KYRA TEACHING SCHOOL ALLIANCE

CLOSING THE GAP: TEST & LEARN

Summaries Of Five Randomised Control Trials

DECEMBER 2015

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At the very heart of Kyra's DNA lies the harnessing of our collective professionalism, expertise, and moral purpose, to ensure no one is left behind, and every school and individual in our partnership thrives – to the benefit of all children.

This means that, as a collective, we constantly engage in cycles of action research: we adapt our practice, put it into action and then reflect on the outcomes before starting the cycle again. This leads to refinements, enhancements and new elements to increase chances of success for all.

During 2014-15, 5 schools have been able to design, carry out and analyse their own Randomised Control Trials (RCTs) that address areas that are personal to their children in their context. By taking part in the Closing the Gap: Test & Learn projects, we have been able to develop teachers' skills in rigorous quantitative research methods. The 5 RCTs successfully carried out by teachers demonstrate a tangible shift in our ability to undertake our own micro-enquiry projects in a rigorous and professional way.

We are delighted to be able to bring to you in our first Kyra Research Publication a summary of each of these RCTs. We hope that this will be the foundation & inspiration for school based research within the Kyra Alliance and beyond.

The participants feel passionately about the work they have undertaken, should you wish to know more you can contact James Siddle (James.Siddle@st-margarets-pri.lincs.sch.uk) or Theresa Peacock (theresa.peacock@monksabbey.lincs.sch.uk)

"Built into action research is the proviso that, if as a teacher I am dissatisfied with what is already going on, I will have the confidence and resolution to attempt to change it. I will not be content with the status quo..."

– Jean McNiff

Changing a classroom's teaching environment can raise attainment in english and mathematics

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Introduction

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).

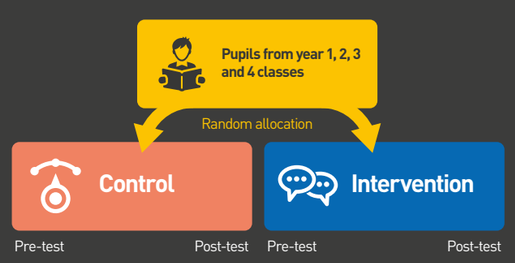
This includes the work of Broadbent, 1958 (cited in Mcains & Castner 2011 and The Basic Skills Agency 2007). It may be possible that removing interactive whiteboards (IWBs) and traditional roller chalk / white boards and replacing them with large expanses of wipeable, magnetic whiteboards would reduce this visual clutter and support the raising of standards in literacy and mathematics through changing the pedagogy of the class teacher.

Research design

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.

IV Level 1 (Control condition): The class will not have the IWB and roller board removed. The curriculum will be the same as the intervention classroom

IV Level 2 (Intervention): Remove IWB and roller chalk / whiteboard to be replaced with a large expanse of wipeable, magnetic whiteboard.



Method

Participants

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 accordingly one class per year group were randomly allocated the changes made to the teaching environment.

One class experienced a term of teaching with the changed teaching environment and the partner classroom was a control. 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. We therefore believe that, using a term as the period of research would allow all other classes to be refurbished in line with the findings of the test. This will involve 116 children.

Procedure

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.

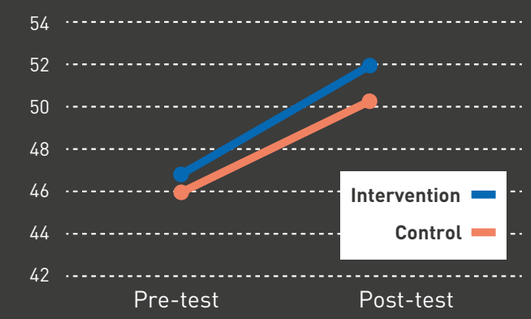
Materials and apparatus

We purchased approximately 8 square metres of wipeable, magnetic whiteboard for each intervention classroom. We had to have equipment and cabling removed to create an uncluttered teaching space.

Results

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= - 0.120). 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.



Conclusions

Preliminary evidence for the effect of IWB removal in mathematics lessons indicates that:

- 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.

Recommendations for future research

- Replicate on a larger scale
- Look at the development of the intervention to include suggested pedagogies

The impact of cleaner-facilitated home reading on attainment & motivation

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Introduction

The benefits of parent involvement in their child's education is unequivocal. This study brings together literature on parent involvement in child reading development, with the ongoing challenge faced by schools to close the attainment gap of disadvantaged children.

