous cohort of students were compared using a chi-square test. We initially used a chi-squared test to compare the Key Stage Two data, which showed no significant difference between the two years. The autumn term progress data was then subject to the same statistical testing. There were some difficulties in comparing the old National Curriculum Levels to the schools’ new threshold system, but the conversions used were based on Senior Leaders’ recommendations.

**Key findings**

The student progress was analysed on three units of work. On the two units where letters were sent home, students in the experimental group showed greater progress which was statistically significant beyond 0.001 (see Table 1 and 2). One unit was kept as a control to remove any effect of teachers, the progress between the experimental and control groups was not statistically significant in this unit (see Table 3). Furthermore, the current cohort of students made more progress in the autumn term, than the previous cohort of students (see Table 4 and 5).
Unit 2 where letter was sent home

<table>
<thead>
<tr>
<th>Levels of Progress</th>
<th>0 or less</th>
<th>1</th>
<th>2 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>students without parental letter</td>
<td>27</td>
<td>50</td>
<td>15</td>
<td>92</td>
</tr>
<tr>
<td>students with parental letter</td>
<td>8</td>
<td>24</td>
<td>30</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>74</td>
<td>45</td>
<td>154</td>
</tr>
</tbody>
</table>

Table 1: Contingency table level of progress / receipt of parental letter unit 2

We observed a statistically significant association between the sending home of a parental letter and levels of progress made in Unit 2: $\chi^2 (df \, 2, \, n=154) = 19.34, \, p<.05$.\(^1\)

Unit 4 where letter was sent home

<table>
<thead>
<tr>
<th>Levels of Progress</th>
<th>0 or less</th>
<th>1</th>
<th>2 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>students without parental letter</td>
<td>30</td>
<td>64</td>
<td>16</td>
<td>110</td>
</tr>
<tr>
<td>students with parental letter</td>
<td>8</td>
<td>30</td>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>94</td>
<td>30</td>
<td>162</td>
</tr>
</tbody>
</table>

Table 2: Contingency table level of progress / receipt of parental letter unit 4

We observed a statistically significant association between the sending home of a parental letter and levels of progress made in Unit 4: $\chi^2 (df \, 2, \, n=162) = 5.05, \, p<.05$.

Unit 3 where no letter was sent home

<table>
<thead>
<tr>
<th>Levels of Progress</th>
<th>0 or less</th>
<th>1</th>
<th>2 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>students in control group</td>
<td>24</td>
<td>69</td>
<td>20</td>
<td>113</td>
</tr>
<tr>
<td>students in experimental group</td>
<td>12</td>
<td>30</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>99</td>
<td>38</td>
<td>173</td>
</tr>
</tbody>
</table>

Table 3: Contingency table level of progress / control and experiment group in unit 3

We observed no statistically significant association between the students in the control group and the students in the experiment group in terms of the progress in unit 3 (where no letter was sent home).

---

\(^1\) The presentation of the test statistic follows this pattern: $\chi^2 (df1, \, n=919) = 34.5, \, p<0.05$. $\chi^2$ refers to the chi-square test, df is the degrees of freedom, n is the number in the sample, the number is the test statistic and the p-value is the confidence level (95%).
Comparison of 2014 and 2015 Key Stage 2 Data

<table>
<thead>
<tr>
<th>Level of Entry</th>
<th>2014</th>
<th>2015</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2b</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2a</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3c</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3b</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3a</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>4c</td>
<td>12</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>4b</td>
<td>18</td>
<td>26</td>
<td>44</td>
</tr>
<tr>
<td>4a</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>5c</td>
<td>27</td>
<td>37</td>
<td>64</td>
</tr>
<tr>
<td>5b</td>
<td>34</td>
<td>22</td>
<td>56</td>
</tr>
<tr>
<td>5a</td>
<td>12</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>6c</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6b</td>
<td>16</td>
<td>19</td>
<td>35</td>
</tr>
<tr>
<td>Totals</td>
<td>170</td>
<td>176</td>
<td>346</td>
</tr>
</tbody>
</table>

Table 4: Contingency table level of entry KS2 SAT Level / year

We observed no statistically significant difference between the intake SAT levels of 2014 and 2015.

Autumn Progress data of 2014 vs 2015 Intake where no letter was sent home either year.

