

My School

Guide to understanding ICSEA

www.myschool.edu.au

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PART 1—WHAT IS ICSEA

What is the Index of Community Socio-Educational Advantage?

Research shows that there is a strong relationship between the educational advantage a student has, as measured by the parents' occupation and level of education completed, and their educational achievement.

The Index of Community Socio-Educational Advantage (ICSEA) is a scale that represents levels of *educational advantage*. A value on the scale assigned to a school is the averaged level for all students in the particular school.

ICSEA provides visitors to the *My School* website with a means of making a comparison of the levels of educational advantage or disadvantage that students bring to their academic studies.

ICSEA does not describe or reflect the wealth of parents of students in a particular school or the wealth or resources of that school.

An ICSEA value is not a rating of the school institution—of its staff or teaching programs—nor is it a score for the school's overall student performance in testing programs.

Why was ICSEA developed?

ICSEA has one purpose. It enables fair and meaningful comparisons of the performance in literacy and numeracy of students in a given school with that of schools serving students with similar backgrounds as part of the *My School* website.

How was ICSEA developed and how is it reported?

The development of ICSEA involved collecting student family background data and identifying, through the use of statistical models, the combination of variables that have the strongest association with student performance in the National Assessment Program—Literacy and Numeracy (NAPLAN) tests, and within that combined grouping, how much each of those variables contribute to performance in NAPLAN.

Every school has an ICSEA value on a scale which has a mean of 1000 and a standard deviation of 100. ICSEA values range from around 500 (representing extremely disadvantaged backgrounds) to about 1300 (representing schools with students from very advantaged backgrounds). The distribution of values is shown in Figure 1 below.

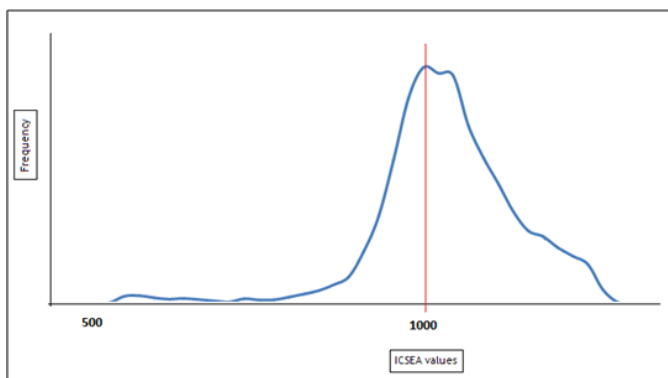


Figure 1. Distribution of all schools' values on the Index of Community Socio-Educational Advantage

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Where is ICSEA used on the *My School* website?

There are three places where ICSEA values appear or are used on the *My School* website.

1. School Profile

Each school's ICSEA value can be found on the School Profile page and is used in the calculation of the distribution of students table. This table, presented alongside the school ICSEA value, shows the distribution of students in a school across four quarters representing a scale of relative disadvantage ("bottom quarter") through to relative advantage ("top quarter"). The two middle quarters are combined on the table ("middle quarters"). This gives contextual information about the socio-educational composition of the school's student community.

The screenshot shows the 'My School' website interface. At the top right is the 'acara' logo. Below it is a navigation bar with 'Find a school', 'Glossary', 'More information', and 'Contact us'. A sidebar on the left contains 'School profile', 'School finances', 'NAPLAN', and 'Local schools'. The main content area is titled 'My Local School, NSW' and includes a 'School profile' section with tabs for '2008', '2009', and '2010'. A 'School comments 2010' section contains a paragraph about the school. Below this are several data tables:

School sector	Government
School type	Secondary
Year range	7-12
Total enrolments	1244
Location	Metropolitan

ICSEA (Index of Community Socio-Educational Advantage)			
School ICSEA value	983		
Average ICSEA value	1000		
Data source	Parent information		
Distribution of students	Bottom quarter	Middle quarters	Top quarter
School distribution	19%	31%	26%
Australian distribution	25%	25%	25%

Teaching staff	87
Full-time equivalent teaching staff	85.8
Non-teaching staff	15
Full-time equivalent non-teaching staff	12

Total enrolments	1244
Girls	598
Boys	646
Full-time equivalent enrolments	1242.8
Indigenous students	3%
Language background other than English	2%
Student attendance rate	94%

