

## The relationship between student attitudes to school survey results and NAPLAN results

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In recent years many policy and curriculum reforms aimed at improving Australian students' literacy and numeracy levels have been introduced into schools and in initial teacher education. Despite this, the Australian National Assessment Plan, Literacy and Numeracy (NAPLAN) data indicates that there has been little or no improvement in Australian students' literacy and numeracy levels over recent years. Some researchers propose that there is a correlation between students' positive affect, engagement and relationships and their academic outcomes. Using correlation analysis this study set out to identify if there was a statistically significant relationship between the Victorian Department of Education and Training's student *Attitudes to School Survey* and academic outcomes as measured by NAPLAN standardised testing. This study finds some statistically significant relationships between student *Attitudes to School Survey* results and NAPLAN scores. This paper presents a study that provides a unique contribution to the current knowledge base around the correlation between student *Attitudes to School Survey* results and NAPLAN academic outcomes. These findings may have applicability in similar contexts.

### Introduction

NAPLAN is an annual assessment for all students in Years Three, Five, Seven and Nine which assesses student knowledge, skills and understandings of the essential elements of the Australian Curriculum (Australian Curriculum and Assessment Authority [ACARA], 2017). The tests cover skills in reading, writing, spelling, grammar and punctuation, and numeracy and provide a measure through which governments, education authorities and schools can determine whether or not Australian students are meeting educational outcomes (ACARA, 2016). In recent years many policy and curriculum reforms aimed at improving Australian students' literacy and numeracy levels have been introduced into schools and in initial teacher education. Despite this, NAPLAN data indicates that there has been little or no improvement, and in some instances a decline in Australian students' literacy and numeracy levels over recent years (ACARA, 2017).

Meanwhile, each year Victorian school students from Years Four to Twelve are asked to participate in an *Attitudes to School Survey*. This Survey was developed by the Victorian Department of Education which undertook a detailed literature review to identify the domains and constructs that are conceptually and empirically known to influence student outcomes and wellbeing (Victorian Department of Education and Training, 2017a). The domains, which are measured in the *Attitudes to School Survey* are; effective teaching practice for cognitive engagement, social engagement, teacher student relationships, learner characteristics and dispositions, school safety and experience of bullying (Victorian Department of Education and Training, 2017a).

Some researchers such as Howell (2009), Lyubomirsky, King and Diener (2005) and Seligman (2012) have proposed that there is a correlation between students' positive affect, engagement and relationships, and their academic outcomes. King, McInerney, Ganotice and Villarosa, (2015) in a longitudinal study examining the relationship between students' positive affect, engagement and school success in 338 Filipino university students, found that positive affect and engagement had a key role in facilitating school outcomes. Similarly, Suldo, Thalji and Ferron (2011), in their longitudinal study of 300 middle school students measuring the correlation between student subjective wellbeing factors such as happiness and life satisfaction, and academic achievement on standardised testing, found that there is a relationship between these factors. These studies flag the possibility that a relationship may exist between student Attitudes to School Survey results and NAPLAN standardised testing results.

A review of current literature reveals there have been no studies examining this relationship. In addressing this gap, this study set out to identify if there was a statistically significant correlation between the Victorian Department of Education and Training's student Attitudes to School Surveys and academic outcomes as measured by NAPLAN standardised testing. This paper presents a study that contributes to the gap in the literature available and provides a unique contribution to the current knowledge base around the correlation between student Attitudes to School Survey results and NAPLAN academic outcomes.

The following sections provide an overview of NAPLAN and the student Attitudes to School Survey. The participants, settings and data analysis method are then outlined. Thereafter the findings are presented and discussed. This study concludes by stating that there are some statistically significant relationships between student Attitudes to School Survey results and NAPLAN scores. This paper ends with a call for educators and policy makers who are wanting to improve student NAPLAN academic outcomes to consider implementing policy and practices to support student classroom behaviour, resilience and effort. Further research in this field is also recommended.

