Dispelling the monolingual myth: exploring literacy outcomes in Australian bilingual programs

Dr Ruth Fielding, Monash University, Melbourne, Australia, ruth.fielding@monash.edu
orcid.org/0000-0003-3081-8893
Prof Lesley Harbon, University of Technology Sydney, Australia,
lesley.harbon@uts.edu.au orcid.org/0000-0002-7873-400X

Biographical Notes:
Dr Ruth Fielding is Senior Lecturer in TESOL and Languages at Monash University. She has researched in multilingual settings since 2006 with a particular interest in student identity and multilingualism. Her book on this topic was published in 2015. Ruth's current research focuses on bilingual programs in Australia, pedagogy and assessment in bilingual settings, and the intersection between identity and intercultural understanding in relation to language learning and teaching. Ruth has taught in language teacher education programs in Australia since 2006.
Lesley Harbon is Professor and Head of School for the School of International Studies and Education at the University of Technology Sydney. After completing her PhD she moved into teacher education and over the past 25 years has accepted roles in Study Abroad, International strategy and International Studies. Lesley has been sole author, or co-author and editor of numerous books, book chapters, and refereed journal articles. She has delivered invited international keynote addresses and seminars and has supervised numerous doctoral, masters, and honours projects, Lesley has consulted on languages education to schooling systems and government agencies.

ABSTRACT

The enduring monolingual mindset in English-speaking countries (Bambgo, 2003; Banda, 2010; Clyne, 2005; Hajek & Slaughter, 2015) results in widespread belief that additional language learning takes time away from literacy in the societal language. Yet extensive research has shown that time spent learning additional languages enhances learners' literacy skills providing first language literacy is sufficiently supported (Bialystok, 2006; Bialystok, 2016; Genesee, 2015). This paper examines the achievements of students at four primary schools in Australia, where bilingual

programs were implemented to teach subject content through an additional language. Data from the national standardised literacy and numeracy assessment were gathered to compare students within the bilingual programs with those not in the bilingual programs. Results show higher performance for students in the bilingual programs compared to their peers in monolingual classes. Drawing on data from a broader study of formal and informal assessment in these schools, this paper presents the standardised test results and teacher qualitative beliefs about literacy development. Findings show that the bilingual style of learning suits children irrespective of many contextual factors and that children's literacy in English is enhanced by the addition of a second or subsequent language.

Key words: bilingual education, CLIL, standardised assessment, first and second language literacy, language achievement

INTRODUCTION

For decades researchers have examined whether there is a benefit to bilingual education, with substantial evidence that there is (Fortune, 2012; Genesee, 2015). Literacy and numeracy have become the measures of success valued by policymakers in many contexts with standardised testing becoming widespread. With literacy the key to "educational opportunities that shape [students'] futures" (Bialystok, 2006, p. 107), and the possibility that bilingual education enhances both first, second and subsequent language literacy, further research was needed to explore different contexts of bilingual education, and to continue to dispel the persistent myths surrounding bilingual education.

This paper presents data from a study of four primary schools in New South Wales, Australia, where bilingual programs were implemented to teach subject content (geography, social studies, creative arts, science) through an additional language. These models of bilingual education have been referred to more recently as Content and Language Integrated Learning (CLIL) programs (Mehisto, Frigols & Marsh, 2008, pp. 9-11) yet were implemented without specific direction about the type of bilingual education to be followed. We refer to the programs as 'bilingual' in this paper given the

debates surrounding bilingual program classification. Our research found that teachers in these schools preferred a CLIL definition to describe their programs (Author & Author, 2014), yet the programs do not fit all definitions of CLIL as applied in the European context (Cenoz, Genesee & Gorter, 2014; Dalton-Puffer, Llinares, Lorenzo & Nikula, 2014). Each school delivers a bilingual stream from Kindergarten/Year 1 through to Year 6 for between 1 and 1.5 hours per day. In three schools a non-bilingual stream is offered concurrently. The fourth school has a small student population and delivers the bilingual program across multi-year classes to all students.

Standardised testing of literacy and numeracy - NAPLAN

In Australia a standardised test for literacy and numeracy is undertaken nationally in Years 3, 5, 7 and 9. This test, called NAPLAN[1], assesses student skills across three literacy sub-strands – reading, writing and language conventions. In this paper we are concerned only with the testing in Years 3 and 5, which occur during primary school. In Years 3 and 5 students undertake the same test. There are minimum expected standards in each sub-strand, as shown in Table 1:

Year 3 minimum standards	**Year 5 minimum standards**
Reading: "When reading simple imaginative texts, students can: • find directly stated information • connect ideas across sentences and paragraphs • interpret ideas, including some expressed in complex sentences • identify a sequence of events • infer the writer's feelings. When reading simple information texts, students can: • find directly stated information • connect an illustration with ideas in the text • locate a detail in the text • identify the meaning of a word in context • connect ideas within a sentence and across the text • identify the purpose of the text • identify conventions such as lists and those conventions used in a letter."	**Reading:** When reading a short narrative, students can: • locate directly stated information • connect and interpret ideas • recognise the relationship between text and illustrations • interpret the nature, behaviour and motivation of characters • identify cause and effect. When reading an information text, students can: • locate directly stated information • connect ideas to identify cause and effect • identify the main purpose for the inclusion of specific information, diagrams and illustrations • identify the meaning of a phrase in context • infer the main idea of a paragraph. When reading a biography or autobiography, students can: • connect ideas • identify the main purpose of the text

[1] See https://nap.edu.au/nap-sample-assessments for examples and details of the NAPLAN test.

	• make inferences about the impact of an event on the narrator • interpret an idiomatic phrase or the meaning of a simple figurative expression. When reading a persuasive text such as an advertisement, students can: • locate directly stated information • identify the main idea of a paragraph or the main message of the text.
Writing: "At the minimum standard, Year 3 students responding to a narrative task generally write a text consisting of a few simple ideas that show audience awareness by using common story elements; for example, using a simple title, or beginning with *Once upon a time.* Students name the characters and setting and the ideas and vocabulary used are generally very simple. Students typically choose mostly simple verbs, adverbs, adjectives and nouns. They may include a few examples of precise words and produce some correctly formed sentences. Students use some capital letters and full stops correctly and correctly spell most of the simple words they choose to use in their writing. When responding to the persuasive task, students …generally write a text consisting of a few simple ideas that show audience awareness by providing some simple information about the topic. Simple persuasive devices such as opinions and reasons are used in an attempt to convince a reader. Students typically choose mostly simple verbs, adverbs, adjectives and nouns."	**Writing:** "At the minimum standard, Year 5 students generally write a story with a few related ideas which are not well elaborated, and attempt to create a clear context by providing brief descriptions of the characters and/or setting. The vocabulary used is usually simple. When responding to the persuasive task these students at the minimum standard for Year 5 generally write a text that attempts to create a position on a topic by providing a context and some points of argument with some simple elaboration. They attempt a small range of simple persuasive devices and use some topic specific vocabulary. When writing to either task, students typically correctly structure most simple and compound sentences and generally use some correct links between sentences. Most referring words are accurate. Students typically correctly punctuate some sentences with both capital letters and full stops. They may demonstrate correct use of capitals for names and some other punctuation. Students correctly spell most simple and common words."
Language conventions: In spelling, Year 3 students at the minimum standard generally identify and correct errors in frequently used one-syllable words and some frequently used two-syllable words with double letters. Students can correct identified errors in: • frequently used one-syllable words • frequently used two-syllable words with regular spelling patterns. In grammar and punctuation, Year 3 students at the minimum standard generally identify features of a simple sentence. They identify some common grammatical conventions such as the correct use of past and present tense and the use of pronouns to replace nouns in sentences. They typically recognise the correct use of punctuation in written English, such as capitalisation for sentence beginnings and proper nouns. In grammar students can: • identify the correct preposition required to complete a sentence • identify the correct pronoun required to complete a sentence • identify the correct adverb of time required to complete a sentence	**Language conventions:** In grammar and punctuation, Year 5 students at the minimum standard generally identify common grammatical conventions such as the correct use of conjunctions and verb forms. They typically recognise the correct use of punctuation in written English, such as the use of question marks and speech marks for direct speech. In grammar students can: • identify the correct conjunction required to join a pair of simple sentences • identify the correct form of the verb required to complete a sentence • identify which adverb in a sentence describes how an action took place • identify the correct plural pronoun required to complete a sentence. In punctuation students can: • identify direct speech that uses capital letters, question marks and speech marks.

• identify the correct form of a participle required to complete a sentence. In punctuation students can: • identify the correct location of a full stop • identify proper nouns that require capitalisation.	

Table 1: NAPLAN minimum standards

We compared student performance in this assessment, by separating the results of students in the bilingual stream from those in the standard classes. While all schools in NSW explore their own test data, none had explored the sub-groups within their schools to see how bilingual program participants fared in comparison to the other students, yet each school wanted to be able to demonstrate the benefits of their program in a measured way and to dispel community concerns. Parents in all school communities and some teachers had expressed concern about upcoming NAPLAN testing for their children in our prior research (Author & Author, 2014).

Prevailing community views continue to indicate concern that additional language learning may hinder development of literacy and other basic skills in the primary school. Even in these schools who have invested in bilingual education there remains uncertainty around evidence of program success. Research showing the benefits is widespread and enduring. Bialystok (2001, pp. 57-59) outlines how bilingualism has historically been thought to be detractive. Substantial research has subsequently shown that providing students have support for literacy development in their first language, students can perform as well as, if not better than, peers in monolingual programs (Fortune, 2012; Genesee, 2008; Lindholm-Leary, 2001). In spite of longstanding research wider community concerns remain. We were compelled to assist these school communities to examine whether there was a demonstrable benefit to student learning in these programs.

LITERATURE REVIEW

Benefits of bilingual education

A strong field of research has existed for decades showing a range of benefits for students studying in a bilingual program which fosters biliteracy. Yet, these benefits require ongoing reiteration to reach community audiences. Genesee (2015) has recently

revisited and dispelled four common myths about bilingual learning, dispelling two of the key myths - the "monolingual brain" and that students with academic challenges cannot learn bilingually. Genesee shows that there are specific cognitive benefits to bilingual learning: *"A bilingual advantage has been demonstrated in the performance of tasks that call for selective attention (e.g., Bialystok, 2001), including tasks that require focusing, inhibiting, and switching attention during problem solving"* (2015, p.6). He also shows that substantial research has found that bilingual education is beneficial for students with academic difficulties and for students from lower socio-economic backgrounds (Genesee, 2015). Genesee indicates that students who perform lower in a monolingual setting have been shown to perform at a similar level to their peers once in a bilingual mode of education. He also argues that despite a strong evidence base, myths persist with policymakers, educators and parents. In spite of six decades of research indicating cognitive benefits of bilingualism starting with Peal and Lambert's research in 1962, Bialystok, Craik and Luk (2012, p248) likewise found that negative "fear and anecdote" continue to prevail within broad perceptions of bilingualism.

Many recent studies reinforce the cognitive benefits of bilingualism clarifying the conditions in which benefit is fostered, and exploring the types of cognitive skill which are influenced by bilingualism. Blom et al (2017) investigated four types of cognitive advantage with children aged 6-7 in the Netherlands. They found that bilingual children demonstrated an advantage in focus and selective attention but no significant difference for working memory. They compared four groups of children bilingual in either Dutch and a regional language or Dutch and a migrant language, to further understand the lack of clarity still existing around the conditions in which cognitive advantage may be present (Blom et al, 2017). Prior work has discussed whether cognitive advantage is most visible when the two languages are less "equal" either in skill (for the individual) or social relationship (within the context/society), or whether there is an effect due to linguistic distance between the two languages involved. Blom et al (2017) found that the children with a regional language exhibited cognitive advantage in tasks which require focus and selective attention. For children with migrant languages, a certain level of proficiency is needed in the migrant language for the same advantages to be seen (Blom et al, 2017). Bartolotti & Marian (2012) found that bilinguals manage cross-linguistic interference more effectively than monolinguals. By teaching participants a new language they measured how the bilingual and monolingual participants dealt with

linguistic interference, finding that bilinguals were better able to navigate this when learning a third or fourth language.