Total net recurrent income	\$12,723,215
Per student net recurrent income	\$10,228
Total capital expenditure	\$2,233,423

Year 12 results	
Senior secondary certificate awarded	198
Completed senior secondary school	200
Vocational Education and Training (VET)	
Achieved VET units of competence	35
Undertook ASbA	0
Post-school destinations	
Students at university	31%
Students at TAFE/vocational study	11%
Students in employment	24%

At the bottom, there is a 'Links' section with 'School website', 'School sector link 1', and 'School sector link 2'. A footer row contains icons for 'School profile', 'School finances', 'Results in graphs', 'Results in numbers', 'Results in bands', 'Student gain', 'Similar schools', and 'Local schools'.

Figure 2. School profile page

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2. Schools serving students from statistically similar backgrounds

A school's ICSEA value is used to select a group of up to 60 schools serving students from statistically similar backgrounds. This is referred to as the statistically similar schools group (SSSG). These schools can be located across Australia but, based on ICSEA, their students have similar levels of educational advantage. This is illustrated for two schools in Figure 3.

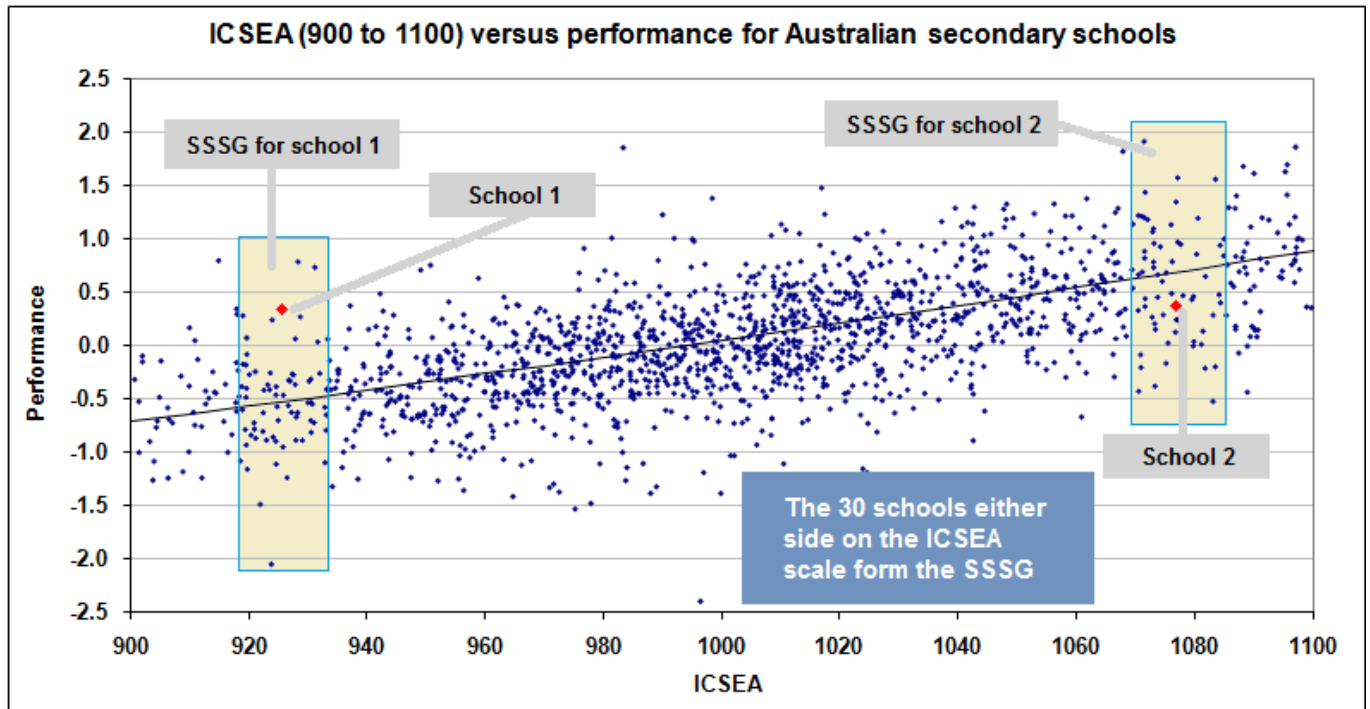


Figure 3. Creating a statistically similar schools group

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The similar schools chart provides an opportunity to compare the results of this group of schools and to identify high performing schools, or to see where a school may seek to improve.

