

TEP Project: Report to schools for 2011



FACULTY OF EDUCATION

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School of Learning Development and Professional Practice

Raising teacher expectations, changing beliefs and enhancing student achievement: An intervention study

The Teacher Expectation Project (TEP)

Report on Year 1, 2011 data

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This report should only be used for the purposes for which it was intended, i.e., to report to principals and teachers involved in the project on outcomes within the TEP project. If it is proposed to use this report for a different purpose or in a different context from that intended at the time of commissioning the work, then the authors should be consulted to verify whether the report is being correctly interpreted. In particular, it is requested that, where quoted, conclusions given in this report should be stated in full.

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Executive Summary

This report documents the results of the first year of the Teacher Expectation Project, an interfaculty University of Auckland research study funded by a Marsden Fast Start Grant and by the Cognition Institute. The TEP research project seeks to evaluate for the first time whether teacher expectations for all students can be raised experimentally and then sustained. Teacher expectations are ideas teachers hold about the potential achievement of students. They are important as they determine the level and types of instruction teachers plan for students and can have an impact on student outcomes. The study aims to measure effects of raised teacher expectations on student academic and social outcomes.

A broadly representative sample of 85 teachers and their 2557 students comprised the participants in the study. Intervention teachers attended four workshops at the beginning of 2011 and met with the researchers at two further intervals during the year. They were videoed twice, before the intervention and then again later in the year. All teachers and students completed questionnaires at the beginning and end of the year. In addition teachers completed an expectation survey at the beginning and middle of the year and students completed an e-asTTle reading and maths test at the beginning, middle and end of the year although only beginning and end of year results for e-asTTle will be reported.

Teacher expectations and student achievement

Teacher expectation

Overall, while there was no difference in the expectations of the intervention and control groups in reading or mathematics at the beginning of the year, there was a significant difference between these groups for both curriculum areas by mid-year. This was mainly because the expectations of the control group fell significantly from the beginning to the middle of the year while the expectations of the intervention group remained consistently high. Teacher expectations were measured at the beginning and middle of the year (rather than beginning and end of the year as for the other scales) since they are predictive of student achievement, so are future-related.

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Student achievement

In mathematics, the asTTle scores of the intervention and control group increased significantly from beginning to end of year. Importantly, however, the mathematics scores of the intervention group increased significantly more than those of the control group. The effect size of the increase for the intervention group was moderate, $d = .49$ while that for the control group was $d = .31$.

In reading, the asTTle scores of the intervention group and control group increased significantly from beginning to end of year – but there was a larger gain in achievement for the intervention group ($d = .38$) than the control group ($d = .32$) although this difference was not statistically significant.

Interestingly, more teachers in the intervention group reported using mixed ability grouping in mathematics than in reading which may have accounted for the increase in mathematics scores, compared with reading.

Teacher beliefs

Teacher efficacy

There were also changes in teacher beliefs over time. Both the teacher control and intervention groups became more positive about their ability to engage students, to use a variety of instructional strategies to teach students and to manage student behaviour and all these changes were statistically significant. However, there was a trend for the scores of the intervention group to increase more than those of the control group across all variables.

Teacher goal orientation

In terms of goal orientation, the teacher intervention group became less performance goal oriented (beliefs that students should be competing and trying to outdo each other) over time than did the teacher control group and this difference was statistically significant. Both groups believed more at the end of the year than the beginning that students should be motivated by focusing on personal development of skills (mastery), but again there was a trend for the intervention group to believe this more than the control by the end of the year.

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Teacher motivation

Teacher motivation was measured using several subscales. Both groups reported more persistence over time, i.e., teachers reported that they would keep working at challenging or difficult tasks or activities in order to make sense of such tasks. Interestingly, over time the intervention group became much less anxious than the control group and also reported less concern about being in control. These scales will be described further in the Results section. Both these differences were statistically significant. It appeared that the intervention group were less stressed and more relaxed than the control group by the end of the year.

Qualitative data collected after each workshop and at the end of the year suggested that teachers were implementing the practices introduced at the workshops. While moving to more flexible ways of working with groups had been challenging for some teachers, most reported by the end of the year that they were using flexible groups. This was particularly so in mathematics and writing, less so in reading. Teachers had been made aware of the importance of enhancing the class climate for student learning and almost all teachers had made changes designed to improve their class climate and students' learning experiences. Goal-setting was also being used more effectively in classes with teachers using the e-asTTle data to set goals with their students. Hence students were being given their results and were working with their teachers to plan the next steps in their learning. Overall, teachers believed that the practices aligned with the project had made a difference to the harmony in their classrooms and to students' learning. Most were positive about the intervention and intended implementing the practices more fully in 2012.

Student beliefs

Self-concept and beliefs about learning

For reading and mathematics self-concept, the score for the intervention group increased across the year when compared with that of the control group and for mathematics the change over time in scores was statistically significant indicating that student interest and enjoyment of maths was significantly greater for the intervention group by the end of the year.

Mastery and performance goal orientation

Surprisingly, by the end of the year students were less likely to want to improve their individual skills in reading and mathematics (a mastery goal orientation) and learn more in reading and mathematics in both intervention and control groups. However, we were pleased to see that the performance

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orientation in reading of the intervention group declined significantly over time. Having a performance goal orientation is where students want to do better than others. This is a competitive orientation and can be particularly detrimental to students who are not the highest achievers. The decline in performance beliefs of students with intervention group teachers mirrored those of their teachers.

Utility value of mathematics and reading

By the end of the year, students in the intervention group believed mathematics was much more useful than did the control group and these differences were statistically significant. The intervention group's utility value scores increased significantly over time while those of the control group declined a little. A similar trend occurred in reading but these differences were not statistically significant.

Class climate

In relation to class climate, student perceptions of teacher care and peer academic support declined significantly over the year although the views of the students with intervention teachers tended to decline less than those of students with control group teachers. Both groups became more positive in their views of their academic competence over the year and there was a trend for this increase to be greater in the classes of intervention teachers. When students feel positive about their classroom climate, they often also feel content about their academic abilities. Overall, the views of the students with intervention teachers were more positive than those of the control group.

Student perceptions of their teachers' expectations

With regard to students' perceptions of their teachers' expectations, over time the intervention group significantly more than the control group came to believe that their teachers thought they were better at mathematics and reading than the students thought they were. Similarly, students in the intervention group appeared to notice a change in their teachers' expectations since there was a trend for them to report their teachers having higher expectations for them at the end of the year than at the beginning.

A summary of the major findings is presented in the Appendix as a bullet-pointed list which could be used to lead staff discussion.

The report is structured as follows:

First, we will briefly reiterate the objectives of the project and the research literature it aims to build upon. Second, the research method employed to conduct the study will be described, along with an

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explanation of the data analyses carried out to date. Third, the results from these analyses are reported for intervention and control group teachers, and for students. Some discussion about these findings is included. Fourth, a summary of Years 2 and 3 of the research process is included to indicate where the next phases of this study will be focused.

Project Objectives and Research Background

The Aims and Objectives of the TEP Project for 2011

1. To raise the expectations of the intervention group and to change their beliefs and practices to those associated with high expectation teachers.
 - Can teachers' expectations be raised and associated beliefs and practices changed?
 - When teachers' expectations change, how much do student achievement and academic perceptions change?
 - When teacher expectations change, how do teacher beliefs change?
2. To monitor the control group as a baseline group by which to determine any changes for the intervention group.
3. To measure academic and social outcomes for students with intervention and control group teachers.

Brief Research Background

Teacher expectations are ideas teachers hold about the potential achievement of students. They are important as they determine the level and types of instruction teachers plan for students and can have a substantial impact on student outcomes. In the seminal experimental study in the field (Rosenthal & Jacobson, 1968), based on purported test scores, teachers were told some students in each class in one school would suddenly blossom that year. Indeed, significant increases were shown for the 'bloomers'. The researchers proposed teachers must have interacted differently with the bloomers and that these differential behaviours led to enhanced outcomes. However, teacher behaviours were not measured in the study.

Following the initial research, different areas related to teacher expectations were studied. One group (Dusek & Joseph, 1985; Hatchell, 1998; Jussim, Eccles, & Madon, 1996; Rist, 1970; Stinnett, Crawford, Gillespie, Cruce, & Langford, 2001) examined how particular student characteristics (e.g., ethnicity) affected teacher expectations. Weinstein and colleagues explored the student perspective and asked how students knew whether their teachers had high or low expectations for them (Marshall & Weinstein, 1986; Weinstein, Marshall, Sharp, & Botkin, 1987; Weinstein, Marshall, Brattesani, & Middlestadt, 1982;

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Weinstein & Middlestadt, 1979). Another group of researchers (Brophy, 1983; Brophy & Good, 1970; Cooper & Good, 1983; Good, 1987) investigated teacher behaviours towards high and low expectation students. However, the cumulative results of several studies in the US (cited above), the UK (Blatchford, Burke, Farquhar, Plewis, & Tizard, 1989) and New Zealand (St. George, 1983) suggested that the effects of teacher expectations on student outcomes were small. Brophy (1985) proposed that expectations for a whole class would have much larger effects. But this phenomenon was not investigated at the time.

Later, a synthesis of the literature (Harris & Rosenthal, 1985) showed that the teacher behaviours that had most effect on student outcomes were indeed those related to the affective and instructional classroom environment (whole class factors), and that the behaviours that had been extensively studied (interactions with individual students) had lesser effects. The results suggested particular teachers affected student outcomes differently; teacher beliefs were moderators of teacher expectations. Weinstein and her colleagues (Brattesani, Weinstein, & Marshall, 1984; Kuklinski & Weinstein, 2000; Marshall & Weinstein, 1986; McKown & Weinstein, 2008; Weinstein et al., 1987) identified high and low differentiating teachers. High differentiating teachers treated high and low expectation students quite differently; low differentiating teachers interacted similarly with all students. Outcomes for students were very different depending on whether they had a high or low differentiating teacher.

In New Zealand, high and low expectation teachers, those who have correspondingly high or low expectations for all students, have been identified (Rubie-Davies, 2006, 2007, 2008, 2010). Students with high expectation teachers improve achievement by more than one standard deviation in one year compared with students of low expectation teachers who make very few if any gains (Rubie-Davies, 2007). These student achievement differences are attributable to identifiable distinctions in the beliefs (Rubie-Davies, 2008, 2010; Rubie-Davies & Peterson, 2011) and instructional practices (Rubie-Davies, 2007) of high and low expectation teachers respectively. This suggests that if teachers could be taught the specific teacher behaviours and beliefs of high expectation teachers, student outcomes could increase substantially. This was a primary aim of this project and specifically of the first year of the project.

Method

During 2011, the work of the TEP project team focused on introducing and monitoring the intervention and its effects. They also worked alongside teachers to provide support in changing teaching practices.

Selection of the Research Methods

Teacher data

A mixed methods approach was used to collect the teacher data. Following the intervention workshops, teachers completed questionnaires that consisted of both quantitative and qualitative data. This enabled the researchers to monitor the effectiveness of the intervention in changing teacher behaviours. A similar survey was included with the teacher questionnaire for the intervention group only, at the end of the year in order for the researchers to judge how effective teachers viewed the intervention both in terms of reported effects on their classes but also in terms of the degree to which the interventions had been implemented.

Videos of the intervention teachers at the beginning of the year provided baseline data for teachers to view their verbal and non-verbal behaviour that could be portraying their expectations. A video taken later in the year allowed teachers to judge any changes they had made in the portrayal of their expectations.

The teacher expectation survey is one developed by the Project Director and used in several previous studies (e.g., Rubie-Davies, 2006, 2007; Rubie-Davies, Flint, & McDonald, 2012).

The teacher questionnaire consisted of well-developed and trialled measures:

1. The teacher efficacy scale (Tschannen-Moran & Woolfolk Hoy, 2001)
2. The PALS scale designed to measure teachers' goal orientation, that is, the degree to which teachers believe that students should be motivated by trying to out-do their peers (a performance goal orientation) and the degree to which they believe students should be motivated by focusing on individual goals and progress (a mastery goal orientation). The PALS scale was developed by Midgley et al. (2000)
3. The motivation and engagement scale (Martin, 2010)

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Student data

Students completed asTTle reading and maths tests at the beginning, middle and end of the year. This enabled the researchers to track any changes over one year. asTTle was chosen because it is the only standardised test available in New Zealand that can be used to track students from Y3 (as some students were at the beginning of 2011) through to Year 10 (as some students will be at the end of 2013).

The students also completed a questionnaire at the beginning and end of the year. This consisted of four main sections and was made up of scales used successfully in previous studies:

- 1) Student motivation (Eccles (Parsons) et al., 1983; Fast et al., 2010; Midgley et al., 2000; Wigfield & Eccles, 2000, 2002)
- 2) Student self-concept (Marsh, 1990)
- 3) Student perceptions of the class climate (Rowe, Kim, Baker, Kamphaus, & Horne, 2010)
- 4) Student self-expectations (Rubie-Davies, 2006; Dixon, Peterson, Rubie-Davies, Widdowson, & Robertson, 2008)

Phases of the project 2011

February: Baseline teacher data from all teachers (intervention group and control) consisting of 1) a teacher expectation survey, 2) beliefs questionnaire, and 3) a twenty-minute video of teachers teaching in their classrooms.

February/ March: Baseline student data were collected in all classes consisting of 1) reading and maths achievement (asTTle), 2) social measures (see above).

March/ May: Four workshop days for intervention teachers underpinned by Timperley's 10 key principles of professional development (Timperley, 2008). Teachers were allocated a project partner to provide on-going collaboration throughout the project to help teachers implement their ideas into their classes.

Day 1: a) Intervention teachers were introduced to the expectation literature and to beliefs and key areas associated with high versus low expectation teachers. These were: grouping, learning experiences, evaluation, motivation, student responsibility for learning and classroom climate.

b) Teachers viewed their own videos and discussed alignment of their current practices with the introduced beliefs and key areas.

c) Teachers identified one area for personal development from those listed above and began to plan at least one changed behaviour related to a key area that they wanted to introduce to their classroom.

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Days 2-4: Focus consecutively on areas above: Day 2: grouping and learning experiences Day 3: classroom climate; and Day 4: Motivation, evaluation and student responsibility for learning (goal-setting). Teachers worked alongside the researchers and with their peers to develop instructional and social behaviours to be introduced to their classrooms in relation to each key area and underpinned by the expectation literature.