In a meta review of recent research into the cognitive benefits of bilingualism it was summarised that:

> Bilinguals do sometimes have an advantage in inhibition, but they also have an advantage in selection; bilinguals do sometimes have an advantage in switching, but they also have an advantage in sustaining attention; and bilinguals do sometimes have an advantage in working memory, but they also have an advantage in representation and retrieval. Together, this pattern sounds like 'mental flexibility', the ability to adapt to ongoing changes and process information efficiently and adaptively." (Bialystok, Craik & Luk, 2012, p. 247).

Of particular interest to this study in relation to 'mental flexibility' are the effects shown in relation to metalinguistic skills which may impact upon the development of literacy in both languages of a bilingual (Cromdal, 1999). Research into metalinguistic skill associated with bilingualism has debated many of the details and components of metalinguistic skill. There is some consensus that metalinguistic skill is neither exclusively linguistic nor cognitive in nature, rather it involves cognitive, linguistic and metacognitive processes (Bialystok, 1986; Cromdal, 1999). Cromdal's (2012) study of bilingual children in Sweden found that bilingual children performed more highly on analysis and control tasks in relation to grammar. They noticed and corrected sentence errors more than the monolingual group. While the bilingual group with less developed second language skills didn't correct errors as highly as the more developed bilinguals, they did perform equally to the monolinguals even in their second language which is notable. In relation to the present study this implies that even early on in the bilingual journey metalinguistic benefits can be measured (Cromdal, 2012). In a study of Gaelic-medium education Cape, Vega-Mendoza, Bak and Sorace (2018) found that the context of bilingual education has an impact on the type of cognitive benefit shown in students. They found that students in their study's context developed superior verbal response inhibition (Cape et al, 2018).

The lack of longitudinal research into language development in bilingual settings has been addressed recently by Lorenzo, Granados & Avila (2019) who have investigated long-term data on language skills focussing upon discipline specific language development in secondary school CLIL contexts. They have found that in CLIL

contexts the discipline specific language within academic language skill has its own development trajectory.

Literacy and links to bilingual education

There is a long tradition of research into literacy learning with development of the conceptualisation of literacy over many decades (Christie & Martin, 2007, Street & Lefstein, 2007; Freebody, 2007). In the Australian context a Systemic Functional Linguistics tradition developed within Applied Linguistics, and alongside the social approach to language, the Sydney School developed a genre approach to a more inclusive pedagogy for literacy education with the main aims of democratising the outcomes of education (Christie & Martin, 2007; Rose & Martin, 2012; Halliday, 1978). Exploring literacy outcomes in bilingual settings necessitates an understanding of how literacy is positioned within bilingual education. Traditional definitions of literacy focus upon extracting meaning from text and sometimes focus upon literacy as the decoding of reading and writing in traditional textual formats (Freebody 2007; Winch et al. 2006). Some conventional definitions of literacy focus upon reading and do not encompass writing (Street and Lefstein 2007). Other definitions of literacy focus on the functions of literacy, seeing literacy as a technical skill which operates similarly across languages (Baker and Prys Jones 1998). This can also be referred to as a "skills approach" (Baker and Prys Jones 1998). This approach can be valuable within bilingual settings as it indicates a transfer of skill between languages.

The development of the term *multiliteracies* initiated a discussion of the broadening of the definition of literacy to incorporate a multiplicity of linguistic and cultural influences which many people experience (Cazden et al. 1996; Cope and Kalantzis 2000; Cummins 2004; The New London Group 1995). Giampapa (2010) summarises the progression of various sub-fields of literacy studies - Literacy Studies (Feire & Macedo, 1987; Heath, 1983), New Literacy Studies (Barton, Hamilton, & Ivanic, 2000; Gregory & Williams, 2000; Street, 1995, 2005), multilingual literacies (Blackledge, 2000; Martin-Jones & Jones, 2000), and critical literacies (Cummins, 2001; Luke & Grieshaber, 2004) – all have debated and discussed the social construction of the forms of literacies that are valued in societies and educational systems, indicating increasingly that migrant and indigenous literacies are devalued and mis-matched in the institutional valuing of literacy skills.

Linking this discussion to the bilingual educational environment, Hamers and Blanc (2000) argue that the skills that are developed by literacy are also the skills that develop through bilingual experience. The skills that Hamers and Blanc (2000) argue are developed by both bilingualism and literacy are heightened metalinguistic skills and linguistic awareness. Ng and Wigglesworth (2007) argue that any discussion of bilingualism must inherently involve a discussion of biliteracy. The inclusion of spoken language in Freebody's (2007) broadened definition of literacy opens up the possibility of recognition of language in bilingual homes as important and valid literacy building tools in addition to accessing written texts in two languages (The State of Queensland 2000). Such a conceptualisation of literacy may result in recognising the acquisition of skills that are transferable across languages (Cazden et al. 1996; Cummins 1979; LoBianco 2000; Murray and Combe 2007). Hornberger's (2004) continua model of biliteracy proposes one framework for research and teaching in linguistically diverse settings. Hornberger (2004) proposes that biliteracy refers to "any and all instances in which communication occurs in two (or more) languages in or around writing" (p.156).

Achievement in bilingual/CLIL settings

Research in the area of Content and Language Integrated Learning (CLIL) has indicated that children can learn their content area knowledge (maths, science, social science) through the means of a new language (Coyle, Hood & Marsh, 2010; Mehisto, Marsh & Frigols, 2008), with recent work empirically tracking the content achievements of students (Fernández-Sanjurjo, Fernández-Costales & Blanco, 2019). Other work in CLIL contexts has explored teachers' knowledge of language for the content related instruction (Morton, 2018). CLIL studies have focussed on evaluation of students' increased L2 oral production (Serra, 2007), students' subject-specific oral language use (Huttner & Smit, 2018) and L2 reading competence (de Zarobe & Zenotz, 2018). Research has not extensively explored the cognitive or literacy benefits of CLIL programs. Bialystok sums up the wider research stating:

> *"there are three possible outcomes: (a) no measurable difference between bilingual and standard programs, (b) some advantage for participation in a bilingual program, or (c) hardship for students in bilingual programs that leads to poorer outcomes than would be obtained in traditional programs*." (2016, p. 675).

Seikkula-Leino (2007) investigated content outcomes and affective factors such as motivation and self-esteem in CLIL and found no negative impact on the students' first language as a result of the learning of content through the second language. Goris, Denessen & Verhoeven (2017, p. 53) examined more of the affective aspects of CLIL, finding CLIL did not produce a significantly greater ability for developing students' social skills or their language confidence.

In a recent special issue on CLIL and immersion practice there was a general focus within the research upon language outcomes in the language of instruction (Hüttner and Smit, 2018; Morton, 2018) and a focus upon instructional strategies and teacher development (Cammarata & Haley, 2018; Coyle et al, 2018; Dale, Oostdam & Verspoor; de Zarobe & Zenotz, 2018; Tedick & Young, 2018). However, there is still minimal exploration of the benefits within newly established bilingual programs, or evidence of benefit to literacy in the societal language. There is scope therefore to better understand the impact of bilingual settings upon societal language literacy development, not only because this is the currency that is valuable to decision makers, but also because this is a central concern of classroom teachers and parents (see Author & Author, 2014).

Despite extensive research in immersion contexts indicating positive literacy benefits, the popular view outside the classroom persists that there might be some detriment to learners in being involved in bilingual learning. There is a recent call in the literature (Lo & Fung, 2018) for more examination of CLIL assessment in terms of both the cognitive and linguistic aspects of student learning. We respond to this call by exploring literacy achievement in bilingual programs in the context of NSW, Australia.

CONTEXT

Four schools in New South Wales, Australia, were selected by their education department to be part of a trial bilingual program from 2010 onwards. The four schools are located in different contexts. School 1 is an inner-city primary school, School 2 is a suburban primary school, School 3 is on the outskirts of a large city and School 4 is in a small regional town. Each school has a different demographic profile within the student body and range from 80 students to over 1000 students. School 1 implemented a program in Korean, School 2 in Japanese, School 3 in Mandarin and School 4 in Indonesian. These four languages were listed as priority languages by the Federal

department of education at that time (see Department of the Prime Minister and Cabinet, 2012). At the time of data collection three cohorts of students had reached Year 5 and had undertaken national testing in literacy in Years 3 and 5.

METHOD

Data were gathered from three sources for this project: full sets of standardised test (NAPLAN) results from years 3 and 5 including student names from 2012 to 2016 inclusive; qualitative interviews with bilingual teachers about their assessment practices; and document examination of assessment and reporting documents. In this paper we report the standardised test data and teacher interviews pertaining to literacy to answer two research questions:

1. How do the bilingual/CLIL program students' NAPLAN[2] results for literacy in English compare with their non-CLIL peers in the same school (and with students in similar schools where 2 streams do not exist)?
2. How do teachers perceive the literacy learning of their students in the bilingual/CLIL program?

Firstly schools were asked to provide their full NAPLAN data. We were granted access to the NAPLAN online system and lists of student names from each school to determine who participated in the bilingual programs. The data for each school were sorted into two streams to enable comparison between the two cohorts in each school. School 4 had no comparison group as all students in that context had some exposure to the bilingual program therefore their data were explored in a descriptive manner and also compared to data which are publicly accessible and deemed "similar" in terms of demographics by the Australian Curriculum and Assessment Reporting Authority (ACARA). Year 5 data from the Schools 1-3 were analysed in SPSS for statistical significance using independent samples t-tests to compare the results of the bilingual streams to the non-bilingual streams. Data were also analysed using simple descriptive statistics to explore overall performance, performance in literacy and performance change from year 3 to year 5 in each individual school.

[2] NAPLAN is the name of the standardised test in Australia: National Assessment Program for Literacy and Numeracy. Please see https://www.nap.edu.au/results-and-reports/how-to-interpret\ for more detail on the program and how the data is reported

In the second phase of data collection, bilingual teachers were interviewed and asked to provide examples of their assessment tools, samples of work and reporting documents. The interviews were semi-structured allowing for key questions to be answered and for teachers to direct the interview as relevant to their context. Themes were allowed to emerge from the interview data according to the teacher responses. Responses were coded according to those themes, and themes were combined and reduced to align with the research questions.

Considerations in the data analysis

As the NAPLAN results in every school are dependent upon many variables across different school contexts, we believed comparison *between* schools to lack meaning. We therefore undertook statistical analysis of the combined data for Schools 1-3, and also analysed the sub-sets of data within each school context using simple descriptive statistics. We compared the students within the bilingual stream of their school with the students in the non-bilingual classes at the same school. We are therefore able to demonstrate where similarities between the results exist, in spite of contextual variations. In order to examine the statistical significance of the results we undertook independent samples t-tests of the combined Year 5 results from the three schools which had discernible bilingual and non-bilingual cohorts.

We obtained university and Department of Education NSW ethics permissions. All interview questions were pre-approved. Although the NAPLAN data was provided to us with student names, once the data were sorted into the two streams for Schools 1-3 names were then removed.

FINDINGS

Within this section we refer to the bilingual stream and non-bilingual stream. In the charts the bilingual stream data is labelled “CLIL” in line with the teacher selection of that term. NAPLAN result analysis answers the research question: How do the bilingual program students’ NAPLAN results for literacy in English compare with their peers (or with students in other similar schools)? Throughout this section the results presented in blue represent the students in the bilingual program and green represents those not in the bilingual program.

