



Access to and equity in the curriculum in the Australian government secondary school system

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Abstract

One of the main aims of schooling both in Australia and internationally is to provide equitable access to education for all children regardless of their social background or the schools they attend. A key part of this aim should be reflected in access to the curriculum, particularly in government schools, which in Australia enrol the majority of students and are affected by policies of marketisation and school choice. The purpose of this paper is to investigate the effects of a range of factors on access to the senior secondary curriculum and mean school achievement. The study addresses whether the number and level of academic subjects offered, and mean school achievement levels, are associated with socioeconomic advantage, location, school size, school selectivity and resourcing. We conduct regression analyses using administrative data on all government schools from Australia's largest state of New South Wales, to show that schools in outer regional, remote and very remote areas, as well as those of lower socioeconomic advantage, and of smaller size, offer fewer and less advanced subjects compared to other government schools. This variability also has an association with mean school achievement levels.

Keywords Government schools · Rural education · Socioeconomic status · Educational inequality · Student achievement · Schooling · Secondary school

Introduction

In most OECD countries including Australia, equity is a key premise underpinning the structure, delivery and resourcing of education [Organisation for Economic Cooperation and Development (OECD 2012)]. The concept of equity encompasses two central ideas: *fairness*—that education should be available to all students at an acceptable standard regardless of their individual background or circumstances—and

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inclusion—that education should be universal and accessible to all (Field et al. 2007). For well over a century in Australia, equity objectives have been implicit in schooling, first in the implementation of free, compulsory elementary schooling during the 1870s and 1880s (Keating and Klatt 2013; Teese 2011) and then in the creation of mass public high schools after World War II (Teese 2011). In the 1970s, increases in government spending levels on schooling were aligned to principles of “equality of opportunity” (Karmel 1973, p. 16).¹ Equity and inclusion objectives have also been recognised in most declarations on schooling since their inception in 1989 (see for example, Education Council 1999, 2019; Ministerial Council for Education, Employment, Training and Youth Affairs 2008) through, for example, a “vision for education in Australia and [a] commitment to improving educational outcomes for young Australians” (Education Council 2019, p. 2).

More recently, the fulfilment of equity goals has been linked to the provision of school funding by governments at both state and Commonwealth level. Initiatives in the recent *Review of Funding for Schooling* (Gonski et al. 2011), one of two documents colloquially known as the “Gonski reviews”, contained aims to improve “the overall equity of educational outcomes in Australia” and to “ensure that demography does not equal destiny for students” (Gonski et al. 2011, p. 110). These aims were mirrored to a much more limited extent in Gonski’s later volume *From Growth to Achievement* (Gonski et al. 2018; Cobbold 2020), but still made the promise of “fair, transparent, equitable and needs-based” funding in the programme that was subsequently adopted (Department of Education and Training, 2017, p. 1). In New South Wales (NSW), Australia’s most populous state, needs-based equity loadings are also provided to schools “to meet the additional learning needs of disadvantaged students and reduce the impact of disadvantage on student outcomes” (NSW Department of Education 2022a, p. 4). A base school loading according to location is also provided (NSW Department of Education 2022a), and funding based on perceived need, additional staffing and other resources also supports the notion of equitable access to curricular offerings (NSW Department of Education 2022a).

Despite all these initiatives, Bonnor et al. outline that “equity, inclusivity, and accessibility to excellent learning opportunities [in Australia] continue to deteriorate” (2021, p. 1). Policies of marketization and school choice have seen an increase over time in the share of students enrolled in non-government schools (Watson and Ryan 2010), and these aspects have increased the social segregation of students across government and non-government schools (Perry & Lamb 2016; Rowe and Lubienski, 2017), the ensuing residualisation of government schools (Kelley and Evans 2004; Preston 2013) and the concentration of higher needs students in government schools (Field et al. 2007; Kenway 2013). Government schools are obligated to be available to all students, and this has relative effects on the size of schools and the flight of students to more advantaged schools, particularly in rural

¹ In his 1972 Australian election speech, former Prime Minister Whitlam famously stated: “Education should be the great instrument for the promotion of equality” (Whitlam 1972, n.p.).

settings (Bonnor et al. 2021; Dean et al. 2021).² In addition, since the early 1990s, government schools have been the subject of “quasi-marketization”, requiring them to compete with non-government schools in relation to management, governance and assessment regimes (Hogan and Thompson 2019). Consequently, national education policy has resulted in Australia having one of the highest proportions of non-government school enrolment levels, with students from more advantaged families significantly overrepresented in these schools (Dean et al. 2021; Bonnor et al. 2021).