<table>
<thead>
<tr>
<th>Progress sub levels</th>
<th>2014</th>
<th>2015</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; and = -2</td>
<td>5</td>
<td>18</td>
<td>23</td>
</tr>
<tr>
<td>-1</td>
<td>19</td>
<td>20</td>
<td>39</td>
</tr>
<tr>
<td>0</td>
<td>35</td>
<td>30</td>
<td>65</td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>24</td>
<td>74</td>
</tr>
<tr>
<td>2</td>
<td>31</td>
<td>20</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7+</td>
<td>1</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>134</td>
<td>305</td>
</tr>
</tbody>
</table>

Table 5: Contingency table progress level autumn / year

We observed a statistically significant difference between the data of 2014 vs 2015 and levels of progress made in the autumn assessment: \( \chi^2 (df 9, n=305) = 32.6, p<.05 \).
The responses to the student survey suggested that students find the smaller more frequent assessments less stressful than larger end of term assessments, with mean weighted scores of 3.31 and 2.81 respectively (where 1 represented most stressful and 5 represented least stressful).

“As it is a starter test there is not much pressure as you can improve next lesson”

“They are fine as I know I will do better on the second test after we have learnt a bit more”

Additionally, 82% (n=82) of students said that it was clear which topics they would be assessed on in the post test and 87% (n=87) of students responded to say it was clear whether or not they had made progress in a unit.

“It is clear because the teacher shows us our first test and then we have a look to see what we need to improve on. Then we look at our second test and see if we improved on our targets.”

There did seem to be a number of comments that suggested students were counting the number of ticks they received on each test and using this as a method of measuring their progress, while others were paying more attention to their targets or specific questions they answered correctly. It is likely that the students were using ticks to measure progress as this is the habit they have developed in key stage two. Furthermore, a surprising number (n=45) of students said that they would have liked to receive a grade or level with their paper.

“It would be nice to know what level you are working at”

“To see more clearly where you are and so you can tell parents/family more easily”

These comment suggest that the culture created by giving levels needs to be addressed and students need to be offered further training on how to judge their own progress using pre and post unit tests. One of the benefits of not using grades is that students do not compare and judge one another negatively, which was captured in the comment below.

“Yes (I would like to receive a grade or level) on both because you can actually see the progress. But the test shouldn't be shared or marked by other students”

The pre and post tests should facilitate students to have an open dialogue about their strengths and weaknesses.

With respect to accessing help outside of lessons, most students relied on help from their parents (54%, n=54), closely followed by the independent learning resources (42%, n=42) published on Show My Homework. Interestingly, MyMaths was only accessed by 19% (n=19) of the students surveyed and only 8% (n=8) said they asked a teacher for help at break or lunchtime. Given that greater progress was made by the students in the experimental group, it is likely that a higher proportion of students in these groups accessed the independent learning resources and received help from their parents, compared to the control group. Unfortunately, the data collected in the survey did not ask for a student’s teacher or set, so further analysis is not possible.

During the year student learning consultants conducted a student learning survey across Key Stage 3 and Key Stage 4. Although their methods may not meet the standards expected of an action research project, their results are still worth mentioning. Across these key stages the Mathematics Faculty were listed as one of the top subject where students felt confident making mistakes. Furthermore, the Mathematics Faculty were also regarded as the Faculty which encourages independent learning most often. The survey also concluded that students felt that the homework set by the Mathematics Faculty was the most useful and relevant within the school. In prior years where similar surveys were conducted, the Mathematics Faculty was only recognised in the homework
category. These findings are evidence of a cultural shift within the Faculty that reflects the ideas of the educational literature summarised in the introduction.

**Conclusions and implications for practice**

Supplying students with targets to improve is far from a new idea, nor is the idea that younger students can work independently. However, the data collect strongly suggests that Year 7 students are unable to learn independently outside of the classroom without guidance from parents and teachers. It is crucial that secondary teachers do not expect Year 7 students to arrive in September, ready to function independently. We must consider the amount of support and communication provided to the students and the parents in a primary school setting, and slowly remove or adapt what is being offered. As the capacity to work independently is so useful for students preparing for GCSE examinations it would be important to consider how teachers are supporting students in each year to gradually build their ability to work independently.

In order to foster independent learning in Year 7 students the following conditions need to be met.

1. Parents need to be made aware of which topics or skills their child needs to improve upon.
2. Resources need to be provided which are easy to use, explain key concepts well and provide opportunities to practice.
3. Students need to be given ample opportunity to see evidence that they have made progress.

These three conditions have guided the development of further Schemes of Work. Furthermore, it is through improving the clarity of assessment that students’ progress and confidence is improved.

Unfortunately, it is not economically or logistically viable to send a parent letter home to all students, after every pre unit test, for every subject. So in order to maintain detailed communication between teachers and parents further strategies are being trialed. Nurturing students’ ability to learn independently and promoting an intrinsic love of a subject is the ultimate goal of any educator. The data collected in this project strongly support the conclusion that the using pre and post testing, maintaining detailed communication with parents, and using investigates to support depth of understanding, foster independence and an appreciation of mathematics.