An independent samples t-test was conducted to compare the results of the four separate literacy strands of the NAPLAN test (reading, writing, spelling, grammar and punctuation)

for bilingual stream and non-bilingual stream students from schools 1, 2 and 3. As multiple comparisons were completed an adjusted alpha level was used for each of the sets of comparisons. For each of the years (2014, 2015 and 2016) an alpha level of 0.012 (0.05/4) was used. For the data from 2014 for **reading** there was a significant difference in scores between bilingual (M = 555.82, SD = 67.44) and non-bilingual streams (M=496.03, SD=70.23; t (286) = 7.24, p=0.000). For **writing** in 2014 there was also a significant difference in scores between bilingual (M = 518.58, SD = 54.97) and non-bilingual streams (M = 479.48, SD = 57.54; t (286) = 5.79, p = 0.000). For **spelling** in 2014 there was a significant difference in scores between bilingual (M = 570.94, SD = 51.48) and non-bilingual streams (M = 522.88, SD = 68.55; t (286) = 6.46, p = 0.000). For **grammar and punctuation** in 2014 there was also a significant difference in scores between bilingual (M = 584.54, SD = 78.78) and non-bilingual streams (M = 516.17, SD = 85.47; t (286) = 6.91, p = 0.000). Therefore in 2014 at year 5 the bilingual stream performed significantly higher than their non-bilingual peers across all four domains of literacy across three different schools. For the 2015 and 2016 t-tests data significance was not shown between the groups. However, the variables showed differences in the expected direction. That is, the bilingual stream performed higher although differences were not statistically significant.

To understand the individual schools in more depth simple analysis of scores was undertaken as follows.

NAPLAN Results in Year 3

At the first stage of testing in Year 3 the bilingual students in all schools outperform their non-bilingual peers. Overall NAPLAN band results for Year 3 students from years 2012 to 2016 showed that the bilingual students outperformed the standard classes by an average of 8%. Overall performance incorporates the student results for both literacy and numeracy tests and shows their overall score across all sub-sections of the test.

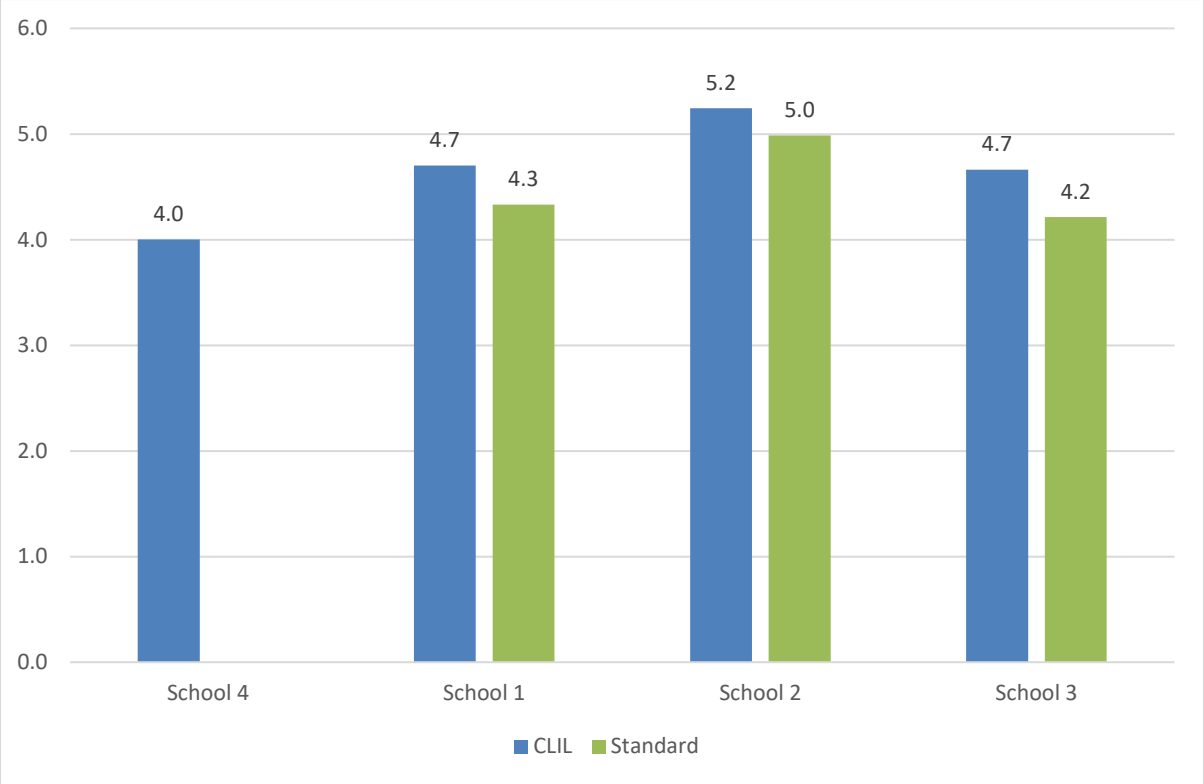

Figure 1: Year 3 Overall NAPLAN Performance, 2012 to 2016

There was little difference in the Year 3 cohort between performance in literacy versus numeracy with a 7% and 9% higher performance band scores respectively.

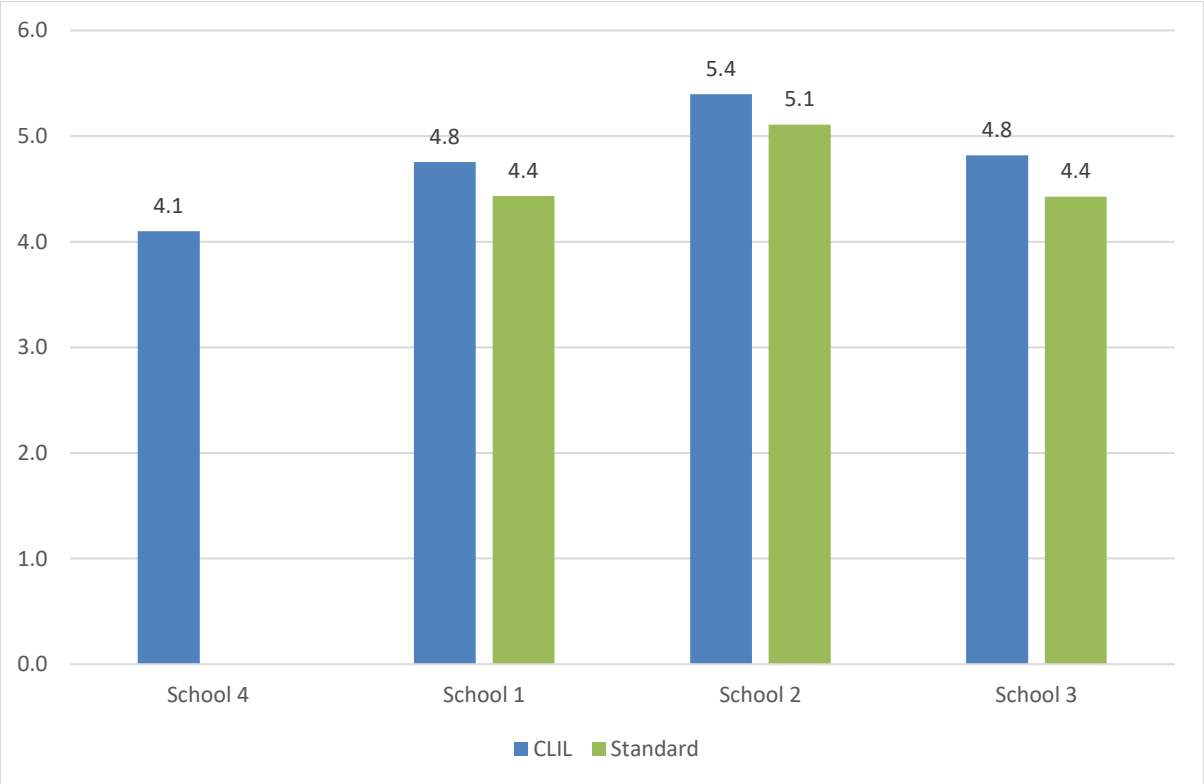

Figure 2: Year 3 Literacy Performance 2012 to 2016

We observe a similar level of outperformance amongst the bilingual cohorts compared to their non-bilingual peers. It is notable that the higher performance is apparent in schools 1-3, which are located in notably different contexts. One cannot therefore attribute the pattern to the selection process for the students, or to specific attributes of the children.

As shown in Figures 3 to 5 the bilingual classes consistently outperform the non-bilingual cohorts in each school. If we consider each school's NAPLAN data over a five-year period we can see that in School 1 (Figure 3) the bilingual outperformance is shown every year at Year 3 level. In School 2 (Figure 4), in one of the four years of data provided the bilingual cohort did not outperform their peers, but did in the other three years. For School 3 (Figure 5) one year (2013) the bilingual cohort had very similar results to the non-bilingual group. In the other four years, the bilingual cohort outperformed their peers.