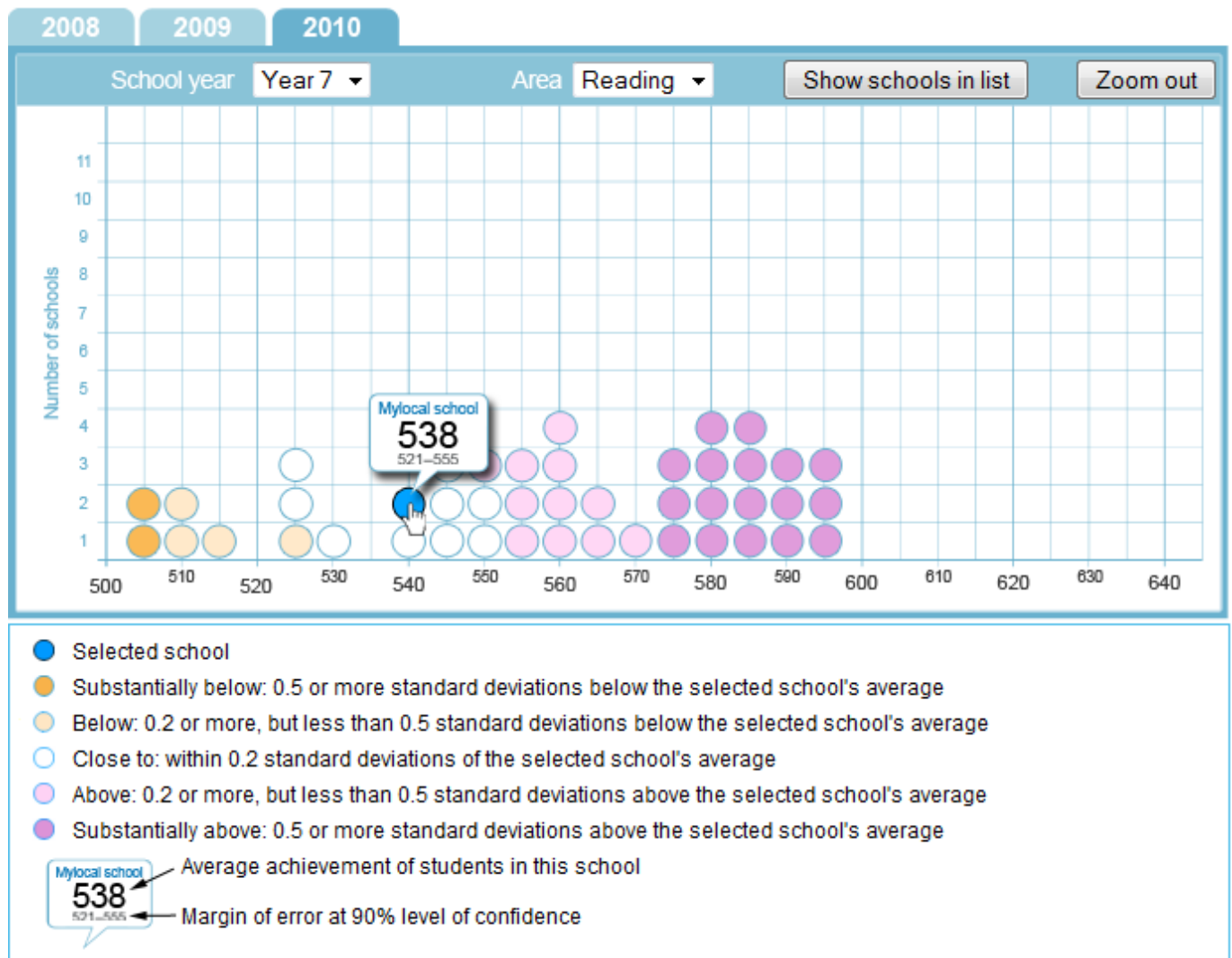


Figure 4. Depicting statistically similar schools group NAPLAN results

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3. Statistically similar schools NAPLAN results comparison

In the NAPLAN results section of *My School*, the selected school's results are shown alongside an average result for schools serving students from statistically similar backgrounds.