April – July:

- a) (April – July) Research mentors visited intervention teachers to provide on-going collaboration with, and support to teachers for their changed practices.
- b) (August) Class videos were repeated in all classrooms
- c) (June-July) All teachers completed the expectation survey
- d) All students completed asTTle reading and maths achievement tests

August - September: The intervention group were sent their videos so that they could reflect on the success of the changed practices. Further project partner meetings were held at which successes, difficulties and possible reasons for these were discussed, as were areas for future development.

November:

- a) All teachers completed the beliefs questionnaire
- b) Intervention teachers completed an evaluation of the programme
- c) End of year student data were collected in all classes consisting of 1) asTTle reading and maths achievement, 2) social measures questionnaire

December:

TEP Showcase at which selected intervention teachers presented their successes within the project.

Sampling

It was decided to approach schools in West Auckland to be part of the project as the West provides the widest range of deciles in Auckland. One school that operates as a junior high and a high decile intermediate school from other areas also agreed to be part of the project. Hence, a total of 12 schools agreed to participate: 6 contributing schools, 3 full primary and 3 intermediate; of these 3 were low decile schools, 7 were mid and 2 were high decile.

Data entry process

As surveys were returned, the data were entered into Smartadata, a computer program specifically designed for fast data entry. Once all the data had been entered it was exported into a database for statistical analyses (SPSS). The project contracted a database designer to develop the databases (in Access) from which the data could be imported into either Excel or SPSS for analysis. Further the

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database designer also wrote a computer program enabling asTTle results to be directly imported into SPSS. With teacher and student questionnaires and multiple waves of data, the requirements for a purpose-built database were significant and required the services of an expert in the field.

The Project Director entered the first round of data. This took several months (March-June). Two University of Auckland students on a University of Auckland Summer Scholarship entered the mid- and end-of-year data, with support from the project administration support personnel. This data entry occurred November-February. Assimilation of the asTTle data in to the Master database and data cleaning took a further five months. Importing asTTle results presented a range of challenges and hence the final Phase 3 student database on which this report is based was not ready until the end of July 2012. We anticipate that this process will be quicker and less problematic from now on.

Data Analysis Process

Data cleaning

Data cleaning involved removing any questionnaires that had more than 10% data missing, removing any achievement data where there was only one entry in maths and reading, and searching for errors in data entry. Cleaning of the data and importing of asTTle results gave a final sample of 2557 students and 85 teachers.

Likert scales

The questionnaires used differing scales. The student questionnaire had a 1-5 scale where 1 = False, 2 = mostly false, 3 = sometimes false, sometimes true, 4 = mostly true and 5 = true. A 1-5 scale allowed variability, whereby students had some choice about what they thought and believed without being too discriminatory making choice difficult for students.

The teacher estimation of achievement survey utilised a 1 – 7 scale. This scale measures teachers' expectations for their students. Teachers were asked to estimate the standard they believed each child in their class would reach in reading and mathematics in relation to national means. In this scale 1 = very much below average, 2 = moderately below average, 3 = just below average, 4 = average, 5 = just above average, 6 = moderately above average, 7 = very much above average.

Because the teacher questionnaire included different subscales from different standardised instruments (see above), the Likert scales varied. The first part of the questionnaire included a teacher efficacy scale. This employs a 1 – 5 Likert scale where the stem asks: How much can you do to... and the

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options are 1 = nothing, 2 = very little, 3 = some influence, 4 = quite a bit and 5 = a great deal. The remainder of the questionnaire (teacher motivation and goal orientation) utilises a 1 – 6 scale whereby the responses are: 1 = disagree strongly, 2 = disagree, 3 = disagree somewhat, 4 = agree somewhat, 5 = agree, and 6 = agree somewhat. Some questionnaire designers prefer a 1-5 (or other odd-numbered) scale which often enables a neutral viewpoint, whereas others prefer an even numbered scale (in this case 1 – 6) as this forces a positive or negative stance.

Reliabilities

In research, it is important to know that the instruments that are being used are reliable and valid. An acceptable level of reliability is one that is above .6. All student and teacher scales met this threshold and indeed many were above .8 reliability levels at both the beginning and end of the year which shows high levels of reliability. This means that the items were measuring what we wanted them to measure and also that both students and teachers responded consistently to the items.

Results and Discussion

The results and discussion are reported in two main sections.

- Section 1 contains the analyses relating to the control and intervention group teachers. So it reports on teacher expectations across the year, the teacher beliefs questionnaire and the extent to which teachers reported engaging with the project and believed the practices they had implemented had had beneficial effects for students.
- Section 2 contains the analyses relating to the students in intervention and control group classes. So it reports on student academic achievement in mathematics and reading over the year and changes in student perceptions in relation to the intervention and control group teachers.

Section 1: Teacher Demographics and Results for Intervention and Control Group Teachers

A total of 85 teachers were originally recruited for the study. Of these, 44 were randomly assigned to the intervention group and 41 were assigned to the control group. Where there were an uneven number of teachers in any school, an additional teacher was randomly selected and assigned to the intervention group. The teachers represented a range of experience and a mix of male and females (see Tables below). The majority of the teacher sample identified themselves as New Zealand European. The demographics of the teacher sample are presented below.

Teacher demographics

Table 1: Percentage of teachers by gender and by ethnicity (N = 85)

Gender	%	Ethnicity	%
Female	70.6	European	61.2
Male	29.4	Māori	9.4
		Pasifika	10.6
		Asian and other	15.3

Table 2: The percentage of teachers by teaching experience in total and in New Zealand

Teaching experience	%	NZ Teaching experience	%
1-5 years	30.6	1-5 years	36.5
6-10 years	24.7	6-10 years	28.2
11-17 years	17.6	11-17 years	15.3
18-25 years	8.2	18-25 years	9.4
25+ years	18.8	25+ years	10.6

Table 3: The percentage of teachers by decile and teaching level

Decile	%	Teaching level	%
1-3	21.2	Year 3/4	25.9
4-7	60	Year 5/6	40.0
8-10	18.8	Year 7/8	34.1

Teacher expectations

Teacher expectations were measured on a 1-7 scale where 1 = very much below average and 7 = very much above average.

Reading

In reading, both the control and intervention groups expected their students to be just above average since a score of 4.0 would represent average. The mean for the control group was above that of the intervention at both Phase 1 (beginning of the year) (control group = 4.93 vs 4.45 for intervention) and at

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Phase 2 (mid-year) (4.72vs 4.47). However, there was a statistically significant group (intervention or control) by time (from beginning to middle of the year) interaction. This was because the expectations of the intervention group remained at similar levels from the beginning of the year to the middle of the year but the expectations of the control group fell substantially (see Figure 1). So the intervention group teachers seemed to have maintained high expectations for their students in reading.

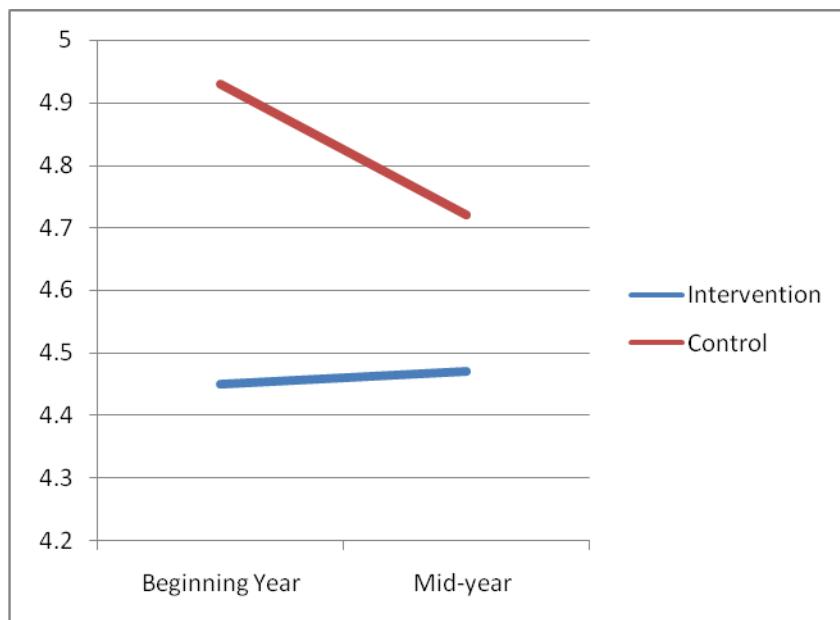


Figure 1.Change in expectations for reading for intervention and control groups from March to June.

Mathematics

In mathematics, both the control and intervention groups expected their students to be just above average since a score of 4.0 would represent average. The mean for the control group was above that of the intervention at both Phase 1 (beginning of the year) (control group = 4.87 vs 4.48 for intervention) and at Phase 2 (mid-year) (4.60 vs 4.44). Again, there was a statistically significant group (intervention or control) by time (from Phase 1 to Phase 2) interaction. This was because the expectations of the intervention group remained at similar levels from Phase 1 to Phase 2 but the expectations of the control group fell significantly (see Figure 2). Therefore the intervention teachers seem to have maintained high expectations in mathematics whereas the expectations of the control group dropped.

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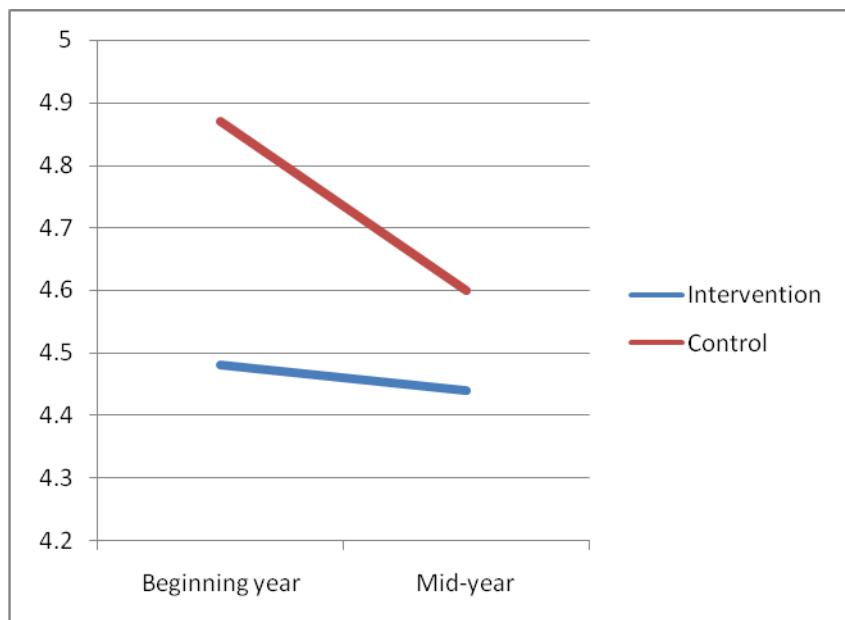


Figure 2.Change in expectations for mathematics for intervention and control groups from March to June.

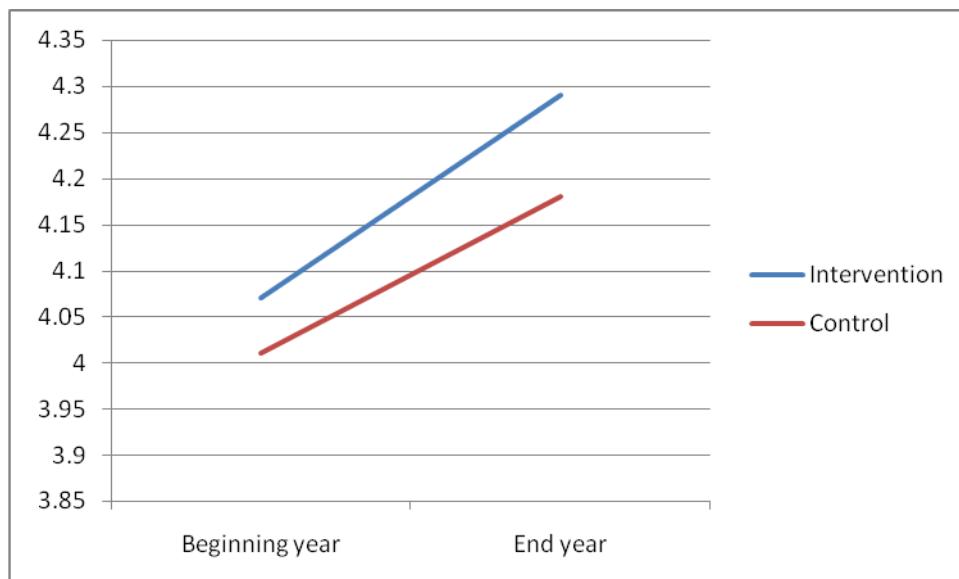
Overall, for both reading and mathematics, the group to which teachers were assigned appeared to affect their expectations over time. For both curriculum areas, the expectations of control group teachers decreased markedly from the beginning of the year to the middle of the year.