## **NAPLAN**

Since its introduction in 2008, NAPLAN testing has been controversial. Debate exists around the ability of the tests to accurately determine students' learning outcomes, the comparative nature of the tests, and the impact of the tests on teaching practice and students' learning. For example, Wu and Hornsby (2014) stated that NAPLAN tests only measure fragments of student achievement and do not necessarily reflect students' whole achievement in literacy and numeracy domains. In addition, Carter (2012), in her study found that some students may not have sufficient time during the tests to show their full ability. Whilst Freeman (2013), highlighted a concern that despite varying academic abilities, English as a second language students often fail to meet the NAPLAN benchmarks which are based on the achievement standards of native English speakers. Furthermore, Wu and Hornsby (2014) pointed out that student achievement should not be confined to measures of literacy and numeracy only. Achievement should include

creativity, critical thinking, ability to follow an inquiry, compassion, motivation and resilience (Wu & Hornsby, 2014).

There are additional concerns raised by Wu and Hornsby (2014) addressing the comparisons made between schools' NAPLAN results. When discussing school average scores, half of all schools will always be described as below average or under-achieving which leads to an assumption that staff in the below average schools are not doing the best they can (Wu & Hornsby, 2014). However, comparing average NAPLAN scores does not take into account other factors which can influence the test results such as poverty, parental support, personality, interests, aspiration, motivation and peer pressure (Wu & Hornsby, 2014).

Further, concerns exist around the impact of the tests on teaching practice and student learning. For example, despite the fact that NAPLAN tests are not diagnostic, teachers are being expected to use the tests to identify weaknesses and to inform their teaching (Wu & Hornsby, 2014). Meanwhile, Thompson and Harbaugh (2013) in their study found that teachers are either choosing or being instructed to teach to the NAPLAN tests, resulting in less time being spent on other curriculum areas, contributing to a narrowing of the curriculum focus and a return to teacher-centred instruction with a resultant decrease in student motivation and engagement.

Further speculation that NAPLAN testing has a negative impact on students came from Thompson (2013) who studied teachers' perceptions of NAPLAN testing and found that there were many teachers who reported that NAPLAN increased student levels of stress and anxiety. In addition, the pressure of the competition introduced by NAPLAN testing is damaging to student confidence and self-esteem (Thompson, 2013). However, Howell (2017) in her study of Year Three and Year Five children's experiences of NAPLAN testing found children's responses to NAPLAN testing varied. Howell (2017) noted that some children's responses suggested that they experience NAPLAN as a negative event, with some children constructing the test as high-stakes and being confused as to the purpose of the tests. However, she also found that children who believed they would get a good score on the NAPLAN tests reported positive experiences of feeling happy, confident and proud (Howell, 2017). Furthermore, Rogers, Barblett and Robinson (2016) in their study of the impact of NAPLAN testing on Year Three and Year Five student emotional distress in students attending independent schools in Western Australia found minimal impact from NAPLAN testing.

## **Attitudes to School Survey**

In 2017 the student *Attitudes to School* surveys were refreshed and aligned to the *Framework for improving student outcomes* which aims to provide schools with actionable insights into key school improvement initiatives (Victorian Department of Education and Training, 2017b). The surveys were also conducted online for the first time in 2017 (Victorian Department of Education and Training, 2017b). The following sections define each of the six domains

measured in the student Attitudes to School Survey and list the questions which Year Five students respond to in the surveys.

### **Effective teaching practice for cognitive engagement**

Effective teaching practice for cognitive engagement is measured through the factors of effective teaching time, differentiated learning challenges, stimulated learning, and effective classroom behaviour.

Effective teaching time involves teachers preparing students for learning, using class time effectively and providing useful feedback (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this factor are:

- My teacher tells us what we are learning and why;
- My teacher asks questions to check that we understand;
- My teacher asks me questions that challenge my thinking; and
- My teacher explains difficult things clearly.

Differentiated learning challenges involves students being challenged and supported at the appropriate level (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this factor are:

- My teacher understands how I learn;
- My teacher helps me to do my best; and
- My teacher gives extra help when students need it.

Stimulated learning involves teachers making students interested in learning (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this factor are:

- My teacher makes the work we do in class interesting; and
- My teacher makes learning fun.

