

Teaching practices that improve performance, attainment and engagement: Results from a longitudinal study of high school students in NSW



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Ian McCarthy is a principal data analyst at the Centre for Education Statistics and Evaluation (CESE) within the NSW Department of Education. Ian is the project lead for the department's Tell Them From Me student, parent and teacher surveys, and oversees the management of the surveys that are completed by over a quarter of a million students each year along with tens of thousands of parents and teachers. Ian also manages CESE's research agenda in relation to the surveys. He recently authored a report for school leaders and teachers that quantifies the impacts that student engagement and classroom practices in Year 7 have on academic outcomes in Year 9. Other research currently underway, led by Ian and colleagues, includes projects that explore the predictors of Year 12 completion, the importance of parental and teacher support for student learning, factors driving disengagement in the middle years of high school, and a qualitative exploration of what works at the school level to improve engagement and wellbeing.

Abstract

This report builds on a body of evidence showing the positive effect of teaching and classroom practices on engagement, wellbeing and academic outcomes. Using two student cohorts in NSW government schools, Years 7 to 9 and Years 10 to 12, we have quantified the effects of quality instruction and other effective classroom practices as drivers of student outcomes (see Figure 1, p. 54). A common theme across both cohorts was the positive impact on key academic outcomes of teachers having high expectations and appropriately challenging all their students (as measured through the NAPLAN tests and Year 12 completion). Modelling also shows that the effects that teaching practices have on NAPLAN, specifically, are mediated by improved attendance, behaviour and intrinsic motivation to learn.

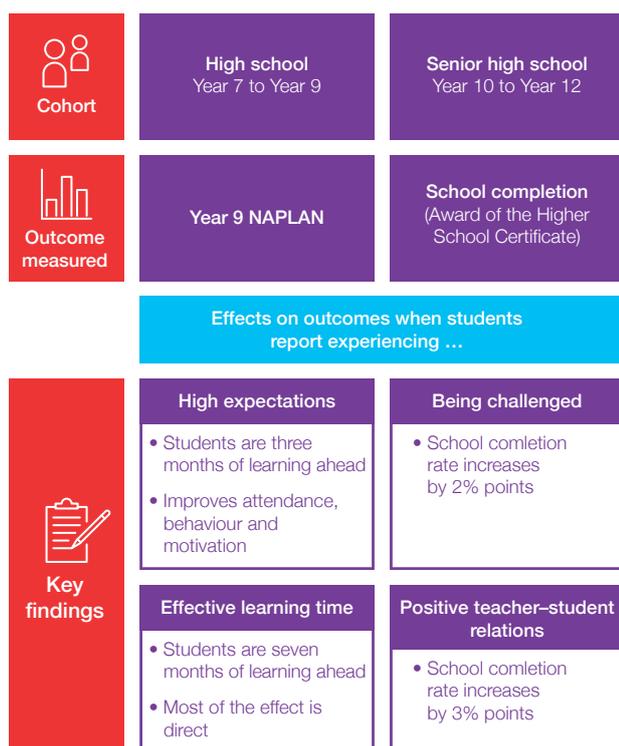


Figure 1 The effect of classroom and teaching practices on student outcomes

Introduction

Research shows that student engagement is linked to effective teaching and classroom practices (Lee & Smith, 1996; Klem & Connell, 2004). Schools can create environments that promote learning and high levels of student engagement, by using explicit and effective teaching strategies, and setting high expectations for achievement (CESE, 2015). These aspects of schooling have become even more important in recent years due to the increased focus on completing high school and undertaking post-secondary education. For instance, there is now evidence that positive engagement during the school years is an important factor not only in enrolment but in the completion of post-secondary education (Lawson & Lawson, 2013).

Methodology

The findings reported in this paper are based on two longitudinal cohorts from a student survey instrument known as Tell Them From Me (TTFM), run

in government schools in New South Wales, Australia. Both cohorts ran from 2013 to 2015 and covered the full span of secondary schooling in the state (Year 7 to Year 9, and Year 10 to Year 12).

The findings from this study are a result of collaboration between the Centre for Education Statistics and Evaluation (CESE) within the NSW Department of Education, and the Institute for Social Science Research (ISSR) at The University of Queensland.¹

Cohort 1: Year 7 to Year 9

Analysis of the Year 7 to Year 9 data (6800 students) used structural equation modelling (SEM) to unpack the complex relationships between engagement, classroom practices and NAPLAN reading² performance. The modelling explored how engagement influences performance, and vice versa; and the relationship between classroom practices and performance as mediated by engagement. Results show how much a difference of one point in each of the TTFM measures affects NAPLAN reading scores. This is illustrated in Figure 2 (p. 55), which depicts two hypothetical students in the same hypothetical school, who are taken to be identical in a range of measurable attributes (e.g. socio-economic status and prior academic performance) but not in their TTFM responses for the measures in question. For instance, Student A has a teacher who uses effective classroom practices; Student B does not. Differences in NAPLAN scores between students are reported using a ‘months of progress’ approach (Goss, Sonnemann, Chisholm, & Nelson, 2016), which measures the months of learning it would take a typical NSW Year 9 student to move from one NAPLAN score to another.

