



National College for
Teaching & Leadership

Closing the gap: test and learn

**Teacher led randomised controlled trials
- Resilience**

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 aim to improve pupils' ability to learn.

Author(s)

Steve Oakes

The Blue Coat School, Oldham

Research title:

Preliminary evidence for the effect of a Mental Toughness Intervention Programme for Y10 Students



Purpose of the research:

Mental Toughness (MT) describes the quality which determines, in large part, how we respond to stress, pressure and challenge...irrespective of prevailing circumstances (Clough, 2008). In 2013, we decided to develop a programme which might develop pupils' ability to cope with stressful situations and life events. We opted to work within the MT framework suggest by Clough et al (2002) and developed a six week programme for Y11 students. The pilot exercise was successful and showed statistical significance in improving aspects of pupil mental toughness.

The purpose of this research was to investigate whether or not the programme could be successfully transferred to other contexts and to cohorts of students that received pupil premium.

The research design:

A between-subject design was used with a pre- and post-intervention comparison of MTQ48 scores. To address the aims of the research the independent variable of intervention was operationalised by creating two conditions.

IV Level 1 (Control condition): No intervention

IV Level 2 (Intervention): The completion of a six week mental toughness programme.

The groups were selected by random allocation.



Methods:

Participants, sample size and randomisation:

In total, 25 participants completed the MTQ48 on at least one occasion. Two participants did not complete the first assessment and a different two did not complete the second assessment. As such, these were removed from the group analysis. This left a sample of 21 participants, comprised of 10 males and 11 females aged 14-15 ($Mean = 14.76$, $SD = .44$). The sample was randomly divided into an intervention group ($n = 18$), who participated in a mental toughness development programme, and a control group ($n = 3$), who did not. Ten of the participants received Pupil Premium (PP) and 11 did not.

Procedures:

Stage 1 – Schools were invited to take part in the research.

Stage 2 – Random selection of intervention group and control group.

Stage 3 – Staff from the school allocated to take part in the study were trained in MT theory, techniques and the Blue Coat curriculum.

Stage 4 – Pre testing of both groups using MTQ48.

Stage 6 – Delivery of the intervention programme over 6 weeks.

Stage 7 – Post testing of intervention group and control group.

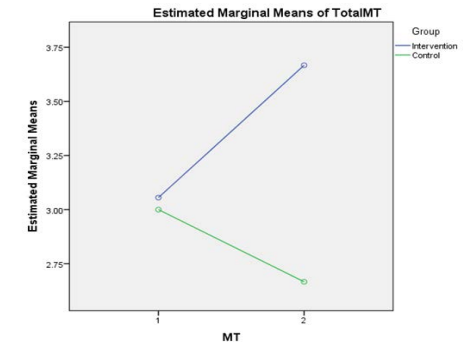
Stage 8 – Results analysed.

Materials (and apparatus):

- Pre- and post- MTQ48 questionnaires.
- Mental Toughness Curriculum and Resources.

Results:

To examine differences in the intervention group, a paired samples t -test was conducted. Overall, there was an improvement in all aspects of mental toughness. Due to the small sample size and variability among the group, this is not statistically significant, but it is a clear trend for improvement. For example, overall mental toughness developed from a mean score of 3.06 ($SD = 1.43$) prior to the intervention to 3.67 ($SD = 1.61$) post-intervention ($t(17) = -1.94$, $p = .07$). The most significant shift in subscale scores was control, which progressed from a mean of 3.56 ($SD = 1.61$) to 4.28 ($SD = 4.28$) ($t(17) = -2.01$, $p = .06$).



Conclusions and recommendations for future research:

This research suggests that the programme of mental toughness developed at the Blue Coat School has potential for transferring to other contexts.

Overall, there was an improvement in mental toughness scores but a larger sample size would be needed for this to be statistically significant.

Contact email: so@blue-coat.org

Research Title: Preliminary evidence for the effect of mental toughness intervention to narrow the gap between pupil premium and non-pupil premium students

Researcher: Miss Sarah Coleman , The Blue Coat School, Oldham, Northern Alliance

Introduction

PP students have been identified nationally as one of the groups that are underachieving in schools.

The research was prompted by some earlier research I had been doing at my previous school- focusing on retention of bursary students at 6th form. Alongside a personal interest in this area it emerged as a whole school priority when I started at The Blue Coat School in September 2014.