Effective classroom behaviour is teachers managing behaviour effectively in the classroom (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- Students at this school treat teachers with respect;
- My teacher expects students to pay attention;
- My teacher sets clear rules for classroom behaviour; and
- Students at this school treat each other with respect.

Teachers' ability to effectively cognitively engage students in learning may have an impact on students' academic outcomes as measured through NAPLAN standardised testing. Curriculum outcomes and pedagogical practices which support student understanding, and are tailored to meet the needs, abilities and interests of the students will enable

students to engage in learning more effectively, and to stay engaged for longer periods of time (Fredrick, Blumenfeld & Paris, 2004; Hattie, 2012).

### **Social engagement**

Social engagement is measured through the factors of student voice and agency, school connectedness, and sense of inclusion. School connectedness involves students having a sense of belonging at their school (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I feel proud about being a student at this school;
- I like this school;
- I am happy to be at this school;
- I feel like I belong at this school; and
- I look forward to going to school.

Student voice and agency refers to students' perception that they have a say at their school (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are;

- At this school, I help decide things like class activities or rules;
- I have a say in the things I learn;
- My teacher thinks my ideas are good; and
- I am encouraged to share my ideas.

School inclusion refers to primary students having a sense of inclusion at their school (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are;

- I have lots of chances to be part of class activities;
- I have friends at this school;
- My teacher makes me feel like I matter; and
- My teacher makes sure all students feel included.

Social engagement factors may have an impact on students' academic outcomes as measured through NAPLAN standardised testing. For example, Delgado, Ettekal, Simpkins and Schaefer (2016) found that a student sense of belonging at school is significant predictor of academic success in Latino adolescents. Also, students having a high degree of voice and ownership in their learning increases their engagement in learning (Baroutsis, McGregor & Mills, 2016).

### **Teacher student relationships**

The Victorian Department of Education and Training Attitudes to School Surveys measure the teacher-student relationships domain through the factors of effort, high expectations of success, and teacher concern. Effort refers to students participating in

class and being encouraged to put in an effort (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I usually pay attention in class;
- My teacher expects nothing less than our full effort; and
- I enjoy doing my work in class.

High expectations of success is teachers and students having high expectations of success (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- My teacher expects me to do my best; and
- My teacher believes that I can do well at school.

Teacher concern is teachers being empathic to students (Victorian Department of Education and Training, 2017) The student Attitudes to School Survey questions in this domain are:

- My teacher cares about how I am feeling;
- My teacher seems to know if something is bothering me; and
- I can talk to my teacher if something is worrying me.

Teacher-student relationships may have an impact on students' academic outcomes as measured through NAPLAN standardised testing. Teachers' high expectations for their students has been linked to motivational, behavioural and academic performance outcomes (Wentzel, 2002). In addition, when teachers are highly aware of and responsive to students' academic, social, and emotional needs, students are more successful academically (Jennings & Greenberg, 2009).

### **Learner characteristics and dispositions**

The domain of learner characteristics and dispositions contains the factors of motivation and interest, attitudes to attendance, learning confidence, resilience and self-regulation, and goal setting. Motivation and interest is students being motivated by what they are learning (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I want to learn new things; and
- I am learning things that really interest me.

Attitudes to attendance measures students' attitude towards absenteeism (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I always try to attend school;
- My parents believe that going to school is important; and

- I try to catch up my work if I am absent from school.

Learning confidence refers to students' confidence in their ability to learn (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I am good at learning; and
- I can do challenging school work.

Resilience measures students' level of resilience, and their capacity to manage, recover and move on from challenging events (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I can recover in a short time when something bad happens to me; and
- I try again when I don't succeed.

Self-regulation and goal setting refers to the measure of the extent to which students prepare themselves for learning (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I try very hard at school; and
- I ask my teacher for help when I find my work difficult.

Learner characteristics and dispositions may have an impact on students' academic outcomes on NAPLAN standardised testing. For example, Vansteenkiste et al. (2012) found that environments that provided high support for student motivation resulted in enhanced concentration, deep learning, and persistence among students. Seligman et al. (2009) in their study of an Australian school found that increasing student resilience resulted in increased academic achievement. In addition, there is a strong correlation between student attendance and student achievement outcomes (Gottfried, 2010).

