



National College for
Teaching & Leadership

Closing the gap: test and learn

**Teacher led randomised controlled trials
- Organisation of learning**

January 2016

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1 What is the early adopter strand of closing the gap: test and learn?

The delivery of comprehensive training for teaching schools participating in the closing the gap: test and learn programme covered rigorous and robust research methods appropriate for use in schools, including quantitative research methods such as RCTs, so that teachers gained an awareness of research methodologies (set-up, design and evaluation) and were able to contribute effectively to the trials. This also ensured that teachers in different contexts were able to deliver the interventions under trial in a consistent manner. The strand of work delivered through the RDNE events focused on training teachers in the delivery of small-scale RCTs (and other forms of experimental research) and immediately yielded school-level activity. In response to this, the NCTL made available 50 'early adopter' grants to support participating teaching schools and their alliances in delivering their own small-scale RCTs. A total of 48 of these studies were presented at a conference poster event at NCTL in Nottingham on 21 October 2015.

2 Research posters

This supplementary document to the main closing the gap: test and learn report contains examples of small-scale trials (micro-enquiries) that were designed and run by teachers, with support from the project team. The teachers running each trial produced a research poster to display at the dissemination event in October 2015, similar to the way that postgraduate researchers present their work at conferences.

50 schools were funded to carry out micro-enquiries as part of closing the gap: test and learn. 47 posters were produced in all. 2 studies were not completed as a result of factors outside the control of the teachers. 1 further study was completed but the school did not produce a research poster in the correct format.

The posters contained in this document all relate to interventions that change the way learning is organised, either by altering the classroom environment or the structure of the teaching.

The effect of the environment on pupil's level of engagement

Alison Ley & Paula Baxter

Introduction

Through observations of our pupils (Profound Multiple Learning Disabilities, Severe Learning Difficulties, Autistic) we have recognised that for some pupils the learning environment can have an impact on their engagement levels. This will then have an impact on their learning & progress.

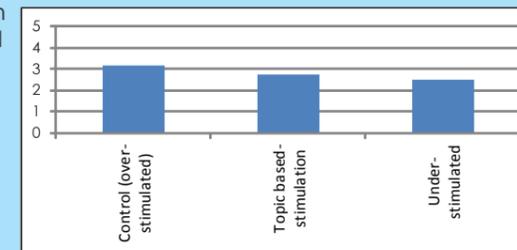
Currently pupils are taught in small classes with a high level of support. The classrooms are equipped with a range of furniture, equipment and visual displays.

The aim is to conduct a small scale experimental pilot to investigate the impact the environment (specifically visual stimulus) has upon pupil's engagement levels. If successful the experiment may be replicated throughout school and it is hoped that it may support us in grouping the pupils more appropriately in terms of their preferred environment for learning and therefore result in better outcomes.

It could be argued that visual stimulus has an impact on pupils learning and thus to optimise learning the environment may need to be abated accordingly. This is an important area to explore using a randomised controlled trial design because although we have redesigned the curriculum to meet the needs of the pupils we haven't as yet changed the environments in which they work.

Results

Prior to analysis, missing control condition data from one participant was replaced with the mean. An initial Friedman test showed a significant difference across all three conditions ($W = 0.12$ (a small effect), $p = 0.034$ (two-tailed)). Planned comparisons using separate Wilcoxon signed ranks tests (with a Bonferroni adjusted threshold for significance of 0.0167) indicated that both topic based stimulation and under-stimulation cause a moderate increase in pupil engagement compared to normal practice (control) ($r = -0.24$, $p = 0.007$ (one-tailed) and $r = -0.36$, $p = 0.004$ (one-tailed), respectively). Mean scores for the five engagement subscales (see table below) indicated a similar pattern for all areas that were assessed.



Mean scores for overall engagement and the five subscales

	Control (over stimulation)	Topic based stimulation	Under-stimulation
Level of communication	3.08	2.70	2.52
Level of eye contact	3.33	2.79	2.75
Response to activity	3.19	2.64	2.39
Response to adults	3.12	2.70	2.43
Time spent on task	3.28	2.76	2.55
Overall engagement score	3.17	2.75	2.50

The scale used for the trial was 1 – fully engaged, 2 – mostly engaged, 3 – partially engaged, 4 – fleeting engagement, 5 – distracted.

Method

Participants

- Opportunity sample of 3 classes. One mixed age (between seven and eleven year old) 4 female and 5 male, mixed condition, similar academic ability primary class. One mixed ability secondary class and one mixed ability primary class. Choosing the different classes gave a better representation of the school population and avoided some aspects of individual difference
- Classes were randomly allocated to one of the three experimental conditions; this helped to reduce any order effect. The experiment was carried out in pupils' regular classroom with their regular teaching staff and followed the regular school week, to improve the study's mundane realism and external validity
- One member of staff was assigned to carry out the observations and filling out the record sheets in each class room

Materials

- Usual classrooms, changing the environment for each stage of the test. In order to ensure that the test is fair the same set of stimulus and resources was used in each environment
- Monitoring sheets to compare environments to engagement were completed by one single member of staff over the three week trial to ensure continuity and fairness

Procedure

- Participants followed their normal weekly timetable and routines within their usual classroom environment. Over the course of the week the participants' levels of engagement was recorded using a standard grid. The same member of staff was responsible for the recordings each week
- This was repeated over the course of three weeks. Each week the environment was changed
- The study was run as a blind trial with the participants involved unaware of the change in condition

Design

An opportunist sample within-subject design was used to address the aims of the research. The independent variable, visual stimulus, was operationalised by creating three conditions.

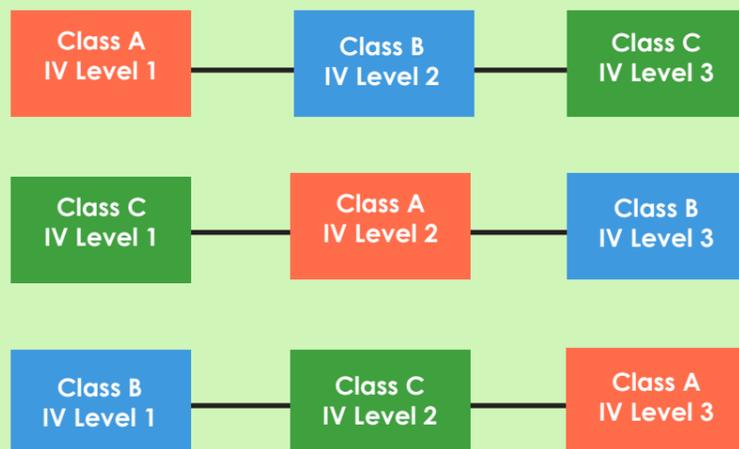
IV Level 1 (Control condition) – the normal classroom environment

IV Level 2 (Intervention) – Visual stimulus related to learning

IV Level 3 (Intervention) – No visual stimulus in the classroom

The dependant variable was level of engagement measured using observations.

The three conditions were counterbalanced in the following way:



Conclusions

This small-scale preliminary study suggests that both topic based- and under-stimulation can have positive effects on classroom engagement across a wide range of areas but that under-stimulation can be marginally more engaging than topic based-stimulation ($r = -0.16$). A larger replication will be necessary to confirm the findings above. If shown to be the case, in such a study, the findings would illustrate for the first time in a controlled trial the significant differences that varied practices can have on engagement and the delicate challenge that teachers face in maintaining the right levels of classroom engagement.