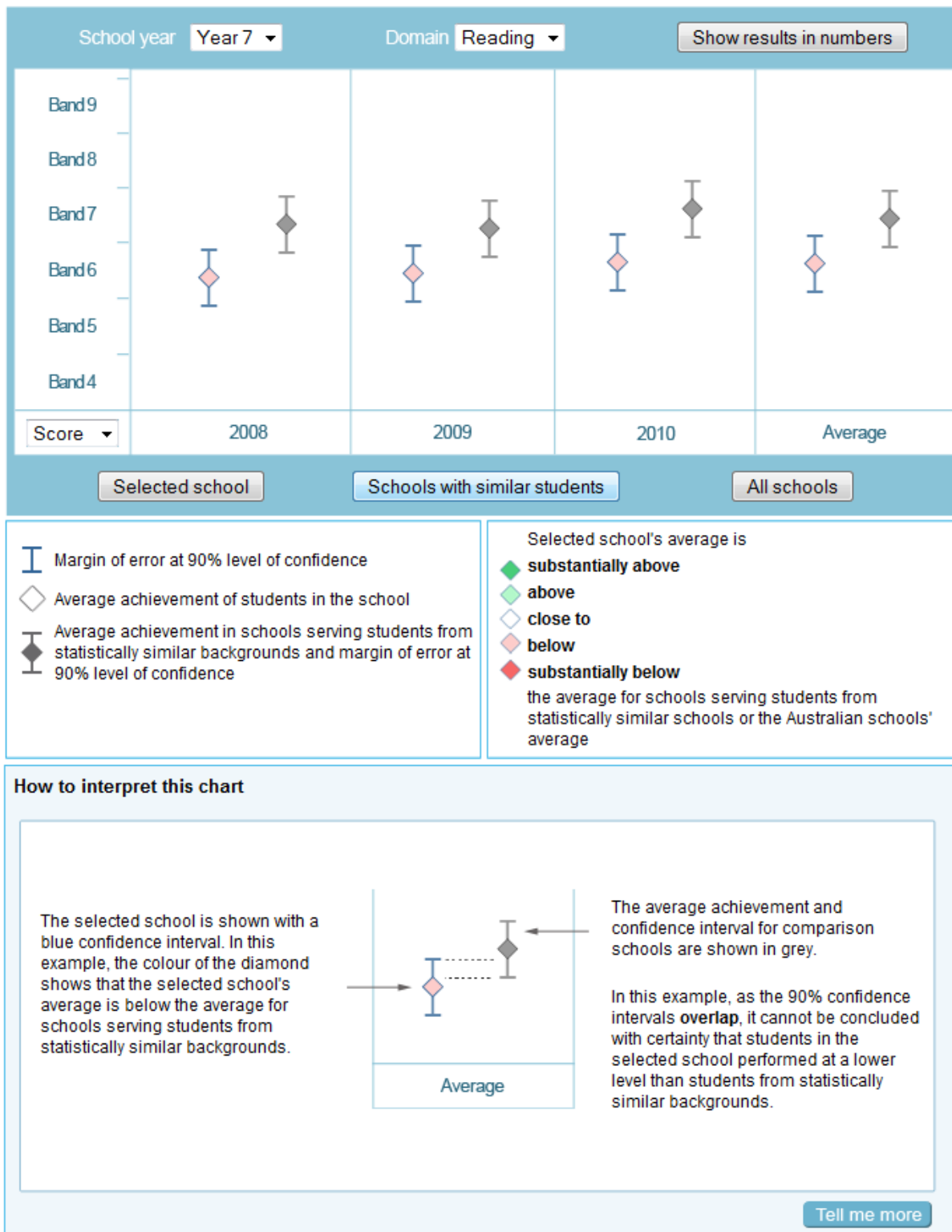


Figure 5. NAPLAN results of selected school with statistically similar schools group results

The statistically similar schools result is an estimated value derived from a regression equation. This is illustrated in the following graph in which a line of best fit has been drawn through the NAPLAN results and ICSEA values of all schools. The comparison point on the line of best fit is the result shown on *My School* for schools with that ICSEA value.