Teacher beliefs

Teacher efficacy scale

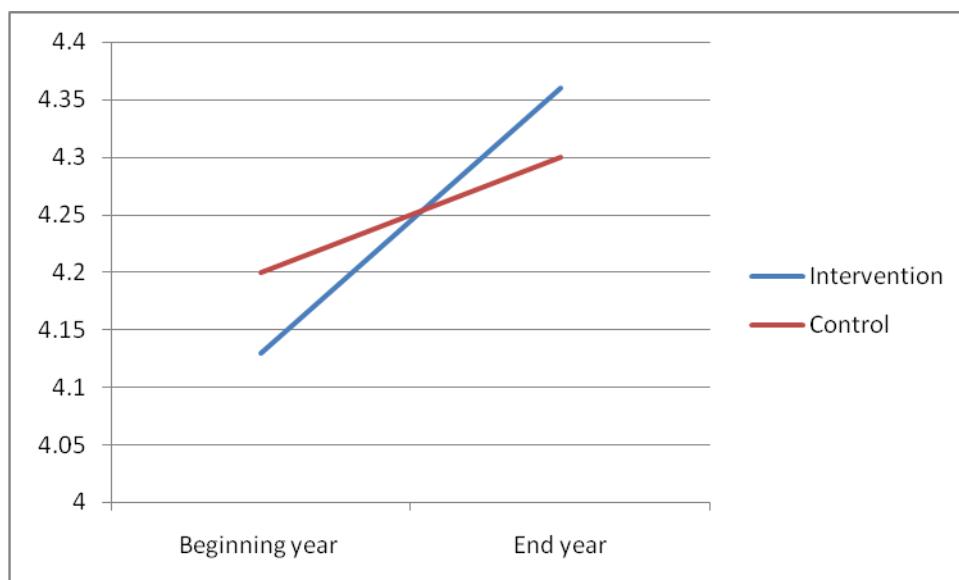
The teacher efficacy scale contained three subscales. There was a statistically significant effect over time from the beginning to the end of the year for all three scales. There was an increase in efficacy in student engagement in reading (confidence that the teacher can engage students), efficacy in instructional strategies (being able to adapt instruction for individual learners) and efficacy in class management (beliefs that the teacher can manage even the most difficult students) for both teacher groups. For efficacy in student engagement, the mean for the control group was 4.01 at the beginning of the year and 4.18 at the end of the year. The mean for the intervention group was 4.07 at the beginning of the year and 4.29 at the end of the year. Figure 3 shows these increases for both control and intervention groups.

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*Figure 3.*Changes over one year in teacher efficacy in student engagement between control and intervention groups

For efficacy in instructional strategies, the mean for the control group was 4.20 at the beginning of the year and 4.30 at the end of the year. The mean for the intervention group was 4.13 at the beginning of the year and 4.36 at the end of the year. Figure 4 shows these increases for both control and intervention groups.



*Figure 4.*Changes over one year in teacher efficacy in instructional strategies between control and intervention groups

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For efficacy in classroom management, the mean for the control group was 4.36 at the beginning of the year and 4.53 at the end of the year. The mean for the intervention group was 4.40 at the beginning of the year and 4.58 at the end of the year. Figure 5 shows these increases for both control and intervention groups.

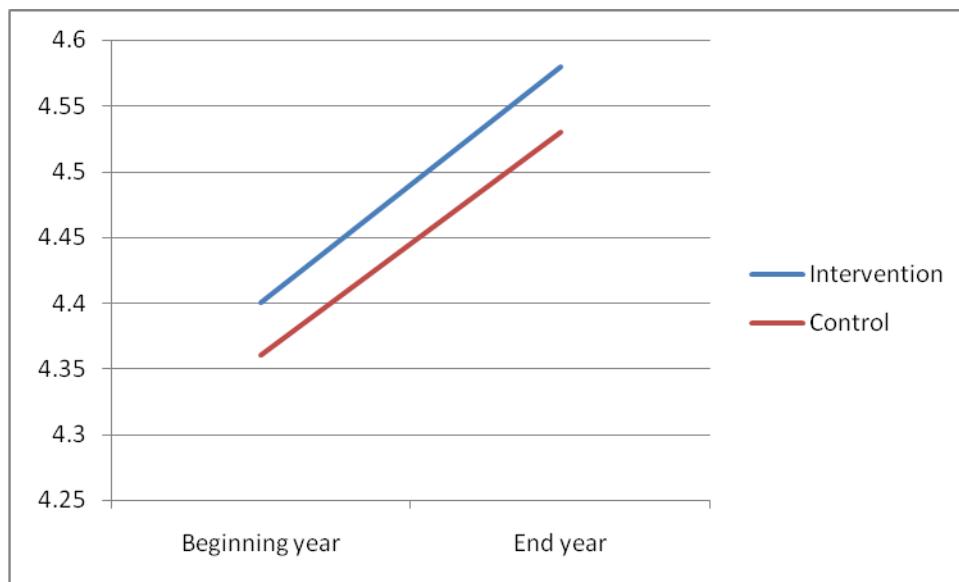


Figure 5. Changes over one year in teacher efficacy in classroom management between control and intervention groups

Overall, while the means for both groups related to their sense of efficacy in teaching reading increased across the year there was a trend for the teachers in the intervention group to become more efficacious about their teaching abilities than the teachers in the control group. This was particularly so for efficacy in instructional strategies where there was an interaction effect indicated by the cross-over of the lines in the graph. This means that by the end of the year the intervention teachers were feeling considerably more efficacious about being able to use a range of instructional strategies to enhance their students' learning than were the control group. It is possible that the workshops provided the intervention group with a wider range of instructional strategies than they previously had and so this, in turn, led to more positive perceptions.

Teacher goal orientation

The teacher goal orientation scale contained two subscales: teacher performance goal orientation and teacher mastery goal orientation. Having a performance goal orientation relates to believing that students should be motivated by focusing on competition and trying to out-do their peers. There was a statistically significant group by time interaction for this subscale. This means that the intervention

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changed teachers' beliefs about the value of having a performance goal orientation. Teachers in the intervention came to believe more over the year that fostering competition among students was not an effective way to motivate students. At the beginning of the year the mean for the intervention group was 4.31 while at the end of the year, this had fallen to 4.03. In contrast, at the beginning of the year the mean for the control group was 4.40 and at the end of the year, 4.46, so there was a trend for control group teachers to believe more strongly in the value of competition by the end of the year than they did at the beginning of the year. Figure 6 shows the changes in teacher beliefs over one year.

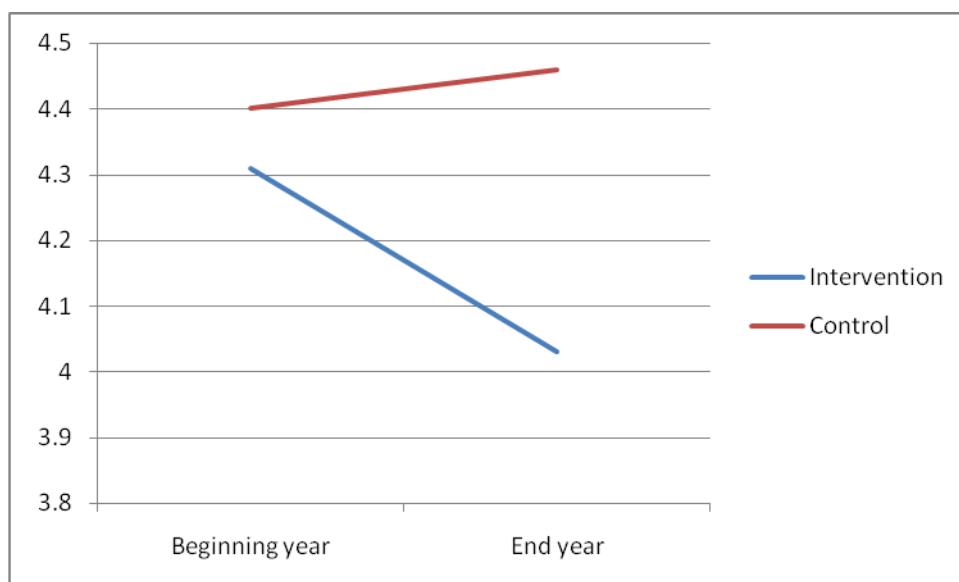
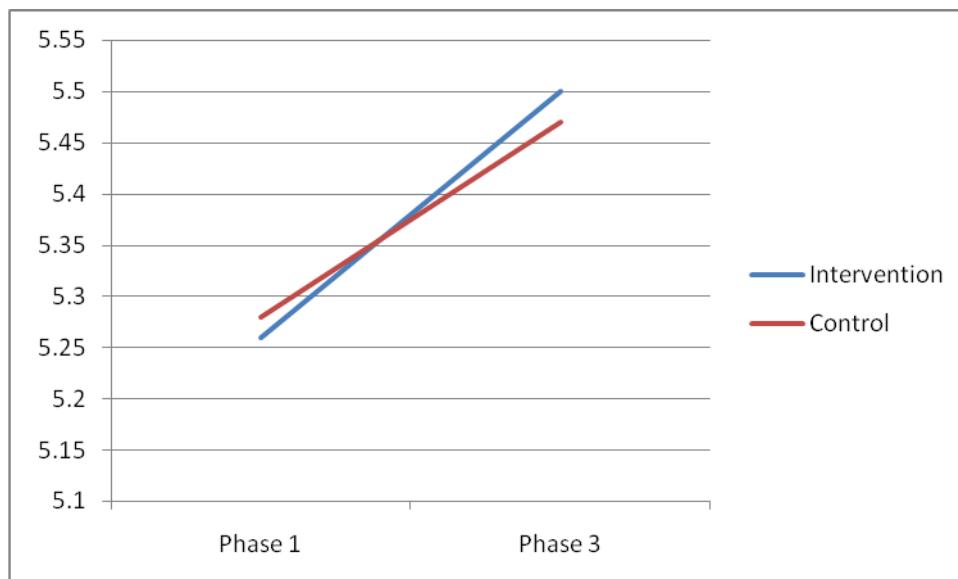


Figure 6. Changes over one year in teacher beliefs between control and intervention groups about the value of competition as a way of motivating students

On the other hand, both teacher groups showed an increase in perceptions that motivating students by focusing on a mastery goal orientation was important. So the teachers came to believe more over the year that they should focus on students' own individual learning and progress. The mean for the control group was 5.28 at the beginning of the year and 5.47 at the end of the year. The mean for the intervention group was 5.26 at the beginning of the year and 5.50 at the end of the year. So, there was a slight trend for the intervention group to become more mastery oriented than the control group. Figure 7 shows these increases for both the control and intervention groups.

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*Figure 7.*Changes over one year in teacher beliefs between control and intervention groups about the value of using individual student progress as a way of motivating students

Teacher motivation

There were also some changes evident over the year in relation to teacher motivation. Changes for three subscales where there were statistically significant changes will be presented: persistence, teacher anxiety, and uncertain control.

Persistence is how much individuals keep working at a difficult or challenging task or activity. Over time both the control and intervention groups reported that they persisted more at tasks. At the beginning of the year, the mean for the control group was 5.10 and by the end of the year this was 5.36. The mean for the intervention group was 5.23 at the beginning of the year and 5.39 at the end of the year. Figure 8 shows these increases for both groups.

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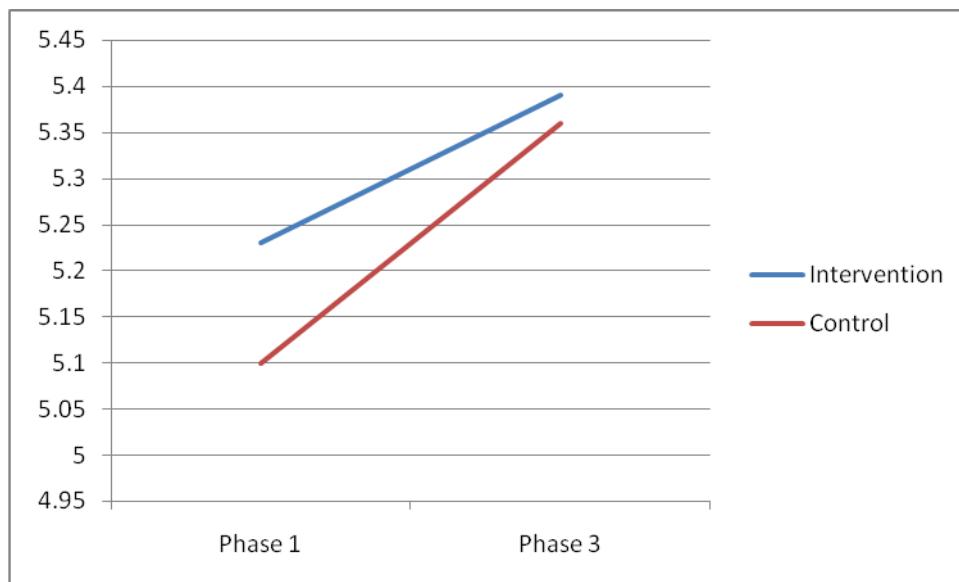


Figure 8. Changes over one year between control and intervention groups in teacher self-reported persistence at work tasks and activities

Anxiety has two components: feeling nervous and worrying. Feeling nervous is the feeling individuals get when they think about their work, while worrying is teacher fear about not doing very well in their work. There was a statistically significant group by time interaction for this subscale. This was because over time the intervention group became far less nervous than the control group. At the beginning of the year the mean for the control group was 3.34 and this increased slightly to 3.39 by the end of the year. On the other hand, the mean for the intervention was group was 3.35 at the beginning of the year but fell to 2.94 by the end of the year. Figure 9 shows this change in teacher anxiety for the two groups over time.