When reading the results it is important to understand the context of the learners. The mixed cohort included pupils with profound, multiple learning difficulties and multi-sensory impairments (PMLD/MSI), Autistic (ASD) as well as generic severe learning difficulties (SLD). On more detailed analysis of individual results it would suggest that the under-stimulated classroom provided fewer distractions for both the ASD and MSI learners, whereas for pupils who are cognitively more able the topic based environment supported their engagement.

A future study may also wish to include measures of attainment, which were beyond the scope of the present design.



Changing a classroom’s teaching environment can raise attainment in English and Mathematics.

LONG SUTTON COUNTY PRIMARY SCHOOL

Bill Lord

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<p>Introduction</p> <p>In the light of advice from the Department for Education and many teaching training institutions that "A stimulating environment makes for a stimulated child" (DfES 2006) many schools have sought to increase the amount of stimuli on display in classes. More recently, there has been meta-analysis of contrasting evidence that these classroom environments can negatively impact pupil experiences through over stimulation and the imposition of visual clutter (Dudek 2000). This includes the work of Broadbent, 1958 (cited in Mcains & Castner 2011 and The Basic Skills Agency 2007). It may be possible that removing interactive whiteboards (IWBs) and traditional roller chalk / white boards and replacing them with large expanses of wipeable, magnetic whiteboards would reduce this visual clutter and support the raising of standards in literacy and mathematics through changing the pedagogy of the class teacher.</p>	<p>Method</p> <p><i>Participants</i></p> <p>Three participants were chosen from Years 1, 2, 4 and 5 as these were the year groups with the closest match in quality of teaching and pedagogical approaches. Three year groups were randomly allocated to take part in the test and then one class per year group was randomly allocated to the changed teaching environment. One class experienced a term of teaching with the changed teaching environment and the paired class continued in the original classroom environment. We considered the ethics of such research. The changes were made as part of refurbishment of teaching environments as our IWBs are beginning to fail and technology has changed to allow work on iPads to be projected through a laptop. Using a term as the period of research allowed all other classes to be refurbished in line with the findings of the test. This involved 116 children.</p>	<p>Results</p> <p>One set of participants and the control group in that year were removed due to classroom based environmental issues which impacted on the controlled status of the research. Gain scores were first calculated using the results in the graph below. A Mann-Whitney U test indicated that there was no significant difference ($p=0.382$ two tailed) between the progress rate of children in the classrooms where the Interactive Whiteboards were removed (Mdn gain = 5.17) compared to the control where Interactive Whiteboards were not removed (Mdn gain = 4.62). The effect size was small ($r= 0.12$). Should the research be repeated with a larger sample (increased from $n= 108$ to $n= 200$) then a future larger study might be able to indicate that the removal of IWBs produces a positive benefit for learning in mathematics compared to classes where IWBs are used.</p>									
<p>Research design</p> <p>A between-subject design was used with a pre- and post-test. To address the aims of the research the independent variable (teaching environments) was operationalised by creating two conditions.</p> <p>IV Level 1 (Control condition): The class will not have the IWB and roller board replaced. The curriculum will be the same as the intervention classroom</p> <p>IV Level 2 (Intervention): Remove IWB and roller chalk / whiteboard to be replaced with a large expanse of wipeable, magnetic whiteboard.</p>	<p><i>Procedure</i></p> <p>The paired classes were taught the same curriculum with teachers still working collaboratively on planning to ensure continued equality of opportunity for all classes. Children’s attainment data was collated before the start of the RCT using summative tests. This was moderated by an external Education Consultant. This process was repeated at the end of the RCT for comparison of impact between the intervention and control classrooms.</p>	<table border="1"> <caption>Gain Scores Data</caption> <thead> <tr> <th>Group</th> <th>Pre</th> <th>Post</th> </tr> </thead> <tbody> <tr> <td>Intervention</td> <td>~46.5</td> <td>52</td> </tr> <tr> <td>Control</td> <td>~46</td> <td>~50.5</td> </tr> </tbody> </table>	Group	Pre	Post	Intervention	~46.5	52	Control	~46	~50.5
Group	Pre	Post									
Intervention	~46.5	52									
Control	~46	~50.5									
<pre> graph LR A[Pupils in Year 1, 2, 3 and 4 classes] -- Random allocation to select year groups and classes to control or intervention --> B[Pre test] B -- Control --> C[Post test] B -- Intervention --> C </pre>	<p><i>Materials and apparatus</i></p> <p>We purchased approximately 8 square metres of wipeable, magnetic whiteboard for each intervention classroom. We had equipment and cabling removed to create an uncluttered teaching space.</p>	<p>Conclusions</p> <p><u>Preliminary evidence for the effect of IWB removal in mathematics lessons indicates that:</u></p> <ul style="list-style-type: none"> • The research design was effective in producing findings but in order to produce more robust findings there would need to be a greater sample size and more work on the pedagogy of teaching without an IWB • The intervention group’s results appear to show the removal of IWBs has an effect at least equal to teaching with an IWB. The intervention might show a greater benefit if findings were found in a major style study. <p><u>Recommendations for future research</u></p> <ul style="list-style-type: none"> • Replicate on a larger scale • Look at the development of the intervention to include suggested pedagogies 									

Flipped learning has a positive impact on attainment in MFL.

Jessica Thomas
Stamford Welland Academy
Cambridge Teaching Schools Network

Introduction

After exam results of 8% A*-C in 2013-14, I was interested in researching ways in which I could improve attainment in MFL at KS4. I attended the ILILC conference, where I saw a presentation on how flipped learning was used in MFL lessons and I thought that it would be interesting to research whether this would have a significantly positive impact on attainment in MFL.

Research design

I used a within-subject design, with a pre- and post-test. To address the aims of the research the independent variable (flipping the learning) was operationalised by creating 2 conditions which were counterbalanced, each for a different topic area.

IV Level 1 (Control condition): Students complete normal HW and normal classwork.

IV Level 2 (Flipped Learning): Students complete the usual class work content as flipped learning from home and a variety of extension activities in the lesson.

	Topic 1	Topic 2
Group 1	IV Level 1	IV Level 2
Group 2	IV Level 2	IV Level 1

Method

Participants

I chose my year 10 Italian class for this research as they were KS4, mixed ability and were at a stage in the syllabus where there were still a number of new topics to cover. There were 18 students in total and I allocated them to two groups using an online random number generator.