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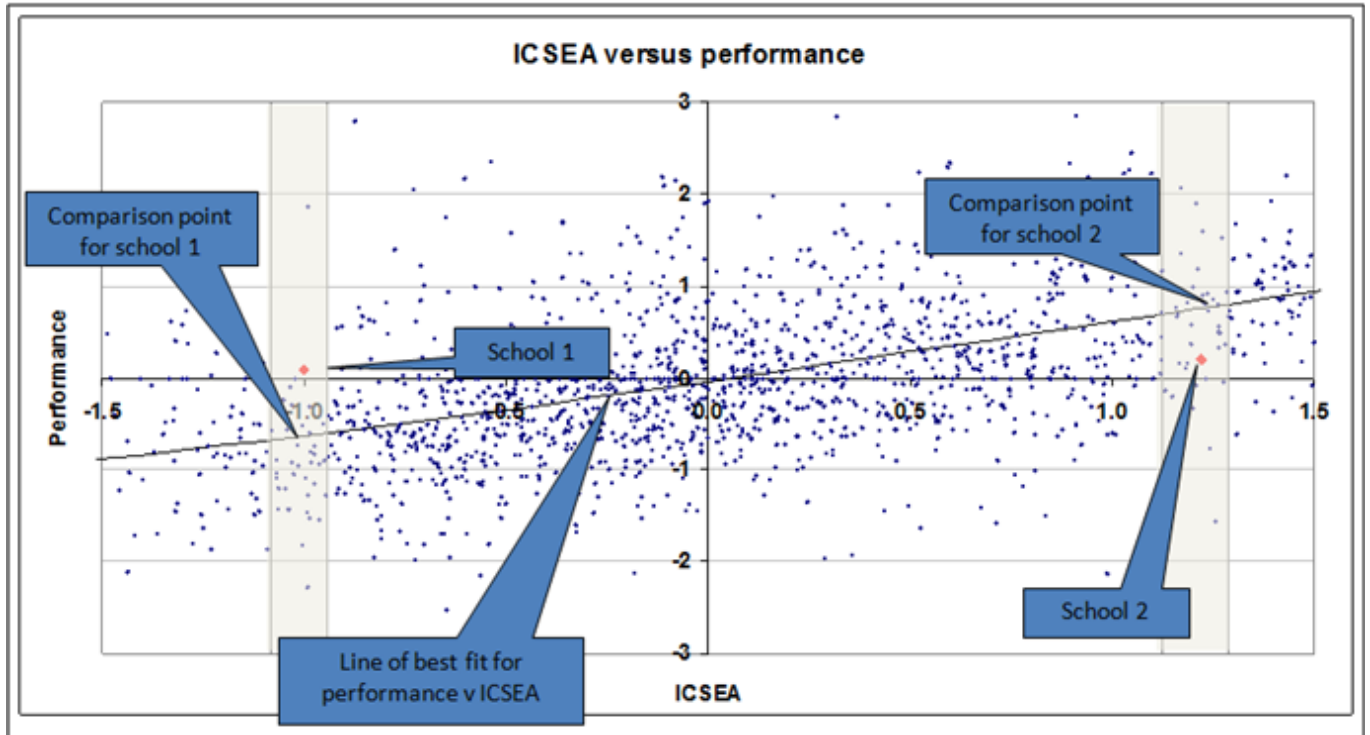


Figure 6. ICSEA vs NAPLAN performance regression line

The NAPLAN result for School 1 is above the comparison point on the regression line and therefore the students of that school performed better than the statistically similar schools result. On the other hand, the average NAPLAN score of School 2 is below the comparison point for statistically similar schools on the regression line.

Using a regression line to determine the statistically similar schools result mitigates the effect of having a very high performing selective school in that group of similar schools.

Do all schools have an ICSEA value?

ICSEA values can be generated for all schools. However, schools that are categorised as special schools on the *My School* website do not have ICSEA values reported and are not included in statistically similar schools groups. Special schools are schools for students with disability and juvenile justice schools. An ICSEA value for these schools can still be provided or published on the website at the school's request.

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How can ICSEA and *My School* be used to drive school improvement?

Schools can use the information on *My School* as a basis on which to:

- monitor performance and identify priority areas in which to focus improvement efforts
- identify schools with students from statistically similar backgrounds that are performing at a high level, particularly in their priority areas
- explore success factors in statistically similar high-performing schools across the country and incorporate relevant strategies into their improvement plans
- communicate with the wider school community about their performance and gain support for improvement initiatives.