I have looked at a number of strategies that have been / are being trialled on EDF and read various literature including ‘Research Based Strategies- Narrowing the Achievement Gap for Under-Resourced Students’ by Ruby K.Payne and ‘Narrowing the Achievement Gap’ edited by Thomas Timar.

Mental Toughness was being trialled at Blue Coat amongst students and I attended the training at the start of the academic year- this prompted me to consider the impact of MT on PP

Method

Participants, sample size and randomisation

Year 10 & 11 - non pupil premium students will be selected randomly from a hat. The pupil- premium students have been selected using quota-sampling- so they need to have been identified as pupil premium- then selected randomly from that quota

The sample size for the study initially was 16: 8 from year 11 and 8 from year 10

Small groups across non-pupil premium and pupil premium will then do follow up interviews and interventions

Procedures:

Pre and post questionnaires / Interviews designed by myself

Mental Toughness questionnaires and coaching materials

Materials

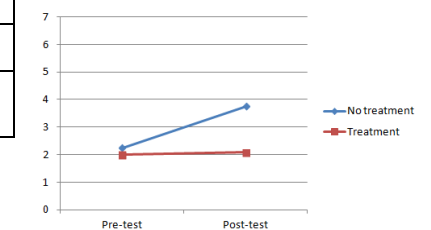
Materials on student funding / visit and talk at university

Pre and Post Mental Toughness questionnaire

Initial Questionnaire to establish study habits

	No-treatment		Treatment		Difference in gain	p-value (two-tailed)	Effect size (n ₂)
Challenge	2.50	2.50	1.75	1.63	-0.12	0.074	0.48
Commitment	2.00	3.25	1.50	1.26	-1.49	0.865	0.01
Confidence	3.25	4.00	3.50	2.65	-1.60	0.720	0.03
Confidence in Abilities	3.00	3.75	3.00	0.96	-2.79	0.254	0.24
Control	3.25	3.50	3.50	1.15	-2.60	0.984	0.0001
Emotional Control	4.00	5.00	4.00	4.00	-1.00	0.596	0.06
Interpersonal Confidence	4.25	4.00	5.00	3.10	-1.65	0.168	0.33
Life Control	3.00	3.00	2.75	1.50	-1.25	0.285	0.22
Total Mental Toughness	2.25	3.75	2.00	2.08	-1.42	0.887	0.004

Mental Toughness: conclusions
Overall mental toughness demonstrated no interaction effect, as both group mean scores reduced between pre- and post-intervention (Figure 1). It is worth noting though that the standard deviations are large, relative to the mean score. This means that there is a lot of variance within each group. Observing individual scores however, it can be seen that there was little movement in either group.



Conclusions

This pilot study was too small for any firm conclusions to be drawn. In particular with such a small sample size the results could easily have been affected by between-participant variation. This said, the results illustrate the effectiveness of the research design and support the need for further research and replication of the study on a larger scale.

Conclusions

Mental Toughness

Although there was no significant difference in mental toughness, there was a small effect made in the ‘confidence’ area – showing a clear increase for the experimental group (pre=3.75, SD=1.89, post=4.75, SD= .95). This has been very encouraging and would be great to think that this level of development could continue over a longer period of time.

A larger replicated study in which both mental toughness and aspirational methods are measured is recommended. This may be considered as part of the well being programme as running interventions at lunchtime was not ideal for pupils and caused attendance issues.

Contact email: scole@blue-coat.org

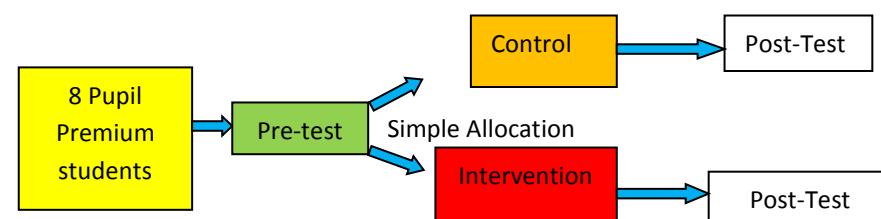
Research design

The research will include an initial analysis of the differences (if any) in home support in particular- when students encounter problems with h/work and c/work- how do they deal with / overcome this?

The research design: A between-subject design was used with a pre- and post-intervention comparison of attainment between PP and non-PP students. To address the aims of the research the independent variable of intervention was operationalised by creating two conditions.