Procedure

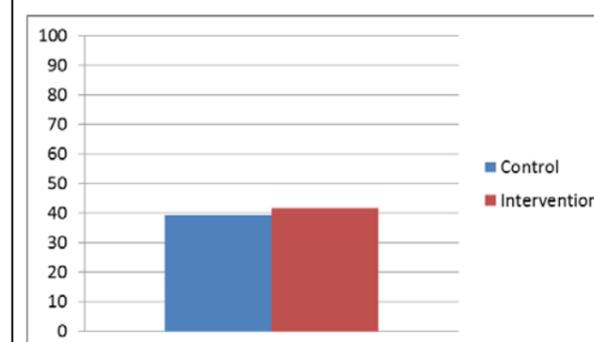
I decided to concentrate on using flipped learning to introduce new grammar as I believed that using it for a variety of purposes may cloud the overall results and it would be simpler to keep the purposes the same. Group 1 were taught how to form the subjunctive in Italian as I normally would in class and then had HW to translate a number of sentences using the subjunctive. During this lesson, Group 2 worked in another classroom completing unrelated work so that they weren't exposed to the grammatical explanation. They completed the same activities as flipped learning from home (making notes from my ppt presentation and completing the same grammatical activities as Group 1 had in class). The next lesson, while Group 1 worked elsewhere, Group 2 had the opportunity to ask about anything they hadn't understood and then completed the same translations that I had set Group 1 as HW. A fortnight later I completed the same activity but with the groups reversed on a different topic (The imperfect subjunctive in Italian)

Materials

I used ppt presentations to present the grammatical information and worksheets to test the application of the grammatical skills learnt. I also used the website showmyhomework.com so that both students and parents had online access to the work being set.

Results

Gain scores were first calculated. As anticipated, because of the small sample size, a Wilcoxon signed-rank test (one-tailed) indicated a non-significant difference between the control group and the intervention group ($p = 0.30$). There was, however, a small positive effect on the progress of the children who experienced the flipped learning ($r = 0.104$).



Teacher assessed student attainment in MFL did appear to improve from CPP2 (Predicted grades collated a month before the research started) to CPP3 (taken three weeks after the research finished).

Conclusions

This was only a small scale pilot study, (due to the fact that I was only on a part time timetable) and I would recommend that a larger scale study should now be completed in order to more fully test the research hypothesis. Despite the small sample size there was, however, a small positive effect on student attainment as a result of exposure to the flipped learning.



There will be a significant difference in the attainment of students when taught using a flipped classroom method in comparison to those given a traditional lecture style lesson.

Peter Harris
The Bishop's Stortford High School
Catalyst Teaching Alliance

Introduction

Based on new technological advancements there have been many developments and opportunities for teachers to utilise students home learning environment. However, there's a lot of research that states that lecturing is the only teaching style present in the traditional classroom (Lage, Platt and Treglia, 2000). Currently students receive information in the classroom being delivered at the bottom end of Blooms taxonomy and are then expected to extend their understanding outside of the classroom to the top end of the taxonomy. It may be possible to improve student engagement and ultimately attainment if they engage with the work outside of the lesson to develop knowledge and understanding whilst inside the classroom they are challenged to evaluate and analyse the work.

Research design

A between-subject design was used with a pre- and post-test. To address the purpose of the research, the independent variable intervention type will be operationalised by creating two conditions.

IV Level I (Control condition) – Normal classroom practice

IV Level II (Experimental condition) – Pupils receive content teaching through an online video prior to the lesson

Method

Participants

Two Year 10 Physical Education classes at The Bishop's Stortford High School (mixed ability) took part in the trial, consisting of 48 boys. These pupils were selected as the only two GCSE PE classes being taught the same aspect of the syllabus by the same teacher. The classes were randomly allocated the condition that they would experience.

Procedure

All pupils will do a pre-test to determine a base-line score. They will remain in the same classes but this score will be a basis for determining progress over the six week intervention. Group 1 participated in a flipped learning approach for the 6 lessons while group 2 followed a normal classroom approach.

Pupils then sat a post-test devised using the AQA Exampro database of questions.

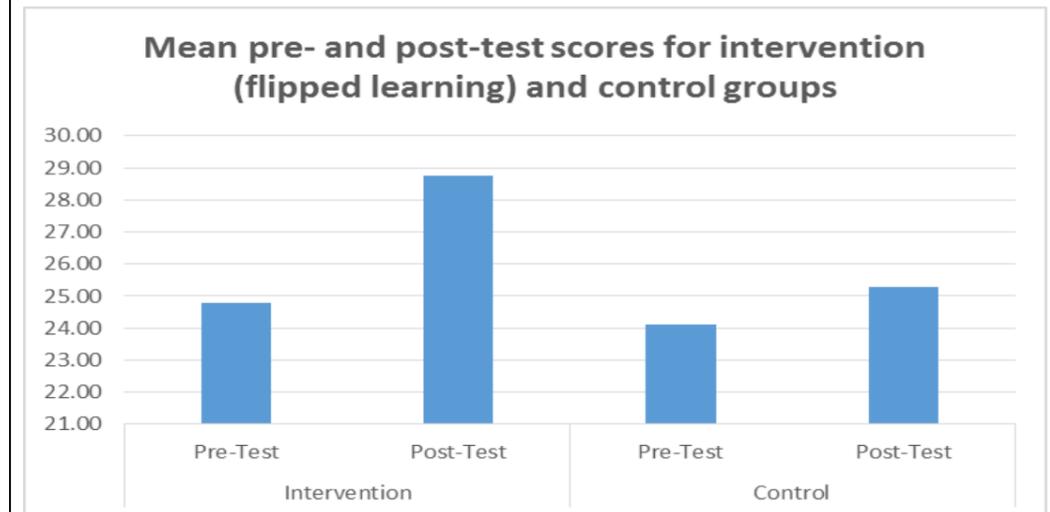
Materials

The test was devised using the AQA Exampro software to create exam papers using past paper questions. The flipped learning materials were made available via YouTube from 'My PE Exam'. Alongside the flipped learning video there were also materials produced in-house to help students make notes whilst watching the videos.

Results

Gain scores (calculated from pre- and post-test scores) were used in the analysis. A Paired samples t-test indicated that there is strong evidence ($p = 0.004$ (one-tailed)) that the intervention improved the progress of the pupils who were taught using the flipped classroom method (Mdn = 3.96) compared to the control (Mdn = 1.17).

A replication would be required to ensure that this conclusion holds true for more students and over a longer period of time.



Conclusions

Flipped learning improves attainment in KS4 GCSE PE tests. Through teacher observations and student voice during the trial students preferred this style of teaching as they felt that they were more engaged with the content because they understood the topic prior to entering the classroom and they were able to work at their own pace ensuring mastery of the topic by viewing the content at a time, place and pace which was suitable to the individual. From the results it is unclear whether the results are as a direct result of one of these factors but students were certainly more engaged in lessons and stated that they found the lessons better. Although a relatively small sample size was used similar studies (Bassaleg School & Cwmtawe Community School) have found similar results.

Using an internet based homework calendar that tracks submissions encourage a higher rate of homework completion.

This research was carried out by Julie Nolan from Stamford Welland Academy. SWA is part of Cambridge Teaching Schools Network.

Introduction

For secondary aged students, a correlation between time spent on homework and achievement has been proven. Most schools have a homework policy that states that homework should be set regularly, however, teachers often report difficulty in managing the quality of the submissions and the submission rate. I believe that a system that allows teachers to track homework submission and quality that open to parents will improve these issues. We bought an internet calendar with this functionality called Show My Homework.

Research design

A counterbalanced within-subject design was used with a pre- and post-test in order to assess the effect of Show My Homework on progress. To address the aims of the research the independent variable (homework type) was operationalized by creating 2 conditions.

IV Level 1 (Control condition): Usual homework style and tracking method which is unavailable to parents.

IV Level 2 (Intervention): Homework is set and submissions made available to parents using 'Show my homework'.