This intervention is designed to move away from rewards, incentives and special events to encourage children to read; it avoids reproducing parents' feeling of guilt or inadequacy and instead aims to empower them to help their child read. It aims to improve reading attainment by:

- Increasing child's motivation for reading through autonomy and enjoyable experiences
- Encouraging warm, positive parent-child interactions and relationships around reading
- Valuing the parent's role in their child's education, and increasing parents' self-efficacy
- Fostering regular reading by building it into a family's routine

Willingham, D.T. 2015; Baker, L., Scher, D. & Mackler, K., 1997; Christina Clark 2007; Lonigan & Whitehurst 1998; Kathleen V. Hoover-Dempsey et al, 2005; Coldwell, Pike & Dunn 2006; Anna D. Johnsonet al 2008; Bergin, C. 2001; Deci, Koestner & Ryan,1999

A Pilot Study

A quasi-experimental pretest-post test match pair design

Three children (two families) participated in the intervention. They were each paired with children.

Pre-intervention reading assessment		
Intervention: Cleaner facilitates parent-child shared reading		**Match pair:** No intervention
Post-intervention reading assessment		

The cost of this intervention was £375/child based on 2 siblings in one family, excluding administration.

Method

Participants

Families receiving the intervention had children at Monks Abbey School, who would be at home during the summer holidays. Parents volunteered themselves to participate in the intervention via a questionnaire sent to all FS and KS1 parents.

Procedure

Participants had a cleaner who came to their home, five evenings a week throughout the summer holidays, to do domestic chores. The parent would spend this time (30 minutes) pleasure reading with their child; that is, reading for enjoyment to each other, without following any prescribed reading scheme or activities.

Materials

The parents and children chose the books together from their own collections, the school library and the public library.

They were provided with a form for recording books read, with space for comments about the child's attitude to reading.

The reading assessments were done by their teacher, who was blind to the trial, as part of the school's usual assessment procedure; participants did not receive any additional testing.

Results

Reading levels improvement results not yet available

Intervention		Match pair

Parent comments:

"G has come on in leaps and bounds. The challenge was getting into the habit we had to do it because (the cleaner) was there, but after a week we got used to it and the children said: 'It's time to read!' and we started doing it at weekends when (the cleaner) wasn't there.
G's Mum

"Alternating reading to W and her reading to me means that she can get through chapter books, like Roald Dahl; before she gave up after a few chapters."

"I can do more because I'm less exhausted. If I'm too busy, it can knock me out for days. We've done more this holiday than we have in ages."
W's Mum (referring to her ME)

Conclusions

This study indicates that the intervention had a positive impact on both families involved, but for different reasons in one case by establishing a reading routine and providing good books; in another by giving mum more rest time which reduced the negative effects on her ME and increased her interactions with her children.

The questionnaire may not be an effective way to recruit families because the overwhelming majority of respondents said that they read frequently with their child a proportion that does not match evidence in school reading records. I would recommend offering the intervention directly to targeted families.

I recommend repeating this intervention, to observe the impact on other individuals and to gain a greater body of data. It can then be compared with other reading interventions for its impact and cost benefit.

Verbal and visual-digital feedback on creative writing in rural primary schools improves progress rates compared to written feedback – a preliminary study

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Purpose of the research

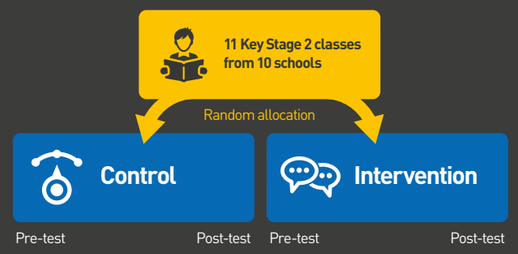
Research evidence suggests that effective feedback has a significant impact on pupil progress. Initial trials show the positive impact of digital feedback on outcomes in writing, and the impact may be greatest on SEND (Special Educational Needs and Disability) and FSM (Free School Meals) children.

This is an important area to explore using a randomised controlled trial design because it is an approach that is poorly studied at a time when many schools are investing significantly in new digital technology. The study was conducted with the support of a grant from the National College for Teaching and Leadership as part of the Closing the Gap: Test and Learn programme.