IV Level 1 (Control condition): No intervention

IV Level 2 (Intervention): Mental Toughness Interventions.



The impact of Growth Mindset interventions on students in different key stages.

Jonathan Gunzi _ Bentley Wood High School for Girls

Introduction

Carol Dweck's Growth Mindsets has become an established piece of educational research. Portsmouth University has designed a six theme Scheme of Work intervention based on Carol Dweck's concept. This project aims to measure the impact in two different year groups through the delivery of the Scheme of Work in PSCH EE lessons over a period of four weeks.

Research design

This was an important area to explore using a randomised controlled trial design because Growth Mindset is an internationally recognised intervention to improve students' self-belief and progress. We wanted to measure the impact of terms of student attitudes to learning in two different Key Stages in the same school. It was important to establish which age groups benefit the most from this intervention. As the benefits were measured for each of the 9 factors of the PASS profile assessment, the school would have a detailed overview of which types of attitudes are impacted on most of the intervention. A matched pair design will be used with a pre- and post-test. The study was a non-randomised case matched study in the previous section. To address the aims of the research the independent variable (Growth Mindset lessons) was operationalised by creating three conditions.

IV Level 1 (Control condition): No growth mindset lessons.

IV Level 2 (Intervention): Growth mindset lessons.

DV-Dependent Variable: variation between key stages and between the 9 factors of PASS profiles.

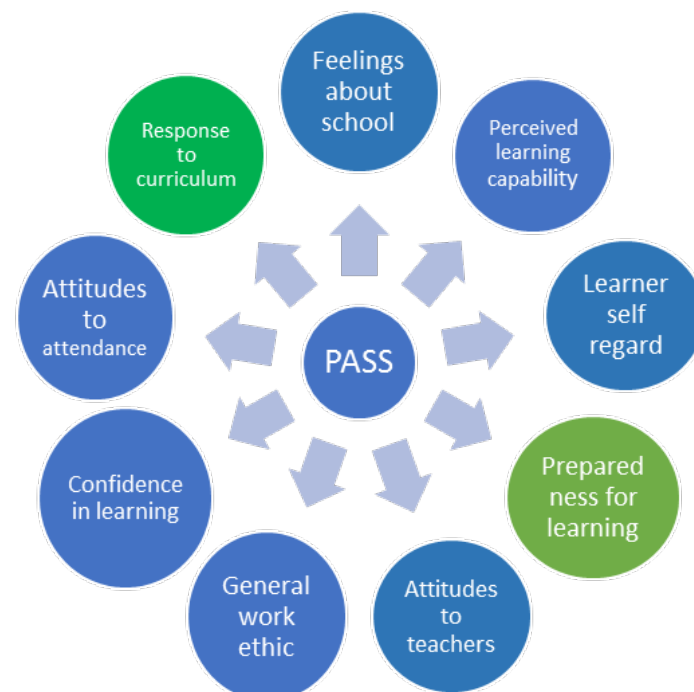
Method

Participants

Control group: half of year 7 and 10 (matched by attendance, effort and homework scores per form class). Year 7 has 210 pupils and year 10 has 180 pupils.
Intervention group: other half of year 7 and 10

Procedure

PASS profile before and after for the full two year groups. Delivery of the intervention to take place before the post test is done. The control group will receive the intervention after the post-test to maintain ethical standards.



Materials

Shortened Portsmouth University Growth Mindset Scheme of Work to fit their 6 themes into 4 lessons.

Results

Pass aspect	Inferential test on year 10 results	Yr 10 p-value	Inferential test on year 7 results	Yr 7 p-value
Feelings about school	Paired samples t-test	0.298	Paired samples t-test	0.484
Learning capability	Wilcoxon signed rank test	0.481	Wilcoxon signed rank test	0.177
Learner self-regard	Paired samples t-test	0.089	Wilcoxon signed rank test	0.101
Prep for learning	Paired samples t-test	0.062	Paired samples t-test	0.031
Attitude to teachers	Wilcoxon signed rank test	0.084	Paired samples t-test	0.195
Work ethic	Paired samples t-test	0.345	Paired samples t-test	0.271
Confidence in learning	Paired samples t-test	0.356	Wilcoxon signed rank test	0.326
Attitude to attendance	Wilcoxon signed rank test	0.063	Wilcoxon signed rank test	0.444
Response to curriculum	Paired samples t-test	0.043	Paired samples t-test	0.033

Conclusions

The statistical analysis shows that the Growth Mindset intervention does have an impact on some aspects of student attitudes to learning. These are 'preparedness for learning' and 'response to curriculum'. Preparedness for learning measures 'metacognitive skills', and Response to curriculum measures 'pupil motivation to do school work' (GL assessment, 2014).