Method

Participants

Students were selected randomly for the intervention from the year 11 students that I teach and match paired with like students from a previous cohort. In total there were 21 matched pairs. 13 boys and 8 girls. They were matched for gender, age, ability and SEND and then randomly allocated to the order in which they experienced the two conditions.

Procedure

The 21 students had homework set using the internet tool show my homework which tracks their tasks and submissions. This information was public to the class, their parents and form tutors. The paired students had homework set in the usual way and submissions were tracked using an excel spreadsheet that was only available to the class teacher. Submission rates were kept over the first 6 weeks of term and compared. Their progress during this timeframe were also measured by formal whole school data entry points that happen at the end of the previous year and during October of the following year. Their progress was measured in fine grade changes.

Materials

The intervention was the use of an internet based homework setting, tracking and feedback tool called Show My Homework. This site has open access for parents. They can view their son or daughters calendar that has details of homework set along with instructions and resources. They can also read teacher feedback and tracking in real time. Each homework is tracked as 'submitted', 'not submitted', 'absent' or 'resubmission requested'.

Results

Gain scores were first calculated then analysed as below.

Submission rates:

A Wilcoxon signed rank test (one-tailed) showed a significant improvement in submission rates ($p = 0.001$), with a large effect size ($r = 0.564$).

Fine grade progress:

A paired sample t-test (one-tailed) also showed an improvement in fine grade progress ($p = 0.01$). This time with a moderate effect size ($r = 0.285$).

Conclusions

I found that show my homework has a large effect on submission rates. I also found that the cohort of students that had homework set through Show My Homework had a small to medium sized effect on progress.

The sample was quite small and all of the students were taught by the same teacher and were all tracked for Science homework and progress. During this time the school was taken over by an Academy Trust who also made changes to curriculum and assessment which could have confounded the results. A larger sample size of varying age students and subjects during a more stable time period may give more reliable results.

There is little difference in the amount of time students spend revising if they are given time to produce their own revision materials during the lesson



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Why look at revision?

Revision techniques that aid in memorising and recall are becoming more and more important to students as the assessment in their qualifications moves increasingly towards terminal exams.

'Learning by doing' (students actively constructing something themselves) is often seen by some as a crucial aspect of students' mastery of knowledge and skills, as opposed to just having students engage in 'learning by viewing' (such as using pre-prepared examples). However, when introducing revision techniques, using a 'learning by doing' approach requires a significantly greater time investment in an

already tightly packed curriculum. We wanted to research whether using a 'learning by doing' approach makes this extra time investment worthwhile: whether it has an effect on how much students subsequently use revision techniques independently.

A range of revision techniques are already taught to our students and the curriculum time being devoted to their teaching is growing as their importance is recognised. However, the impact that they have upon the revision that those students then carry out independently has not yet been investigated.

After two weeks, both groups were then asked about the amount of time they spent using each of the two techniques independently (outside of lesson time) using a questionnaire.

We used a counter-balanced within-subject research design whereby all students involved experienced being part of the control group (examples only) as well as the intervention group (examples and create their own). Random allocation of classes helped to reduce any bias and we counter-balanced the order that students experienced the two techniques in the lesson to avoid any order effects.

Revision techniques

This research project is not investigating which revision techniques are the most effective but whether independent usage of revision techniques is influenced by giving students time to create their own materials in lessons (which would reduce curriculum time for other activities).

However, we thought that particular techniques lent themselves better to the way we planned to deliver these lessons. We decided to use flashcards and summary sheets as the two revision techniques in this research project.

Lesson materials

Teaching of the revision technique involved a pre-prepared PowerPoint presentation that described, step-by-step, how to use each technique. A range of pre-prepared examples using the techniques were also made available, enough for each student to individually look over. For the students who were producing their own materials using a technique, various stationery materials were made available

(paper, card etc.). A questionnaire was also provided that asked students about the time spent using the revision techniques in the two weeks following the revision lesson.

Lesson procedure

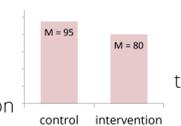
Students in all classes received similar teaching of two revision techniques. This involved a description of the technique (approx. 5 minutes), followed by exposure to examples of how this technique can be used (approx. 10 minutes). Students in the intervention group for a particular revision technique were then also given time to produce their own materials using that technique (approx. 20 minutes). As both classes experienced one technique as control and the other as intervention, the overall time requirement for each class was identical and fitted into the one hour lesson time used in both of the participating schools.

After two weeks, students in all of the classes were asked to complete a questionnaire asking them how long they had spent using the two revision techniques in their own time since the lesson.



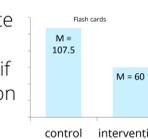
What we found out in our research

A Wilcoxon signed ranks test indicated a borderline significant ($p = 0.052$, two tailed) but very small ($r = 0.068$) increase in the amount of time students spent independently using a revision technique if they had *not* been given lesson time to create materials using it ($M = 95$) compared if they *had* been given lesson time to create materials using that revision technique ($M = 80$).

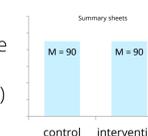


In separate analyses, use of the flash cards technique showed a significant ($p = 0.019$, two tailed) but small ($r = 0.131$) increase in the amount of time students spent independently using a revision technique if they had *not* been

given lesson time to create materials using it ($M = 107.5$) compared to if they *had* been given lesson time to create materials using that revision technique ($M = 60$).



However, use of the summary sheet technique revealed a non-significant ($p = 0.941$) result that showed no difference in effect ($r = 0.006$) between being and not being given lesson time to create materials using that revision technique (both $M = 90$).



Our conclusions

Our research suggests that giving students time in the lesson to prepare their own revision materials made little difference to how much time they subsequently spent revising using that technique.

In fact, our analysis shows a very small difference in favour of those students who were *not* given such lesson time for preparation of materials. This ties in with other research findings (see left) and may be the result of the extra cognitive load on students when dealing with the creation of their own revision materials. This is something that should be investigated further, particularly in light of our two chosen revision techniques producing different results when analysed separately.

Our advice to teachers based on this study would be to use valuable lesson time for other activities; students appear to spend just as much time revising using a technique you have showed them examples of than one you have also given them time to prepare materials using during the lesson. They seem just as likely to do this activity in their own

Issues and limitations

As we conducted this study, we became aware of a number of factors that future studies in this area should attempt to minimise.

We feel that the preparation of the lesson materials minimised a lot of potential issues with the delivery of the revision lesson. However, there was still the possibility that some teachers may favour one method over another which could introduce bias into the teaching of the lesson.

The process of asking students about how much time they had spent revising using a technique could be improved. A small number of students clearly had difficulty filling in the questionnaire or misunderstood how it should be completed (although there may also be issues with how the teacher delivering the lesson was instructing their class during this process).

Relying on students' own recounting of time spent revising has obvious issues with the reliability and accuracy of the data they provided.

Where next?

We would like to see this study replicated in other schools and expanded to include other revision techniques, especially in light of our findings when we analysed our two chosen revision techniques separately.

It would be useful to investigate further how students used their revision time at home. How much time was spent on creating revision materials compared to using them and did this have any impact on the amount of time they spent revising overall.

Our study has also revealed other areas that warrant further exploration. The range of time that students spent revising was very broad: a small minority spent a considerable portion of their own time on revision activities; however, a large number of students were reporting very little or no time spent revising at all. The reasons behind this and the barriers to effective revision should be explored.