### **School safety**

The Attitude to School Surveys school safety domain includes the factors of advocate at school, managing bullying, and respect for diversity. Advocate at school is the students' perception that they have an adult or teacher they can rely on and who supports them at school (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- At this school, there is a teacher or another adult who cares about me;
- At this school, there is a teacher or another adult who listens to me when I have something to say;
- I have someone at school who I can share any problems with; and
- There is a teacher or another adult at this school who tells me when I do a good job.

Respect for diversity identifies the students' perception that people are treated fairly and diversity is respected (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- All students are treated fairly at this school; and
- It is okay to be different at this school.

Managing bullying refers to the students' perception that the school handles bullying and harassment appropriately (Victorian Department of Education and Training, 2017). The student Attitudes to School Survey questions in this domain are:

- I feel safe at this school;
- This school deals fairly with bullying problems; and
- I know where to get help if I feel bullied.

School safety may have an impact on students' academic outcomes on NAPLAN standardised testing as peer victimisation and bullying have been found to lower academic competence (Cross, Shaw, Hearn, Epstein & Monk, 2009).

The review of current literature reveals a lack of academic discussion around the Attitude to School Surveys.

## **The study**

### **Participants and setting**

Government primary schools in the Victorian Department of Education and Training's North Western Region with an *Index of Community Socio-Educational Advantage* score between 900 and 1100 and with more than ten Year Five students who participated in both the NAPLAN testing and also completed the Attitudes to School Survey in 2017 were invited to participate in this study (total 43 schools). Of these schools, 35 agreed to participate in this study (N = 35). Schools in the North Western Region of Victoria included in this study are situated in a variety of rural settings, including small country towns with populations of 250 people to Australia's largest inland city with a population of 112,000 people. The schools included vary in size with total enrolments between 68 and 580 students. Schools in regional and rural settings often have large geographical catchment areas of student enrolments including both city dwelling and farm based community members.

The Index of Community Socio-Educational Advantage was created by the Australian Curriculum and Assessment Authority (ACARA) to enable fair comparisons of NAPLAN test achievement by students in schools across Australia (ACARA, 2015). Selecting schools with an Index of Community Socio-Educational Advantage within 100 points of the national average of 1000 points allowed for the control of factors in the student's family background such as parents occupation and education, as well as school level factors such as; school geographical location and proportion of indigenous students which



can potentially influence educational outcomes (ACARA, 2017). This eliminated these factors as extraneous variables in this study. In addition, collecting Year Five student data for both NAPLAN and Attitudes to School Survey scores allowed for the elimination of student age as an extraneous variable. Whilst selecting schools with greater than ten students enrolled in Year Five who participated in both the NAPLAN testing and also completed the Attitudes to School Survey in 2017, reduces the possibility outliers significantly effecting the school mean NAPLAN or Attitude to School Surveys scores.

After obtaining university ethics approval and school principal informed consent, an application for data was submitted to the Victorian State Government, Department of Education and Training, Performance and Evaluation Division to obtain each school's average Year Five NAPLAN and Attitudes to School Survey factor scores. No school's NAPLAN or Attitudes to School Survey individual question data or individual student data was requested. During the data collection phase, all school identifiers were removed and replaced with a numerical code. Validity and background information on this data was obtained from Victorian State Government, Department of Education and Training to enable the researcher to determine the validity of these data sets.

NAPLAN test questions are developed to meet Australian curriculum standards (ACARA, 2016). The tests are trialled with samples of students and then equated to allow for year-to-year comparisons to be made (ACARA, 2016). The NAPLAN data obtained was each school's Year Five average score in reading, writing, spelling, numeracy, grammar and punctuation. The NAPLAN scores describe the development of student achievement from Year Three to Year Nine, scores range from 0 to 1000 with the spread of scale scores for each year level following a normal distribution curve, with two thirds of students' scores falling within plus or minus 100 score points of the average for that year level (ACARA, 2017). Average Year Five level NAPLAN scores for each school have been used in this study. These scores were calculated by taking the total of each school's individual student scores and dividing it by the total number of students who have taken the test, excluding students who were exempt.