Future research at Bentley Wood High School will be to measure the impact of delivering the Growth Mindset intervention to current year 7, 10 and 12, by adapting the materials to lengthen the intervention from 4 weeks to 6 weeks and to differentiate for the different age groups.

The effect of mindset training on low and high ability learners – preliminary evidence from a case-matched quasi-experimental study

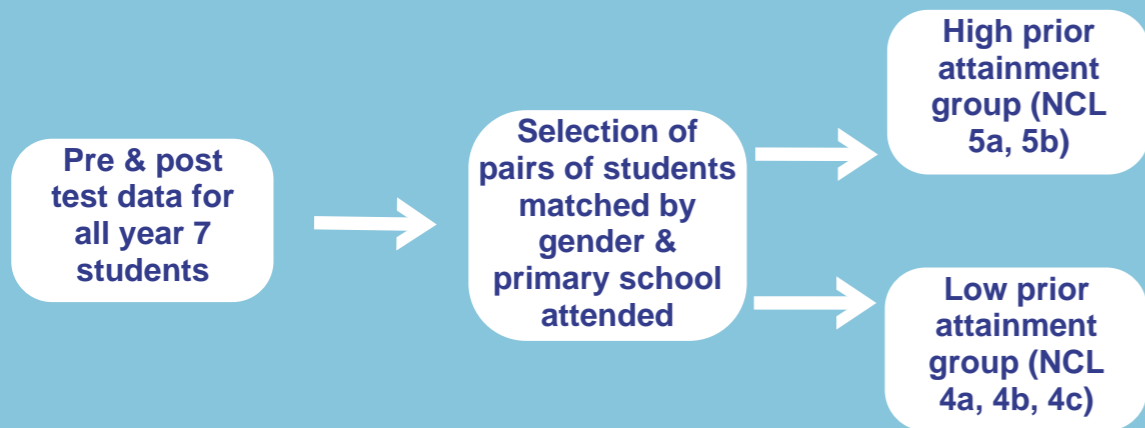
Ian Gaunt
Liz Samuel
Christina Watson The Queen Katherine School October 2015

Introduction

Having worked on the mindset intervention in phase 1 of the CTG trials, The Queen Katherine School decided to introduce this intervention for all year 7 students. Preliminary results from phase 1 suggested that the intervention was more effective for children on FSM. Carole Dwecke's work also suggests that some students of high attainment are unwilling to challenge themselves because they do not want to fail. They develop a fixed mindset and may be reluctant to change. This study aimed to investigate how mindset training impacted on students of higher and lower prior attainment in our context.

Research design

A quasi-experimental design used existing pre and post test data for matched pairs of participants.



The dependent variable of prior attainment was operationalised as KS2 NCL of 5a and 5b for high prior attainment and 4a, 4b, and 4c for low prior attainment. Students with a prior attainment of 5c were excluded to create a clear difference between the groups.

Method



Participants

Participants were selected from year 7 of a semi-rural comprehensive school. The high prior attainment group included all 33 students for whom we had complete sets of data. Groups of matched students (gender and primary school) of lower prior attainment were identified for each of these high attaining students and the paired student was then chosen at random.

Procedure

All year 7 students were tested on their first day in school using the test developed by Portsmouth University provided through CTG. The school then ran six sessions of mindset training in humanities lessons, and, after a break of a further 6 weeks, the students' mindset score was tested again. This pre-existing data was used to establish the extent to which students of lower and higher prior attainment moved towards a more growth mindset after mindset training.

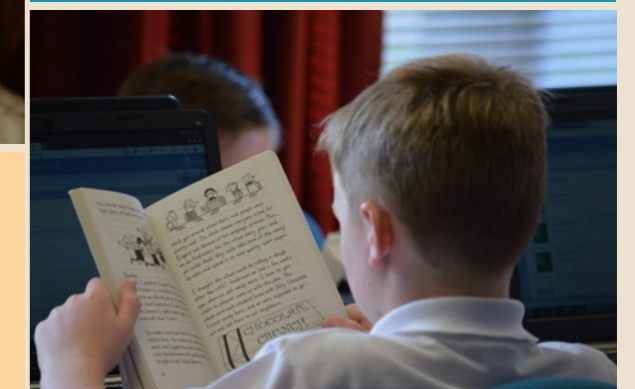
Materials

The mindset training used standard lessons, delivered to mixed ability teaching groups.