Current research in this area

There has been some research carried out already into the impact of using 'learning by doing' versus 'learning by viewing' approaches when teaching. However, so far these have not been focused on the teaching of revision techniques. They have also focused on the performance of students in a particular subject area whereas we want to measure the impact on students' subsequent use of the techniques they have learned.

Stull and Mayer (2007) looked at the effect of giving students graphic organisers for a particular Biology topic versus asking the students to produce their own. As expected they found that the students generating their own took longer to learn the material but it was those who had been given the graphic organisers who showed the best learning of the topic. They concluded that the extra cognitive processing required to produce their own graphic organisers had meant that there was less capacity remaining for the students' processing of the actual content. By contrast, the other students were engaged by being challenged to see how the content had been converted into a graphic organiser.

In addition, Sweller and Cooper (1985) found that learning was faster and better when some Maths practice questions were replaced with worked-out examples.

We thought it would be interesting to see if these differences in students' performance are also seen in their independent usage of revision techniques following their exposure to them.

How we carried out our research

Who it involved

This research project involved classes of students from two schools in the Redhill Teaching School Alliance: The Redhill Academy and The Carlton Academy. 13 teachers were involved altogether across the two schools, working with one class each. This gave us a sample size of 231 students aged between 14 and 17 (Year 10, 11 and 12).

What they did

Each of the classes involved was randomly assigned to one of two groups. Classes in one group were taught how to use the first revision technique and given examples of how that technique can be used. They were then taught how to use the second revision technique: as before they were given examples of how that

technique can be used but in addition they were then given time to create their own materials using this second technique.

Classes in the other group did the opposite: they were taught the first revision technique, given examples and then given time to produce their own materials using the first technique. They were then taught how to use the second revision technique followed by examples of how that technique can be used (with no time devoted to creating their own materials using it).

	Revision technique 1	Revision technique 2
class A	Review examples only (15 minutes)	Review examples Create their own materials (25 minutes)
class B	Review examples Create their own materials (25 minutes)	Review examples only (15 minutes)

Aims of our research

The aim of our research was to establish whether allowing students time to produce their own materials when they are being taught a revision technique will increase the time they subsequently spend using that technique independently in the future.

In order to achieve this aim, the research sought to answer the following research question: *does getting students to produce their own materials during sessions where they are taught about a revision technique increase the amount of time they spend using that technique independently afterwards?*

Experimental hypothesis: There will be a significant difference in the amount of time students spend independently using a revision technique when they given time to produce their own materials using during the lesson compared to when they are not given this opportunity.

Null hypothesis: There will be no significant difference in the amount of time students spend independently using a revision technique when they given time to produce their own materials using during the lesson compared to when they are not given this opportunity.

A counter-balanced *within-subject design* was used with a post-test only.

IV Level 1 (Control condition): revision technique taught without the opportunity for students to produce their own materials using the technique
IV Level 2 (Intervention): revision technique taught with the opportunity for students to produce their own materials using the technique

This research project has been carried out as part of a range of professional development opportunities offered by the Redhill Teaching School Alliance, enabling staff to engage in their own research to investigate what works best in our schools

Find out more by visiting www.redhilltsa.org.uk

The impact of supported familiarisation in the transition between phases.

by Katherine Jenkins and Kate Brooks katherine.jenkins@meadowbank.stockport.sch.uk, katie.brooks@gatley.stockport.sch.uk

Introduction

There is evidence to suggest that where children have a positive start in their new environment they are more likely to feel valued, and make a more positive start as learners.

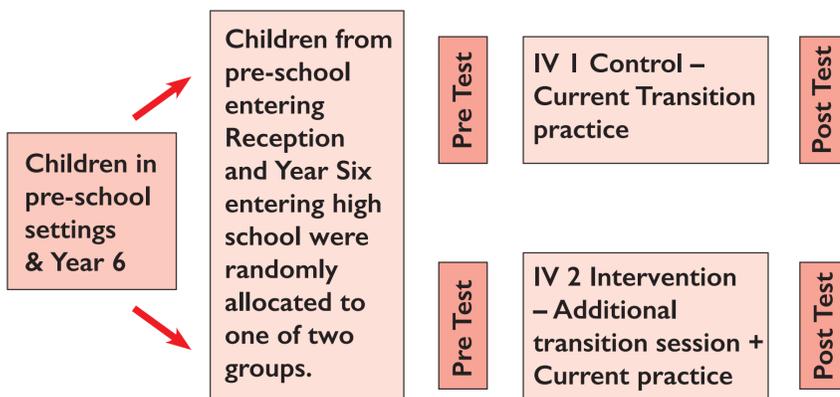
Research shows that when the settling in period is positive for the child it can not only impact on their happiness throughout their time at a new setting but also on how the child views future transitions. A major longitudinal study by the Effective Pre-school, Primary and Secondary Education 3-14 (EPPSE 3-14 project) showed that the most successful schools were those with very close links and co-ordination between primary and secondary schools. The study suggests that a variety of opportunities for induction between schools can improve the transition experience for children. This is an important area to develop using a randomised controlled trial design because it may provide a way to support children's transitions between phases, building self-confidence.

Research design

A Between subject design was used with a pre and post-test. To address the aims of the research two conditions were created.

IV Level 1 – Children only took part in the pre-existing transition practice on entering reception and Year 7.

IV Level 2 – Children received an additional transition session in the new setting, led by an adult they were familiar with from their existing setting. This additional session took place before the standard transition practice.



Method

Participants

- A total number of 88 pupils transferring from pre-school to primary school and from primary school to high school.
- The children were allocated randomly by the familiar adult to either the control or experimental group.
- Where possible schools tried to ensure an even spread of boys and girls between each group.

Procedure

- Prior to any transition, all children answered the first question in the questionnaire to assess their initial feelings about their new setting.
- For children entering Reception, the pre-school teacher visited the primary school with the experimental group and lead a small carpet activity (story or singing).
- For children entering Year 7, the year 6 member of staff visited the High School with the experimental group to teach a Literacy or Science session using the new school's resources and facilities, they would otherwise be unfamiliar with.
- Both control and experimental groups then continued with the existing transition practice.
- On completion of all transition, children completed the questionnaire to assess their feeling towards the transition into their new setting.

Materials

- Pupil voice questionnaire, adapted for the age group, was administered by the familiar adult to the experimental and control groups to assess the impact of transition on confidence.

Results

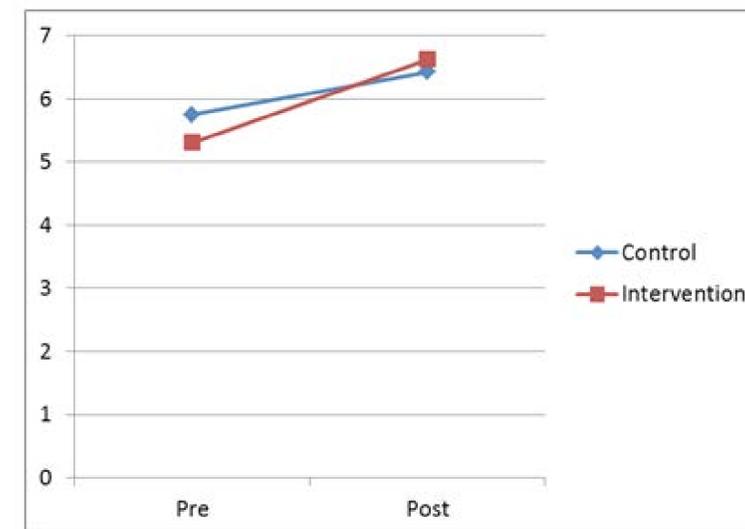


Figure 1: A graph showing the gain scores for the control and experimental groups

A Mann-Whitney U test (one-tailed) was used. This shows that there was a significant difference ($p < 0.001$) in the child's self-confidence where a familiar adult has delivered an additional transition session in the unfamiliar setting as opposed to children not receiving an additional transition session.