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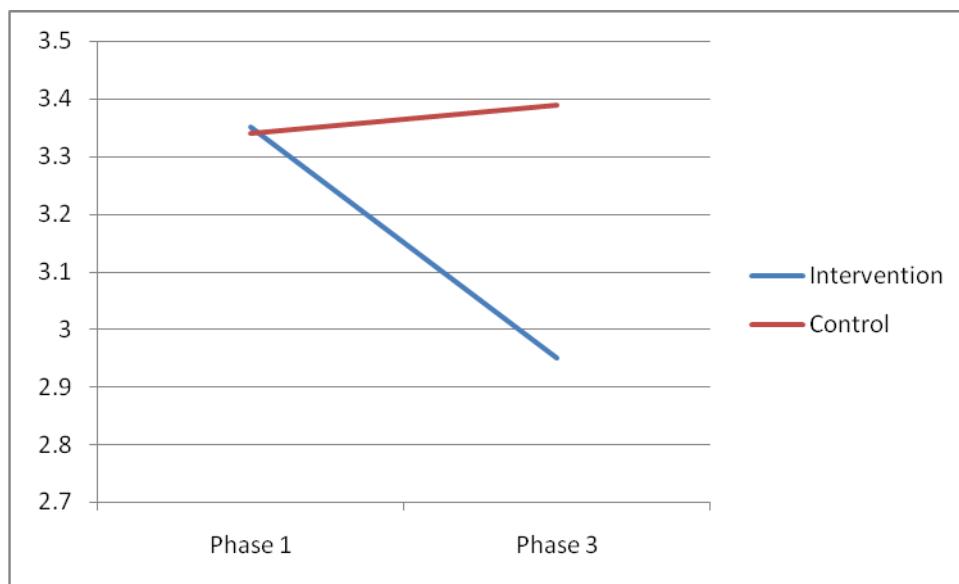
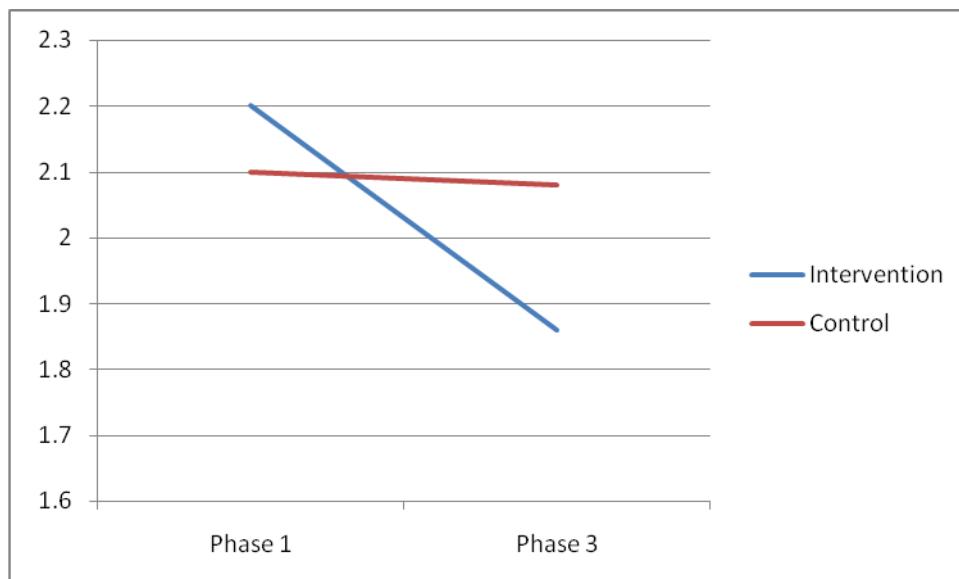


Figure 9. Changes over one year between control and intervention groups in teacher anxiety

Uncertain control relates to individuals being unsure about how to do well or how to avoid doing poorly. If teachers are uncertain in control they can be at risk of feeling helpless or disengaging from work. Again, with this subscale, the intervention group became far less uncertain than did the control group. Or, conversely, they felt more in control. There was a statistically significant group by time interaction. This was because over time the intervention group became far less uncertain about having control than did the control group. At the beginning of the year the mean for the control group was 2.10 and this decreased slightly to 2.08 by the end of the year. On the other hand, the mean for the intervention group was 2.20 at the beginning of the year but fell to 1.86 by the end of the year. Figure 10 shows this change in teacher uncertain control for the two groups over time.

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*Figure 10.*Changes over one year between control and intervention groups in teacher uncertain control

Hence, over the first year of the project, intervention teachers seemed to be feeling less anxious about their work and more in control when compared with their control group peers.

Teacher evaluation of the project

During the first year of the project, teachers evaluated each workshop and at the end of the year were asked to complete a survey of their perceptions about the project and how successful they believed the first year had been.

Flexible grouping and activity choices

Following the second workshop for the intervention group, results indicated that there was a marked shift in the proportion of teachers using flexible groupings and providing a wider range of choices/group activities with 90% of participants claiming to use flexible grouping following the intervention, compared with 0% prior to the intervention. Participants felt that they were making a positive difference to students' learning outcomes through the use of flexible grouping in areas such as mathematics, spelling, writing, and to a lesser extent, topic studies. However, while 77.8% of participants claimed to integrate flexible grouping into their reading programmes, they seemed less satisfied with the outcomes in reading with only 44.4% being fully or highly satisfied. The reasons given were that the reading ages of students were wide and diverse. As one teacher stated, "My bottom 2 groups have reading ages of below 7.5 and cannot access the material used for other groups". They also felt that some children did not cope with choosing activities while others thrived on having choices. This teacher summarised it well by saying:

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I find it best to keep reading groups structured in the old way [ability grouped]. Everything else is flexible grouping.

Responses collated from the follow-up project partnership meetings indicated once again that teachers were indeed using flexible and mixed ability groups, particularly in mathematics and reading. A number of teachers reported greater fluidity of groups where children moved according to their needs. One teacher claimed that, because of the intervention, she was now more aware that what she had been doing with her lower-level children was controlling their learning and not giving them freedom of choice. She added that giving them choice has “raised the bar in their learning”. Teachers said that they were also providing more inquiry activity centres, wider ranges of activities and greater choices. Buddy systems had been set up for students to help each other and children were starting to actively seek help from one another rather than from the teacher.

Participants reported developing or introducing a wide range of innovative ideas which included: literacy circles where children chose their own books but answered the same questions; task boxes from which children could choose activities; ‘reciprocal teaching for reading’ cards where children ran the groups themselves and the teacher participated as a group member; reading response activity boxes which included a wide range of interest based books and activities; research; art; writing; language and spelling response activity boxes; before and after comparison charts where children were able to demonstrate what they knew before and after a free-choice activity; peer mentoring where all children had the opportunity to participate in activities no matter what level of reading they were on - for example pod casting; digital story books; using music in language through ‘Karafun’, a type of karaoke programme; using ‘Computers on Wheels’ (COWS) for research activities and many more. Teachers also allowed students to do a lot of free writing – not teacher directed, while some activities linked to a shared reading book.

Teachers reported that having mixed groups, learning opportunities and activities were working well and that children, especially middle-ability children, were highly interested in the tasks and were enjoying working in mixed groups. Lower ability children were found to be using their more able peers to extend themselves. One teacher posited, “My ‘needy kids’ are suddenly hooked into activities and are more engaged”. Yet another teacher felt that, “Flexible groups are more efficient – teaching towards a skill” and that “flexible grouping in all curriculum areas dissolved the notion of ‘top’ group or ‘bottom’ group”. Teachers also felt that flexible groups were less likely to result in cliques. Teachers emphasised

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that while children enjoyed having choices of activities, teachers still needed to model these activities through explicit teaching and skills workshops. Some teachers stated that they used ability grouping for instructional reading because of the wide range of abilities within their classes; others said they used the grouping on a needs basis only, while some teachers moved fully to flexible grouping. One teacher claimed that he now used 'sentence groups' or 'conjunction groups' instead of ability groups. This teacher stated:

I've done away with ability groups and have a range of activities to choose from, but I still pull out targeted students for guided lessons, focussing on gaps.

There were also some concerns expressed about mixed or flexible ability grouping encapsulated in the comments from these two teachers:

It is a slow process and difficult to continue the momentum as groups change and some finish tasks much faster than others. I am concerned with noise level and children who find it difficult to stay on task.

My top maths group found it difficult to work with lower groups but were quite happy to explain the activity.

Others spoke about the need to "Work on breaking down gender division and encouraging grouping that combined males/females". Being a beginning teacher with a mentor teacher who expected ability grouping, limited one teacher from implementing flexible grouping as much as she wanted to.

Overall, while many teachers were using mixed grouping in reading and could see the benefits of this arrangement, far more teachers reported using mixed ability grouping in mathematics.

Enhancing classroom climate

A survey conducted immediately after the third intervention workshop on classroom climate indicated strongly that the majority of participants were enlightened by the session. This was with particular reference to the power of positive emotions and a positive classroom climate, and about the fact that there was research supporting the effect of teacher warmth on student outcomes, that sociometric measures were available to assess the classroom climate and that there were tools available to improve the class climate. The sentiments of these two participants encapsulate the feelings of the group as a whole:

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Teacher warmth is the strongest predictor of academic achievement – I hadn't known there was research about this.

I learnt about sociograms and a range of teaching tools to encourage a positive classroom climate.

Arguably the most honest remark by a participant when asked if she had learnt anything new about classroom climate was her response:

"Lots – about myself and about my class. Me! I am responsible for the climate in the class".

Participants expressed that they were feeling “enthused”, “excited”, “inspired”, “energised”, and “confident to walk away with something practical to try out in my class”. As this participant stated:

I feel very positive. Really interesting information about the social side of teaching and classroom structure. Want to get into my class now and do the sociometric measurement and questionnaire.

However, some participants realised the enormity of the task, with one stating, “What a lot I have to do and think about!” and another, “I want to try all these ideas, but need time to process all my thoughts”.

Participants also expressed their surprise about the effects of a positive classroom climate on student learning and on teacher expectations. One participant stated, “I was surprised by the effect of positive emotions on learning (the positive thinker sees more options and direction, whereas the negative sees less or fewer options)”, while another expressed her amazement “that having a positive classroom climate could actually raise my expectations of my students”. Yet another participant was really surprised at her own negativity when tested, stating:

I was surprised that this [classroom climate] could make such a big impact. I didn't think I scored very well in the positivity test¹, but I couldn't believe I was so negative.

Participants expressed that they would change a number of things about their practice and implement new ideas as a result of the workshop on classroom climate. These ideas included creating time to fit in discussions and activities about positivity, including more positive approaches into their teaching,

¹ Positivity Self Test by Barbara L. Fredrickson (2009). *Positivity: Top notch research reveals the 3-to-1 ratio that will change your life*. New York: Three Rivers Press, pp. 233-234.

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administering sociograms and class inventory surveys to see where kids were at, making children more responsible for the classroom climate, creating ‘family groups’ within the class, introducing a brag wall or wall of fame, and making more time for fun in the classroom.

Responses collated from subsequent follow-up project partnership meetings indicated that participants had indeed put much effort into enhancing the classroom climate by implementing all of the ideas mentioned in the previous paragraph as well as many additional ones. Participants reported a strong focus on creating a positive classroom environment by using ‘clock buddies’ where children with the same eye colour or birthday month for example worked together; ‘Club Fridays’, a type of book club, where children shared their favourite books over a soft drink and biscuits; sociograms; mixed social groups; and brag walls where children as well as staff working in the classroom put things up that they were proud of. Teachers were excited to find that children were more confident, excited and motivated and were exercising choice. There was much more of a student voice and children were developing good relationships with each other. One participant stated:

The biggest difference I've noticed is in my classroom climate. I used the sociogram and the atmosphere has changed – every two weeks the children move desks and it means they have all got to know one another and there is more harmony in the classroom.

A participant who used sociograms to set up ‘family groups’ in his classroom, reported that these had been hugely successful, leading to a more cohesive atmosphere in the class where children supported and looked after each other. Furthermore, students who previously did not get on were now working well together as a result. Another participant was pleased to find that her focus on creating a positive safe classroom climate for children to learn in had particularly benefitted her special needs children. Yet another participant reported her intrigue in the psychology of the classroom climate in relation to what she thought was going on and what students thought was going on. She stated:

I have discovered how very perceptive they [students] are in terms of knowing who rates socially in the class.

In a subsequent follow-up survey, when asked whether they had been working on classroom climate in their classrooms, all but one participant (97%) indicated that they had been working on this aspect with 77% either agreeing or strongly agreeing that what they had done had made a positive difference to classroom relationships. The remaining 23% were neutral. Of the 72% of participants who claimed that they were satisfied with the changes they had made with respect to classroom climate, many reasons

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were given for this satisfaction including working on non-verbal communication; commencing a Tuakana/Teina programme; allocating wall space for celebrating successes and sending praise cards home; allowing more time for students to engage in communication with a wider range of classmates; and implementing some of the positive classroom climate activities suggested in the intervention workshops and as this participant added:

I have been certain to affirm to each student by way of feedback, their successes and next steps. The dedication and interest shown in their work has meant positive attitudes towards their learning which has in turn helped with the classroom climate.

Other comments indicating the reasons for success included, “More student voice and less teacher talk”; “Discussing about what makes a good learner”; “More use of positive language and non-verbal cues”; and “Giving children more power to make up their own rules, systems, consequences, giving them ownership”.

Many of the participants indicated, however, that this was just the beginning of the journey for them and that they wished to continue with this and improve it further. This participant stated:

I have not been consistent enough. It takes time to break habits, incorporate new learning and not try to work on too many things. I want to continue with this in term 4.

Another added:

It is extremely difficult to make changes after being set in one's way for so long.

Participants reported that children enjoyed being able to work with students they did not normally get to work with and that their lower-ability readers were improving a lot more through the influence of the higher-ability students. Further, the students seemed more enthusiastic when choosing their books rather than being told what to read and were motivated to read and support each other. However, while some thrived on choice some found it hard to make decisions.

Goal setting

Survey monkey results following the fourth workshop of the intervention, showed that 60% of participants were implementing goal setting and feedback in their classrooms to enhance student motivation and autonomy, drawing on what they had learnt in the research workshops. Of these, 83% indicated that they either believed or strongly believed this was making a positive difference to their

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students' reading outcomes and that they were satisfied with the changes made in respect to goal setting and/or feedback. The other 17% were neutral in their responses, stating that they needed more time to gauge the success of implementing goal setting.

Responses collated from the subsequent follow-up cluster project meetings indicated that goal setting was being implemented in a variety of ways in classrooms, for example through the use of exemplars, using e-asTTle. Teachers stated that goal setting was enabling children to self-manage their learning and identify their own levels and gaps within these. They stressed the importance of children setting goals that were measurable and attainable, and reflecting on these goals regularly (weekly or having a reflection day). Goal setting was used particularly effectively in one middle school - as Teacher A stated, "We use goal setting in conjunction with the 7 habits of highly effective adolescents" and Teacher B commented that goal setting was used by students "as part of inquiry learning to manage their own learning and time". At another middle school, a teacher stated that children were "engaged in goal setting and have set up portfolios where they set goals based on their asTTle tests and track their progress". One of the teachers at a primary school described a writing progression table resource he has developed to help children with goal setting. The teacher described this as follows:

As a class we look at specific goals from the progression table. The students focus on 2-4 goals at their level and have a focused writing session. With student-teacher conferencing we can both look at the writing piece and highlight the successes from the table and circle goals for next time.

Teachers reported positive benefits and advantages of goal setting for their students, which included students being able to recognise and stay focused on their next learning steps, co-constructing success criteria, setting targets, self and peer-assessing goals based on their own assessment data and self-evaluation, and managing their learning and time more effectively.