The Australian Council for Educational Research (ACER) refreshed the 2017 Attitude to School Surveys by reviewing research and literature from international surveys and selecting items for each measure which had demonstrated high reliability in previous research (Victorian Department of Education and Training, 2017a). The surveys then underwent cognitive and pilot testing and were amended as required (Victorian Department of Education and Training, 2017a). The Attitude to School Survey data obtained for this study was the Year Five factor level data for each of the following domains: effective teaching practice for cognitive engagement, social engagement, teacher student relationships, learner characteristics and dispositions and school safety. Data from the 'Experience of bullying' domain was incomplete as some schools' data was missing. Therefore, a decision was made not to include that domain in this study. Each individual factor is assessed on the Attitude to School Surveys by asking students to respond to between two to five survey questions which address that factor. Survey items use a five-point Likert response scale with 1 indicating "Strongly disagree", 2 = "Disagree", 3 = "Neither agree nor disagree", 4 = "Agree" and 5 indicating "Strongly agree" (Victorian

Department of Education and Training, 2017). Individual question scores for each factor are collated to produce scores which range between 0 and 100.

### **Data analysis**

Raw data was analysed using correlation analysis. Correlation analysis provides a method for exploring the relationship between variables and as such, has been previously used by researchers to demonstrate bivariate relationships in education and wellbeing. For example, Arslan (2017) used correlation analysis to study the relationship between teachers' cognitive wellbeing and school connectedness, teaching efficacy, and overall teacher functioning. A correlation analysis is a statistical test to determine the tendency for two variables to vary consistently (Creswell, 2005) and was applied to this research to determine whether the dependent variables (NAPLAN scores) are influenced by the independent variables (Attitude to School Survey scores).

Statistical correlation analysis methods as described by Brase and Brase (2010) were used in the data analysis. The validity of the NAPLAN and Attitudes to School Survey data was established through careful analysis of the NAPLAN and Attitudes to School Survey data collection methods. After both sets of data had been collected and validated, a scatterplot was developed to determine linearity and to check for the presence of outliers. Then using Microsoft *Excel*, a correlation matrix was developed showing the correlation coefficient ( $r$ ) for each of the relationships. As per Creswell (2005), an ' $r$ ' value of between 0.2 and 0.35 was taken to indicate a slight positive relationship. An ' $r$ ' value of between 0.35 and 0.65 was taken to indicate a positive relationship. When using a Pearson Critical Value Table, the intersection of 33 ( $N-2$ ) degrees of freedom and the alpha level ( $p = 0.05$ ) shows that the minimum  $r$  value needed in order for this relationship to be statistically significant, and above chance alone was 0.349.

### **Findings and discussion**

The findings and discussion are presented under the Attitudes to School Survey domains of effective teaching practice for cognitive engagement, social engagement, teacher student relationships, learner characteristics and dispositions, and school safety.

#### **Effective teaching practice for cognitive engagement**

It can be seen in Table 1: Correlation matrix: Effective teaching practice for cognitive engagement, that using a linear correlation model a statistically significant relationship exists between 'Effective classroom behaviour' and spelling ( $r = 0.373$ ) and numeracy ( $r = 0.357$ ). There is also a slight positive relationship between 'Effective classroom behaviour' and reading ( $r = 0.329$ ), writing ( $r = 0.297$ ) and grammar and punctuation ( $r = 0.309$ ). Questions in the effective classroom behaviour factor relate to students respecting teachers and the teacher setting rules for behaviour in class. This factor demonstrates an influence on students' spelling and numeracy NAPLAN outcomes above that which would be expected by chance alone. There is a slight positive relationship between 'Differentiated learning challenges' and writing ( $r = 0.207$ ). Questions in the differentiated

learning challenges factor relate to teachers' understanding how students learn, and helping them when needed. There are no statistically significant correlations between 'Effective teaching time' or 'Stimulated learning' and NAPLAN outcomes (see Table 1).

