

2016

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This conference paper was originally published as:

Cranley, L., & Hine, G. (2016). Are there any winners in high-stakes mathematics testing? A qualitative case study exploring student, parent and teacher attitudes towards NAPLAN numeracy tests in years 3 and 5. *MAV (Mathematical Association of Victoria Annual Conference) 2016*.

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Original conference paper available here:

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ARE THERE ANY WINNERS IN HIGH-STAKES MATHEMATICS TESTING? A QUALITATIVE CASE STUDY EXPLORING STUDENT, PARENT AND TEACHER ATTITUDES TOWARDS NAPLAN NUMERACY TESTS IN YEARS 3 AND 5

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Through the annual implementation of National Assessment Program – Literacy and Numeracy (NAPLAN), testing of mathematical standards across Australia invokes questions about the impact that high-stakes testing has for the teaching and learning of mathematics. According to recent studies on high-stakes testing, the role of the teacher is instrumental in children’s achievement results. The purpose of this case study is to explore perspectives about NAPLAN from key participants at one Western Australian Primary School, namely: students, teachers, and parents. The paper will report on the extent to which instructional pedagogy at one school has been affected by the implementation of NAPLAN testing and subsequent publication of results. Consistent with a phenomenological perspective, the qualitative data for this investigation were collected through semi-structured interviews and field notes. These data offered particular insights into how key participants viewed the impact NAPLAN testing has had on the instructional pedagogy in Year 3 and Year 5 classrooms.

Introduction

Since the implementation of the National Assessment Program – Literacy and Numeracy (NAPLAN) in Australian schools in 2008, debate concerning the rationale of such testing has escalated steadily. The purpose, value, and results of NAPLAN have come under scrutiny from teachers, parents, ministers for education and politicians (Belcastro & Boon, 2012). The amount of criticism towards high-stakes testing of school-aged children continues to rise, with much debate focussing largely on the benefits of NAPLAN and the effects this procedure has on the well-being of all involved. Chiefly the debate centres around the question of ‘Are there really any winners in high-stakes testing?’ In answering this question, White and Anderson (2012, p. 61) doubted whether a high-stakes test could improve learning, “particularly when we consider it within the context of the time it takes to get back, the excessive time often taken to prepare for it, compounded as it is by the pressure many schools feel as a result of NAPLAN being published online via the *My School* website”. Furthermore, much has been written concerning the negative impact NAPLAN has had on the teaching and learning of mathematics. Some of the prominent issues include educators teaching to the test, a perceived narrowing of the curriculum, and the disempowerment of teachers (Bagnato & Yeh Ho, 2006; Klenowski & Wyatt-Smith, 2011). For instance, Thompson and Harbaugh (2013) highlighted that teachers face increased pressure for their

students to succeed due to publication of NAPLAN results on the *My School* website which can be viewed internationally. Perso (2009) underscored how mathematics teachers are concerned about getting the educative ‘balance’ right in terms of adequately preparing their students for NAPLAN and not altering their programs to teach to the test. Other writers have identified various negative effects NAPLAN testing has had on students’ mental health and well-being in general (Carter, 2012; Quinell & Carter, 2011; White & Anderson, 2012).

The Whitlam Report (ACARA, 2013) outlined the benefits of having a national a high-stakes testing procedure. The report stated that if used with other appropriate assessments, NAPLAN can “provide valuable data on student numeracy and literacy outcomes to a range of stakeholders as part of NAPLAN reporting” (ACARA, 2013, p. 7). At the same time, the Australian Curriculum Assessment and Reporting Authority (ACARA) cautions that NAPLAN results should be used as a snapshot of students’ achievement and should be viewed as only one of the high-quality assessments in the course of the year. In a similar manner to which the Programme for International Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) results are viewed, NAPLAN is the measure through which governments, education authorities, schools, and the community can determine the extent to which young Australians are meeting important educational outcomes (ACARA, 2014; Belcastro & Boon, 2012; Klenowski, 2010). Furthermore, Supovitz (2009) noted that high-stake test results have become the primary indicator of school and student performance within Australia, with monetary or non-monetary rewards, and a range of interventions offered for low-performing schools.

Purpose and Justification

The purpose of this research is to investigate the impact of high-stakes testing on the teaching and learning of mathematics for students, classroom teachers, and parents. Au (2007) states that a test is considered ‘high stakes’ when its results are used to make important decisions that affect students, teachers, administrators, communities, schools, and districts. The research also explored the extent to which NAPLAN test conditions contributed to student performance and student self-perceptions in mathematics. To obtain these perspectives from key stakeholders, qualitative data were gathered through the exercise of semi-structured interviews and researcher-generated field notes. Using these methods, the researchers wished to give individual children, their parents, and their teachers, a voice in sharing their experiences about how NAPLAN has affected their relationships with mathematics. In doing so it hoped that educators can better understand student, teacher, and parent perceptions about NAPLAN testing, which has been identified as an area of need (Belcastro & Boon, 2012).