These following three teachers further explained how they used various assessment tools/programmes to guide children's goal setting:

Goal setting has given the class greater ownership of their learning. We looked at asTTle records in child-speak to determine next steps for reading and maths and used rubrics and success criteria as student checklists as a goal setting guide.

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Self-selection has been motivating for most children. I shared the asTTle results from teacher expectations with students and they were able to set their own goals.

Using e-asTTle and IKAN (the Individual Knowledge Assessment of Number) test summaries has helped my students identify gaps in learning. Transparency in data was helpful in setting goals (e.g., students all saw the data).

Teachers also reported how students were becoming more adept at setting and evaluating goals with one teacher stating:

They [students] became much more articulate and reflective on what they wanted to improve... far more beneficial in improving the students' autonomy over their own learning.

Tracking our learning goal weekly through self-assessment, peer assessment and class editors, children then choose their next learning goal. Once the goal is achieved the children go back to check with parents.

Summary

The majority of the teachers came into the expectation research project because the opportunity was offered and they thought it would be beneficial to their teaching practice and students' learning and consequently raise student performance and achievement. The teachers also wanted to learn new strategies for engaging and extending students.

It was evident from the findings that the majority of the intervention teachers were enthusiastic and positive about using flexible grouping within the classroom for learning opportunities and activities whilst retaining ability groupings for instructional reading. A few teachers even chose to move fully to flexible groupings. Teachers who used flexible grouping commented that they felt the changes they had implemented had made a positive difference to students' learning outcomes. They referred to flexible grouping as the teacher being able to give greater variety of choices for all students and students being able to support and encourage one another to a greater extent in their learning. Of note, however, although the intervention was originally targeted only at reading, more teachers reported using flexible grouping in maths than in reading.

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One of the underlying messages of the intervention teachers was that they believed on the whole, (based on their comments and observations) that the implementation of goal setting within the classroom was having a positive effect and making a difference to student learning outcomes. The teachers were clear that having the students set goals to target specific learning areas was helping to focus them and give greater ownership of their learning.

The classroom should be an enjoyable and secure environment in which students work. Responses from the intervention teachers in the study indicated quite clearly that they were enthused and very positive by the changes in their classroom as a result of new teaching strategies and practices.

Therefore there was a lot of emphasis on the teacher's relationship with the students and whether the students felt secure and comfortable in expressing their views and opinions. The teachers also expressed surprise that there were such a range of tools and sociometric measures available to them to work with in assessing the changes that they made in their classroom climate. As Hattie (2009) espoused, the impact of the classroom climate on both teachers and students has a powerful effect on their learning.

One of the underlying messages throughout the intervention was that what the teachers acquired in relation to high expectation strategies directly impacted on the learning outcomes for the students. As the teachers became more able to understand and use the strategies discussed in the intervention workshops/professional development, their sense of wanting to change and adapt their teaching strategies increased. There was a trend in the findings which indicated that as a result of the intervention the teachers had been working on enhancing the classroom climate, believing that what they were doing was making a positive difference to the student learning outcomes. As Guskey (2002) concluded, for most teachers becoming a better teacher simply means enhancing the learning outcomes for the students they teach. It was clear that for the intervention teachers this was an important part of their involvement in the research.

The findings of this study support the view that when students are challenged and extended as a result of teachers who have high expectations for all their students, their learning progress is substantially increased. Certainly this is what the teachers reported. The study showed that teachers believed that when they used flexible and more mixed ability groupings with greater activity choices in their programmes that this in turn enhanced their classroom climates, and supported their students' self-regulation through goal setting and feedback. In turn, these changes were perceived to make the

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teachers more effective in enhancing their students' academic and social outcomes. The significance of this study is that it shows that teacher expectations can be changed for all students through teaching teachers the beliefs and practices of high expectation teachers.

Section 2: Student Demographics and Results for Students in Classes of Intervention and Control Group Teachers

A total of 2557 students participated in the study. They were the students of the intervention and control group teachers reported on above. There was a relatively even spread of students across class levels (Year 4-8) and ages (8-12 years). There were also similar proportions of boys and girls. Most students were European with similar proportions of Māori, Pasifika and Asian students being represented. More students were in mid-decile than in high or low decile schools. The student demographics are presented below.

Student demographics

Table 1: Percentage of students by gender and by ethnicity (N = 2557)

Gender	%	Ethnicity	%
Female	48.8	European	49.3
Male	51.2	Māori	17.1
		Pasifika	15.8
		Asian	14.2
		Other	3.6

Table 2: The percentage of students by year level and age

Year level	%	Student age	%
Year 3	8.1	6 years	1.1
Year 4	19.1	7 years	9.7
Year 5	17.4	8 years	18.6
Year 6	18.3	9 years	17.4
Year 7	17.7	10 years	18.7
Year 8	19.3	11 years	17.8
		12 years	16.4
		13 years	.4

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Table 3: The percentage of students by decile

Decile	%
1-3	20.0
4-7	59.0
8-10	21.0

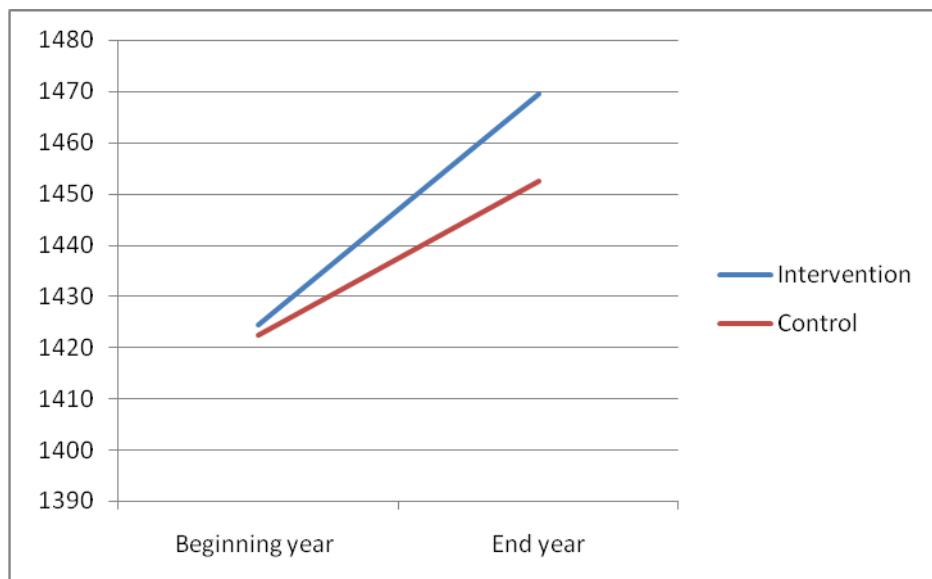
One difficulty for the project has been gathering complete data for students, particularly for e-asTTle. For example, of the 2557 students involved in the project, only 1907 completed e-asTTle mathematics at the beginning of the year and 1550 students did so at the end of the year. Of those, 1278 completed e-asTTle at both time periods. This is data from less than half the students actually participating. A similar pattern was evident for reading, where 1850 students completed the e-asTTle reading test at the beginning of the year, 1559 at the end of the year and for 1254 students there was data for the e-asTTle reading test at both the beginning and end of the year. Loss of data occurs for a number of reasons: students leave the school, they are not present on the day of the test, or the test is not administered to some students or classes. However, as researchers, this becomes a major impediment to gathering data that can be considered truly representative of what is occurring in classes as a result of the intervention.

Student achievement

Mathematics

In mathematics, there was a statistically significant group by time interaction in e-asTTle mathematics scores for students in the classes of intervention and control group teachers. This means that over time the group that teachers were randomly assigned to mattered for student achievement. While the scores of both groups increased over time, the scores of the students in the classes of the intervention group teachers increased more, significantly more than those of the control group. At the beginning of the year, the mean score for students in classes of control group teachers was 1422.44 and this had increased to 1452.37 by the end of the year. In contrast, the mean score for students in the classes of intervention teachers was 1424.33 at the beginning of the year but had risen more sharply to 1469.57 by the end of the year (see Figure 11). This represented an effect size gain for students with intervention teachers of $d = .49$, a sizeable change over one year. It is interesting that this pattern occurred in mathematics where a larger proportion of teachers reported having introduced flexible grouping than in reading.

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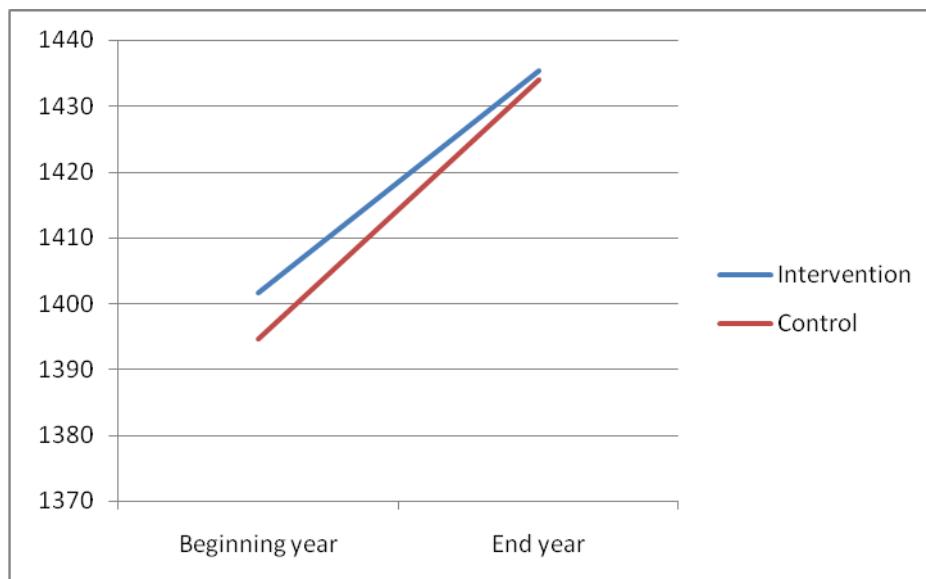


*Figure 11.*Changes over one year for students in classes of control and intervention groups in e-asTTle scores in mathematics.

Reading

In reading, the mean asTTle score for the students with control group teachers at the beginning of the year was 1394.67 and was 1433.94 at the end of the year. For the intervention group, the mean was 1401.57 at the beginning of the year and 1435.36 at the end of the year (see Figure 12). Over time, both groups showed a significant increase in scores. For the intervention group, this represented an effect size change in score of $d = .38$, a moderate effect. However, as reported above, several teachers chose to use flexible grouping in mathematics but not in reading. Given the results reported for mathematics, this may be important. While all but one teacher in the intervention group had made some changes in reading grouping by the end of the year, only 19 reported having implemented flexible grouping fully or almost fully into their reading programmes. In contrast, 25 teachers reported implementing flexible grouping into their mathematics programmes.

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*Figure 12.*Changes over one year for students in classes of control and intervention groups in e-asTTle scores in reading.

While it is possible that the use of flexible grouping may have contributed to the substantial increase in mathematics scores for students in the classes of intervention group teachers, it is to be remembered that flexible grouping was only one component of the intervention. It may be that teachers found it easier to set goals with their students in mathematics than in reading, for example, given that mathematics is a linear subject. Or, it could be that the changes made to the class climate had more effect on student achievement in mathematics than they did in reading. Of the intervention teachers, 21 reported introducing substantial changes to the class climate and 17 reported using goal setting more consistently in their classes than they had previously done. However, considering that the intervention included three major components: flexible grouping, enhancing class climate and goal setting, it is likely that the combination of introducing all three contributed to the overall achievement gains of students in mathematics in classes of intervention group teachers.

Student perceptions of their teachers' expectations

One of the scales in the student questionnaire measured student perceptions of their teachers' expectations. The first scale examined whether students perceived that their teacher had higher expectations for them than they had of themselves. Examples of items are: "My teacher thinks I am a lot better at my schoolwork than I really am" and "I don't think I am as good at my schoolwork as my teacher thinks I am." There was a significant group by time interaction for this scale meaning that there were distinct differences in the beliefs of the two groups over time. As can be seen in Figure 13, students in the intervention group, more so than students in the control group, came to believe that their teacher had very high expectations for them. The mean for the control group changed from 2.92 to 2.923 over the year while that for the intervention group increased from 2.86 to 2.99.

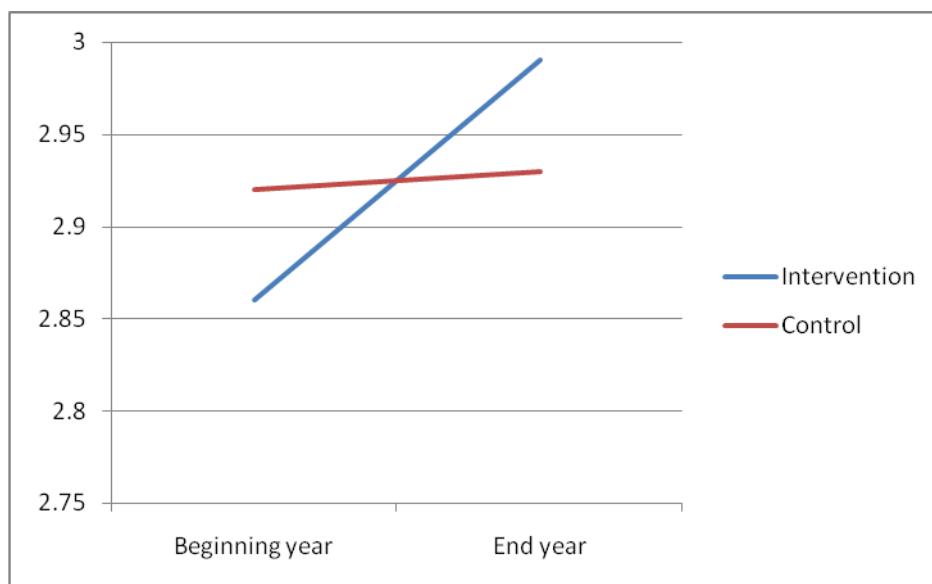
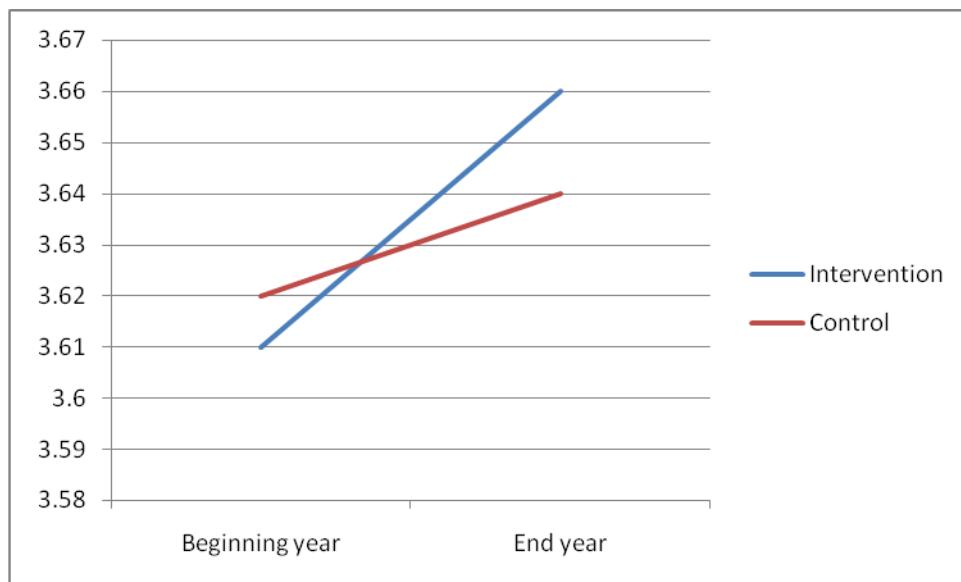


Figure 13. Changes over one year for students in classes of control and intervention groups in beliefs that their teachers' expectations for them were higher than their own beliefs.