Table 1: Correlation matrix: Effective teaching practice for cognitive engagement

	Effective teaching practice for cognitive engagement			
	Effective teaching time	Differentiated learning challenge	Stimulated learning	Effective classroom behaviour
Reading	0.051	0.115	0.060	0.329
Writing	0.093	0.207	0.159	0.297
Spelling	0.142	0.094	0.079	0.373
Numeracy	0.160	0.162	0.126	0.357
Grammar and punctuation	0.035	0.069	0.105	0.309

Other studies have also found that negative student behaviour is associated with reduced academic achievement. For example, Borg (2015) in a Norwegian study of classroom behaviours, genders and school performance found that classroom behaviour contributes to variances in academic outcomes. Similarly, Georges, Brooks-Gunn and Malone (2012), in a study of the impact of low attention and aggressive behaviour in over 14,000 children found that the presence of disruptive classroom behaviour results in lower test scores across the whole cohort. Teachers often cite lost teaching time in dealing with challenging behaviour as a contributing factor to reduced academic outcomes (Pisacreta, Tincani, Connell & Axelrod, 2011).

However, this study did not support the findings of previous research in the area of effective teaching practice. For example, positive associations have been found between students' academic outcomes and teachers maximising the time during which students are actively engaged in learning (Hattie, 2012), and differentiated learning to support cognitive engagement (Fredrick et al., 2004; Taylor, Pearson, Peterson & Rodriguez, 2003). However, these researchers did not measure student learning outcomes solely in the form of national standardised tests such as NAPLAN. For example, Fredrick et al. (2004) measured achievement as teacher testing scores, whilst Taylor et al. (2003) used a mix of standardised reading comprehension tests as well as writing in response to a prompt, phonemic awareness and dictation tests. Hattie (2012) in his meta-analysis of over 900 studies measured achievement as a mix of standardised tests and researcher or teacher constructed tests. These differences in the ways in which academic outcomes were measured may explain why this study did not repeat the findings of these previous studies.

### **Social engagement**

It can be seen in Table 2: Correlation Matrix: Social engagement that using a linear correlation model there are no statistically significant correlations between 'Student voice and agency', 'School connectedness' or 'Sense of inclusion' and NAPLAN outcomes.

Table 2: Correlation matrix: Social engagement

	Social engagement		
	Student voice and agency	Sense of connectedness	Sense of inclusion
Reading	-0.077	0.153	0.112
Writing	0.145	0.197	0.146
Spelling	-0.037	0.139	0.063
Numeracy	0.020	0.194	0.150
Grammar and punctuation	-0.009	0.119	0.125

This study does not support the findings of previous research in the area of social engagement. For example, positive associations have been found between students' academic outcomes and school connectedness (Niehaus, Rudasill & Rakes, 2012), positive classroom emotional climate (Reyes, Reyes, Brackett, Rivers, White & Salovey, 2012) and social engagement (Finn & Zimmer, 2012). However, Niehaus, Rudasill and Rakes (2012) measured academic outcomes through end of year grade point average scores; Reyes et al (2012) measured academic achievement through the students' end of year grades in reading, writing, listening, speaking, conduct, homework, and effort; whilst Finn and Zimmer (2012) measured academic achievement as composite scores in end of year reading and math tests. These differences in the ways in which academic outcomes were measured may explain why this study did not repeat the findings of these previous studies.

### Teacher student relationships

Using a linear correlation model, it can be seen that there is a statistically significant relationship between 'Effort' and writing ( $r = 0.383$ ), and slight positive relationships between 'Effort' and reading ( $r = 0.322$ ), spelling ( $r = 0.207$ ), numeracy ( $r = 0.284$ ) and grammar and punctuation ( $r = 0.347$ ). Questions in the effort factor relate to students paying attention and enjoying classroom work and teachers expecting students to give their full effort in class. This factor demonstrates an influence on students' NAPLAN writing outcomes above that which would be expected by chance alone. There is also a slight positive correlation between 'High expectations of success' and writing ( $r = 0.241$ ). Questions in the high expectations of success factor relate to teachers expecting students to do their best. There is also a slight positive correlation between 'Teacher concern' and writing ( $r = 0.284$ ). Questions in the teacher concern factor relate to teachers being aware of and caring about how students feel and students knowing they can talk to their teacher if something is bothering them. There are no other statistically significant results are present (see Table 3).