Conclusions

This was a small scale study to investigate the effect of developing new transition practices for both Pre-school and Year Six pupils. This new approach appears to have a significant positive impact on pupil self-esteem ($r = 0.212$). It suggests that the involvement of a familiar adult from the existing setting in the transition process has a significant impact on the children's confidence in moving to a new setting. It would be useful to confirm this with larger numbers of pupils. It would also be interesting to investigate whether the presence of the familiar adult or extra transition sessions in a new environment made the most impact on the children's increased confidence. One of the limitations identified within the study was the different ways that the questionnaire was delivered by different adults. It would be beneficial for all adults to receive training in the delivery of questionnaires prior to any further study being undertaken. This would ensure consistency of delivery of the questionnaires.



Co-teaching - An investigation into how effectively co-teaching closes the achievement gap for underachieving pupil premium students.

Jonathan Gunzi _ Bentley Wood High School for Girls

Introduction

Bentley Wood High School had a ninety two co teaching lessons this academic year. Co-teaching lessons were timetabled mainly in year 10 and 11 classes. Co-teachers are expected to take an active role in the lesson and focus on 3-5 underachieving pupil premium students in that class through verbal and written feedback in lessons. Co-teaching has often been regarded in the past as one teacher teaching the lesson and the other assisting in the same way as a teaching assistant. Staff are unaware of co-teaching best practice.

After the first whole school assessment it was decided to focus co teaching on year 10 where possible. This meant that co teachers were often not subject specialists. Staff completed the co-teaching rating scale at the start and end of the research.

Research design

This is an important area to explore using a randomised controlled trial design because there is a gap to narrow between pupil premium and non-pupil premium students. Almost a third of our pupil premium budget is spent on co-teaching. It was crucial to assess the impact of this intervention to plan for the staffing budget for next academic year.

A matched pair design was used with a pre- and post-test. To address the aims of the research the independent variable (co-teaching) was operationalised by creating two conditions.

IV Level 1 (Control condition): No co-teaching

IV Level 2 (Intervention): Co-teaching in two or more subjects.

Method

Participants and procedure

A learning walk was conducted to determine the students who were a focus for the co-teacher and had co-teaching in more than one subject. These 10 students were then matched with 10 other students who did not receive co-teaching based on attendance, homework and effort scores.

Staff completed a co-teaching rating scale and results were analysed. This was an online survey that 28 members of staff completed.

Learning walks took place further into the study to monitor the impact that it was having and speak to the co teachers regarding the student progress and staff perceptions of co teaching.

Materials

The scores used for the statistical analysis are the average point scores (APS) from assessment 1 and assessment 2.

The survey used for the research was the co-teaching rating scale Developed by; Susan E. Gately and Frank J. Gately, Jr. Teaching Exceptional Children (2001)

Results

The data was normally distributed and a paired sample t-test (one tailed) was used. The p-value was 0.434, with a small effect size $d_z = 0.054$. As anticipated because of the small sample size the result was non-significant.

Discussion

The learning walks that took place displayed that some staff highly valued co-teaching to target individual students. The majority of teachers rated co teaching as 4 / 4 for value, however there was little evidence in books and when speaking to students to suggest that effective co-teaching was taking place. Staff were concerned that they were often taken for cover during co-teaching lessons which took away desire when planning. Another big concern was staff being put into co teaching with another subject, this meant it was difficult to fully help students without the knowledge.

Staff surveys had little change to the perception of co teaching. By the end of the study many of the results were similar with some even falling such as 'I present lessons in the co taught classroom' where the majority said they rarely do this. See the table below for survey results.

Some interesting findings from the rating scale included;

- 75% of staff were comfortable to move freely around the classroom
- 39% of teachers didn't believe planning was both teachers' responsibility and 50% said they only sometimes did this.
- 79% of teachers only sometimes or rarely 'passed the chalk freely between the teachers'
- 53% of teachers said time wasn't made for common planning and only 7% usually completed this.

Conclusions

The following conclusions were made as an outcome of the study.

1. Co teaching outside of subject expertise is not clearly recommended as subject knowledge is required. However the sample size was small, and there is a need for further study beyond this preliminary study.
2. Students said they liked having 2 teachers in the classroom as it's easier to ask for help.
3. Staff valued the extra support from an additional teacher with students that are falling behind.
4. No impact on Pupil premium students achievement

Next steps

1. Staff training on methods of co teaching
2. Use extra timetabled lessons as sixth form pre-teaching lessons when students have non-teaching periods.

Increasing involvement of Teaching Assistants in reviewing intervention programmes accelerates progress with SEN pupils to close the gap in Mathematics.

by Rwth Sloan rwth.sloan@meadowbank.stockport.sch.uk

Introduction

Across our teaching school alliance, RAISE analysis shows the gap between SEN pupils and other children requires further investigation. Data shows that in many instances children with additional needs are not performing as their peers do nationally and therefore the gap between their own performance and that of the rest of the children is not closing.

The Sutton Trust research reviewed the impact of support staff in schools and found little or no effect on pupil attainment. There is evidence that there is greater impact when teaching assistants are given responsibility in specific curriculum interventions. The more involved the teaching assistant is in planning and reviewing the intervention the greater the academic gains. (Education Endowment Trust 2011)

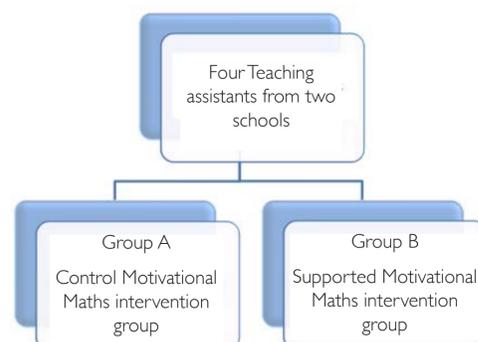
Research design

A between-subject design was used. A pre- and post- maths test was carried out to establish any difference in rates of progress between the control and experimental groups.

To address the aims of the research the independent variable, Teaching Assistant deployment, was operationalised by creating 2 conditions.

IV Level 1 (Control condition): Teaching Assistants delivering a prescribed intervention programme

IV Level 2 (Intervention): Teaching Assistants delivering the same intervention, but involved in regular reviews with the SENCO throughout the programme.



Method

Participants

Two schools SENCO's identified two Teaching Assistants from their schools to administer a prescribed maths intervention programme to children in year 3 and 4. The children chosen were randomly allocated to each teaching assistant ensuring that they were chosen from the school support stage of the register for learning needs only. The same number of children were chosen for each condition with a gender balance in one school but a girl heavy sample in the other school (20 children in total). The Teaching Assistants were then randomly allocated the group by tossing a coin – heads for intervention and tails for control.