There was a similar trend for the scale that measured student perceptions of their teachers' expectations overall. Examples of items in this subscale were: "My teacher thinks I am good at maths" and "My teacher expects me to do well at school." The mean for the control group was 3.62 at the beginning of the year and 3.64 at the end; for the intervention group, the increase in beliefs went from a mean of 3.61 at the beginning of the year to 3.66 at the end of the year and these changes over time were statistically significant. The changes in means for students in the control and intervention groups

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are represented in Figure 14. Hence, it appears that students with intervention teachers increasingly became aware over the year that their teachers had high expectations for them.



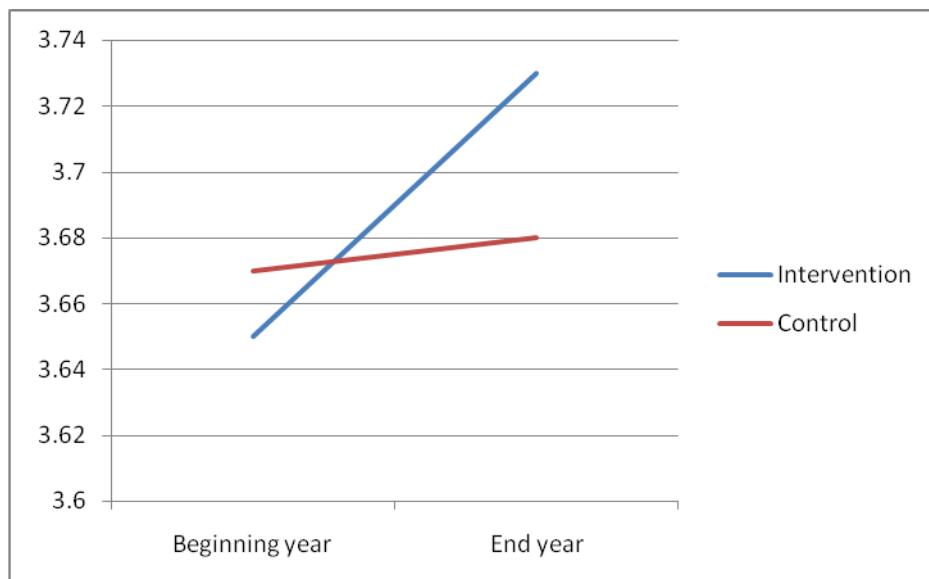
*Figure 14.*Changes over one year for students in classes of control and intervention groups in beliefs that their teachers had high expectations for them.

Student beliefs

The student questionnaire includes scales that measure student self-concept, student motivation, student perceptions of the class climate and student self-expectations. Students rated their beliefs on a 1-5 scale where 1 = False and 5 = True. Hence, a 3 represents the mid-point on the scale (Sometimes true, sometimes false). The results reported below are for those scales where there were statistically significant changes in student beliefs over the first year of the study.

Self-concept in mathematics

Interestingly, given the results above, there was a statistically significant change in student mathematics self-concept over time. At the beginning of the year, the mathematics self-concept of the students with control group teachers was 3.67 and by the end of the year this was 3.68. However, for the intervention group, the mean rose from 3.65 at the beginning of the year to 3.73 by the end of the year. These results are presented in Figure 15 and suggest that student confidence in the intervention group in their mathematics capabilities rose significantly over the course of the year. Examples of items that make up the mathematics self-concept scale are: "I learn things quickly in maths" and "Work in maths is easy for me." Also, in relation to the achievement results above, there were no statistically significant changes in student self-concept in reading over the year (Time) nor were there any changes depending on whether students were with intervention or control teachers (Group).



*Figure 15.*Changes over one year for students in classes of control and intervention groups in mathematics self-concept scores.

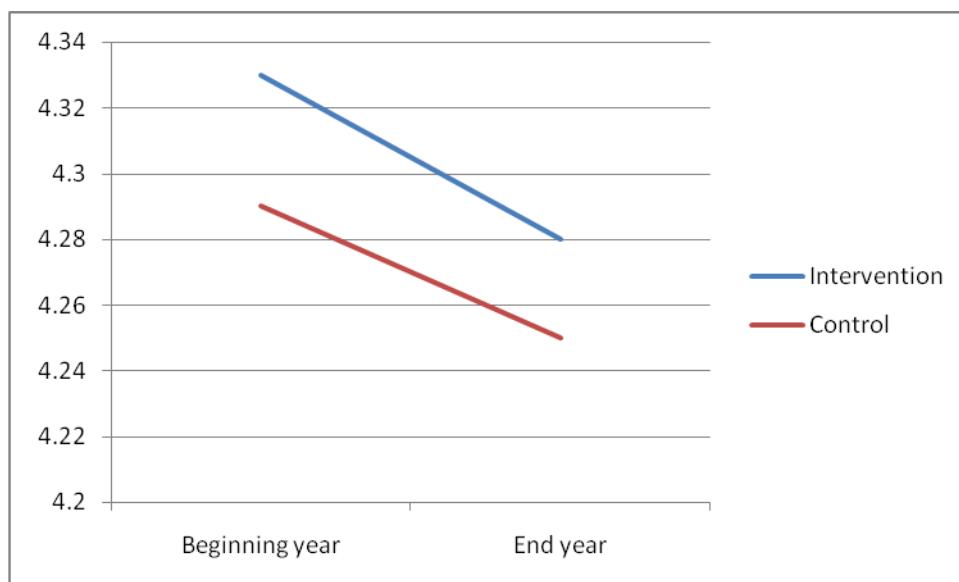
Student motivation

One of the measures within the motivation scale is of students' mastery and performance goal orientation. Mastery beliefs are where students want to enhance their skill development. Students completed parallel items for reading and maths. Example items are: "It is important to me that I completely understand my work in maths this year" and I really want to learn as much as I can in reading this year." Performance goals are where students want to out-do others, so rather than setting personal goals for improvement, the comparison is with their peers. Example items are: "It's important to me that other students in the class think I am good at maths" and "I really want to do better than most other students in reading."

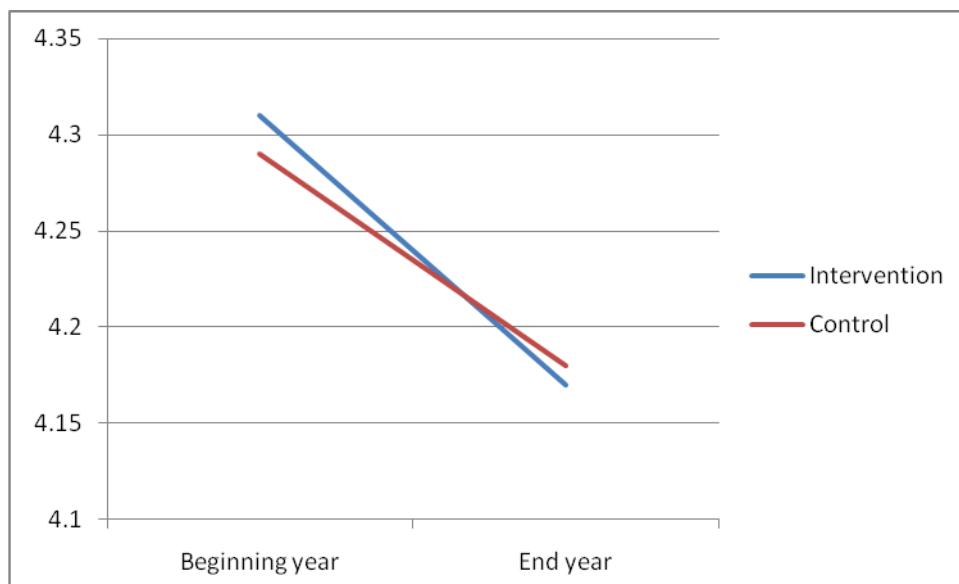
For student mastery goal beliefs in both mathematics and reading, there were significant changes over time. The perceptions of both the control and intervention groups became less mastery oriented over time. In mathematics, the mean for the control group was 4.29 at the beginning of the year and fell to 4.25 by the end of the year, while the mean for the intervention group was 4.33 at the beginning of the year and 4.28 by the end of the year (see Figure 16). A similar pattern was evident in reading. The mean for the control group fell from 4.29 to 4.18 by the end of the year and from 4.31 to 4.17 for the

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intervention group (see Figure 17). This result for the intervention group, in particular, was surprising given the focus of the project on mastery goals. The focus on personal development and improvement within the project is not reflected in the students' beliefs. However, it is to be remembered that on a 1-5 scale the means for both groups across both time periods are high (above 4.0 when 3.0 is the mid-point). Further, goal-setting was the focus of the last workshop and it may be that teachers had not worked so fully on this aspect of the project as they had on others that were introduced earlier. It will be interesting to see whether or not these results are replicated for students with intervention teachers in the 2012 results.



*Figure 16.*Changes over one year for students in classes of control and intervention groups in mathematics mastery goal beliefs in mathematics.



*Figure 17.*Changes over one year for students in classes of control and intervention groups in mastery goal beliefs in reading.

There was a similar statistically significant change over time in student performance goal beliefs. In mathematics, the mean for the control group students fell from 3.61 to 3.43 over the year while the mean for the intervention group fell from 3.62 to 3.39 (see Figure 18). A similar pattern was found in reading but this time there was a significant group by time interaction as well as a significant change over time. This means that the group students were in was important in terms of the change in beliefs. Students in the intervention group came to believe less in the importance of competition over the year. At the beginning of the year, the mean for the control group was 3.62 and fell to 3.43 while for the intervention group, the mean fell from 3.64 to 3.35 (see Figure 19). That the intervention group came to value less competing with others is important in terms of the project. This was one of our aims.

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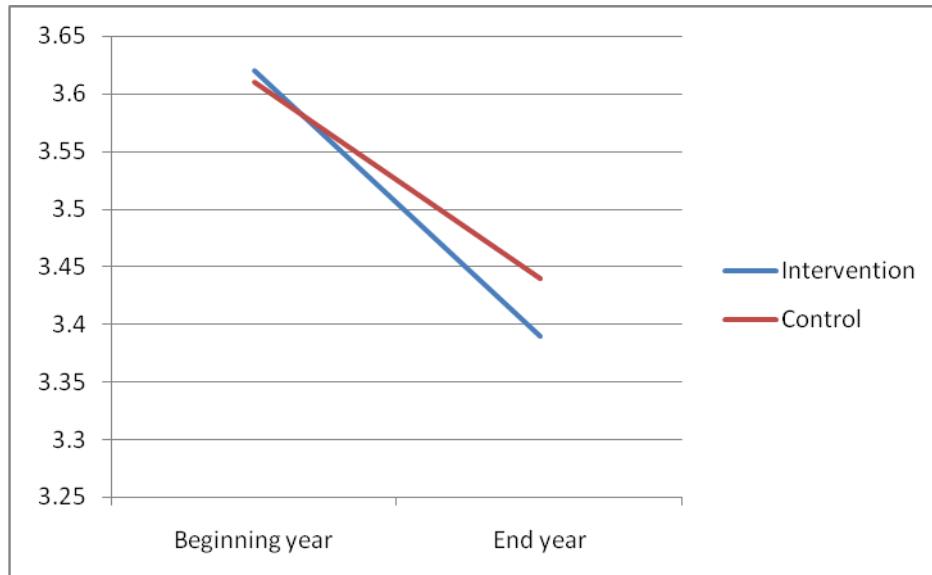


Figure 18. Changes over one year for students in classes of control and intervention groups in performance goal beliefs in mathematics.