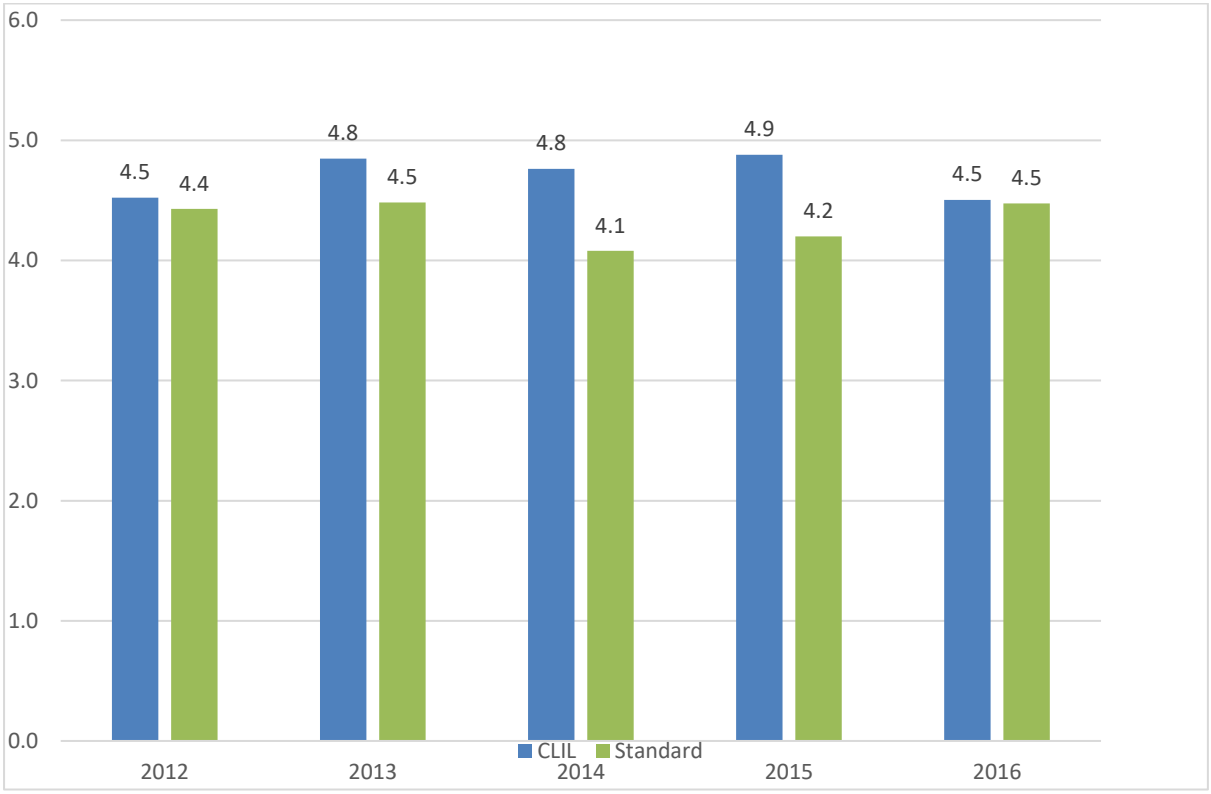

Figure 3: School 1 Year 3 Overall performance 2012 to 2016

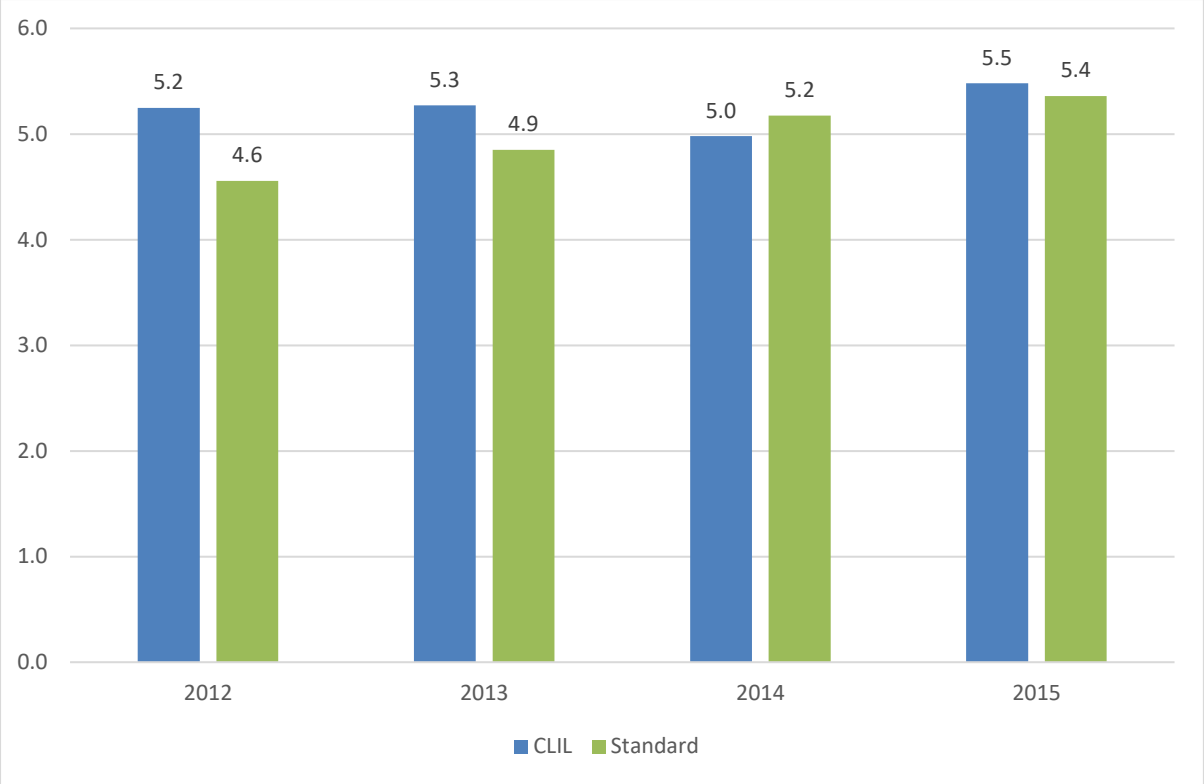

Figure 4: School 2 Year 3 overall performance 2012 to 2015

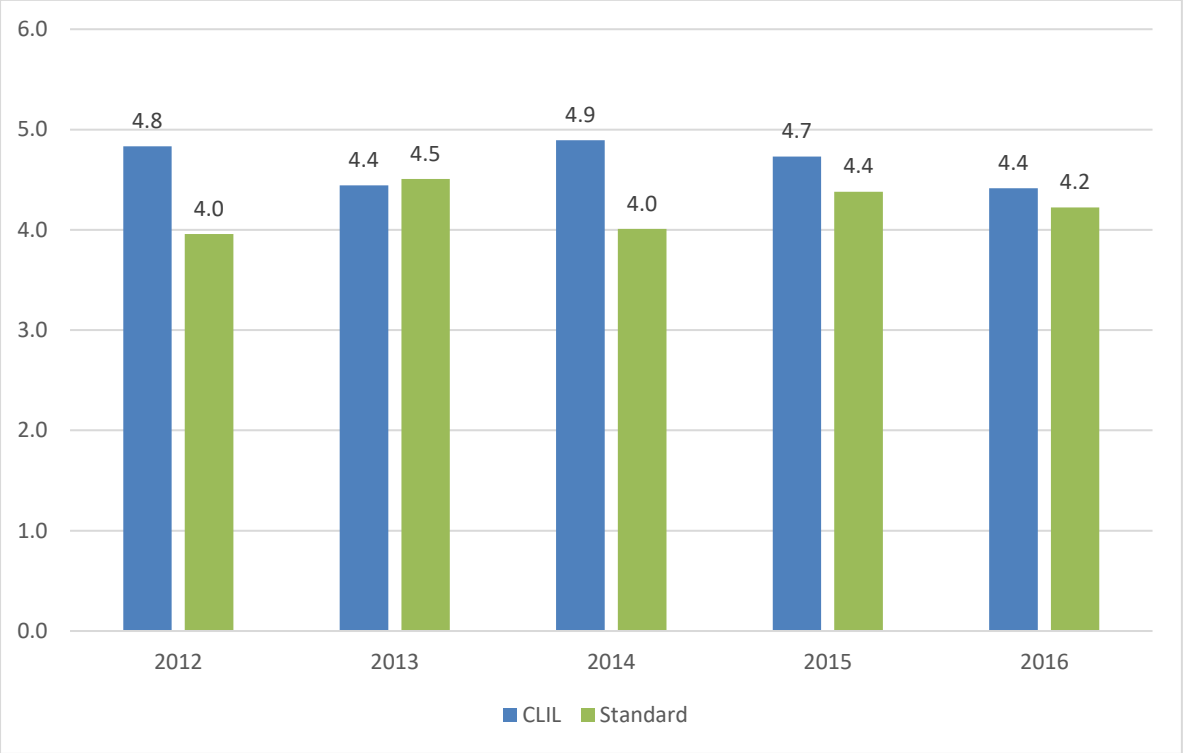

Figure 5: School 3 Year 3 Overall Performance 2012 to 2016

As we do not have a comparison cohort within School 4 (Figure 6a) we can only present overall results for the whole school. We can see that there is fluctuation in the results observed in different groups across the 5-year period of testing in Year 3.

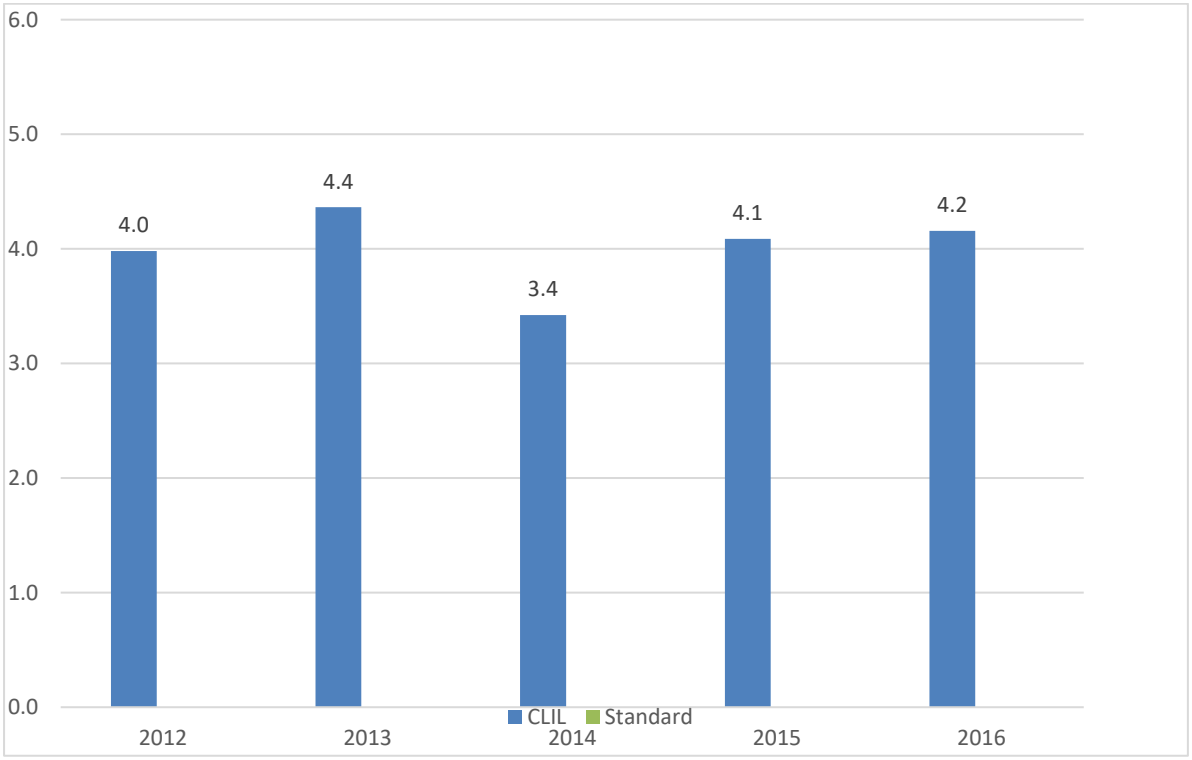

Figure 6a: School 4 Year 3 Overall Performance 2012 to 2016

If we compare school 4 to their demographically "similar" schools for Year 3 performance (taking writing as an example) performance is comparable to the similar schools. In 2014 there is a lower performance demonstrated but across the other years of the program (2012, 2013, 2015, 2016) we can see that School 4 performs at the upper end of the range for similar schools. Being such a small school (only 80-85 students in the whole school) statistical data on their performance has substantial limitations.

Figures 6b-f show years 2012, 2013, 2014, 2015 and 2016 comparison with similar schools for Year 3 writing.