Thus, the burden for the realisation of equity goals lies disproportionately with government schools (Cobbold 2021; Vickers 2005) and is set alongside the additional pressure to deliver quality student outcomes. While government schools are charged with offering educational opportunities in environments which seek to maximise student achievement (Cobbold 2021), at the same time they carry the bulk of high-needs students and may be further differentiated in terms of their size, location, social composition and funding base (Bonnor et al. 2021; Bonnor and Shepherd 2017; Watson and Ryan 2010). There are also strong public perceptions and discourses surrounding government schools and their responsibility for equity (Gerrard 2018; Gerrard et al. 2017). As stated by Gerrard:

... the ‘public’ in ‘public schooling’ symbolises ... something that goes to the heart of equity and democracy—or at the very least the idea of, and hope for, equity and democracy. (Gerrard 2018, p. 207)

The Australian schooling system, curriculum and equity issues

In this scenario, we seek to demonstrate how government secondary schools take on the challenge of providing equitable and accessible education by examining differences in the curriculum options available to students in their final year. In Australia, secondary school is the culmination of the last 6 years of schooling in which most students are aged between 13 and 18 years, with the final year known as Year 12. Schooling is mainly the responsibility of each state and territory. However, curriculum, teaching standards and achievement testing are national responsibilities for most years of schooling (the Australian Curriculum was introduced in 2015), with state and territory governments specifying curriculum for the final two years of schooling and certifying final year student achievement. Around two-thirds of students are enrolled in government schools (Australian Bureau of Statistics 2022). The remainder attend schools in the non-government sector, consisting of Catholic and other independent schools. While non-government schools charge fees from

² In Australia, government schools are largely free of compulsory fees and usually operate according to conditions which mean they must admit all students whose parents live within a certain radius of the school. In contrast, parents may apply for admission to any non-government school of their choice. In addition, students applying to government selective schools in NSW are tested for their academic ability and must live in the state of NSW in the secondary years (NSW Department of Education 2022b).

parents, unlike most countries, they also receive government funding, and there are few restrictions on how such funding is used (Thomson 2021).

Evidence suggests that access to subjects and resulting student achievement is influenced by the socioeconomic status (SES) of students as well as the types of schools they attend (Dean et al. 2021; Chesters and Daly 2017; Roberts et al. 2019). This is not only because students, from the very earliest years of school, are often channelled into different subjects according to their social background and perceived ability levels (Francis and Mills 2012; Perry 2012), but also because schools may be stratified according to the subjects they offer (Han 2015; Perry and Lubienski 2020). Currently, there is also a lack of evidence to identify whether national and jurisdictional policies are supporting the provision of equal access to the curriculum. This is problematic given curriculum access has the potential to influence post-school opportunities for students (Roberts et al. 2019). We focus on factors that influence access to the curriculum among government schools in Australia's largest jurisdiction of NSW. While curriculum access is only one aspect of schooling, it is albeit an important example of the equity challenges faced by Australia's government schools.

Factors affecting curriculum equity

Evidence suggests that decisions about curricular offerings are influenced by a variety of factors. In Australia, such factors should be mediated by a national curriculum that "sets the expectations for what all young Australians should be taught, regardless of where they live in Australia or their background" (Australian Curriculum and Reporting Authority [ACARA], 2021, n.p.). However, schools are still required to interpret the national curriculum before implementing it. In addition, the national curriculum in senior secondary schooling is not universal, with each state and territory repurposing it into their jurisdictional curriculum. In senior secondary curricula, there are a wide variety of subjects available, and schools need to make decisions about what subjects they will provide to their students. These decisions are usually made based on student demand, staffing, budgets, and the perceived benefits for student pathways (Perry and Lubienski 2020). However, it is also apparent that access to subjects is influenced by ability streaming,³ levels of socioeconomic advantage, funding, school location and size. Before proceeding to our analysis, we review each of these factors in turn.

Streaming

The practice of streaming—placing students into classes or learning groups based on an assessment of their apparent ability level—often starts early in schooling and can influence student opportunities through schooling. In Australia, streaming of

³ This practice is also known as streaming or tracking internationally, particularly in the UK and USA.

students occurs at a high rate compared to other OECD countries (OECD 2012), particularly in the subjects of mathematics, English and science in high school (Perry and Lamb 2016). There are, however, no national policies that dictate requirements for dividing students according to ability grouping (Johnston and Wildy 2016), even though the introduction of the Australian Curriculum aimed to reduce this practice (Perry and Lamb 2016). Internationally, there is mixed evidence about the impact of streaming on curricular offerings. In some instances, the practice of streaming students appears to increase curricular offerings (Au 2007), while in other schools it decreases curricular offerings (Au 2007; Berliner 2011). Streaming students by ability level has also received a lot of criticism. It does not always provide benefits for students (Macqueen 2012; Education Endowment Foundation 2018; Parsons and Hallam 2014), and the practice has been criticised for negatively affecting students located outside metropolitan locations, students from low SES backgrounds, students from non-English speaking backgrounds, Indigenous students, racial minority groups, and particular genders (Brunello and Checchi 2007; Connolly et al. 2019; Dickson et al. 2020; Hornby and Witte 2014; LeTendre et al. 2003; Macqueen 2012; Oakes 2008). Streaming students early in their schooling can also restrict them from accessing certain subjects later in their schooling (LeTendre et al. 2003; Jaremus et al. 2020).