Results

A Wilcoxon signed-ranks test (one tailed) indicates no significant difference ($p = 0.441$) in the impact of mindset training on students of low prior attainment when compared with that of students of high prior attainment.

The effect size indicates ($r = -0.009$) that the impact of mindset training was similar for both groups.



Conclusions

For this sample, level of prior attainment made no difference to the impact of mindset training with year 7 students.

Our concern was that offering mindset training for all students would not be justified if it had a very limited impact for high attaining groups. This research has contributed to a decision to continue with this intervention for all students as they go forward into year 8 as well as repeating the intervention with the new year 7. We will continue to monitor the impact.

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Preliminary evidence from a small-scale pilot study regarding the use of an NLP informed coaching programme to support Year 10 English teaching

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Purpose

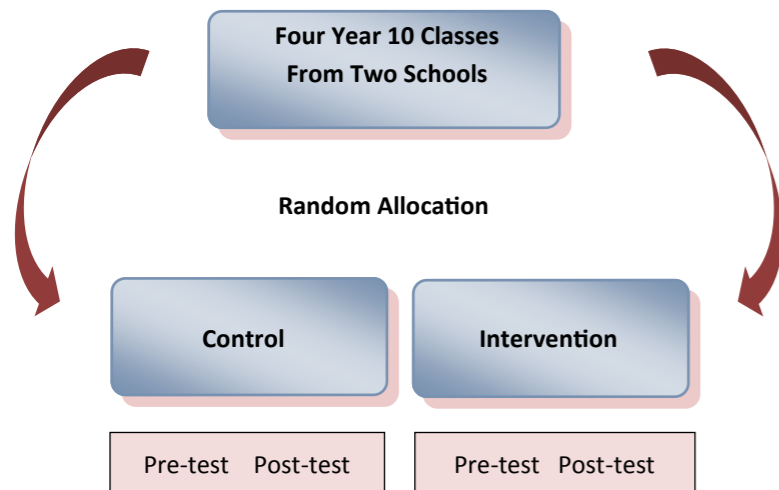
We are interested in researching the use of NLP informed coaching approaches in English to see if they can lead to improvements in progress and attainment in two schools (Churchfields Academy and The Ridgeway School and Sixth Form College), each of which has a very different student demographic. This is an important area to explore using a randomised controlled trial design because Churchfields and The Ridgeway are in Swindon and, within the town, progress and attainment in English (and indeed other subjects) are not what they should be compared to regional and national data. Indeed, the South-West is one of the lowest achieving regions in the country.

Hitherto, English interventions in both Churchfields and The Ridgeway have been largely along traditional lines and, despite the fact there have been some gains across the town, progress and attainment could be better. Local schools are, therefore, keen to look at alternative approaches to improving English outcomes. If the trial is successful, and there is proven evidence that NLP coaching approaches work, Churchfields and The Ridgeway will use the research findings to offer training and development in English, and possibly other subjects as well, to Swindon's ten secondary schools.

Research Design

A between-subject design with pre- and post-test was used. The independent variable (NLP informed coaching) was operationally defined by creating two conditions:

- IV Level 1 (control condition): English lessons within the addition of NLP coaching
- IV Level 2 (intervention): English lessons with the addition of NLP coaching



There were four dependent variables all administered before and after the treatment period:

- DV1 - GCSE attainment with A* to G converted to a 24 point scale
- DV2 - An application in class assessment
- DV3 - Benchmark English attainment test
- DV4 - Questions 1 – 6 from Dweck's Implicit Theories of Intelligence Scale

Methods

Participants

59 participants in four similarly attaining classes across two schools took part in the study (33 boys and 26 girls). The average SAS CAT score for the four groups was 87.7. 35% of pupils were pupil premium. Pupils' classes were randomly allocated to control or intervention.