Procedure

Initially Motivational Maths intervention programme training was delivered to the SENCOs and Teaching Assistant's. The SENCO's then randomly allocate children and support staff to the two groups. The children were assessed at the beginning and end of the five week programme which was delivered the same time for 30 minutes three times a week in the same place for the sessions to avoid potentially confounding variables such as variable noise level in different areas.

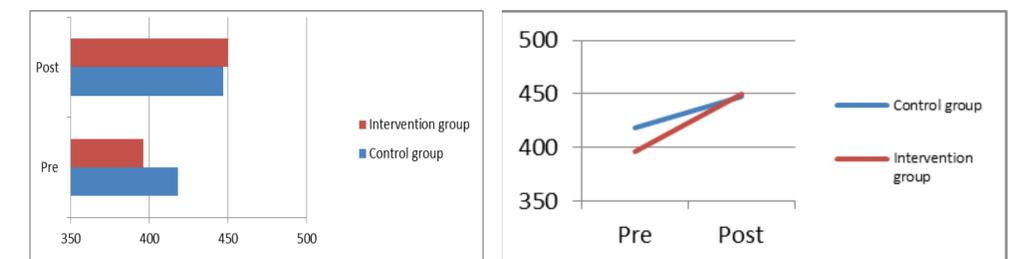
The teaching assistant allocated to the supported Motivational maths group met with the SENCO each week to discuss the needs of the children and review the programme. The teaching assistant allocated to the control group implemented the programme without these additional discussions.

Materials

Motivational Maths training and resources were shared with the support staff and the Carol Bight Assessment tool was used for the pre and post intervention tests to assess the attainment of the children. All the Teaching Assistants had access to the resources but only one from each school had weekly support and guidance from the SENCO.

Results

Gain scores were first calculated from the data in the graph. A Mann-Whitney U test indicated a significant ($p=0.029$ (one tailed)) improvement in attainment for pupils who were exposed to the supported Motivational Maths intervention (Mdn= 5.5) compared to the control motivational maths intervention (Mdn = 2.5). This represented a medium effect size ($r= 0.399$).



Conclusions

The Intervention group in both schools made either a medium or large effect size. Throughout the research the Teaching Assistants receiving additional guidance and support were keen to review their group's attainment and discuss next steps. Although one Teaching Assistant received additional support the Teaching Assistants themselves developed a mutually supportive relationship and worked on the project as a team, developing many sessions and resources jointly. All the groups made progress using Motivational Maths – Carol Bright assessment. The intervention group in both schools scored higher than the control group. All the children made gains ranging from 26 to 1.

Because of the small sample size the data does not show that the progress made could not be attributed to chance. Future research may want to use a wider sample of Teaching Assistants as the sample size becomes bigger the effect of chance would be reduced.

Learning from a test that we failed to complete

Lynne Coulthwaite, Ian Gaunt, Pascale Hardman, Jo Rodham, Liz Samuel, Christina Watson.

The Queen Katherine School October 2015

Introduction

With the introduction of more linear examinations, the importance of enhancing recall has been highlighted. A teaching and learning community focussed on 'sticky learning' raised awareness of the apparent effectiveness of low stakes testing and we decided to look at whether low stakes testing was better than review as a method of enhancing recall

Research design

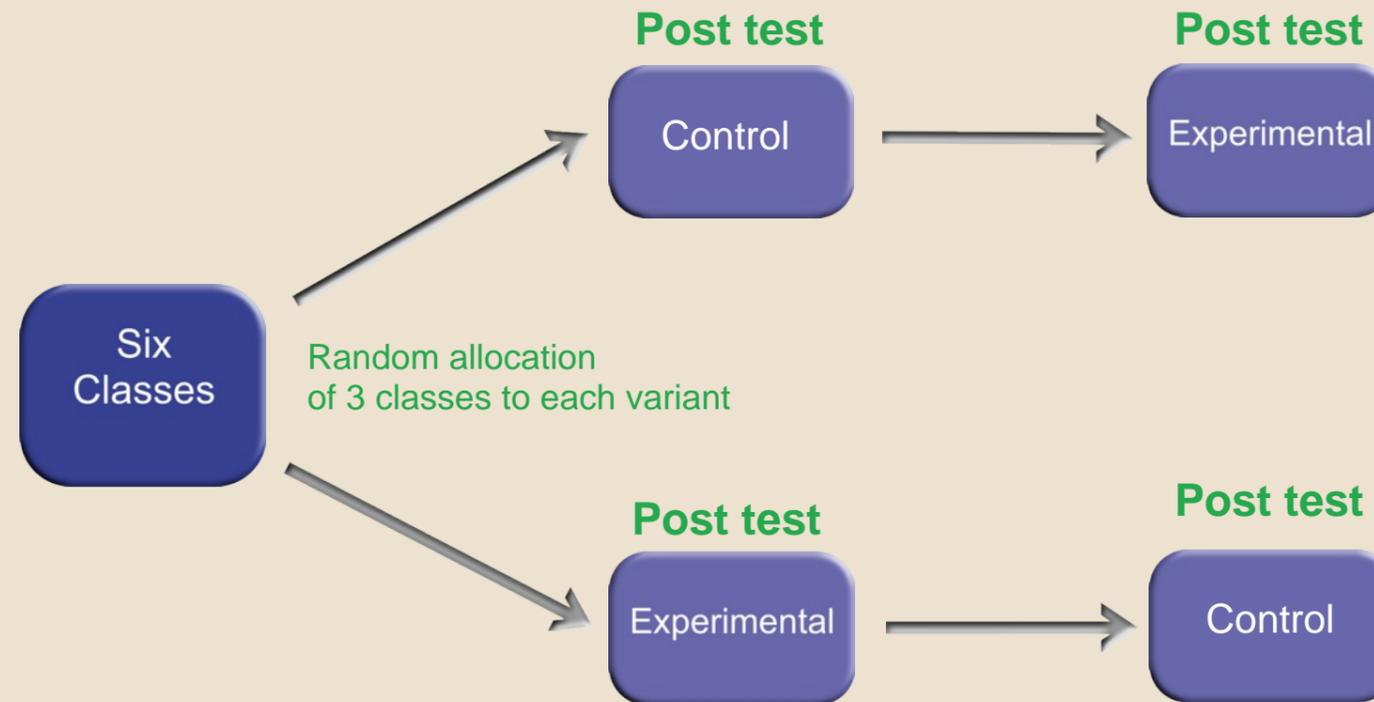
A within subjects design was used with post test only. Counterbalancing was used to control order effects.

The independent variable was defined operationally by creating two conditions.

IV level 1. (control condition)
Students were taught content, content was reviewed and later tested

IV level 2. (experimental condition)
Students were taught context, low stakes testing was used and content was tested later

Method



Participants

Six classes of students from a semi-rural comprehensive took part in the study. They were drawn from different subject areas (geography, history, science, and French) and from different year groups. In total approximately 80 students took part.

Procedures

Each member of staff working on the study identified two comparable areas of content that they could teach over a six week period. For each area of content, staff devised a test of the content that used a 10 point marking scale. They prepared matched lessons in which they delivered the two sets of content.