School socioeconomic advantage

Schools with different levels of socioeconomic advantage provide access to different curricular offerings to students throughout their schooling. In senior high school in Australia, students from higher SES backgrounds are more likely to study high levels of mathematics and science (Dean et al 2021; Roberts et al. 2019). On the other hand, students from lower socioeconomic backgrounds are more likely to participate in vocational studies (Roberts et al. 2019; Thomson 2005). In the lower years of high school, socioeconomically advantaged students are also more likely to achieve higher scores in PISA assessments at age fifteen (Chesters 2019) and to show increases in their test scores (Perry and McConney 2010). Further, socioeconomically advantaged students are more likely to have access to opportunities such as International Baccalaureate (IB) programmes and opportunity (extension) classes (Perna et al. 2015). Internationally, schools in disadvantaged areas with lower enrolment levels are less likely to have access to the same resourcing as more advantaged schools which may also influence their curricular offerings (Cobbold 2017).

School funding

Access to the curriculum also relates to the influence of school funding. Schools with higher levels of funding generally have access to more resources and are therefore able to offer a wider range of curricular offerings (Baker and Weber 2016). There are several possible reasons for the influence of funding on curricular offerings. Some subject and course offerings may cost more in terms of material and staff, which influences what subjects schools are able to offer (Fazekas 2012). For

example, school leaders identified declining enrolments and therefore declining funding as a reason to discontinue offering an IB middle years programme and the additional cost of professional development for staff was not considered cost-effective (Dickson et al. 2020). Schools with less funding often direct resources towards the needs of most students because it is more cost efficient than spending funding on a small number of students (Lamb 2007). Higher levels of funding also enable schools to allocate more funding to teacher salaries and therefore potentially lower staff and student ratios (Baker and Weber 2016). Socioeconomically advantaged private schools are more likely to subsidise curricular offerings that are not cost neutral compared to less advantaged schools, and these curricular offerings are more likely to be subjects that support university entry than vocational subjects (Perry and Lubienski 2020). Public schools with socially advantaged families (Rowe and Perry 2020a, 2022), as well as public selective schools (Rowe and Perry 2020b), are also more likely to subsidise curricular offerings because they can attract more funding from parents (Rowe and Perry 2020a).

Location

In Australia, the location of a school is also likely to influence the curricular offerings that students can access in senior secondary schooling. Compared to students in metropolitan locations, students in non-metropolitan locations are less likely to access more advanced subjects (Dean et al. 2021), have fewer subjects to choose from (Roberts et al. 2019) and are more likely to undertake vocational education subjects (Perry and Lamb 2016; Roberts et al. 2019). There are also differences in the focus of content within subject areas that students access. One study, for example, identified that non-metropolitan students had less access to digital technology subjects and were more likely to enrol in design, technology and engineering-focussed subjects compared to metropolitan students (Murphy 2020). Internationally a similar pattern of access to advanced and extension programmes is evident. In the USA for example, students located outside metropolitan locations have less access to IB programmes of study (Thier and Beach 2021) and Advanced Placement courses (Gagnon and Mattingly 2016; Thier et al. 2020) compared to students in metropolitan locations. Access to curricular offerings is also made more difficult by small student numbers and the difficulty non-metropolitan schools face in attracting and retaining staff (Downes and Roberts 2018).

School size

Regardless of location, school size impacts the decision-making processes around curricular offerings. Selectivity in enrolment processes in some schools means that they can more easily attract higher SES students and encourage high enrolment levels from year to year (Böhlmark et al. 2016; Bonnor et al. 2021; Perry and Southwell 2014) and research has also shown that more advantaged schools in terms of student

composition across both government and non-government sectors have experienced the greatest growth in enrolments over time (Bonnor et al. 2021). Schools with larger student numbers are able to offer a wider range of curricular offerings compared to smaller schools and to offer more courses and individual subjects as a result (Dean et al. 2021; Lee et al. 2000; Perry and Southwell 2014). Subject offerings in larger schools are also driven by student background, school composition and interest in subjects, whereas in smaller schools, school leaders' perceptions of student abilities, interests and expected pathways are more likely to influence school decision-making processes in regard to subject offerings (Perry and Lubienski 2020).

The importance of equity in the curriculum

The principle of equal access to schooling for all students should encompass equal access to curriculum opportunities, including elective subjects, advanced courses, senior secondary subjects and extracurricular activities. Nationally, the Australian Curriculum aims to ensure all students have access to the same curriculum content regardless of school, student background and location in the interests of "improving the quality, equity and transparency of Australia's education system" (ACARA, 2021, n.p.). Yet the Australian Curriculum and associated policy processes have tended to focus on supplying standardised and measurable outcomes, rather than working with diverse groups of learners and making curriculum and knowledge accessible to all (Zipin 2015). Instead, as argued by Connell (2012) it is important to strive for:

...curricular justice; that is to say, a curriculum organized around the experience, culture and needs of the least advantaged members of the society—rather than the most advantaged [...] where the abstract idea of 'diversity' becomes a concrete matter of experience, and the possibilities of mutual aid become shared learning and creative experiences. (Connell, 2012, p. 682)

In what follows, we examine access to and achievement in the senior secondary curriculum in NSW government schools. This is a key example of how all schools carry a higher responsibility to provide access to the curriculum, compensate for social background and facilitate social mobility, thus pursuing curricular justice.