Procedures

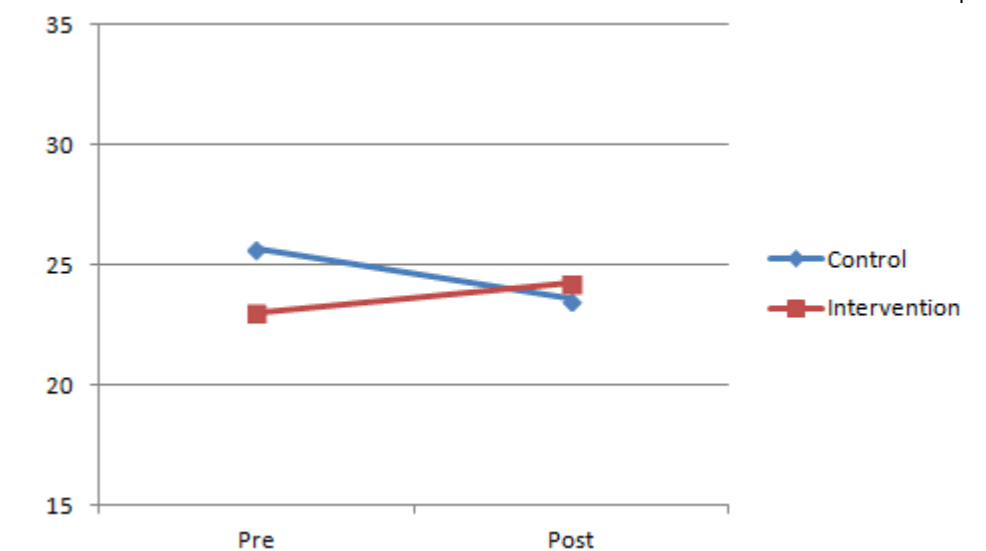
Two teachers with some coaching background (but no NLP) were trained in NLP approaches on four half day meetings. Training focused on: achieving rapport; using the meta model; using pre-suppositional language; spatial marking; anchoring; modelling and using a version of the GROW coaching model to scaffold and develop pupils' independent learning. The two teachers integrated NLP approaches into their classroom practice over a five month period with two comparable Year 10 English classes. Comparison of the two groups, together with the two control groups, was captured using a spreadsheet which, over six cycle reports, recorded GCSE attainment on a 24 point scale (to allow for fine grading) and attitude to learning on a four point scale. Additional quantitative comparative data was collected from common benchmark tests at the beginning and end of the trial period. Similarly, qualitative data relating to pupils' perception of themselves as learners was captured using a questionnaire (DV4 above) at the beginning and end of the trial period.

Materials and apparatus

The benchmark test, taken under exam conditions and used for both control and intervention groups, was a single question from a past IGCSE Paper 1 reading passage. All four groups answered the same question from two different past papers at the beginning and end of the trial period. The attitude to learning grade was based on a four point scale with each point being divided into four behavioural descriptors devised by the two participant teachers. Qualitative data was captured using questions one to six from Dweck's *Implicit Theories of Intelligence Scale* which is commonly associated with the concept of Growth Mindsets.

Results

Gain scores were first calculated from pre- and post-test ITIS scores shown in the graph below. A Mann-Whiney U-test indicated a significant ($p = 0.025$ (one-tailed)) change in growth mindset for the children who were exposed to the NLP coaching (mdn gain +2.0) compared to the control group (mdn gain -2.0) who experienced a decline in growth mindset during the treatment period. A medium effect size difference ($r = 0.28$).



Again analysing gain scores, there was also a significant gain ($p = 0.005$) in classroom engagement for the children who experienced the intervention (mdn gain = 1.0) compared to the control (mdn gain = 0.0) A medium effect size ($r = 0.27$). There was no difference in progress with regard to either GCSE attainment ($p = 0.289$ (one-tailed), $r = 0.048$) or on the benchmark test ($p = 0.418$ (one-tailed), $r = -0.04$).

Conclusion

An NLP coaching programme appeared to have a positive effect on growth mindset compared to a declining trend in mind-set within a control group of children. This is supported by anecdotal reports that pupils from both intervention groups grew in confidence and became increasingly resourceful in applying self-coaching-type strategies to initiate responses to classroom tasks, especially those relating to literature study. On balance the programme seems to have enhanced levels of classroom application and engagement which, in itself, warrants further research given that both intervention groups would match a typical lower banded profile (see *Participants* above). It remains speculative in this study as to whether or not a change in attitude would have a longer term impact on progress and attainment. This said, the small sample size and randomisation at class level means that the findings need to be interpreted with caution. However, this pilot study has laid the ground work for a larger replication of the design.