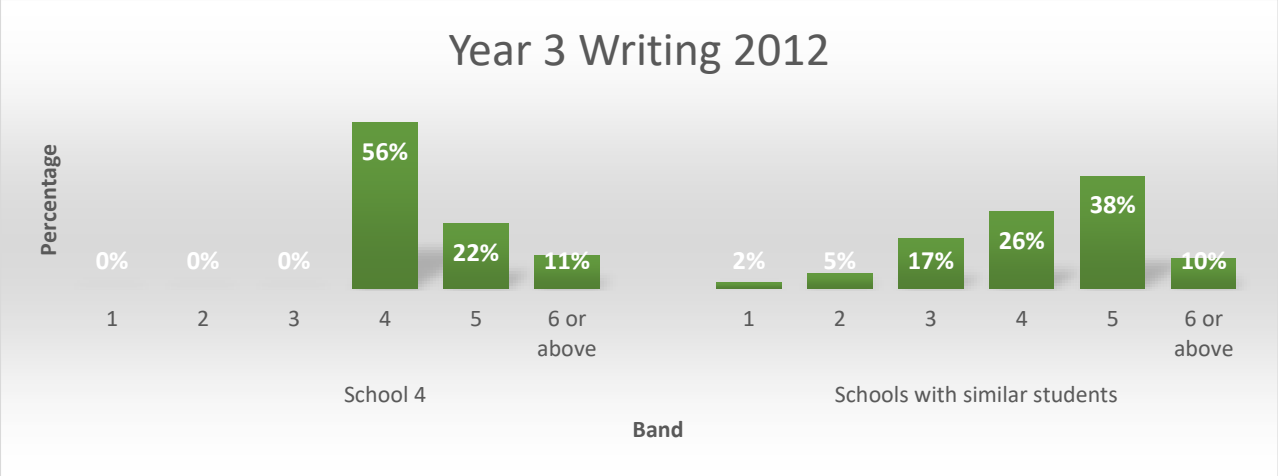

Figure 6b – Year 3 writing 2012 School 4 compared to similar schools

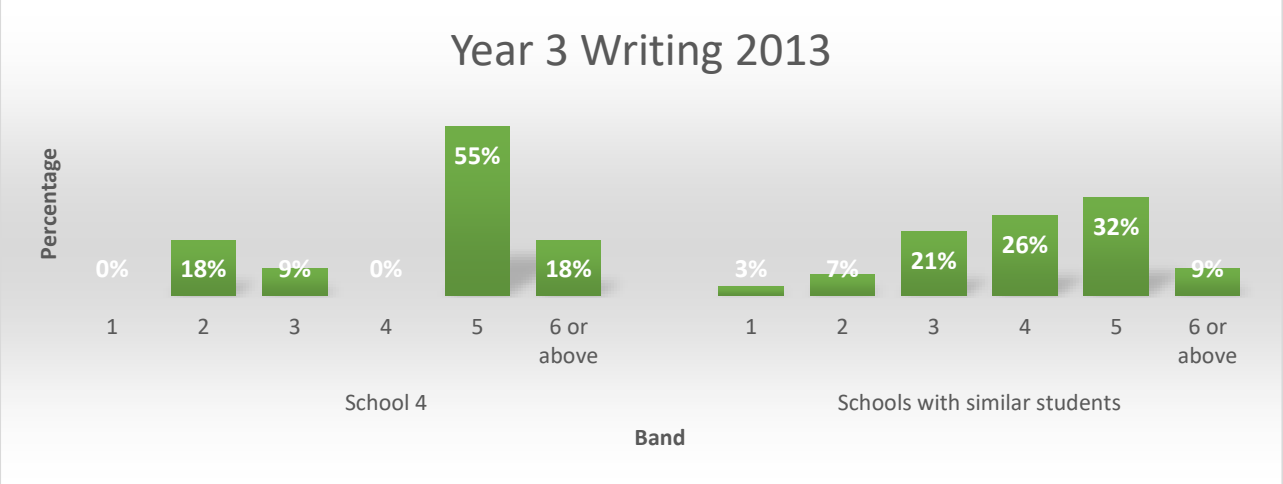

Figure 6c – Year 3 writing 2013 – School 4 compared to similar schools

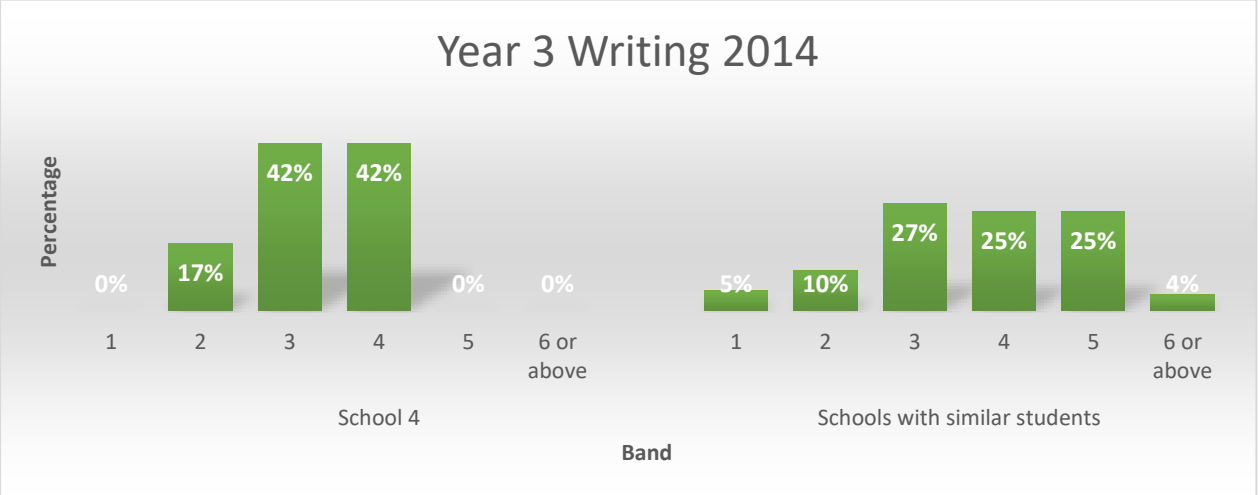

Figure 6d – Year 3 Writing 2014 – School 4 compared to similar schools

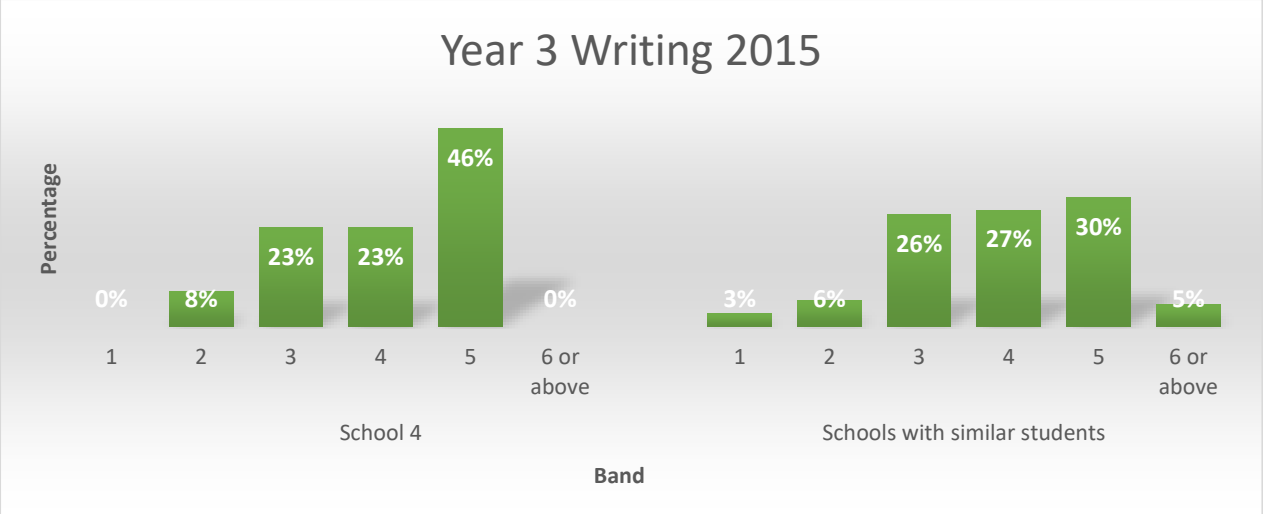

Figure 6e – Year 3 Writing 2015 – School 4 compared to similar schools

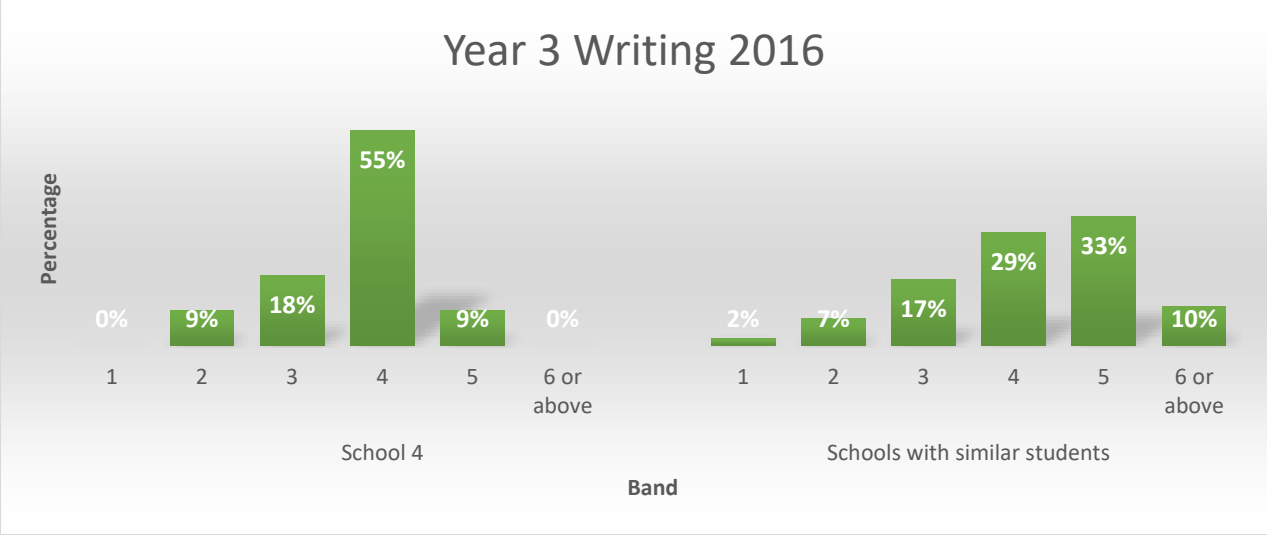

Figure 6f – Year 3 Writing 2016 – School 4 compared to similar schools

Data for Figures 6b to 6f were generated from https://www.myschool.edu.au/ publicly available data.

NAPLAN in Year 5

In addition to the t-test we performed the same descriptive analysis for Year 5 data looking at each school as for Year 3. Overall NAPLAN band results for Year 5 students from years 2014 to 2016 showed that the bilingual students outperformed the other classes by an average of 6% (Figure 7). As the students were already outperforming by 8% in year 3 there wasn't as high an increase to Year 5. The levels of outperformance staying relatively similar as students progress from Year 3 through to Year 5.

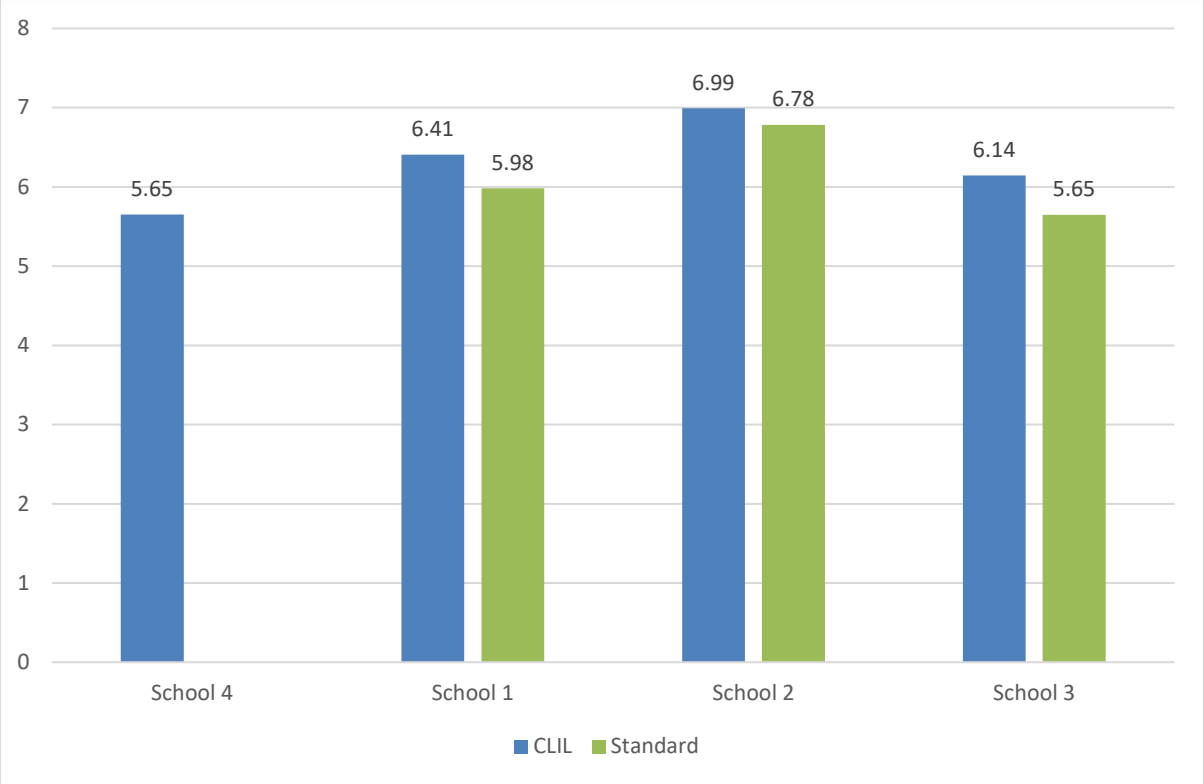

Figure 7: Year 5 Overall Performance 2014 to 2016

As per the year 3 data there was little difference between literacy and numeracy performance when separating these sub-tests, literacy is shown in Figure 8.