Method

Data

This research draws on all government schools in NSW (436 schools) in 2017, in which at least one student in each school is undertaking a subject in the examinable curriculum (see below for further details). NSW is the most populous state in Australia, having approximately 10.7 million residents in 2023 (Australian Bureau of Statistics 2023a), about 41% of the total Australian population (Australian Bureau of Statistics 2023b). NSW is the single largest school jurisdiction in Australia and

one of the largest in the world by student numbers (NSW Department of Education 2019). The analysis includes all government schools in NSW and the government school sector comprises 436 schools (56.6%) of a total of 770 schools in NSW that have Year 12 enrolments. In this regard, the site of our study is significant as it comprises a large component of all government schools. The data used in this study are derived from a database developed by the authors drawing upon administrative data from the NSW Education Standards Authority (NESA), the curriculum authority with responsibility for all NSW schools, for students completing senior secondary schooling in 2017.⁴ Out of the 436 government schools, 21 are fully selective schools which are included in the analysis although they are not always separately identified. School characteristics are taken from the NESA dataset, supplemented where necessary from ACARA data on Australian schools (ACARA, 2016a).

We analyse the number of subject offerings in the final year of government secondary school (that is, Year 12) in NSW. In NSW, final year student achievement is recognised through the award of the Higher School Certificate (HSC) Record of Achievement (NSW Education Standards Authority 2020; Universities Admissions Centre 2018). School subjects included in this analysis are those which are examinable and contribute to the award of the HSC. The exceptions to this are language subjects. These are excluded because there are a very large number, they are studied by relatively few students in NSW and are often both culturally and regionally specific to those studying them.

Outcome variables

The outcome variables are the number of vocational (VET) subject offerings per school, the number of non-vocational (non-VET) subject offerings per school and the mean number of subjects per total school enrolment size. A fourth outcome variable is average HSC results per school. The mean results in this analysis are based on students' marks for each examinable course that students undertook (language subjects excluded), averaged for each school. Additional outcome variables are also used to assess the complexity of subject offerings in schools as part of the descriptive analysis: the number of non-VET subject offerings at stages 1, 2 and 3 per school, and the number of VET subject offerings at stages 1 and 2 per school. These stages are imposed by the authors in the research to distinguish between the level of subjects, that is, between more or less advanced subjects in relation to senior secondary schooling (Perry and Southwell 2014; Dean et al 2021).

Predictor variables

We use the predictor variables of mean school SES, location, year size, level of government funding per student, number of teaching staff per enrolment and type

⁴ Data in our research have been provided with agreement from the NSW Education Standards Authority and are examined under University of Canberra Human Ethics Approval Number 20170077.

of school. These variables cover the main factors identified earlier in this paper as affecting curricular access. School mean SES is calculated using students' SES (derived from parental occupation and education information from school enrolment forms), where the SES scores of all students are averaged per school and divided into a three-way equal cut of the data, representing low, medium and high levels of school SES. Location is based on the geographic remoteness structure (Australian Bureau of Statistics 2018), coded to four categories of this classification: major cities, inner regional areas, outer regional areas and remote/very remote areas. Year 12 enrolment size is the number of total enrolments in the final year of school and is included as a three-way equal cut of the data (small, medium and large). A variable is included to estimate levels of government funding, which is the combined total amount of state/territory and Australian Government funding allocated to each school in 2017. This information is compiled from financial data provided to ACARA (ACARA 2016b) and is also classified into the 3 equal categories of low, medium and high. Two additional variables are included, but because of issues of collinearity, they are each only included once in the models in Tables 4 and 5. The number of teaching staff per enrolment is a measure of school resource levels and is classified into 3 equal categories: low, medium and high. This variable is only included in the models in Table 4. Type of school separately identifies fully selective schools from other government schools and is only included in the model in Table 5. In addition, the number of subjects per year 12 enrolment is added as a predictor to the model in Table 5 to assess the relationship of curriculum access to school mean achievement levels.

Analytical strategy and research questions

Initially, we explore the data through descriptive analysis and then conduct Ordinary Least Squares regression to test the association between the number of vocational and non-vocational subjects offered in the final year of school, mean school achievement levels and the characteristics of government schools. There are two research questions:

1. Are the number and level of academic subjects offered in the final year of secondary school associated with school socioeconomic status, location, enrolment size and the resourcing levels of government schools?
2. Are mean school achievement levels associated with school socioeconomic status, location, enrolment size and the selectivity of government schools?