Limitations

The main limitation was the sample size and the available time. Pupils were introduced to a different way of working, effectively a change of classroom culture, and had only five months to adjust. Ideally research and development work of this type should be undertaken over a full academic year.

A small scale pilot study into the effectiveness of two meditative techniques on the improvement on concentration in a SLD school.
Does practising Mindfulness techniques at the beginning of lessons increase engagement of pupils with Severe Learning Difficulties?
 Sophie Caines



Introduction

The key principle of Mindfulness is simply paying more attention to the present moment – to your own thoughts and feelings, and to the world around you. Research has shown this can have a powerful impact on mental wellbeing.

This research focusses on the effect of Mindfulness on learning, in pupils with SLD.

Very little current research concerns pupils with SLD. I will investigate the effect Mindfulness has on engagement in pupils with a range Severe Learning Difficulties.

This research is suited to randomised control trials as, by its nature, this is a complex population and the potential to 'wash out' any population bias will be increased.

The aim of this research was to establish whether mindfulness activities have an effect on engagement and indicate and inform further research

Method

Participants

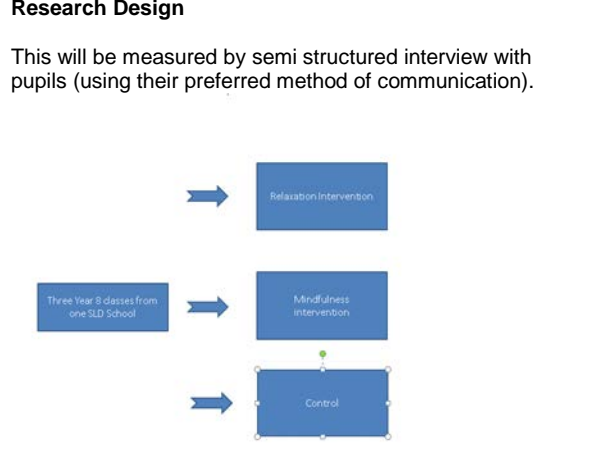
- Participants were sampled from within classes in the context of a school for pupils with Severe Learning Difficulties.
- Participants were from a stratified random sample, with classes randomly assigned to each condition.
- Class groups experienced each condition once, as the impact of mindfulness could be remembered.

Materials

- Teacher training in mindfulness
- 3 lessons on India, a slide show, making a flag from spices and a music plenary
- Questions for Semi Structured interview, written in symbols

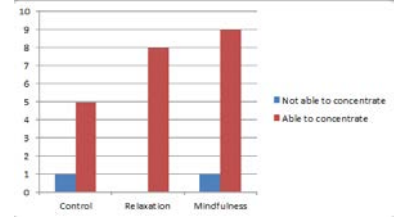
Procedure

- Each group was observed during the same planned and resourced lesson, all of which took place at the same time of day on the same day of the week.
- The Control group did not have an intervention.
- 1 Intervention group spent the first ten minutes experiencing mindfulness techniques, under low stimulus conditions, e.g. low lighting, soft music.
- Placebo group spent the first ten minutes under low stimulus conditions (to compare whether this of mindfulness techniques are having an impact)
- Pupils views on level of engagement were solicited using the pupils preferred method of communication (talking and reading symbols).
- Results were measured by comparing aggregated pupil scores for engagement within each condition.
- All groups had the opportunity to take part in each procedure at later date, which ensures research is ethical. Subsequent interventions were not relevant as the intervention may had the potential to impact on engagement in the other conditions.



Results

A 2x2 chi squared test of independence indicated that the overall change in concentration across all three conditions approached significance (p = 0.09).



For completeness, this was followed by separate post hoc comparisons for the improved concentration scores only. This indicated an improvement in concentration in the mindfulness lesson (9) compared the control lesson (5) which again approached significance (p = 0.08), and a similar level of significance for relaxation (8) compared to the control (5) (p = 0.08).

	Not able to concentrate	Able to concentrate
Control	1	5
Relaxation	0	8
Mindfulness	1	9

Conclusion

Looking at the contingency table for all of the data (above), it would appear that both mindfulness and relaxation may be equally helpful in improving concentration. However, the sample size was too small to produce a significant finding. A future study may wish to use a larger scale to produce statistically relevant and generalizable results.

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