Previous studies have also found a positive relationship exists between effort and academic achievement. For example, Strayhorn (2014) found that effort, or grit, is positively related to college grades and explains twenty-four percent of the variance in the college grades of black male collegians at predominantly white institutions. Strayhorn (2014) concluded that grit is more predictive of academic success in college than traditional measures such as high school grades or college test scores. So too, Duckworth

and Quinn (2009) in their study on the development of a grit scale found that effort was a strong predictor of grade point average.

Table 3: Correlation matrix: Teacher-student relationships

	Teacher-student relationships		
	Effort	High expectations for success	Teacher concern
Reading	0.322	-0.045	0.020
Writing	0.383	0.241	0.284
Spelling	0.207	-0.002	0.085
Numeracy	0.284	0.071	0.040
Grammar and punctuation	0.347	0.126	0.098

### Learner characteristics and dispositions

There is a statistically significant relationship between 'Resilience' and writing ( $r = 0.361$ ). In addition, slightly positive relationships exist between 'Resilience' and reading ( $r = 0.291$ ), spelling ( $r = 0.254$ ), numeracy ( $r = 0.341$ ) and grammar and punctuation. ( $r = 0.242$ ). Questions in the resilience factor relate to students recovering when something bad happens and trying again when they don't succeed. This factor demonstrates an influence on students' NAPLAN writing outcomes above that which would be expected by chance alone. Also there is a slight positive relationship between 'Attitudes to attendance' and reading ( $r = 0.206$ ), writing ( $r = 0.304$ ), spelling ( $r = 0.234$ ) and numeracy ( $r = 0.294$ ). Questions in the attitudes to attendance factor relate to students attendance at school, parents beliefs that school is important and students catching up on work missed due to absence. So too, there is a slight positive relationship between 'Self-regulation and goal setting' and writing ( $r = 0.205$ ). Questions in the self-regulation and goal setting factor relate to students trying hard at school and asking their teacher for help when needed. There are no other statistically significant relationships between the domain of 'Learner characteristics and dispositions and NAPLAN results (see Table 4).

Table 4: Correlation matrix: Learner characteristics and dispositions

	Learner characteristics and dispositions				
	Motivation and interest	Attitudes to attendance	Learning confidence	Resilience	Self-regulation and goal setting
Reading	-0.014	0.206	0.081	0.291	0.159
Writing	-0.016	0.304	0.099	0.361	0.205
Spelling	0.039	0.234	0.037	0.254	0.140
Numeracy	0.030	0.294	0.120	0.341	0.103
Grammar and punctuation	-0.004	0.181	0.087	0.242	0.172

Other studies have also confirmed the positive correlation between resilience and academic outcomes. For example, Seligman, Ernst, Gillham, Reivich and Linkins (2009) in

their study of an Australian school's teaching of positive education find that increasing student resilience results in increased academic achievement.

This study also confirms the findings of previous research which finds a strong correlation between student attendance and student achievement outcomes. In a study of elementary and middle school students, Gottfried (2010) found statistically significant positive relationships between attendance and academic achievement. Similarly, Aucejo and Romano (2016) found that a reduction of student absences by ten days per year increased students' test scores in maths by 5.5% and in reading by 2.9%. However, Guenther (2013) in his examination of indigenous education in remote Australian communities challenged the notion that improved school attendance will improve student academic outcomes. In a correlation analysis of NAPLAN data and attendance records, Guenther (2013) showed that high attendance rates did not improve NAPLAN reading and numeracy outcomes in these schools.

### School safety

There is a slight positive relationship between 'Managing bullying' and writing ( $r = 0.216$ ), spelling ( $r = 0.208$ ) and numeracy ( $r = 0.324$ ). Questions in the managing bullying factor relate to students feeling safe at school, getting help when needed, and the school dealing with bullying problems. There are no other statistically significant findings between 'School safety' and NAPLAN results (see Table 5).