The research design

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

- **IV Level 1 (Control condition)**
  - Written feedback, the school's normal practice
- **IV Level 2 (Intervention) – Digital feedback**



Methods

Participants, sample size and randomisation

Eleven classes from ten rural primary schools participated in the study. Pupils were randomly allocated to a control or intervention group in each class. In total, 231 Key Stage 2 pupils (120 boys and 111 girls) took part in the research (113 in control and 118 in the intervention). The total number of FSM pupils was 42 (18.18%), which is below the national average (NA) of 26.6%. The total number of SEND pupils was 40 pupils (17.3%) which is slightly above NA of 16.6%.

Procedures

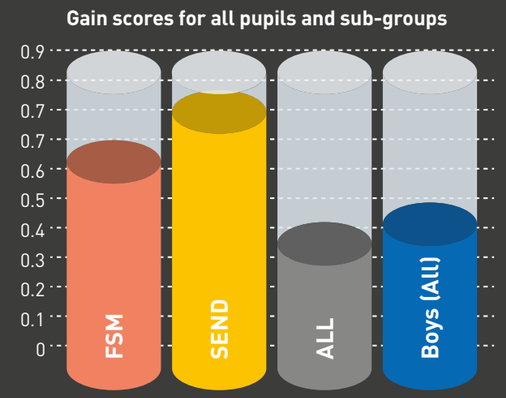
The randomly allocated groups were given a writing prompt, success criteria rubric and video, together with a short film as a writing stimulus. Pupils had ten minutes' planning and 40 minutes' writing time. The control group received written feedback; the intervention group received feedback digitally. Each group had the same amount of 'fix it' time the following day. Pupils made corrections and recorded 'What I have learnt' statements. Pupils were then given another piece of creative writing (of the same genre) the following day. The procedure was repeated. The work was marked against the two success criteria points and the gain scores were recorded. Blinded marking of approximately 10% of the work was then undertaken.

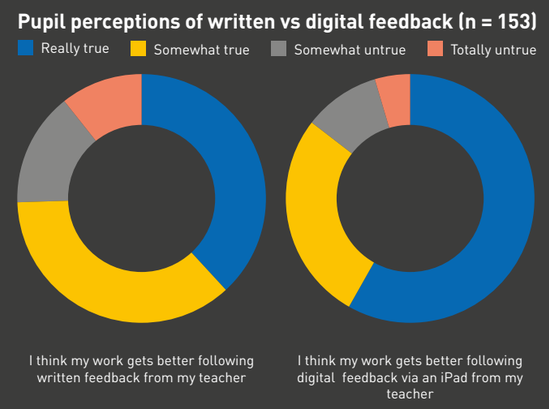
Materials (and apparatus)

A success criteria rubric was used along with a model text. Models of written and digital feedback (through video) were used to standardise marking. A format was given to pupils regarding how to correct their work following feedback.

Results

Gain scores were first calculated. Mann-Whitney U tests indicated a significant improvement for all pupils who underwent the intervention compared to the control, and for sub-groups. There was a moderate positive effect size for disadvantaged pupils (n = 43, p = 0.03 (one-tailed), r = 0.308) and SEND pupils (n = 40, p = 0.013 (one-tailed), r = 0.37); and an overall small positive effect for all pupils (n = 231, p = 0.004 (one-tailed), r = 0.218).





Limitations

The trial was limited by its relatively small sample size and therefore requires replication with greater numbers. Although the results suggest a greater impact on boys it is not clear why this is the case. Although the effect of the intervention was greatest on SEND pupils the trial did not take into account the specific different needs of these pupils.

Conclusions and recommendations for future research

The gains in the present study were similar to prior EEF research evidence, with regard to the impact of digital technology on closing the gap in attainment (which suggested that digital technology may produce gains of +4 months' progress over an academic year). In particular, the data suggested that the intervention produces the greatest gains for disadvantaged and SEND pupils. The survey that looked at pupil perceptions indicated that, in general, pupils feel they make better progress following digital feedback, evidence which backs up the findings in the RCT. Previous research has also suggested that gains may be even more substantial in mathematics; therefore a future study may wish to look at different subject areas. A future study may also wish to take into account different types of SEND pupils and any difference in effect depending on type of special need.

Peer reading improves the reading age of pupil premium children compared to reading only to adults – a preliminary study

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Purpose of the research

Recent research carried out by teaching schools on behalf of the National College for Teaching and Leadership's (NCTL) national agenda R&D project suggests that peer reading can have a positive impact on pupils' reading ability and enjoyment.