The plan was that staff taught two sets of three lessons. In the first lesson they taught the content, in a lesson a week later they either reviewed (control) or used low stakes testing (experimental) to revisit the content. In a lesson the following week they ran their test to measure recall.

Results

Only one pair of teachers (shared class) was able to complete the procedures described above and generate results from test. Only half of their class had attended all lessons so there were only results for 16 children. The remaining staff, completely unexpectedly, failed to run lessons where they just reviewed content. When the study was designed, staff saw low stakes testing as an under-used technique that they wished to explore. However, in the classroom trying just to review material, they realised they were actually using low stakes testing techniques. This meant that they failed to run lessons that matched control conditions.

Conclusions

This study was valuable in making teachers more aware of their behaviour in the classroom and of the techniques that they used as their normal default. While teachers did manage to over-ride this default for one class, we decided it would be unethical to re-run the study. We would be creating a control condition that teachers did not believe to be as effective as current practice. The model of applying a research project in different subject contexts in a large secondary school is one which we will use again. However, we will avoid trying to research in the summer term when pressure on staff and absence among students makes working together and getting complete sets of data equally difficult.

A preliminary study into the effects of a weekly spelling test on pupils progress in retaining spellings

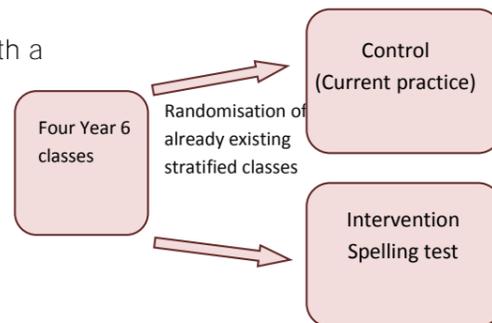
Sharon Baker and Ann Howard
Westbridge Teaching School Alliance

Introduction

Weekly spelling tests have been commonly used in primary and secondary schools without research based evidence as to whether they help pupils progress in learning and remembering how to spell. Teachers and Senior Leaders within Westbridge Teaching School Alliance were sceptical as to the impact of a **weekly test on pupil's progress in remembering spellings.** With the inclusion of spelling lists within the English programmes of study for the National Curriculum 2015, we wanted to research whether spelling tests have a part to play in our school strategies for learning spellings.

Research design

A between-subject design with a pre and post-test was used. To address the aims of the research the independent variable was defined by two creating two conditions.



IV Level 1 – Weekly spelling lessons using existing practice in school (control condition)

IV Level 2 – In addition to the existing practice a weekly list of spelling was taken home to learn and tested each week.

Method

Participants

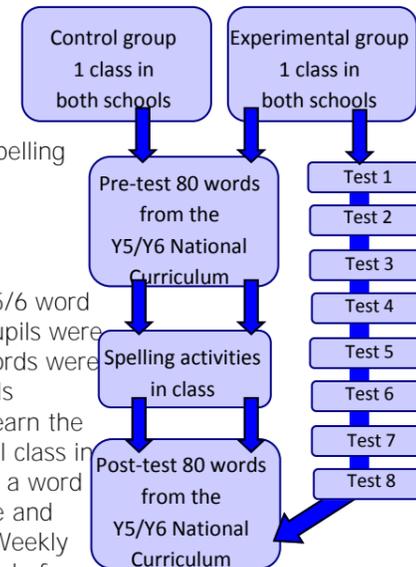
Westfield Community School and Platt Bridge Academy together form the Westbridge Teaching School Alliance. The two primary schools serve two separate communities in Wigan with high levels of socio economic deprivation. The research was completed in four year 6 classes (two in each school) Both schools teach spelling through a variety of spelling strategies but without any spelling tests. In total 88 pupils took part in the study. 46 pupils from Westfield Community School and 42 from Platt Bridge Academy. Classes are already stratified in mixed ability, mixed gender groups. One of the year 6 classes in each school was randomly allocated as the control group while the other class tested the experimental hypothesis that a weekly spelling test would increase their spelling score compared to the control group.

Procedure

Eighty words were taken from the year 5/6 word list of the new national curriculum. All pupils were given a pre-test of the 80 words. The words were then split in eight groups of ten. All pupils completed spelling activities in class to learn the ten words of the week. The experimental class in each school was also given the words as a word list at the start of the week to take home and learn for a test at the end of the week. Weekly spelling scores were recorded. At the end of eight weeks all pupils completed a post test of the same 80 words in the pre-test. Pre and post tests were carried out by the trial co-ordinators

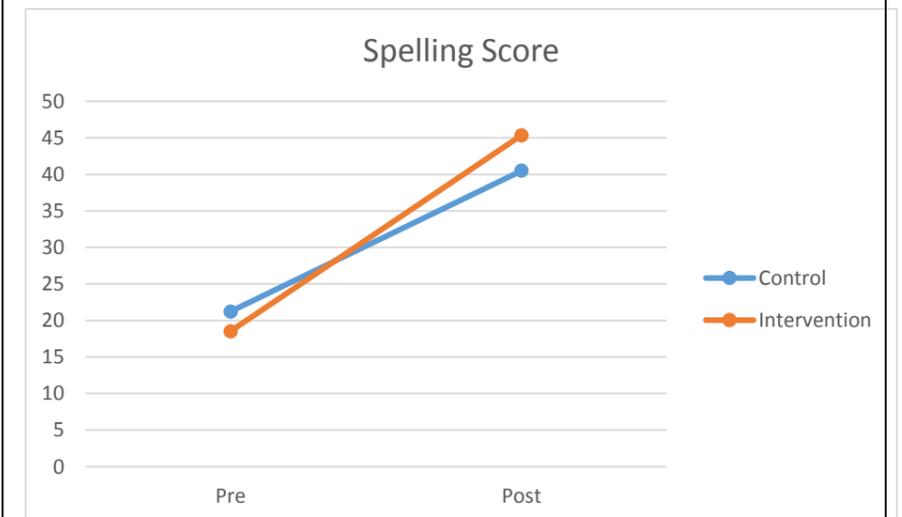
Materials

The trial co-ordinators wrote context sentences for each of the eighty words drawn from the National Curriculum spelling list for Years five and six. Words were divided into groups of ten and the context sentences containing the words were given to class teachers on a weekly basis to be used within the schools agreed teaching strategies for spelling. In addition the pupils from the two intervention groups received the same list to take home. Pre and post - test recording sheet was produced and scores were recorded in an Excel spread sheet.



Results

A Mann-Whitney U test was applied to pupils' spelling gain scores (calculated from the data in the graph below).



This indicated significant progress ($p=0.003$ (one tailed)) if a weekly spelling test was used (Mdn 26.50) compared to no weekly spelling test (Mdn = 21).

Conclusions

We were surprised by the outcomes of our research as we had not expected the spelling test to make a significant difference to pupil's progress scores. Although this was a trial involving a reasonable number of pupils we intend to expand the trial in the two schools next year. As there appears to be a positive effect we propose to carry out a within subject design trial so all pupils would experience spelling without tests and then with test. We would then be able to look at the impact on individual pupils, gender and ability groups. What the research did not show was how long pupils remembered words they could spell on the post- test or if they applied it to free writing activities.

Future research may want to replicate our subsequent within subject trial.

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