Results

Descriptive analysis

To contextualise NSW government schools, selected characteristics of these schools are given in Table 1 and Fig. 1 by location. Of the 436 government schools in NSW,

Table 1 Characteristics of NSW government schools, 2017

Measure	School location					All schools
	Major cities	Inner regional areas	Outer regional areas	Remote/very remote areas		
Total government schools (n)	247	96	76	17	436	
Non or partially selective schools (n)	228	95	75	17	415	
Fully selective schools (n)	19	1	1	0	21	
School socioeconomic status (%)						
Low	27.1	26.0	50.0	88.2	33.3	
Medium	26.3	53.1	35.5	11.8	33.3	
High	46.6	20.8	14.5	0.0	33.5	
Mean year 12 enrolment (n)	123	76	28	10	92	
Minimum year 12 enrolment (n)	29	7	1	1	1	
Maximum year 12 enrolment (n)	450	250	94	26	450	
Mean teaching staff per total school enrolment (n)	12.6	11.3	9.4	7.6	11.6	
Mean level of government funding per student (\$)	14,969	17,652	22,854	31,817	17,558	
Mean subjects per total school enrolment (n)	26.8	19.5	14.9	19.7	22.9	
Mean subjects per Year 12 enrolment (n)	3.8	2.3	1.2	0.9	2.9	

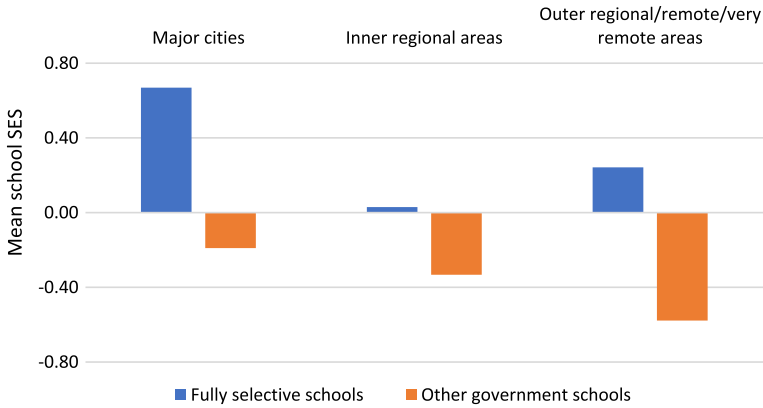


Fig. 1 Mean school SES by location and type of school

57% are in major cities, 22% are in inner regional areas, 17% are in outer regional areas and 4% are in remote or very remote areas. While 47% of schools in major cities are of high average SES, most schools in regional and remote areas are of medium or low SES and the mean number of Year 12 enrolments and average staffing levels per student also decrease according to the remoteness of a school's location. In contrast, the amount of government funding increases by remoteness. Table 1 also provides the average number of (examinable) vocational and non-vocational subjects offered by schools across each of the four locational groupings. As the mean number of subjects is highly correlated with the total numbers of enrolments in schools, the two measures included in the table show the mean number of subjects per total school enrolment and the mean number of subjects per Year 12 enrolment. The first of these measures indicates that it is outer regional areas, on average, that offer the fewest subjects relative to the size of their total school enrolments. The second measure indicates that schools across increasingly remote locations offer fewer subject offerings even when the size of the Year 12 enrolment cohort is considered.

Figure 1 shows that the average levels of SES are very different across selective schools and other government schools in NSW. While enrolment in selective schools is open to all students regardless of SES (rather, they are subject to academic ability and an application process—NSW Department of Education 2022b), the current data indicate that low SES students are underrepresented in these schools.

It is possible to examine subjects by stages based on the scaled mean score of each subject. The scaled mean is used by the Universities Admission Centre to calculate a student's Australian Tertiary Admission rank (ATAR)⁵ and is defined as the “average academic achievement of the course candidature” (Universities Admission Centre, 2018, p. 8). The nature of the subject in terms of how foundational

⁵ The ATAR is used to determine a university entry rank and distribute places in Australian universities according to this rank.

Table 2 Average number of academic curriculum offerings, by type of government school

VET subjects	Mean number of subjects offered per school								
	n = 436 schools								
	Stage 1		Stage 2		Both stages				
	Mean	SD	Mean	SD	Mean	SD			
School type									
Government (non or partially) selective	2.6	1.6	2.9	1.7	5.5	2.7			
Government fully selective	0.3	0.7	0.4	0.7	0.8	1.1			
All government schools	2.5	1.6	2.8	1.7	5.2	2.8			
Non-VET subjects	Stage 1		Stage 2		Stage 3		All stages		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
	School type								
	Government (non or partially) selective	12.9	3.8	7.6	7.6	2.9	2.0	23.4	7.6
Government fully selective	9.4	3.2	10.3	10.3	5.6	1.1	25.3	4.4	
All government schools	12.8	3.9	7.7	2.7	3.0	2.0	23.5	7.5	

Table 3 Average number of academic curriculum offerings in government schools by location

VET subjects	Mean number of subjects offered per school								
	n = 436 schools								
	Stage 1		Stage 2		Both stages				
	Mean	SD	Mean	SD	Mean	SD			
Location of school									
Major cities	2.2	1.7	3.1	1.5	5.3	2.6			
Inner regional areas	3.3	1.5	3.1	1.8	6.4	2.7			
Outer regional areas	2.3	1.6	1.7	1.4	4.0	2.5			
Remote/very remote areas	1.6	1.4	0.9	0.8	2.6	2.0			
All locations	2.5	1.6	2.8	1.7	5.2	2.8			
Non-VET subjects	Stage 1		Stage 2		Stage 3		All stages		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
	Location of school								
	Major cities	13.9	2.7	8.9	1.9	3.7	1.57	26.4	5.2
Inner regional areas	13.8	3.3	7.7	1.8	3.1	1.8	24.7	5.4	
Outer regional areas	9.4	3.6	5.0	2.9	1.2	1.49	15.6	7.2	
Remote/very remote areas	6.4	2.8	2.8	2.1	0.1	0.33	9.2	4.7	
All locations	12.8	3.9	7.7	2.7	3.0	2.0	23.5	7.5	