Key Research Question

The key research question for this project is: *What is the impact of high-stakes testing on the teaching and learning of Mathematics in one Western Australian Catholic Primary School?*

Sub-questions

Three sub-questions were developed from the key research question.

What is the impact of high-stakes testing on mathematical teaching and learning for Year 3 and Year 5 students?

What is the impact of high-stakes testing on mathematical teaching and learning for Year 3 and Year 5 teachers?

What is the impact of high-stakes testing on the understanding of mathematical teaching and learning of the parents or guardians of Year 3 and Year 5 students?

Methodology

Case Study

This research was conducted through an intrinsic case study (Stake, 1995) where all data were collected from one Western Australian Catholic primary school within a low socio-economic area as defined by the *My School* website. A case study approach was chosen because the researchers wished to carry out

a detailed investigation over a period of time within a particular context (Hartley, 2002). By involving students, parents and teachers from Year 3 and Year 5, the researchers were able to explore the extent to which high-stakes testing had an impact on the teaching and learning of mathematics for these participants. Specifically, the case study design enabled the researchers to discern similarities and differences through both Year 3 and Year 5 cohorts for students, teachers, and parents.

Participants

The parents, children, and teachers involved with the Year 3 and Year 5 classrooms were the key participants in this research. Six children from each year were selected purposively by their classroom teacher based on their academic ability; two students achieving results at an A level or higher, two students achieving at the intended target for that year level, and two students achieving at a D level or lower. To ensure the holistic nature of the research, parents of participating students and the Year 3 and Year 5 classroom teachers were also interviewed.

Table 1 *Number of participants*

	Students	Parents	Teachers
Year 3	6	3	3
Year 5	6	3	3

The adult participants were chosen to discern the extent to which their experiences affected their understanding of NAPLAN, and their relationship with both the teacher and the school. To allow for an appropriate commentary, the parents were interviewed shortly after NAPLAN results were disseminated.

Methods

The researchers used semi-structured, qualitative interviews and took field notes as data for this research. Individual interviews were conducted face-to-face with key participants soon after the NAPLAN test had been administered (teachers and students) and after the results had been disseminated (parents). Conducting interviews at this time allowed the researchers the best opportunity to ascertain a true account from all participants regarding their perceptions of the testing. The interviews were recorded so they could be transcribed and analysed at a later date. The researchers also took field notes during the interviews to note any salient observations or emerging thoughts arising during the interviews.

Data Analysis

The researchers analysed qualitative data collected from the child and adult participants according to a framework offered by Miles and Huberman (1994) which comprises the stages: data collection, data reduction, data display, and conclusion drawing/verification. Following the data collection stage, and within the framework employed, the researchers used a content analysis process to interrogate the data. According to Berg (2007, p. 303), content analysis is “a careful, detailed systematic examination and interpretation of a particular body of material in an effort to identify patterns, themes, biases and meaning”. Using this analytical process the researchers were able to generate themes, and ultimately, key findings.

Presentation of Findings

The results of the study are organised into three categories according to research participant grouping, namely: students, teachers and parents. The most prominent theme that emerged for each stakeholder group is presented in the table below.

Table 2. *Emergent themes from data analysis*

Stakeholder Group	Theme
Year 3 and Year 5 Students	Anxiety about sitting NAPLAN
Year 3 and Year 5 Teachers	Changes in Pedagogy in preparation for NAPLAN
Year 3 and Year 5 Parents	Discrepancy in results from school report and NAPLAN results

Students

All Year 3 and Year 5 students reported feeling a heightened sense of anxiety when sitting the NAPLAN test. Compared with Year 5 students, Year 3 students described a higher level of anxiety as they had not sat the NAPLAN test before. To illustrate, one Year 3 student recalled: “[The teacher] explains things better when it’s not NAPLAN stuff. Because they don’t explain the test before you do it. We spread the desks out, so we could concentrate on the test”. However, even though Year 5 students had sat NAPLAN before, 80% of students expressed feeling nervous. For instance, a Year 5 student remembered “I get just a little anxious if I don’t get the question and I skip it and don’t get time to go back”. Overall the students’ reported anxiety was related to the test conditions they were placed under and the arrangement of the classroom, rather than the actual test itself. As one Year 3 participant noted: “NAPLAN day is different because I am not allowed to ask my teacher questions”. According to eight of twelve students interviewed, the classroom environment was altered from the regular classroom setting. The desks were placed in single file, which led to a feeling of isolation as one Year 5 student explained “I felt a bit nervous and insecure because I felt like it was only me getting tested and no one else”.