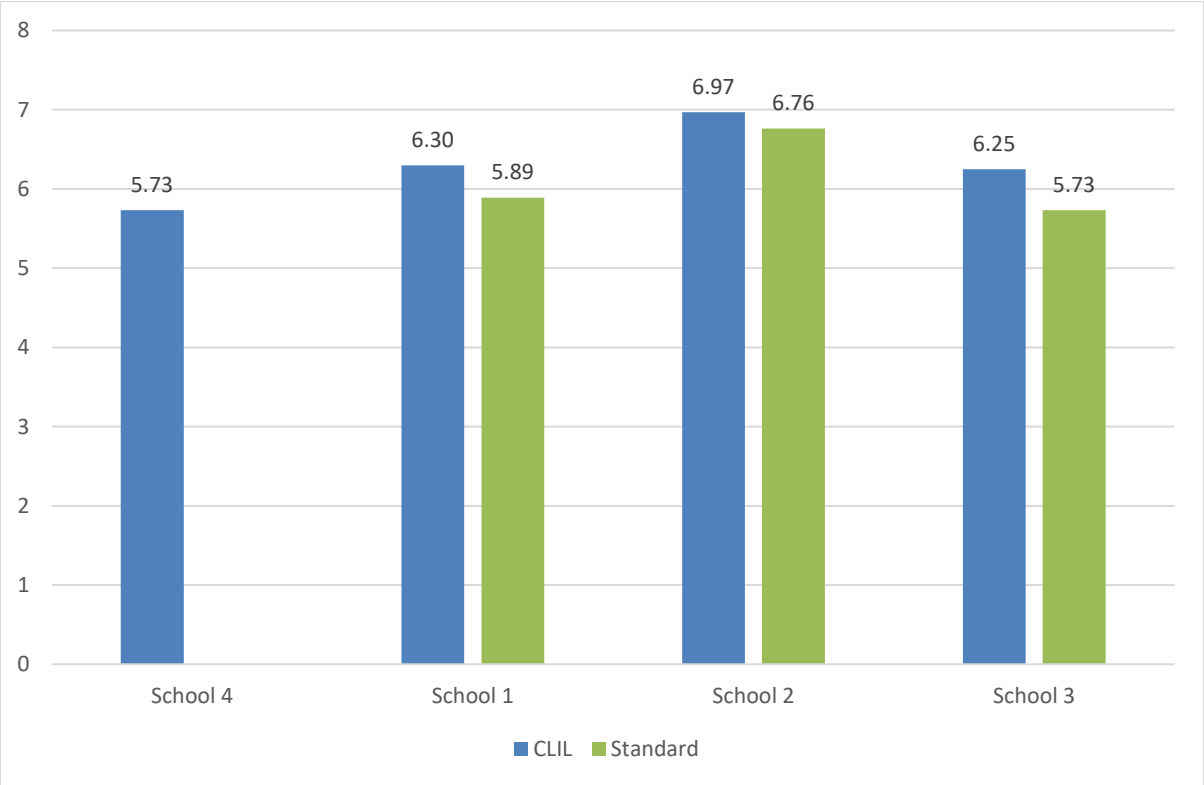

Figure 8: Literacy – Year 5 Performance 2014 to 2016

As shown in Figures 9 to 11 the bilingual cohorts outperformed the non-bilingual groups in all schools across the three years of testing for Year 5, apart from School 2 in 2016. The decrease in performance at School 2 might be accounted for by the nature of the program in this one context, where the “Gifted and Talented” students are taken out of the bilingual program in Year 4. Therefore these high performing students would move from the bilingual group to the non-bilingual group by Year 5.

Overall performance in the NAPLAN test for year 5 students across the three years of data for School 1 (Figure 9), shows that in the latter two years of data the bilingual students outperformed their peers relatively comparatively. In the first year of data results were very similar for both cohorts in this school.

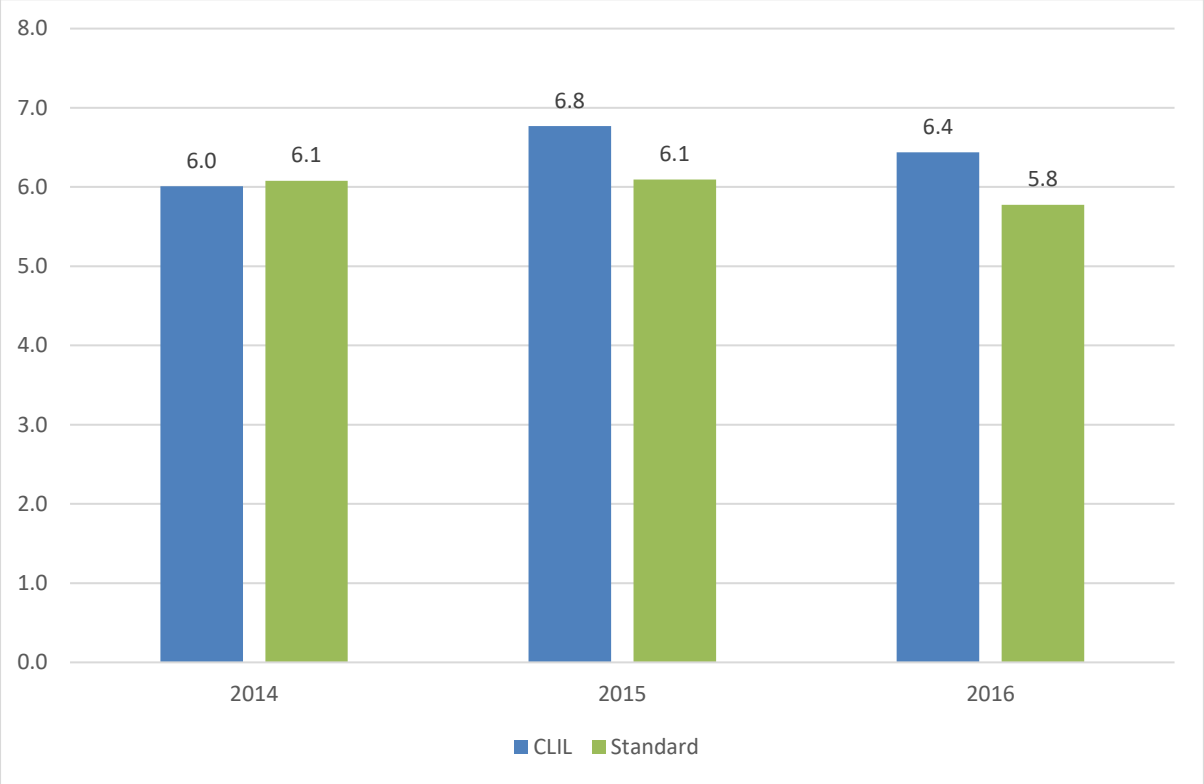

Figure 9: School 1 Year 5 Overall Performance 2014 to 2016

In School 2 (Figure 10) we see the opposite pattern to School 1, with overall higher scores for the bilingual students in the first two years of data, and slightly lower in the third year.

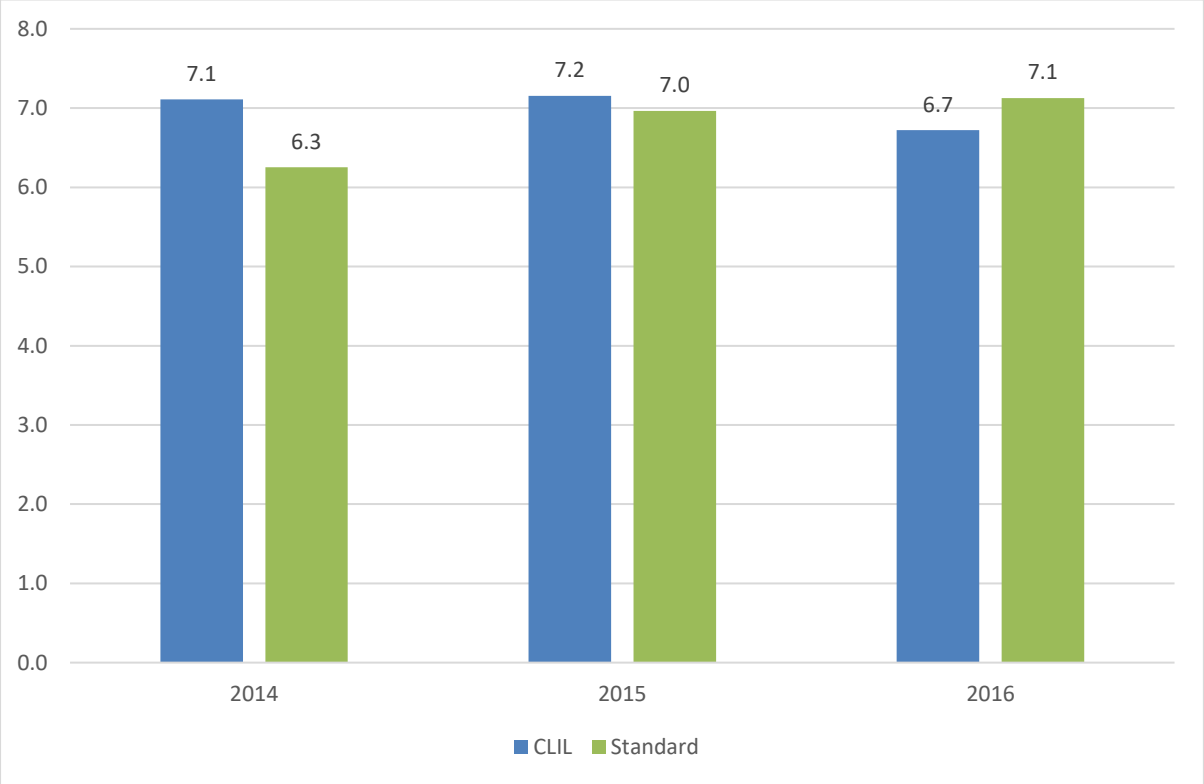

Figure 10: School 2 Year 5 Overall Performance 2014 to 2016

In School 3 (Figure 11) we can see the bilingual cohort outperforming the non-bilingual cohort in two years of data, and performing equally in 2015.