Table 4 Linear regression models estimating coefficients for effect of school variables on number of subject offerings

	All NSW government schools					
	n=435 schools					
	VET subjects	SE	Non-VET subjects	SE	All subjects per Year 12 enrolments	SE
School SES (ref=low)						
Medium	0.73*	0.3	2.95***	0.5	-0.05	0.1
High	-0.45	0.4	4.83***	0.5	0.04	0.1
Location (ref=capital cities)						
Inner regional areas	1.2***	0.3	1.1*	0.5	-0.7***	0.1
Outer regional areas	0.2	0.4	-3.3***	0.7	-0.9***	0.2
Remote/very remote areas	-0.7	0.7	-7.5***	1.2	-1.0***	0.3
Year 12 enrolment size (ref=small)						
Medium	1.6***	0.4	5.3***	0.7	1.0***	0.1
Large	2.0***	0.5	8.9***	0.8	2.8**	0.2
Number of teaching staff per total school enrolment (ref=low)						
Medium	0.2	0.4	-0.1	0.7	-0.1	0.2
High	1.3*	0.6	-0.8	1.0	-0.1	0.2
Level of government funding per student (ref=low)						
Medium	1.4**	0.4	0.1	0.7	-0.1	0.2
High	0.7	0.6	-1.4	1.1	-0.1	0.2
Constant	2.5***	0.6	17.4***	1.1	2.1***	0.2
Adjusted R squared (expressed as %)	23.0%		70.8%		71.3%	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: One school is excluded from this table because data on government expenditure per student are not available

or “advanced” it is, can be estimated through its scaled mean. Stage 1 subjects are regarded as the most basic offerings, while Stage 2 and 3 subjects are seen to prepare students more specifically for academic study and generally reflect the higher status of subjects in the curriculum hierarchy (Roberts et al. 2019; Teese 1998). In Tables 2 and 3, subjects with scaled means below 24.1 are grouped together as stage 1 subjects, with most subjects having scaled means above this level grouped as stage 2 subjects, and stage 3 subjects (generally with the highest scales means) constituting extension (or the most advanced level) courses (see Online Appendix for a listing of all subjects included and their stage allocation).

In Table 2, we compare the number of curriculum offerings at each stage across fully selective government schools and other government schools. Overall, a much lower average number of VET subjects are offered in fully selective schools than other schools (0.8 versus 5.5 subjects) although the distribution of VET subjects is relatively similar across Stages 1 and 2. In relation to non-VET subjects, an average

Table 5 Linear regression models estimating coefficients for effect of school variables on average school HSC results

	All NSW government schools	
	<i>n</i> = 435 schools	
	Mean school HSC results	SE
School SES (ref = low)		
Medium	2.30***	0.5
High	5.58***	0.6
Remoteness area (ref = capital cities)		
Inner regional areas	0.22	0.5
Outer regional areas	1.75*	0.7
Remote/very remote areas	− 4.60***	1.2
Year size (ref = small)		
Medium	− 1.07	0.8
Large	0.38	1.1
Level of government funding per student (ref = low)		
Medium	− 1.74**	0.6
High	− 2.54**	0.8
Number of subjects per year 12 enrolment		
Medium	0.75	0.8
High	2.17*	1.0
Type of school (ref = govt non/partially selective)		
Government fully selective	6.58***	0.9
Constant	25.72***	0.9
Adjusted R squared (expressed as %)	56.67%	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: One school is excluded from this table because data on government expenditure per student are not available

of 2 extra subjects is offered in fully selective schools (25.3) than other schools (23.4). In addition, 63% of subjects are on average Stage 2 or 3 subjects in fully selective schools, while for other schools, 45% of subjects are Stage 2 or 3 subjects. The table suggests that stratification exists even among government schools in the subjects that are studied (Teese 2011). This is related not only to the academic ability of students but also to the higher average SES of students in fully selective schools.

Table 3 examines the mean number of curriculum offerings per stage for government schools by location. Schools in outer regional areas and remote and very remote areas offer fewer subjects, on average (4.0 and 2.6 subjects, respectively), than do schools in either inner regional areas (6.4 subjects) or major cities (5.3 subjects). Schools in outer regional areas and remote and very remote areas have a lower count of both Stage 1 and Stage 2 subjects than schools in inner regional or major city areas, and the latter schools also have a greater proportion of Stage

2 subjects relative to Stage 1 subjects (48% and 58%, respectively) than schools in outer regional areas (43%) and schools in remote and very remote areas (35%).