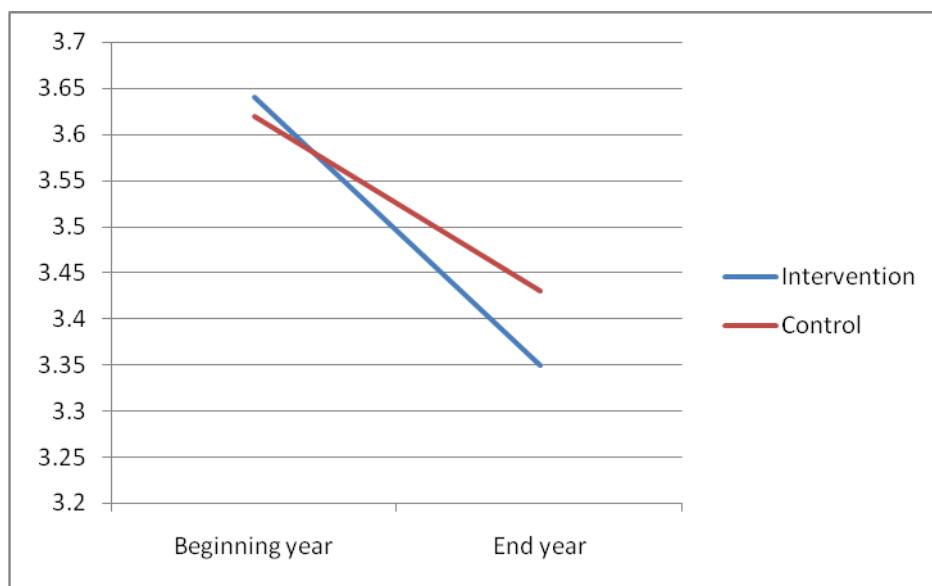
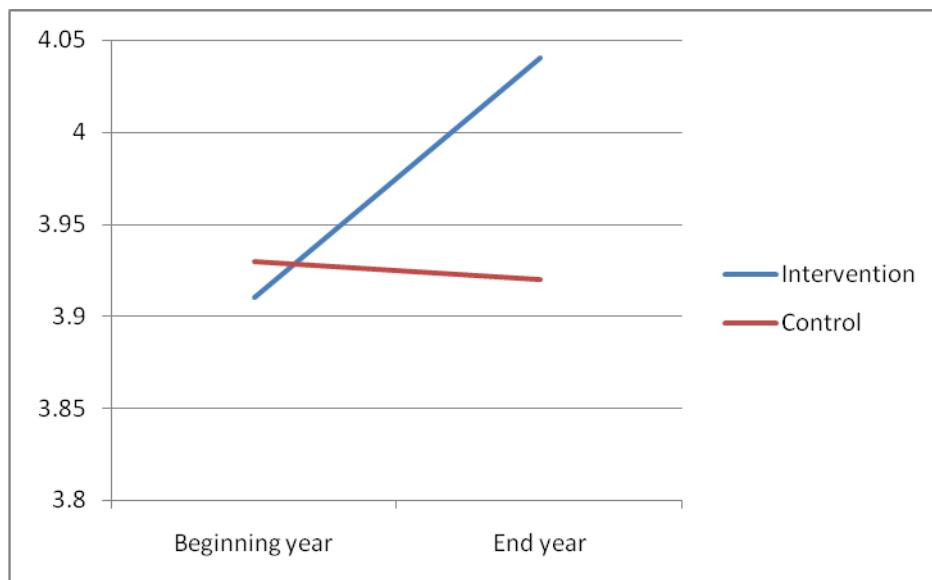


Figure 19. Changes over one year for students in classes of control and intervention groups in performance goal beliefs in reading.

We also examined students' perceptions of the utility value of mathematics and reading. Utility value is a measure of the extent to which students believe the subject is useful outside of school and will be useful to them when they get older. We had parallel items in mathematics and reading and sample items are: "I use maths a lot outside of school" and "I will use reading in many ways when I grow up."

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In mathematics, there was a significant group by time interaction. In other words the group students belonged to (control or intervention) was important in terms of the change in their beliefs. The beliefs of the control group related to the usefulness of mathematics, were similar from beginning to end of year (Mean = 3.93 at beginning of year and 3.92 at end of year) while the intervention group came to see mathematics as more useful by the end of the year (Mean = 3.91 at beginning of year and 4.04 at end of year). Figure 20 shows this change in beliefs over one year for the two groups.

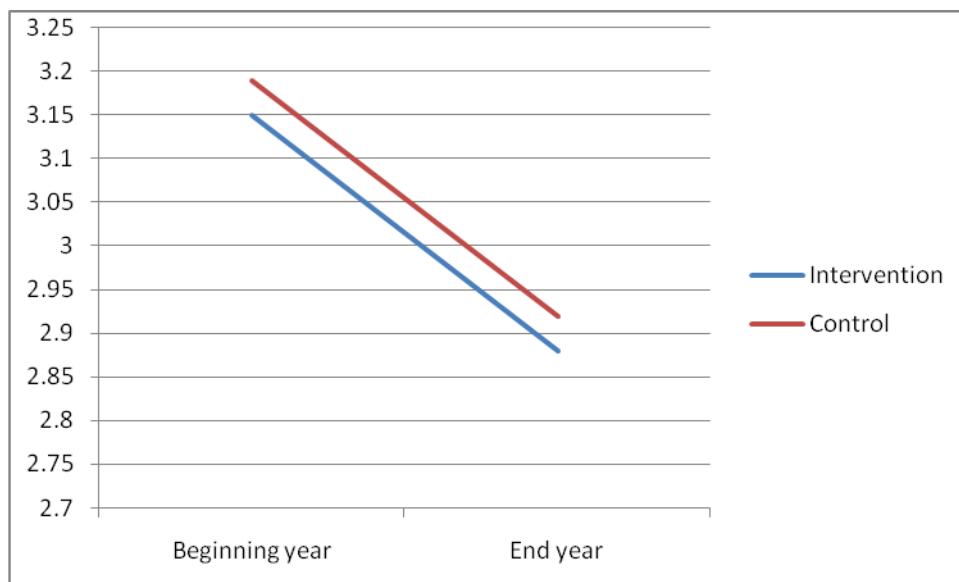


*Figure 20.*Changes over one year for students in classes of control and intervention groups in beliefs about the usefulness of mathematics.

The patterns were similar for student beliefs about the usefulness of reading but these differences were not statistically significant and so in the interests of space will not be reported.

A final scale that measures aspects of motivation was the attribution sub-scale. This scale examines whether students attribute success to innate intelligence or to hard work. These attributions are important because when students (and teachers) believe that intelligence is innate, then the view is that students are either smart or they are not and that this cannot be changed. This belief has been associated with a decline in motivation as students who are not doing so well come to perceive that they can do nothing about it. In contrast, those who believe that effort and hard work can improve intelligence, tend to be more motivated to try hard and work towards enhancing achievement by enhancing skills. Examples of items in this scale are: "Children succeed at school if they are born brainy" and "You need to be brainy to get a good report at school." Some items are reverse scored because they represent beliefs in effort, for example, "If you work hard at school, you will do well."

Over the year, there was a significant change in student beliefs for both control and intervention students. Over time, both groups came to believe more in the importance of effort for doing well in school, rather than in the importance of ability. The mean of the control group fell from 3.19 to 2.92 while that for the intervention group fell from 3.15 to 2.88 by the end of the year (see Figure 21).



*Figure 21.*Changes over one year for students in classes of control and intervention groups in beliefs about intelligence rather than effort being important for success at school.

Class climate

We also measured student perceptions of the class climate. Subscales within this measure examine factors such as perceptions of student-teacher relationships, peer relationships and students' general feeling about their class. Considering that enhancing the class climate was an aim of the project, we expected the views of the intervention group to be more positive by the end of the year. To some extent the results reflect that assumption. However, as will be seen below, for some subscales the beliefs of both groups of students became more negative by the end of the year but mostly the views of the control group declined more than those of the intervention group.

Over time (beginning to the end of the year), students in both the control and the intervention groups perceived that their teacher was providing less personal support than they had at the beginning of the year. Examples of items in this scale are: "My teacher really cares about me" and "My teacher cares about my feelings." At the beginning of the year the mean for the students whose teachers were in the

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control group was 3.94 and this fell to 3.85 by the end of the year. For the intervention group, the mean fell from 3.88 to 3.84. These trends are shown in Figure 22 below.

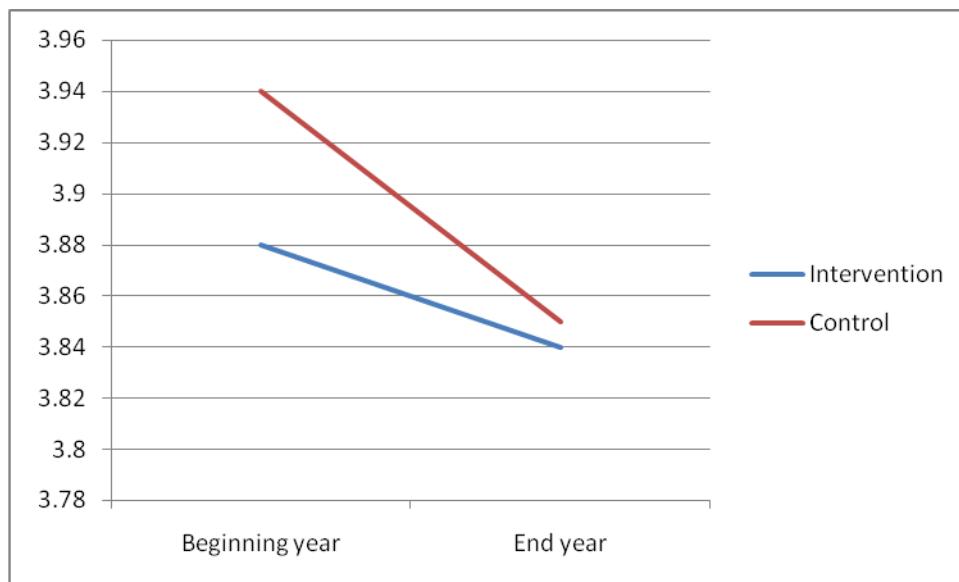
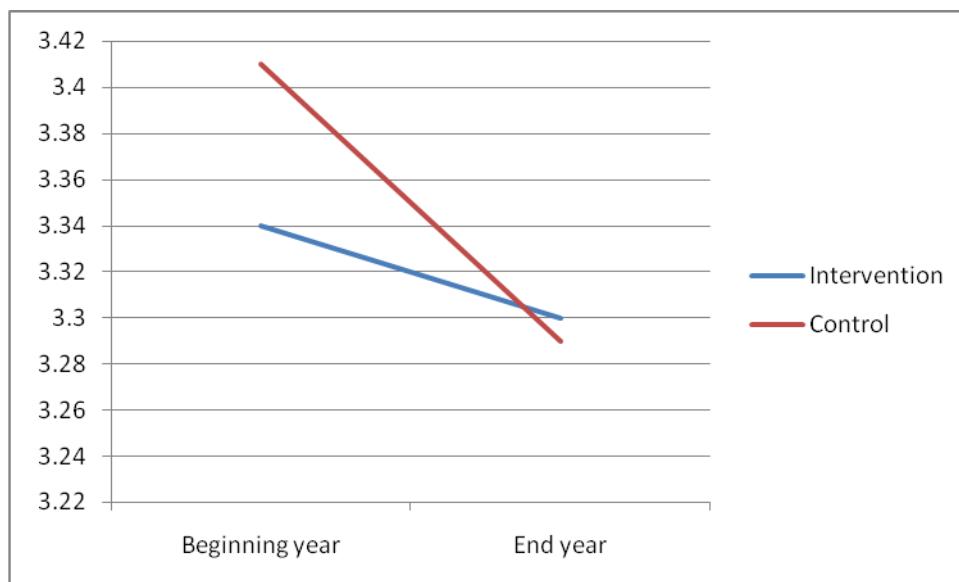


Figure 22. Changes over one year for students in classes of control and intervention groups in perceptions of teacher personal support.

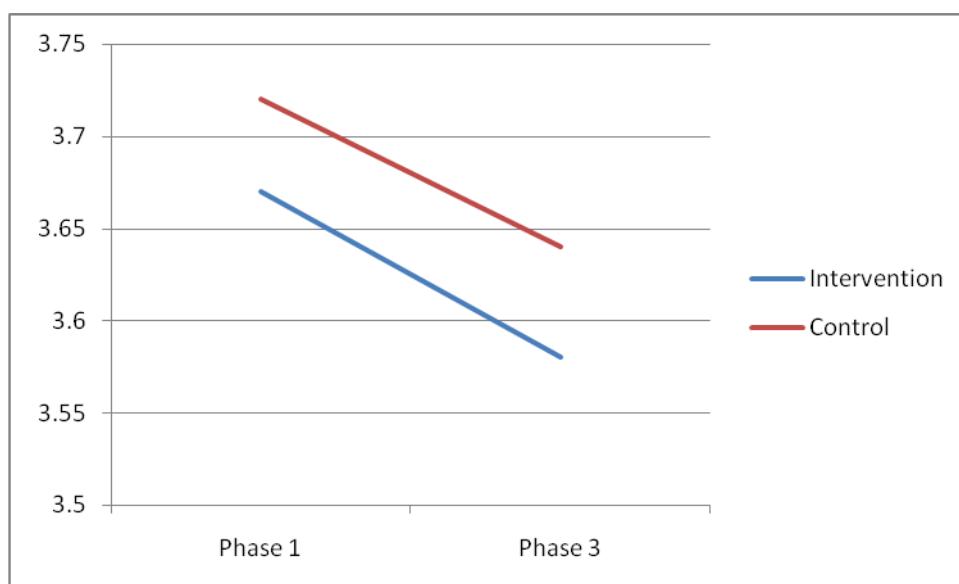
A similar pattern was found for perceptions of peer academic support where there was a decline in means for both groups. Examples of items in this scale are: "The kids in this class like to help me learn" and "The kids in this class care about how much I learn." The mean for the control group changed from 3.41 at the beginning of the year to 3.29 by the end of the year while the mean for the intervention group was 3.34 at the beginning of the year and 3.30 at the end of the year (see Figure 23).

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*Figure 23.*Changes over one year for students in classes of control and intervention groups in perceptions of peer academic support.

The decline in student perceptions of peer personal support was similar for both the intervention and control groups. The control group mean fell from 3.72 to 3.64 while that of the intervention group declined from 3.67 to 3.58 (see Figure 24). Examples of items from this subscale are: "In this class, other students think it is important to be my friend" and "In this class, other students like me the way I am."



*Figure 24.*Changes over one year for students in classes of control and intervention groups in perceptions of peer personal support.

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Over time, however, students generally became more positive in their perceptions of their academic competence. Examples of items in this scale are: "I do very well at my schoolwork" and "I am very good at my schoolwork." Means for the control group changed from 3.88 to 3.90 over the year and that of the intervention group from 3.89 to 3.94 as shown in Figure 25.