Cohort 2: Year 10 to Year 12

For the Year 10 to 12 data (10800 students), multilevel logistic regression was used to explore the relationships between different measures of student engagement and teaching practice, and the individual/family/school factors that may impact a student’s likelihood of completing Year 12. The aim was to determine whether school completion was more likely for certain groups of students or types of schools than others. In Figure 3 (p. 55), odds ratios, which denote the relative odds of an event, are converted to the predicted probability of different ‘hypothetical’ types of students completing school. These hypothetical students are characterised by identical socio-demographic characteristics and

¹ The results from the Year 7 to 9 modelling have been published and are available from the CESE website at: <https://www.cese.nsw.gov.au/publications-filter/improving-high-school-engagement-classroom-practices-and-achievement> A full report showing results from the Year 10 to Year 12 modelling will be published in 2018.

² The National Assessment Program – Literacy and Numeracy (NAPLAN) is an annual assessment for students in Years 3, 5, 7 and 9 that covers a range of subject areas. This paper focuses on ‘reading’ because it is a core NAPLAN test and has been highlighted as a critical requirement for success in the 21st century (Vacca, Vacca, & Mraz, 2011)

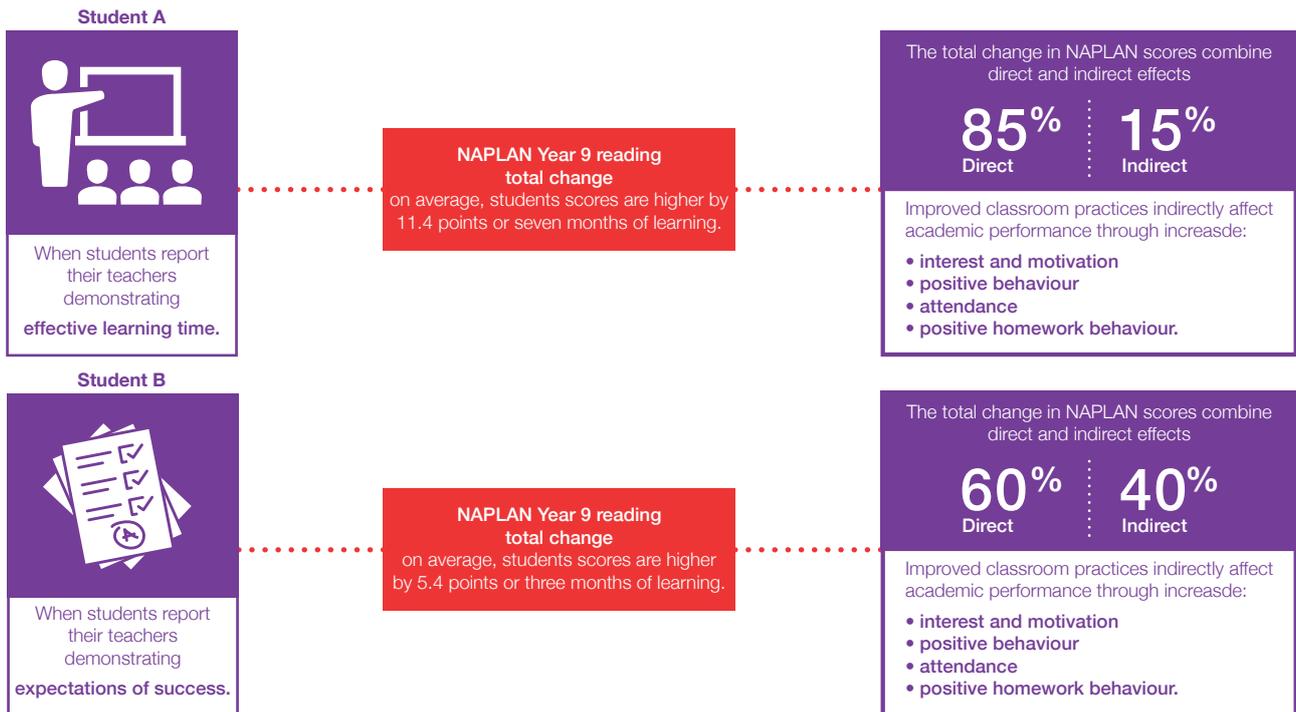


Figure 2 The direct and indirect effects of effective learning time and expectations for success on reading performance in Year 9