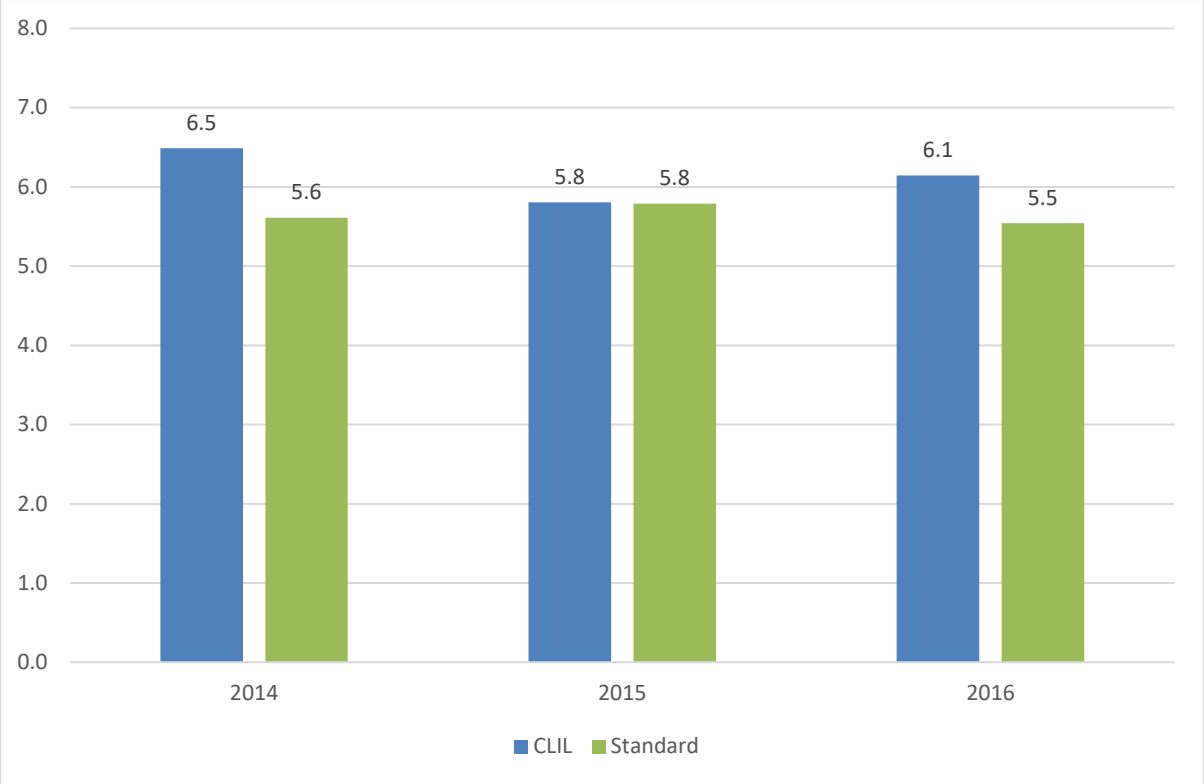

Figure 11: School 3 Year 5 Overall Performance 2014 to 2016

There is no comparison cohort for school 4 (Figure 12a), thus we show just the NAPLAN scores for each year as a whole.

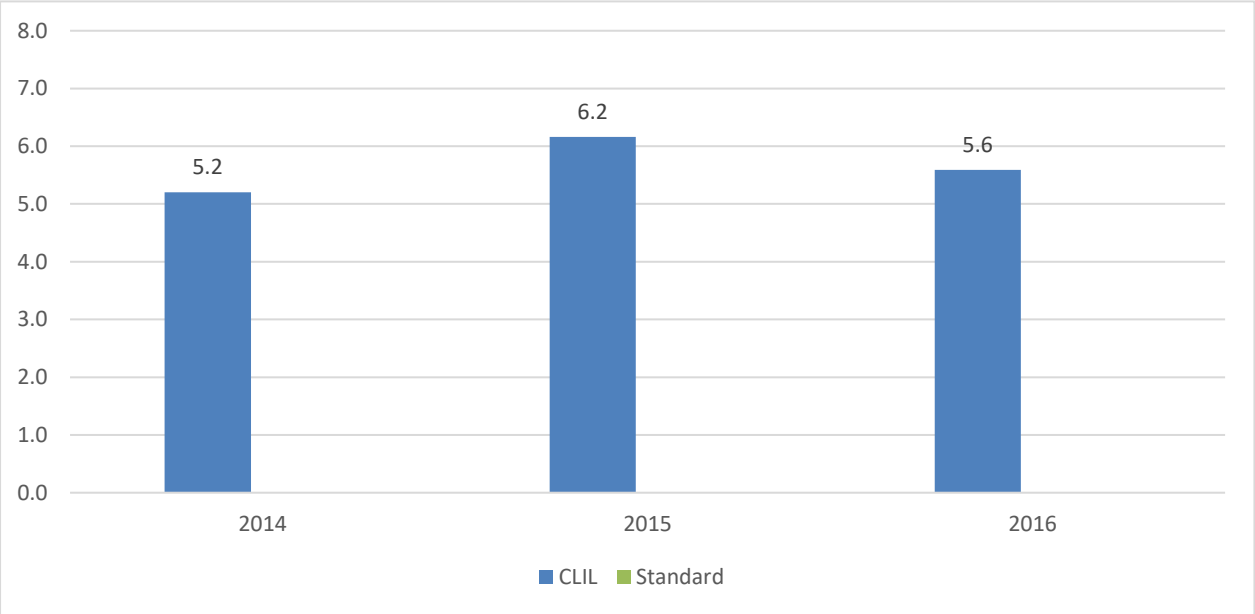

Figure 12a: School 4 Year 5 Overall Performance 2014 to 2016

We are able to compare school 4 with schools that the testing organisation deem "similar" in terms of demographic and socio-economic status using the publicly available data published about similar schools (see Figure 12b). In the 2016 results for writing, we can see that School

4 performed strongly across bands 6 and 7, although had no students performing in bands 8 or above. Given that the school is small in population one student can alter the percentages substantially, although overall the school performed in a comparable to the other schools identified as “similar”.

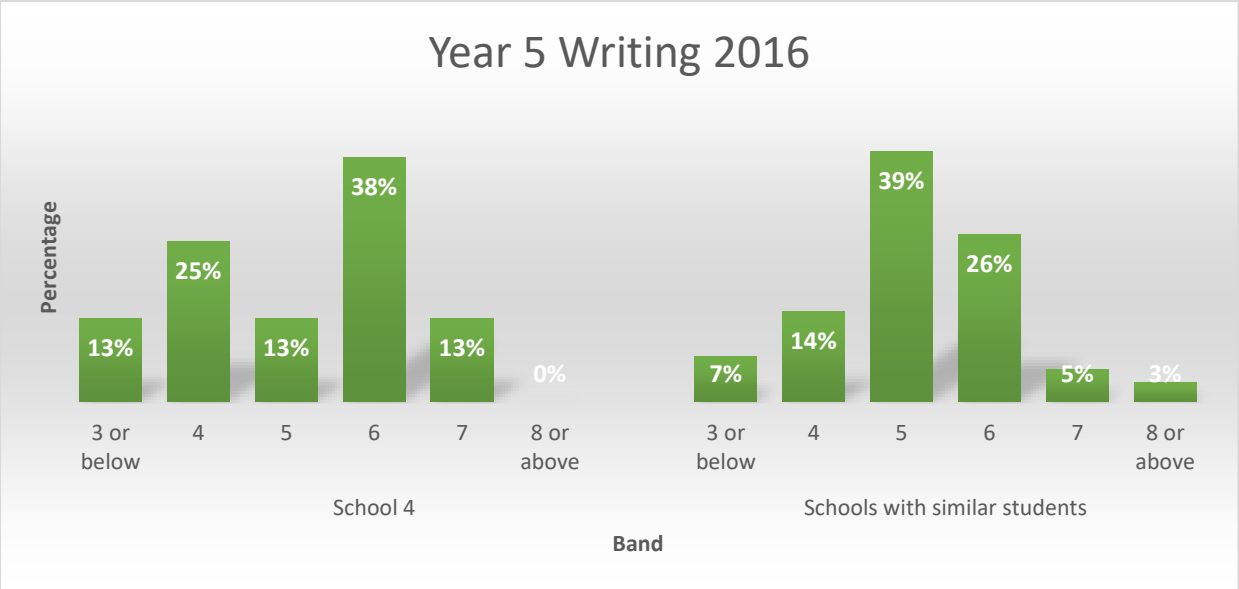

Figure 12b: band performance in writing compared with similar schools

Band change from Year 3 to Year 5.

By looking at the cohort performance comparing their results from year 3 and 5, we can see that band performance varied by 1.5- 2% as students moved from Year 3 to Year 5 in both the bilingual cohorts and non-bilingual (Figure 13). We can therefore say that there is no detriment to student NAPLAN results because of participation in the bilingual program. We can see that there is band improvement for both groups of between 1% and 2%.

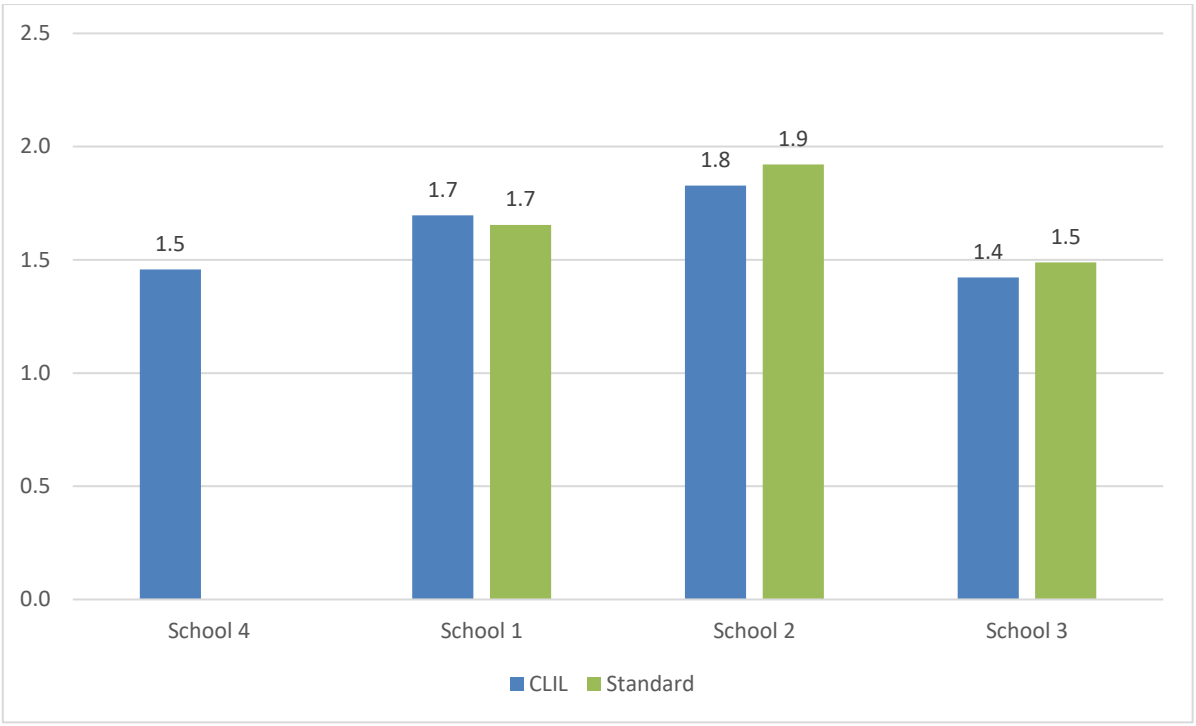

Figure 13: Band Improvement Overall (Year 3 to Year 5)

Looking solely at literacy improvement there is little difference between the two cohorts. Even in School 2 where the top performing students are taken out of the bilingual program, the difference in literacy performance is negligible between the two groups. In Schools 1 and 3 there is no difference in performance improvement (see Figure 14).