The original research shows that it has a positive impact on KS3 pupil premium (PP) pupils and we wanted to explore the potential impact on KS1 and KS2 PP pupils. This was an important area to explore using a randomised controlled trial design because all schools strive to close the gap for all groups. It may also lead to ways to optimise learning time for PP pupils. The research had two aims; these were:

- To establish whether reading to peers can have a positive impact on the reading ability of PP pupils
- To establish whether reading to peers can have a positive impact on the reading enjoyment of PP pupils

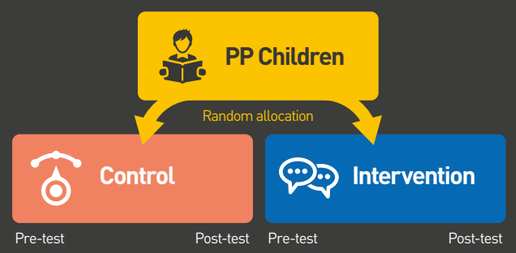
This study was conducted with funding from the NCTL Closing the Gap: Test and Learn programme and support from CfBT Education Trust.

The research design

A between-subject design was used with a pre- and a post-test. To address the aims of the research the independent variable (peer reading) was operationalised by creating two conditions:

- **IV Level 1 (Control condition)**
  - PP readers continue to receive current reading intervention
- **IV Level 2 (Intervention)**

PP readers receive additional peer reading time three times a week



Methods

Participants, sample size and randomisation

Eight classes from an inner-city primary school participated in the study. From these classes, PP children were identified and then randomly allocated to a control or intervention group in each class. As this participant group contained similar pupils and the study primarily aimed to test the effectiveness of the design, simple randomisation was applied.

In total, 54 PP pupils took part in the study. The small sample made it unlikely that anything other than a large effect size would be detected as significant; however, it was considered important to establish the effectiveness of the design before considering the implementation of a larger study.

Procedures

The randomly allocated groups were both given the New Group Reading Test (NGRT) to establish reading age. They were also asked to rank their enjoyment of reading on a scale from 1 to 10.

The control group then continued with the normal reading provision (guided reading once a week, reading to an adult individually once a fortnight).

Members of the intervention group were buddied up with a peer from their own class (working above the reading level of the intervention participant). The intervention group had three 15-minute sessions where they would read to their buddy. This was repeated each week for six weeks. At the end of the six weeks, both groups were again given the NGRT reading age test.

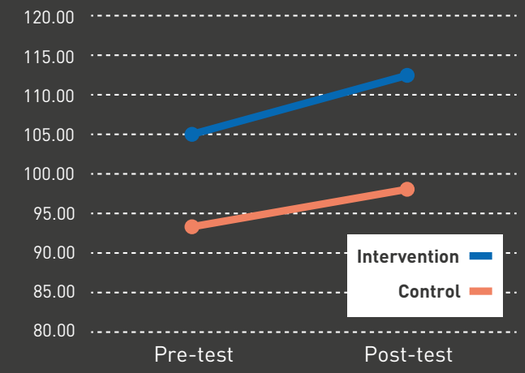
Materials (and apparatus)

The reading buddies had reading records that they would fill in for each other. The NGRT was used to gain a reading age in months. This NGRT was developed by GL Assessment and the National Foundation for Educational Research (NFER) and is available from www.gl.assessment.co.uk. The NGRT includes sentence and passage comprehension.

Results

Gain scores were first calculated using the results in the graph below. A Mann- Whitney U test indicated that there was no difference ($p = 0.114$ (one-tailed)) between the progress rate of children in the intervention (Mdn gain = 5.0) compared to the control (Mdn gain = 2.00). The effect size was small ($r = 0.124$). However, artificially amplifying the sample by a factor of two (from $n = 54$ to $n = 108$) yielded a significant result ($p = 0.043$), suggesting that a future larger study might be able to detect a positive benefit for peer reading compared to existing practice.

Pre- and post-test scores for the control group and intervention



Limitations

The main limitation was sample size. However, it should also be acknowledged that the use of simple randomisation may have introduced the risk of between- participant variation which could have affected the results.

Conclusions and recommendations for future research

The research design was effective in producing findings that suggested that the intervention group made an average of five months' reading age gain over six weeks compared to two months for the control group, although a large study would be needed to confirm this effect. On the current evidence, the intervention appears to be at least equal to existing practice and therefore a viable alternative treatment, one which might show a modest benefit if the findings were replicated in a larger trial involving at least twice as many children. A future study may also wish to consider case- matching or stratified randomisation as a means of controlling for between-pupil variation.