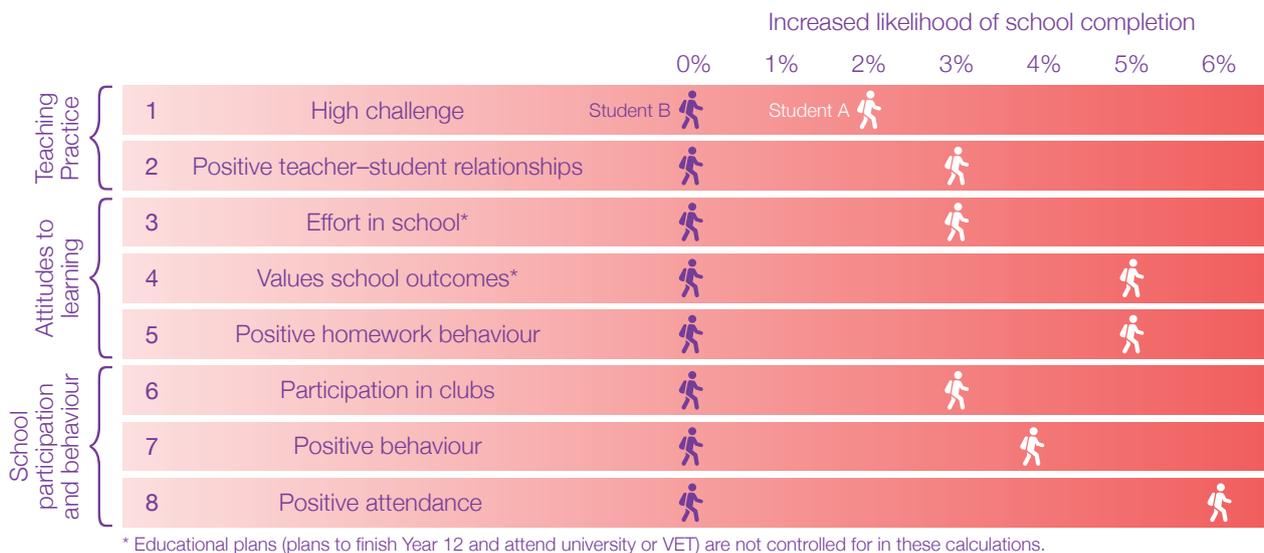


Figure 3 Predicted increase in school completion rate of students who report high levels of engagement

either low engagement or high engagement in the TTFM measures. For example, imagine Student A has positive attendance at school and a predicted probability of school completion of 84 per cent, while Student B has poor attendance and a predicted probability of 78 per cent. This indicates that the likelihood of a student with positive attendance completing Year 12 is six percentage points greater than a student with poor attendance. Note that all other student, school and engagement characteristics are held constant in this example.

Results/Discussion

Cohort I: Year 7 to Year 9

Figure 2 highlights those classroom practices reported by Year 7 students that were found to have statistically significant and marked effects on Year 9 NAPLAN results.

Modelling shows that where two students are identical in terms of socio-economic status and prior academic performance, a Year 7 student who reported

receiving effective learning time (ELT) or high academic expectations can be seven and three months ahead, respectively, in Year 9 from a student who does not (CESE, 2017).

In the TTFM survey, ELT refers to teacher use of classroom time, such as whether classes are well organised and whether important or difficult concepts are taught well. Teachers' effective use of learning time affects student learning directly, by unlocking learning that improves academic performance; and indirectly, by increasing student engagement in school, which then improves performance. In the study, a majority of the reported improvement (85%) for ELT was the result of direct effects on performance, while 15 per cent was due to indirect effects on performance, through improved intellectual and institutional engagement.

The aspects of teaching that make up the effective learning time measure in TTFM include:

- organising lessons well
- paying particular attention to how important ideas are taught and helping students understand their significance
- requiring students to demonstrate mastery, especially of difficult ideas
- allowing students to ask questions and ensuring responses are clear and have been understood.

Wang & Holcombe (2010) found that students who learn in supportive classroom environments that promote mastery of classroom content have, on average, enhanced engagement and learning outcomes. In their study of middle-school students in the US, Fredricks, Blumenfeld, and Paris (2004) similarly found that students exhibited higher cognitive (intellectual) engagement and greater use of learning and metacognitive strategies when they had teachers who presented challenging work and pressed for understanding.