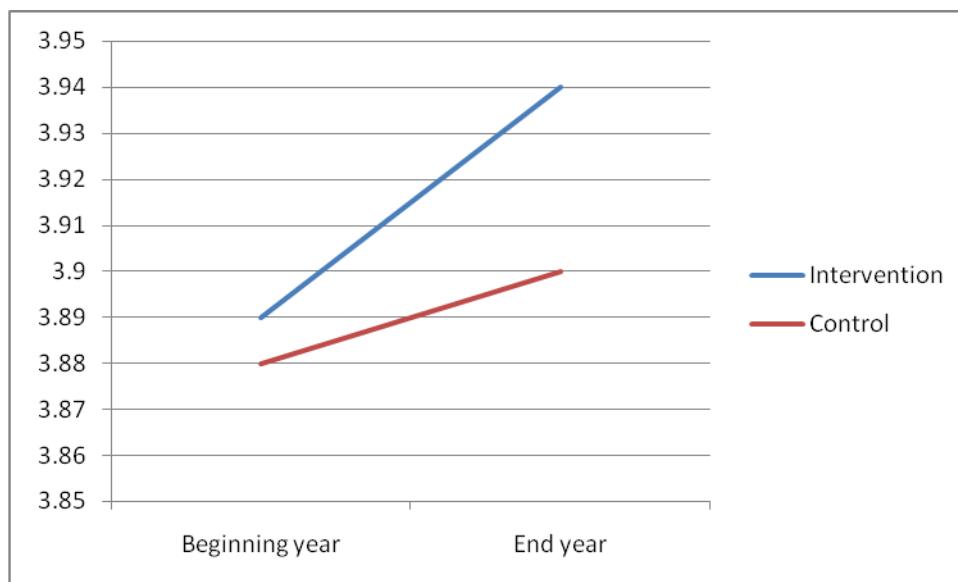
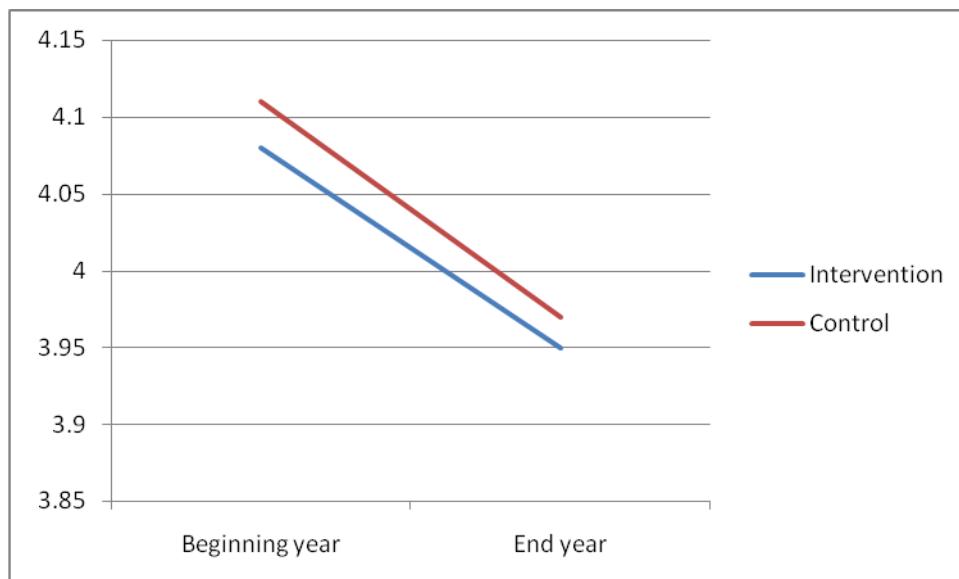


Figure 25. Changes over one year for students in classes of control and intervention groups in perceptions of academic competence.

The final subscale that measured student perceptions of class climate was school satisfaction. As shown in Figure 26, there was a decline for both groups in how satisfied students were with school by the end of the year. Examples of items in this scale are: "I look forward to going to school" and "There are many things about school that I like." Over the year, the mean for the control declined from 4.11 to 3.97 and from 4.08 to 3.95 for the intervention group.

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*Figure 26.*Changes over one year for students in classes of control and intervention groups in satisfaction with school.

Section 3: Summary of main findings and brief discussion

Teacher expectations

Over time, the expectations of the teachers in the intervention group for their students remained high from the beginning to the middle of the year. On the other hand, the expectations in both reading and mathematics of the control group declined significantly. It may be that the intervention had a buffering effect for the group who received the training related to high expectation teachers. It is also possible that the naturally occurring cycle is that teachers begin the year optimistic about their students and the progress that they will make. However, as the year progresses and some students prove difficult to influence, teachers may become less optimistic. Changes in teacher expectations have been infrequently studied in the literature and there are no other large scale studies that have examined this phenomenon. It will be interestingly to track the expectations of both groups over the next two years, the intervention group to examine if their expectations remain high and the control group to see if their expectations are influenced as they implement the changed practices related to flexible grouping, enhancing the class climate and goal setting.

Student achievement

As expected student achievement increased in both the control and the intervention group over the course of the year, but in mathematics the intervention classes showed a significantly greater rate of gain than for students with the control teachers, whereas there were no differences between the control and intervention group for reading. It seems from the qualitative surveys that more teachers used flexible grouping in mathematics than they did in reading. This may be one explanation for the enhanced outcomes in mathematics when compared with reading. Further, it may be that teachers found it easier to set goals with students in mathematics than they did in reading because it is a linear subject. It will be interesting to continue to track student achievement over time and examine further long-term changes.

Student perceptions of teacher expectations

There were changes over time between intervention and control groups in student perceptions of their teachers' expectations. Students in the intervention group appeared to be aware that their teachers had high expectations of them. It may be that the teachers were giving students more explicit messages about what they expected. However this was determined, students did seem to understand that their intervention group teachers expected them to do well. Other researchers have reported how perceptive students are and how they know what their teachers' expectations are for them (Weinstein, 2002). It will be interesting as we track over time to see whether the students with the original intervention group change their perceptions of their teachers' expectations depending on whether they move to another intervention teacher, to a control teacher or to a teacher not involved in the project.

Teacher and student beliefs

Overall, there was a trend for the teacher efficacy beliefs of those in the intervention group to increase over the year more than for the control group, particularly for efficacy in instructional strategies. A parallel student self-belief that was measured was self-concept. The self-concept of the students in classes of intervention group teachers increased considerably over the year in comparison to that of the control group. Interestingly it was the mathematics achievement of this same group that increased across the year when compared with that of the control group teachers. Rubie-Davies (2006) found a similar result, such that by the end of one year in her study, there was a significant difference between the self-concept in reading of students with high versus low expectation teachers.

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The goal orientation of both teachers and students was also measured in the first year of this project. Again, there was some alignment between teacher and student beliefs. Intervention group teachers came to be significantly less performance oriented over the year compared with control group teachers. Similarly, the students with intervention group teachers when compared with those with control group teachers, also showed a significantly greater decline in a performance orientation. One aim of the project was for the focus of student achievement to move from competition to a focus on individual student learning and development of skills. However and conversely, over the year, there was a trend for intervention teachers to become more mastery oriented than control teachers, also in line with the project aims. However, this was not reflected in student beliefs. Students in both intervention and control groups became less mastery oriented over the year. It may be that while teachers in the intervention group emphasised competition less over the year, that they did not sufficiently include goal setting in their teaching for students to change their focus. Implementing goal-setting was the pedagogical change least likely to be introduced into classes by intervention teachers. Several reported they were going to concentrate more on goal setting in 2012, once they had flexible grouping and enhancements in the class climate integrated into their normal teaching practice. However, this contention as to whether an increased emphasis on goal-setting would lead to changes in students' mastery beliefs would need further investigation if it were to be confirmed.

Students with intervention teachers also came to view mathematics as being a subject they would use outside of school and when they grew up more so than students with control group teachers. The differences in the views of students were statistically significant by the end of the year. When students perceive that a curriculum area is useful and valuable, this has been shown to influence motivation (Wigfield & Cambria, 2010) which in turn can influence achievement and, indeed, as has been shown, student achievement in mathematics did increase significantly more in classes of intervention teachers than in classes of control group teachers.

Overall, it is interesting to find that in the classes of intervention teachers, student achievement increased in mathematics over the year and that there are corresponding increases in student self-concept, beliefs about the utility value of mathematics and a decreased performance orientation in relation to mathematics. It appears that the increased achievement of students in classes of intervention teachers also had benefits in terms of students' perceptions.

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Over time, there was a significant difference between the intervention and control group teachers in their anxiety and feelings of control when compared with the control group. It may be that the more relaxed class climate associated with enhancing relationships in the classroom and the positivity that was developed led to the intervention teachers becoming less anxious than the control group. Similarly, that the intervention teachers were making quite substantive changes to their pedagogical practices associated with the project, may have led to them feeling more in control of what they taught and how they taught it, when compared with the control group who continued to teach in traditional ways.

Interestingly, however, the perceptions of class climate of students in classes of control and intervention groups declined over time in terms of perceptions of teacher personal support, peer personal support and peer academic support. There was a trend for the decline to be greater in classes of control group students, however. Again, it may be that in general student perceptions of the class climate decline over time. This has not been previously tested in the literature. It may be that over time the perceptions of students with the intervention group teachers decline less or even begin to improve as the practices designed to enhance the class climate become embedded in teacher practice. That the perceptions of students with teachers in the intervention group showed less of a decline than for students with control group teachers is therefore important.

Qualitative data

The findings from the qualitative data largely supported the findings for the quantitative data. Teachers reported using flexible grouping more in mathematics than in reading. However, those who had fully implemented flexible grouping into their reading programmes reported that it was working well and that they had seen obvious benefits for students. For example, they realised that ability grouping constrained the learning of low ability children whereas flexible grouping enabled them to have choice and fostered motivation and enthusiasm. Teachers further reported that flexible grouping meant they had introduced a wider range of activities to the class which students were clearly enjoying. There was a perception in the classes of teachers where flexible grouping was fully embedded that student achievement progress had accelerated over the year.

Teachers further reported benefits in the efforts they had made to enhance the class climate. They reported students being more confident, excited, motivated and demonstrating greater self-confidence and less concern about the achievement of others. Enhanced relationships in the classroom were also

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reported. It will be interesting to measure changes in student beliefs over time in relation to the class climate as the practices introduced last year become more embedded in teacher practice.

Goal-setting had been implemented to a lesser extent than the other components of the intervention and it may be that this was why no change in student mastery beliefs was found. However, the use of e-asTTle for setting goals, which in effect is a change from a focus on performance in relation to others to a focus on one's own goals, may explain the decrease in a performance orientation that was found for the students with intervention teachers.

Last word

Looking across the results, the project appears to show some substantive differences between intervention teachers and their students and control group teachers and their students. Because the study is experimental, we are able to make claims that the changes may be due to the intervention. That there are changes is exciting and augurs well for future phases of the study.

Section 4: Next steps

The study continues for the 2012 and 2013. In 2012, the control group were introduced to the intervention: flexible grouping, enhancing the class climate and goal setting. A key idea in this phase of the project was that the intervention group teachers would support the control group teachers as they made changes to their practice. This was a deliberate component of the intervention because it enables us to test whether the practices can be taught to other teachers by those originally taught by us. If there are changes in teacher and students beliefs, teacher expectation and student achievement in the classes of the control teachers this year, in line with those in the intervention teachers' classes last year, then we know that the intervention can be taught and become operationalized in schools without us having to support the teacher learning. A further aspect of the second year of the study is to see a) whether intervention teachers maintain the practices because they see them as worthwhile and b) whether students with intervention teachers benefit more in the second year of the study when the practices (if maintained) are likely to become more embedded than they did in the first. A further aspect of this study is to track the students who were in the classes of intervention teachers in 2011. We will be able to see whether the students maintain their high achievement and continued progress in mathematics, what happens in relation to their reading achievement and what effect moving to new teachers will have on their beliefs. We have students moving from one intervention teacher to another,

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some moving from intervention teachers to control and others moving from intervention teachers to new schools or teachers that were not involved in the project in 2011. Hence, we will be able to examine the long-term effects of the intervention for students.

In 2013, the final year of the project, we will only be involved to the extent that schools want us to be. We will be measuring change at the beginning and end of the year, as in 2011 and 2012. But, largely, this year is designed to test whether or not the intervention will be sustained in the classes of both control and intervention teachers. This is the ultimate test of whether teachers find the practices valuable and able to be embedded into their regular practice. We can also monitor whether the positive effects on student achievement and beliefs found for the first year of the project continue into this final year of the project. We will still be monitoring changes for the original group of students with intervention teachers.

We are very excited at the positive effects that the intervention has had on student achievement, teacher expectations, and teacher and student beliefs in the first year of the project. Such changes are very difficult to achieve in research, which is why experimental studies such as ours, where teachers are randomly assigned to the intervention, are regarded as the gold standard in research. If changes are found, they can be considered to be due to the intervention and not to other factors. This is unlike other forms of professional development in which new practices may be introduced and enthusiastically implemented but there is no real measure of effects on students or teachers. That changes have been found is a testament to the commitment and enthusiasm of the intervention group who so willingly trialled the range of class activities we developed in the workshops.

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Appendix

Major findings in Year One of the Teacher Expectation Project

- Teacher expectations of control group teachers declined significantly from beginning to mid-year
- Intervention group teachers reported using flexible grouping more in mathematics than in reading
- Almost all intervention group teachers made changes to the class climate
- Many intervention group teachers were using goal setting more regularly with their students
- Teachers reported increases in class harmony and student achievement as a result of introducing the practices
- Many intervention teachers reported that they would be implementing the TEP practices more fully in 2012
- asTTle mathematics scores of students with intervention teachers were significantly higher than those of control group teachers by the end of the year
- Trend for teacher efficacy scores (efficacy in engaging students, using a variety of instructional strategies, class management) for the intervention group to increase more than those of control group over the year
- Performance beliefs of intervention group teachers (beliefs that students should be motivated by competition) declined significantly compared to control group teachers by year's-end
- Intervention group teachers became significantly less anxious by end the year compared with controls
- Intervention group teachers felt significantly more in control in their job than control group teachers by the end of the year
- Self-concept in mathematics of intervention group students increased significantly over the year compared to the control group
- Performance beliefs of intervention group students declined significantly over the year
- Beliefs in the value of mathematics increased significantly for intervention group students compared to controls
- Students in classes of intervention teachers significantly more than those with control group teachers believed their teachers had high expectations for them by the end of the year.