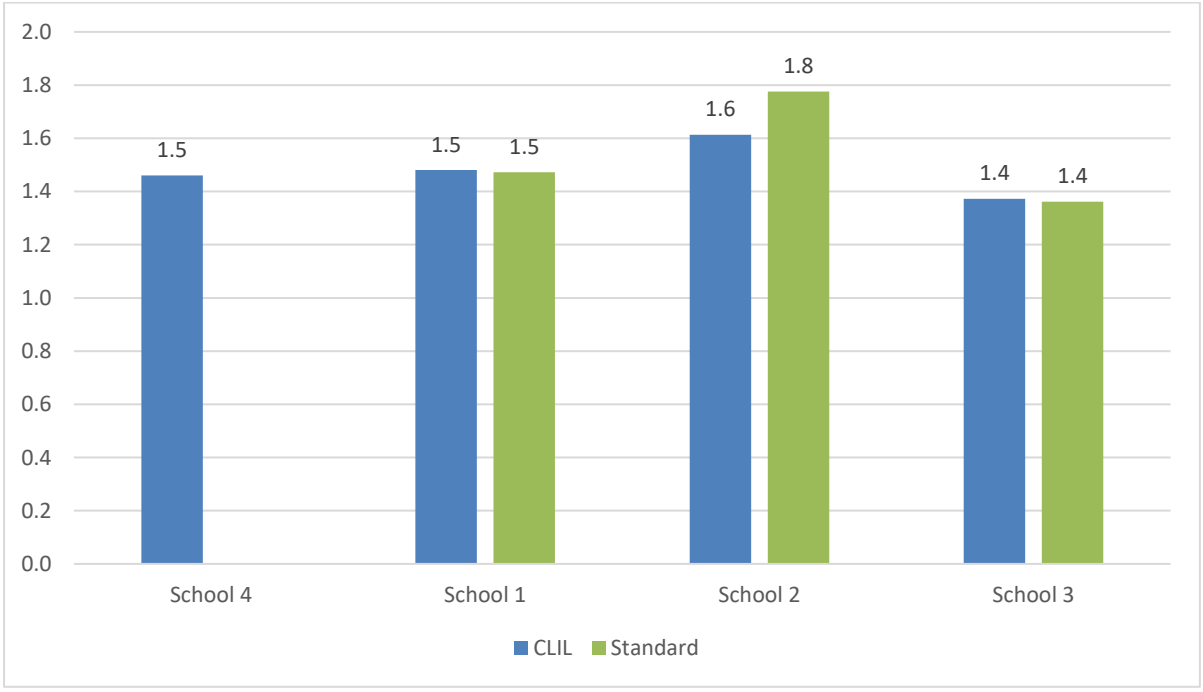

Figure 14: Literacy Band Improvement Year 3 to Year 5

Overall, our analysis of the NAPLAN data from these four schools over a 5-year period indicates that in some measures the bilingual cohorts outperform their peers to a statistically significant degree. In other measures performance is similar between both groups showing absolutely no detriment to being in a bilingual program. Literacy improvement is masked in School 2 where the top performing students are removed from the bilingual program before year 5 and yet both groups still perform to a similar standard.

Teacher perception of literacy in CLIL contexts

We also interviewed teachers about their perceptions of student achievement in English in relation to the bilingual programs to understand teacher perception of literacy in these programs. In this section we outline the aspects of the interviews that answer the question:

How do teachers perceive the literacy learning of their students in the bilingual/CLIL program?

Our interviews indicated the ways in which the teachers perceived their students' performance in English. We specifically noted their ideas about how involvement in the bilingual program showed links to their understanding of, and use of, English.

Teachers across two schools indicated the ways they see their students performing well in English and how they believe that is a result of the student participation in the bilingual program:

> *"it's [the bilingual program] working, 85% of the Korean bilingual students at School 1 hit band 5 or 6 in both literacy and numeracy so that's very encouraging." (S1T1)*
>
> *"90% of the students across three bilingual classes are at the expected level or exceeding it and they're only 5 years old" (S2T5)*
>
> *"I've got to say that I was blown away by how much they were able to pick up in such a short time. These children … in their English development, their reading, their writing, they're already performing at a very high level." (S2T6)*

Overall the teacher comments indicate that the teachers believe their students are succeeding more highly in English as a result of participating in the program.

Teachers also made some specific comments about their perceptions of the direct link between literacy skill development and studying within the bilingual program, on the whole indicating positive links:

> *"There hasn't been any negative impacts [for students by being in the program] that I've witnessed. And even though I work here and I'm a parent I didn't really think that would be the case." (S4T1)*

> *"It's hard to assess or articulate the actual the reason or the evidence for it but I can definitely see it there." (S4T1)*

> *"if anything it improves their comprehension" (S3T1)*

Even when teachers found it difficult to quantify the link between language learning and literacy development, they still highlighted the metalinguistic awareness and cross-linguistic transfer that is developed in the students in the bilingual program:

> *"the only thing I've noticed from what I think is due to the bilingual program is the children's ability to switch between languages, so when they learn Gumbaynggirr Aboriginal language, pick it up really easily. They understand that languages can have different word order and create meaning differently. And they switch between Indonesian and Gumbaynggirr… So they're developing that ability to switch codes I guess. That's what I've noticed." (S4T3)*

> *"just reading and spelling … they just seem to be more switched on with it all. Somehow it just… I'm not sure how it works but you see they are better." (S4T4)*

> *"look I'm not sure how it works knowing another language, but I'm convinced it does help them. Does it make them more aware of structure of language, does it make them more aware of sound, phonetic awareness, possibly yes." (S4T4)*

The sub-conscious nature of the language switching which students undertake was highlighted by one teacher as evidence of the cognitive development of their students and the natural way in which they began to interact in both languages:

> *"sometimes out in the playground some kids will just talk in Indonesian, and we want to encourage that." (S4T4)*

Some teachers also indicated that they were astonished by the cognitive development they had observed in the students they taught who participated in the bilingual programs. Teachers

don’t feel equipped to label exactly what they observe but they believe that there are significant changes in the students involved in the bilingual programs:

> *“Their brains are amazing. A lot of times they're quiet for other reasons … shyness things like that and you think maybe they're not quite getting it and they blow your mind when you do ask them.” (S2T5)*

> *“Plus a lot of guessing skills, like oh I heard part of that word or I heard a negative form so maybe it’s to do with negative so they can also guess the context” (S2T8)*

> *“it’s hard to tell if doing the bilingual makes them more of a problem solver and more of an intellectual thinker or if it’s just the children whose parents put them down for bilingual. But certainly the kids in my class do better academically than the ones in the other class. … and they need to listen really well. They need to know those tiny little differences” (S2T9)*

One teacher observed substantial differences between the ability of the students in the bilingual program to talk about language, and to distinguish metalinguistic subtleties more easily than students in the other stream:

> *“Definitely in phonics. Recently we’ve changed our phonics program and this year is the first time they’ve come across this program. Typically speaking a lot of children come in Kindergarten … know the names of the sounds but not the sounds themselves. So we start at that level and learn the sounds. But now we’re talking about phonemes and graphemes and these children have taken to the program a lot better. They can hear the sounds better. They’ve taken to it better than other year 5 students.” (S2T9)*

Similarly, another teacher identified student ability to understand metalinguistics. She had observed students using strategies to break language down into its component parts:

> *“They break the language into small chunks so this helps their literacy in English” (S2T8)*

The extracts above indicate a range of ways in which teachers see the students developing cognitively and how these teachers believe it has a positive impact upon student ability in English. The teachers find children appear to be better able to talk about language, to deal with language at a metacognitive level, and are better able to manipulate language, decode and understand languages as systems.

One teacher indicated that they used the English syllabus to help them to plan their program content in order to know how to focus on language in sufficient detail:

> *"the English syllabus, even though it is the English syllabus, applies to the Mandarin program because it's about knowing how to read, applying the strategies of how to read in both languages." (S3T1)*

This teacher saw the crossover between the English curriculum and what is taught through the use of an additional language. They were able to identify the skills which transfer between the two contexts of learning, and had begun to strategically use these documents to link to the learning within the bilingual program.

Some constraints to being able to see the benefits were mentioned within School 2 as students leave the bilingual stream if they are to go into the extension class (also referred to as 'Gifted and Talented'). One teacher said:

> *"We have a challenge class which is children who have a higher creativity. Usually more academic and due to time constraints they don't do bilingual … So it is a shame." (S2T9)*

Teachers at all four schools made comments about the links they see between literacy in the additional language and literacy in English. They highlighted metacognitive and metalinguistic development that they observe in their students and indicated a belief that there is a link between the bilingual learning environment and student literacy development.

DISCUSSION AND LEARNING IMPLICATIONS

We set out to explore bilingual program students' NAPLAN results for literacy in English in comparison with their peers in the same school and with students in other similar schools where no comparison group was available. We found across all four schools the Year 3 students in bilingual classes scored more highly than students in non-bilingual classes by an average of 8 per cent, across all five years of our analysis (2012 to 2016). We also found that students in the bilingual programs continue to perform at a higher or equal level to non-bilingual peers through to Year 5. Using a t-test we found a significantly higher performance by bilingual students in Year 5 for one year of data, while the other two years showed higher achievement although not at a significant scale. While prior research in the field has shown no detriment to student learning from participation in bilingual programs, it is significant that this study has shown a

measured higher performance level. What is particularly notable is that one school removes their “gifted and talented” students from the bilingual program in year 4, and yet the bilingual group still outperformed the other group at Year 5.

In regards to the literacy skills that the NAPLAN test aims to measure, we can infer that higher performance on this test implies improved ability within reading to:

- Connect and interpret ideas across paragraphs
- Interpret the nature, behaviour and motivation of characters
- Identify cause and effect
- Infer a main idea in a text
- Identify meaning within context
- Interpret idiomatic or simple figurative expressions.

In terms of writing, students performing more highly in the NAPLAN test indicate improved ability to:

- Respond to narrative and persuasive tasks
- Use simple persuasive devices, opinions and reasons
- Write simple and compound sentences
- Use referring words accurately
- Punctuate correctly
- Spell most simple and common words correctly
- Use verbs, adverbs, adjectives and nouns.

In relation to language conventions improved performance within the NAPLAN test is linked to ability to:

- Identify spelling and grammar errors
- Correctly identify conjunctions, forms of verbs, adverbs, plural pronouns, prepositions, participles to complete a sentence
- Punctuate using full stop, capitalisation, questions marks and speech marks.

This implies that student reading and writing is more sophisticated in a range of ways when students perform more highly in the tests. An improvement from Year 3 to 5 indicates mastery of more skills within this list, and with more accurate interpretation and application across different text types.

What is notable is that similar patterns of high performance appeared in varied contexts. By comparing students with their peers in the same school within bilingual versus monolingual programs we could see similar patterns in different school contexts. Students in contexts which would be considered typically disadvantaged academically (for reasons such as socio-economic status, Language Background other than English etc) achieved higher results within the bilingual programs than outside of them. This is notable, when we observe schools removing students from additive programs due to a perception that they will struggle as was the case in school 3.

Our t-test analysis shows that in one year there was a statistically significant benefit shown from the bilingual program. For the other two years the statistics demonstrate that there is higher performance by the bilingual groups, but not to a statistically significant level. There is therefore no detrimental impact to student literacy outcomes by being in these bilingual programs. This reflects research which indicates either benefit or no detrimental impact (Bialystok, 2016; Fortune, 2012; Genesee, 2008; Lindholm-Leary, 2001). Our data add to the argument that bilingual programs can benefit all learners regardless of language background or learning challenges (Genesee, 2015). Prior to our study none of the schools had undertaken a comparison of the bilingual classes and the non-bilingual classes. It is therefore valuable to be able to provide this data to school administrators, policy makers and the department of education to indicate that the bilingual stream students perform, at least to the same level as the regular stream, at best they show significantly higher results in literacy achievement.

We also set out to analyse how teachers perceive the literacy learning of their students in the bilingual program. Teachers reported varying perceptions about students' use of, and knowledge about English, due to having explicit study through an additional language in the classroom. Teachers within the bilingual programs were convinced of the positive experience for most learners. Teachers were not concerned about switching/mixing interference and could identify cognitive and metacognitive advantages for their students (Bialystok, 2001, 2016). Teachers noticed improved focus, concentration and ability to undertake listening tasks in more detail as notable skills that their students developed (Bialystok, 2016).

CONCLUDING COMMENTS

This research adds to the call for more varied and widespread understanding of the benefits of bilingual education for learning in the societal language. Our data show that in different contexts (socio-economic, linguistic and urban/regional) within NSW Australia, students performed at a higher or equal level in standardised literacy tests compared to their peers who were not in a bilingual program. Such programs therefore can be implemented in contexts which might previously have been deemed unsuitable for additional language learning.

Learning content through language offers a solution to the often-cited challenge of the crowded curriculum with no detriment to student achievement in the measured literacy outcomes which are valued in the wider education system. This is significant for languages education which is often neglected in crowded curriculum discussions, with the importance of English literacy being valued more highly. Our data show that students can learn through an additional language and perform at a higher or equal level in their English literacy measurement. This was also shown when the most academically able students were removed from the bilingual class showing that students of all ability levels can perform highly in a bilingual program.

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