Teachers

Teachers indicated that they felt some pressure from parents in regards to NAPLAN. Year 3 teachers were able to reassure parents who were anxious about NAPLAN, with one teacher noting: “We just try to calm the parents down so that it’s not a big deal. It’s only one test. Most parents are good with that explanation”. However, Year 5 teachers experienced greater pressure from parents as NAPLAN results are used as entrance criteria for secondary school. One Year 5 teacher relayed general concerns from parents, “I still think a lot of parents here put a lot of value on the results, because they are worried about the results for high school. What if they don’t perform well and they need the results to get into high school?”

Initially, all teachers declared that they did not alter their pedagogical approaches in preparation for NAPLAN. One teacher stated “Personally, it’s not a big deal for me, and I don’t like teaching to the test, so I’d never teach something just because they’re going to include it”. However, after probing during the interview, all teacher participants conceded that they did alter their mathematics lessons mainly through the arrangement of the classroom. To illustrate this another teacher stated

It would definitely be fair to say that it is different from the normal way you teach, you move the desks, the week before or whatever are moved into their test conditions, we’re just sitting our test like this because of classroom conditions.

Teachers also commented how they used NAPLAN practice tests within their classrooms to ensure that children were adequately prepared for the test under time constraints. One teacher commented

We do more practice tests prior to NAPLAN; we have photocopied practice tests and get them to complete them under timed pressure so they get used to sitting for 40 minutes and working non-stop for 40 minutes.

In addition, all teachers stated how the time they spent using practice tests resulted in a 'narrowing' of mathematics education, in that they were unable to teach the prescribed mathematics curriculum to students.

Parents

NAPLAN results affected the relationship between the school and parents differently within the two cohorts. Year 3 parents were not concerned that the school performed under the national average in mathematics, as they felt the school report was more important than the NAPLAN results. One Year 3 parent commented, "No I wasn't concerned. I will wait for her school report. For me the school report is more important, the children spend a lot of time with those teachers". However, the relationship between the school and the Year 5 parents appeared somewhat damaged through expressed concerns about the NAPLAN results affecting their child's acceptance into secondary school. One Year 5 parent stated her concerns, "I don't want to hand this application into [school] knowing that it's not a true evaluation of my child....I've got the primary school that doesn't worry about it but then the high school that does". Four of six parents noted the difference between their children's achievements in school reports and in NAPLAN. In particular, parents stated that they were confused by these differences and recalled feeling unsure as to "who was telling the truth". One parent stated

So what worries me is, is our academics maths class really an academic maths class, when compared with the rest of Australia? Maybe our whole level is not right? Maybe we shouldn't have an academic maths class if we're not up there with the academics.

The parents articulated confusion and disappointment with the results and began to question the merit of the school. For instance, one parent remarked on the difference in the results between the school and the neighbouring school. This was evidenced by one parent who noted "I did go on the *My School* website to see what the other school got and I was thinking why I am paying money at this school when the other school has better results?" This real discrepancy in reported results was echoed by three other parents interviewed.

Discussion and Conclusion

The aim of this research was to investigate the impact of NAPLAN on the teaching and learning of mathematics for students, teachers and parents at one school. Findings indicated that the anxiety students experienced was caused by alterations to the classroom environment and the time restrictions placed on them. These findings support the earlier work of Belcastro and Boon (2012) who suggested the effect an unfamiliar classroom environment can have on 8 year old children. Walking into the altered environment gave students a sense that they were about to engage in an unfamiliar activity. The test conditions also contributed to their heightened sense of anxiety, which is consistent with other commentators (Carter, 2012; Watson et al., 2002). For instance, Year 3 and 5 students at this school are usually allowed considerable time when completing regular classroom tests. However, NAPLAN time constraints resulted in students feeling nervous to complete the test as they did not have enough time to check their answers as would have been typical classroom practice. Teachers indicated changing their pedagogy mainly through alterations to the physical environment and the inclusion of sample tests in mathematics lessons. According to teacher testimony, the conditions prescribed by ACARA have inadvertently forced them to change their pedagogical approaches. Such practice 'narrowed' the mathematics curriculum by replacing lessons with sample NAPLAN tests, a finding consistent with Perso (2011). Parents commented that NAPLAN results had affected their relationship with the school, due to the concern and confusion arising from disparate NAPLAN results and school reports (Downey, 2000). On the whole, Year 5 parents found it more difficult than Year 3 parents to reconcile the differences due to their children preparing for secondary school.

Anxiety experienced by students, pressure on teachers to alter pedagogical practice and the confusion and disappointment experienced by parents concerning NAPLAN reporting, all indicate that there are no winners in high-stakes testing for the participants of this study.

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