Looking at non-VET subjects, Table 3 again shows that a lower count of subjects occurs on average for schools in outer regional areas (15.6 subjects), and remote and very remote areas (9.2 subjects) than for either schools in inner regional areas (24.7 subjects), or those in major cities (26.4 subjects). These patterns exist across the three stages of non-VET subjects, showing that there are higher counts of subjects across all stages in schools in inner regional areas, outer regional areas and remote and very remote areas compared with those in major city areas. As for VET subjects, there are also a higher proportion of Stage 2 and 3 subjects in major cities (48%) than in inner regional areas (44%), outer regional areas (40%) and remote and very remote areas (32%). As also explored earlier in this section, the lower average number of subjects in outer regional areas, and remote and very remote areas is not fully explained by the relatively small number of (Year 12) students in these schools.

Linear regression analysis

In the following analysis, four models are constructed to examine the separate effects on the number of subjects offered in government schools along with the mean HSC results of students in these schools. In the models, a series of predictor variables (as outlined above) are tested for their effects on the associations between school characteristics and the respective outcome variables. These are interpreted as net effects on the outcome variables.

In Table 4, the three models are presented showing the effects of the predictor variables on the number of vocational subjects, the number of non-vocational subjects, and all subjects per Year 12 enrolment. The average number of vocational subjects offered in government schools is 2.5, and the average number of non-vocational subjects is 17.4. Looking first at vocational subject offerings, the data show that the number of these subjects is positively associated with medium SES schools (0.7), schools in inner regional areas (1.2), medium and large schools (1.6 and 2.0, respectively), schools with high numbers of teaching staff per total school enrolment (1.3) and schools with medium levels of government funding (1.4). The number of vocational subjects is on average 0.7 lower in remote and very remote areas than in major cities, although the result is not at a statistically significant level. This finding is despite perceptions of the importance and impact of the VET in Schools programme on Indigenous and remote students in terms of their pathways to further education and work (Campbell 2004; Frawley et al. 2017; Johns et al. 2004), noting that the count of vocational subjects only covers those which are examinable in the HSC.

Turning to non-vocational subject offerings, a higher number of subjects is positively associated with schools in both medium and high SES schools (3.0 and 4.8, respectively), inner regional areas (1.1) and those with medium and high Year 12 enrolment levels (5.3 and 8.9, respectively). The number of non-vocational subject offerings is negatively associated with schools in both outer regional and remote/very remote areas (-3.3 and -7.5, respectively). The findings indicate that schools of lower average SES, as well as those that are more remote and have fewer Year 12

enrolments offer, on average, fewer non-vocational subjects, even after controlling for differences in other school characteristics, although it is likely that the number of subjects is related to the number of Year 12 enrolments to some extent. In addition, the relationship between non-vocational subject offerings and both numbers of teaching staff, and levels of government funding, account for relatively small point differences, indicating there is not a straightforward association between school resourcing levels and access to the curriculum.

The third model in Table 4 examines the effects of a similar group of predictor variables on all subjects per number of students in Year 12. Because the number of subjects is highly correlated with enrolment size, the inclusion of this additional model attempts to assess the effects of school characteristics over and above the relativities of enrolment size. Most markedly, the model confirms that schools in all non-metropolitan areas offer, on average and net of the effects of other factors, fewer subjects than schools in major cities (ranging from -0.7 to -1.0). The model also confirms that even when using a measure which directly assesses the number of subjects relative to enrolment size, schools with both medium and high enrolments are more likely to offer greater numbers of subjects per student than those with low enrolments. This model explains well over half of the observed variation in the model (Adjusted $R^2 = 71.3\%$) and is an indication of a high strength of association between the number of subject offerings and the identified school factors.

Finally, Table 5 considers the relationship between school characteristics and average school HSC levels of achievement, where the number of teaching staff per total school enrolment has been removed from the model, and school type (in which selective schools are identified) is included. A predictor variable on the number of teaching staff per Year 12 enrolment has also been added to the model. After controlling for differences in other school characteristics, higher average HSC results are positively associated with medium and high SES schools (2.3 and 5.6, respectively) and, most notably, with government fully selective schools (6.6) and medium and high numbers of subjects per enrolments (0.8 and 2.2, respectively). Higher average HSC marks are also positively associated with large enrolment size (0.4 points) and with schools in inner and outer regional areas (0.2 and 1.8, respectively). However, average HSC marks are negatively associated with schools in remote and very remote schools (-4.6) and schools with both medium and high levels of government funding (-1.7 and -2.5 , respectively). The model in Table 5 again explains over half of the observed variation in the model (Adjusted $R^2 = 56.7\%$) and is an indication of a high general strength of association between mean school achievement and the identified school factors.

Discussion

The results presented here suggest that the characteristics and social context of government schools, including their socioeconomic composition, location, size and selectivity, all have an influence on students' access to the curriculum and ultimately, mean student achievement levels. Our research shows that differences in the number of curriculum offerings are related to the socioeconomic composition of

schools. In schools with high school SES, the number of non-VET subjects is, on average, almost 5 subjects higher than for schools with low SES. Further, high SES schools have higher mean achievement levels, on average, than low SES schools and descriptive analysis confirms that lower SES schools offer fewer advanced subjects in both VET and non-VET streams. While policies at both state and Commonwealth level aim to compensate schools through additional funding and resources, in this research neither the number of teaching staff, nor levels of government funding, are highly correlated with higher numbers of subjects or higher HSC results. This indicates that the “solutions” to date to address school resourcing levels may not be those that lead to the greatest improvements in terms of access to the curriculum, as well as achievement.