**References**


Education Endowment Foundation (2016) *The evidence for marking, Best Evidence in Brief*, available online at: [http://ieeyork.blogspot.co.uk/search/label/marking](http://ieeyork.blogspot.co.uk/search/label/marking)
Appendix A: Grid Assessment of pre-unit and post-unit tests

<table>
<thead>
<tr>
<th>Number</th>
<th>Conventions</th>
<th>Arithmetic</th>
<th>Geometry and measure</th>
<th>The number system</th>
<th>Foundation</th>
<th>Developing</th>
<th>Secure</th>
<th>Accomplished</th>
<th>Exceeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 &amp; 02</td>
<td>&amp; A &amp; &amp; &amp;</td>
<td>&amp; &amp;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03 &amp; 04</td>
<td>&amp; B &amp; &amp;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05 &amp; 06</td>
<td>&amp; C &amp; &amp;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07 &amp; 08</td>
<td>&amp; D &amp; &amp;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The table continues with additional columns and rows, detailing the assessment criteria and performance levels.
Appendix B: Extract of the Key Skills for Mathematics

Key skills of Mathematics for KS3

<table>
<thead>
<tr>
<th>Area 1: Using equipment</th>
<th>Key Skills in this area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Using a ruler, compass, protractor and calculator to perform simple procedures like measuring and drawing.</td>
<td></td>
</tr>
<tr>
<td>- Using a ruler, compass and protractor proficiently to perform complex procedures like constructions, bisectors and loci.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 2: Number System</th>
<th>Key Skills in this area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Read, write, order and compare numbers and fractions up to 10 000 000 and determine the value of each digit.</td>
<td></td>
</tr>
<tr>
<td>- Multiply and divide by powers of 10.</td>
<td></td>
</tr>
<tr>
<td>- Understand the effect of multiplying and dividing by decimals.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 3: Arithmetic</th>
<th>Key Skills in this area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Use negative numbers in context.</td>
<td></td>
</tr>
<tr>
<td>- Multiply up to 4 digits by two digit whole numbers.</td>
<td></td>
</tr>
<tr>
<td>- Divide up to 4 digits by 2 digit whole numbers and interpret remainders (e.g., as fractions, decimals or rounding).</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Area 4: Geometry and Measure</th>
<th>Key skills in this area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Use, read, write and convert between standard units of length, area, volume, mass, time and speed.</td>
<td></td>
</tr>
<tr>
<td>- Understand the concept of area and volume.</td>
<td></td>
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<tr>
<td>- Classify triangles and quadrilaterals based on their properties.</td>
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</tr>
</tbody>
</table>

Year 7 Key Skills for Mathematics

<table>
<thead>
<tr>
<th>Progression</th>
<th>Foundation</th>
<th>Developing</th>
<th>Secure</th>
<th>Accomplished</th>
<th>Exceeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Equipment</td>
<td>- Able to use a ruler and protractor (acute angles) accurately.</td>
<td>- Able to use a compass to draw circles and semi-circles.</td>
<td>- Able to use the power, root and fraction buttons accurately.</td>
<td>- Able to measure and draw reflex angles.</td>
<td>- Able to use compass to accurately construct triangles.</td>
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<tr>
<td>- Read, write, order and compare numbers up to 100 000.</td>
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<tr>
<td>- Use decimals in context.</td>
<td>- Able to read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.</td>
<td>- Multiply whole numbers by powers of ten.</td>
<td>- Multiply decimals by powers of ten.</td>
<td>- Add and subtract negative numbers.</td>
<td>- Able to compare the size of fractions with different denominators.</td>
</tr>
<tr>
<td>- Multiply up to 4 digit numbers by 2 digit numbers.</td>
<td>- Divide up to 4 digit numbers by 2 digit numbers.</td>
<td>- Recall up to 12 times tables.</td>
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</tr>
<tr>
<td>- Understand inverse operations.</td>
<td>- Able to add and subtract negative numbers.</td>
<td>- Able to multiply and divide positive numbers.</td>
<td>- Able to multiply and divide decimals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Interpret remainders as decimals.</td>
<td>- Able to multiply and divide negative numbers.</td>
<td>- Able to calculate volume of prism given the area of the cross section.</td>
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</tr>
<tr>
<td>Geometry and Measure</td>
<td>- Able to calculate perimeter and give answers in appropriate units.</td>
<td>- Translate shapes.</td>
<td>- Be able to explain the concept of, and calculate area of simple and compound shapes.</td>
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</tr>
<tr>
<td>- Recognises appropriate units for length, area and volume.</td>
<td>- Relate shapes about a coordinate.</td>
<td>- Able to calculate surface area and volume of cubes and cuboids.</td>
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</tbody>
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