Like ELT, high teacher expectations were found to affect student learning directly (60%) and indirectly (40%). The direct effects stemmed from strategies such as teachers encouraging students to work hard (and students responding by doing so), while the indirect effects took place through stronger engagement in the form of improved behaviours and academic interest and intrinsic motivation.

Some of the ways that teachers demonstrate high academic expectations of their students, as measured in TTFM, are:

- being clear about what is expected of students and following up on expectations
- making it clear to all students that they must work hard to succeed

- encouraging students to do better, for instance, through personal best goal setting; that is, a student's attempt to improve on or match their previous best standard of performance
- providing feedback that explicitly identifies the next learning steps and the skills necessary to improve
- expecting homework to be done on time.

Lee and Smith (1996) highlighted the importance of having consistent and clear expectations for students in order to keep them engaged and foster learning at school. Klem and Connell (2004) similarly found that students whose teachers and school held high standards for academic learning and conduct, and had fair and clear expectations, were more likely to be engaged in and connected to school. These studies demonstrate the important links between engagement and effective teaching and classroom practice.

Cohort 2: Year 10 to Year 12

Figure 3 shows the indicators of engagement and teaching practice captured in Year 10 that are significantly and positively associated with school completion two years later. It reports how much more likely a student who reports high levels of engagement in each of the engagement and classroom practices is to complete Year 12 than a student who reports disengagement and low levels of classroom practices. Reported differences account for student socio-economic status and prior achievement, other engagement indicators and, in most cases, students' plans for school completion and further education.

It should be noted that the likelihood reported for each individual measure is cumulative and can be aggregated when a student experiences more than one type of engagement. For example, a student who has positive teacher–student relationships, positive homework behaviour and positive attendance could be approximately 14 percentage points more likely to complete Year 12 than a student who has low engagement in all three measures. Students' effort in school and their valuing of school outcomes are only significantly associated with school completion when students' educational plans are not included in the statistical model. This result suggests that these types of engagement have a positive impact on shaping students' plans for school completion, which in turn impacts their actual completion.

Modelling reveals that Year 10 students who report high levels of challenge (i.e. that their classes deal with difficult or challenging material) were two percentage points more likely to complete Year 12 than students with the same academic characteristics who report low levels of challenge.

Challenge is widely viewed as being critical for student engagement and achievement and can be used to counteract student disengagement (Shernoff, Shernoff, Csikszentmihalyi, Shneider, & Shernoff, 2003). In contrast, a lack of challenge can lead to drop-outs or underachievement at school, particularly among high-achieving students from disadvantaged backgrounds who are less likely to achieve as highly as their advantaged peers (Wai & Worrell, 2016; Yazzie-Mintz, 2010).

Like challenge, teacher–student relationships can help prevent and/or lower the risk of students dropping out of high school (Barile et al., 2012; Krane, Karlsson, Ness, & Kim, 2016; Lee & Burkam, 2003). Croninger and Lee (2001) specifically found that informal talks between teachers and students outside the classroom have a strong impact on reducing dropout in academically and socially at-risk students.

Students' attitudes toward learning are also important for decreasing the likelihood of students dropping out of school (Fall & Roberts, 2012). Research shows that the degree to which students value school is closely linked to positive educational outcomes (Wigfield & Cambria, 2010) and is a critical predictor of students' persistence in their education (Eccles & Wigfield, 2002; Wang, 2012). In contrast, student misbehaviour, truancy, and poor attendance can all result in lower graduation rates (Archambault, Janosz, Fallu, & Pagani, 2009; Finn, 1989; Rumberger & Lim, 2008). In such situations, extra-curricular activities can positively influence students' educational aspirations and overall academic potential, by increasing students' engagement and attachment to their school. For example, Fredricks and Eccles (2006) found that participation in school clubs predicted higher grades and educational expectations up to two years later.

Conclusion

This study demonstrates that when students receive high-quality teaching with a focus on high expectations, appropriately challenging content and constructive relationships between teachers and students, they do well across a number of indicators of success throughout secondary school.

Crucially, our research shows that when teachers demonstrate high expectations for all and employ effective and explicit teaching practices, their students respond through improved academic interest and intrinsic motivation, attendance, behaviour and perceptions of the value of homework and study.

More information

A report on the modelling work using the Year 7 to Year 9 cohort is available here: <https://www.cese.nsw.gov.au/publications-filter/improving-high-school-engagement-classroom-practices-and-achievement>.

To get updates on new TTFM-related and other CESE publications, subscribe to the CESE mailing list at: <https://www.cese.nsw.gov.au/contact-us>, or follow CESE on Twitter: <https://twitter.com/nswcese>.

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