Table 5: Correlation matrix: School safety

	School safety		
	Advocate at school	Managing bullying	Respect for diversity
Reading	0.043	0.142	0.141
Writing	0.135	0.216	0.185
Spelling	0.071	0.208	0.103
Numeracy	0.088	0.324	0.142
Grammar and punctuation	0.096	0.125	0.154

Previous studies also indicate that bullying has been found to cause lower academic competence. For example, Juvonen, Wang and Espinoza (2011) in their study of bullying experiences in middle school found substantial decreases in grade point average among students who self-reported victimisation. Fry et al. (2018) in their meta-analysis of 43 studies examining the association between childhood violence and educational outcomes found that being bullied has a significant impact on children's standardised test scores.

### Conclusions

This study with its focus on the correlation between student Attitudes to School Survey results and NAPLAN results addresses a gap in current literature and makes a unique contribution to the knowledge base around the correlation between student attitude to

school and academic outcomes. The results demonstrate that a statistically significant positive correlation, above that which would be expected by chance alone, exists between effective classroom behaviour and spelling and numeracy, as well as between resilience and writing, and between effort and writing and effort and grammar and punctuation. In addition, slight positive relationships were present between NAPLAN outcomes and effective classroom behaviour, differentiated learning challenges, high expectations for success, teacher concern, attitudes to attendance, self-regulation and goal setting, and managing bullying.

Writing was the NAPLAN academic outcome which was the most sensitive to students' attitudes to school, showing a positive relationship with nine of the eighteen factors measured in this study. This suggests that in seeking to improve students' NAPLAN writing scores, it would be beneficial for teachers to implement strategies to improve students' attitude to school with particular focus on differentiated learning challenge, effective classroom behaviour, attitudes to attendance, resilience, self-regulation and goal setting, managing bullying, effort, high expectations for success, and teacher concern. NAPLAN grammar and punctuation results had the least number of positive relationships with student attitudes to school results, demonstrating slight positive or statistically significant positive relationships with only three of the eighteen factors measured in this study. These factors were effective classroom behaviour, resilience, and effort.

The findings of this study suggest that teachers wanting to improve students' NAPLAN scores across reading, writing, spelling, numeracy, and grammar and punctuation should address the student attitude to school factors of effective classroom behaviour, resilience, effort, attitudes to attendance and managing bullying in the classroom, in addition to the traditional academic focus on mathematics and literacy.

The student attitudes to school factors which did not demonstrate any slightly positive or statistically significant positive relationships with NAPLAN results were effective teaching time, stimulated learning, motivation and interest, learning confidence, advocate at school, respect for diversity, student voice and agency, sense of connectedness, and sense of inclusion. However, NAPLAN testing only measures students' reading, writing, spelling, numeracy, and grammar and punctuation outcomes. It could be argued that skills such as curiosity, interest, passion, creativity, critical thinking, problem-solving skills, inquiry thinking, compassion and pro-social behaviour are equally important skills for the twenty-first century and are not currently being measured through any nationally implemented assessment programs. It is possible that the student attitudes to school factors which, in this study, did not demonstrate any positive correlations with NAPLAN scores, may demonstrate positive correlations with twenty-first century skills. Further research is recommended to correlate student attitudes to school scores against these twenty-first century academic outcomes to check for positive correlations and to justify and aid in the development of a national assessment of these skills.

## Limitations and recommendations

It must be remembered that correlation does not equal causation and one limitation of this study is that it has not been possible to determine that the students' attitude to school (independent variable) occurred before the NAPLAN scores (dependent variable), thus longitudinal studies in which the same population of students are studied to examine the correlation between their attitudes to school and subsequent academic results are recommended to clearly establish causation in terms of academic outcomes.

This research is the first to use correlation analysis to study the relationship between Australian Year Five students' NAPLAN scores and student Attitudes to School Survey results. These findings may have applicability in similar contexts, however, further research is recommended to determine if these findings can be reproduced in students in other year levels or in international contexts. Further research in this field is important as determining a positive correlation and causation between student attitudes to school and academic outcomes will enable policy makers and educators at all levels from pre-primary, primary, secondary and tertiary to make evidence-based decisions and reforms in schools and in teacher education to improve students' learning outcomes.

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