‘Look, Cover, Check, Write’ improves attainment in Year 1 primary school lessons

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Purpose of the research

This is an important area to explore using a randomised controlled trial design because spelling is a weakness for children throughout the key stages in our school and the children do not always engage in spelling homework.

Finding a more active strategy could help create a method that is suitable for all groups of learners. A number of approaches are possible and so the study has aimed to test two strategies against a control condition to ensure efficient use of participants. The research by necessity applied a mixture of one- and two-tailed hypotheses because although it was predicted that both active learning and the Look, Cover, Check, Write strategy would be better than the control, it was not known which of these would be best when compared to each other. This study was conducted with the support of a grant from the National College for Teaching and Leadership as part of the Closing the Gap: Test and Learn programme.

The research design

A post-test (counterbalanced) within-subject design was used. To address the aims of the research the independent variable was operationalised by creating three conditions that allowed for the testing of two interventions simultaneously:

- **IV Level 1 (Control condition)**
  - Normal teacher practice without video delivery
- **IV Level 2 (Intervention A)**
  - Teacher on video delivering general (active) spelling strategy
- **IV Level 3 (Intervention B)**
  - Using the Look, Cover, Check, Write (LCCW) approach delivered by the same teacher on video

Methods

Participants, sample size and randomisation

Three mixed-ability Year 1 classes were randomly allocated to the order in which they experienced the conditions. 88 pupils took part in the study. Prior to analysis, two missing pieces of data (caused by absence) were replaced with the mean for that group.

Materials (and apparatus)

Videos of spelling strategies and a script for the teachers were developed. There were also standard sets of spellings and a test score sheet.

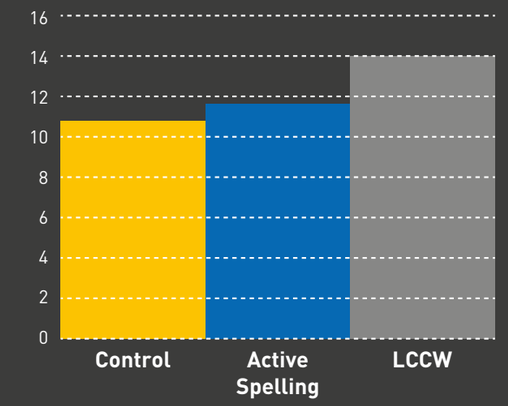
Procedure

Each class had the same set of words to learn during the fortnight. Then each fortnight new words were added to the spelling list. The spelling tests were 10 minutes long and delivered in the mornings. All teachers involved received a detailed briefing prior to the start of the research.

Results

An initial Friedman’s ANOVA indicated that the overall change (shown in the graph) was significant ($p < 0.005$ (two-tailed)) with a moderately small effect size detected ($W = 0.22$). This test was then followed by planned comparisons comparing all conditions with each other using Wilcoxon signed-rank tests. A Bonferroni adjusted threshold for significance of 0.0167 was applied. The results from these tests and effect sizes are given below.

Mean spelling for the three conditions in the present study



	Control	Active spelling	LCCW
Control		$r = -0.045$ $p = 0.037$ (one-tailed)	$r = -0.241$ $p < 0.005$ (one-tailed)
Active spelling	$r = 0.045$ $p = 0.037$ (one-tailed)		$r = -0.191$ $p < 0.005$ (two-tailed)
LCCW	$r = 0.241$ $p < 0.005$ (one-tailed)	$r = 0.191$ $p < 0.005$ (two-tailed)	

Limitations

This study used a more laboratory-style approach than most education experimental research so far. This said, it is believed that the study maintained high levels of mundane realism (maintaining a real classroom environment) and therefore good levels of both external and internal validity. It is too soon, however, to be certain what the effect of these much more tightly controlled forms of design are and whether they produce demand characteristic and other biases (resulting from the use of video rather than a live teacher) that are known in psychology research.

Conclusions and recommendations for future research

Use of the LCCW strategy produced significantly better attainment during the spelling tests than both the active spelling approach and normal classroom practice. However, it appears that the active spelling approach is at least an equal alternative treatment to normal practice. A moderately small positive effect on attainment was detected with regard to the LCCW approach compared to the control and a moderate effect compared to the active learning approach. A future study may wish to look at the effectiveness of the approach in different contexts and with different sub-groups of pupils. In summary, LCCW appears to be a highly effective way of improving children’s spelling as measured by in-class testing.

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