Differentiation in curriculum options is further influenced by differences in the selectivity that determines which students attend certain types of school. Descriptive analysis shows that an average of 2 extra subjects overall, along with fewer average vocational subjects and almost double the average number of the most advanced non-VET subjects, is offered in fully selective schools compared with other government schools. Moreover, regression analysis shows that mean school achievement levels in fully selective schools are almost 7 marks higher, on average, than for other government schools. While places in fully selective schools are based on academic ability and not socioeconomic background, it is known that students from lower socioeconomic backgrounds are underrepresented in selective schools, as reinforced by our analysis. Thus, stratification occurs within the government system by way of the different kinds of school curricula that presuppose students’ interests and likely post-school aspirations.

As well as this, the results indicate clear differences in the number of school subjects offered in schools in outer regional, remote and very remote areas compared with those in inner regional areas and major cities. Schools in non-metropolitan locations are generally less likely to offer VET and non-VET subjects than those in metropolitan locations. Moreover, descriptive analysis confirms that there are differences in the number of more advanced subjects that metropolitan and non-metropolitan schools offer, and the overall achievement of students as demonstrated through the lower average HSC results of schools in remote and very remote areas. However, the higher average results for schools in outer regional areas and inner regional areas (though for the latter, not at a statistically significant level) suggest along with Corbett (2015, p. 10) that many rural schools “may well be overperforming” in terms of the results they achieve given the constraints they face.

It is often assumed that larger schools typically provide a greater number and variety of subjects, with the research literature, indicating that decisions about curriculum offerings by school leaders may be critical in smaller schools (Lee et al. 2000; Perry and Lubienski 2020). The results of our study do confirm that larger schools are associated with greater subject numbers—schools with large Year 12 enrolments offer 9 more non-vocational subjects, and 2 more vocational subjects, on average, than schools with small Year 12 enrolments. This would be expected given the generally larger number of final year students in large schools; however, even when examining the number of subjects per student, schools with medium and high enrolments are likely to offer greater numbers of subjects than those with low

enrolments. Further, after controlling for enrolment size in this way, schools in non-metropolitan areas still offer, on average, fewer subjects than schools in metropolitan areas which suggests that making these schools larger through amalgamations is not necessarily a solution. The marginalisation of smaller schools is a converse effect of the selectivity and marketization processes operating in favour of more socially advantaged schools which means they can sustain higher enrolment levels (Bonnor et al. 2021; Dean et al. 2021; Perry and Southwell 2014).

A limitation of our research is that we have only examined a single jurisdiction in Australia, and our results may not be generalisable to other systems. However, we note that our research builds on similar studies in the Australian context (Perry and Southwell 2014) and that both NSW and Australian schools share many features of high performing education systems internationally and face many of the same challenges in relation to marketization influences and equity issues.

Conclusion

Richard Teese (2011) describes a major transformational change in the history of schooling in Australia as involving not only expectations about educational opportunities but also, increasingly, that of outcomes. He states that this transformation:

...is now already well advanced in socially more advantaged urban communities across the country. But in poorer and more socially-mixed communities as well as in many remote settings, public schools face major challenges... [and this] has far-reaching implications for public schools and how they are funded. For they are the main vehicle for converting opportunities into outcomes. (Teese 2011, p. 11)

This view is validated by the evidence we have presented in the current research. We have shown that substantial stratification of curricular options is apparent within schools in the government sector, where a narrower range of curriculum and fewer advanced-level subjects are generally offered in those schools that serve students from socially disadvantaged backgrounds, as well as schools that are smaller or are in outer regional, remote or very remote areas. These characteristics together combine to form the most marginalised of schools in regard to curriculum availability, diversity and complexity, despite the fact that many receive relatively high levels of government funding and additional resources. Such differentiation is negatively associated with students' ability to progress academically and their opportunities to pursue a range of educational and career choices. It is important to address these issues in order to ensure all students have equality in terms of the opportunities made available through and beyond their schooling experience, thus to bring about curricular justice.

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Author contribution All authors helped shape the research and contributed to the interpretation and critical feedback of the results. JD took the lead in analysing the results. JD and ND took the lead in writing the manuscript.

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Data availability The data that support the findings of this study are not openly available due to reasons of privacy and are subject to ethics approval.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval Data in our research have been given ethics approval by the University of Canberra Human Research Ethics Committee and are examined under University of Canberra Human Ethics approval number 20170077. All research was performed in accordance with the National Statement on Ethical Conduct in Human Research (<https://www.nhmrc.gov.au/research-policy/ethics/national-statement-ethical-conduct-human-research>).

Informed consent Informed consent was not required as this study used administrative data approved by the relevant authority under University of Canberra Human Ethics approval number 20170077.

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