Teachers can use the information on *My School* as a basis on which to:

- integrate the information from the website with system and classroom data and use this to develop intervention programs to support higher levels of student achievement in literacy and numeracy
- determine where they need to make adjustments to teaching programs and strategies
- connect with teachers in other schools to share ideas
- compare the progress of their students with students in other schools
- engage with parents in support of their children's learning.

Parents and other members of the school community can use the information on *My School* as a basis on which to:

- understand how their local school is performing relative to other schools serving students from statistically similar backgrounds
- gain a broader understanding of the learning environments and performance of schools in their local community, as well as within their State or Territory and across the nation
- initiate communication with a school based on comprehensive and detailed information
- seek a greater level of engagement with a school in support of their child's learning
- become involved in advocating for and supporting improvement initiatives within the school.

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PART 2—HOW ARE ICSEA VALUES CREATED

What is the ICSEA formula?

ICSEA values were first published on the *My School* website at the end of January 2010. For the second version of the *My School* website the ICSEA formula has been revised and student-level data used to create a stronger measure of educational advantage.

At the request of Education Ministers, ACARA investigated the possibility of using student-level data, obtained directly from students' families, to calculate ICSEA, rather than indirect ABS census data.

The modelling indicated that by using direct student-level parent occupation and education data, it is possible to obtain a stronger measure of socio-educational advantage (SEA) in most cases.

The modelling also showed that including a variable related to language background increased the association of ICSEA with average school achievement.

Subsequently, Ministers approved the move to the direct data approach and the inclusion of language background of students for *My School 2.0*.

The formula for ICSEA used in *My School 2.0* contains the following variables:

$$\text{ICSEA} = \text{SEA (direct/indirect)} + \text{Remoteness} + \text{Percent Indigenous} + \text{Disadvantaged LBOTE}^*$$

**(LBOTE combined with the percentage of parents with an education of Year 9 equivalent or below)*

What information is used to develop the formula?

When enrolling a child in school all parents are asked which of the following options best describes their occupation, and the school education and non-school education levels they achieved.

Parent occupation

- Senior management in large business organisation, government administration and defence and qualified professionals
- Other business managers, arts/media/sportspersons and associate professionals
- Tradesmen/women, clerks and skilled office, sales and service staff
- Machine operators, hospitality staff, assistants, labourers and related workers
- Not in paid work in last 12 months

School education level

- Year 12 or equivalent
- Year 11 or equivalent
- Year 10 or equivalent
- Year 9 or equivalent or below

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Non-school education level

- Bachelor degree or above
- Advanced diploma/Diploma
- Certificate I to IV (including trade certificate)
- No non-school qualification

All categories were considered in developing ICSEA. However, of these categories the following group of variables in combination were found to be the best predictors of achievement in NAPLAN. Therefore, they are the variables used in the calculation of the SEA component of ICSEA.

Table 1 lists these variables, the weight given to each variable in calculating ICSEA and the national average of the percentage of parents in each variable.

Variables	Weights used to calculate ICSEA	National average % of parents
Occupation variables		
• Associate professional	.154	20.8%
• Skilled non-professional	-.031	21.9%
School education variables		
• Year 10 or equivalent	-.092	26.5%
• Year 9 or equivalent or below	-.042	8.2%
Non-school education variables		
• Bachelor degree or above	.364	20.0%
• Advanced diploma/Diploma	.078	11.4%
• No non-school qualification	-.196	40.5%

Table 1. Direct SEA data variables

What are the school variable weights?

The school variables shown in Table 2 below are then added to this SEA component to produce the final ICSEA value. The SEA component has a weight of 0.670.

Variables	Weights used to calculate ICSEA	National average % of parents
• Percentage of Aboriginal enrolments	-.355	7.6%
• Accessibility/Remoteness index	-.005	1.6%
• Percentage of disadvantaged LBOTE students	-.050	2.9%

Table 2. School variables

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Why is a combination of data methodologies used for *My School 2.0*?

The construction of the SEA component of ICSEA for *My School 2.0* uses two alternative data sources:

- Information relating to parent occupation, school education, non-school education and language background obtained from student enrolment records (direct data)
- Australian Bureau of Statistics (ABS) census data (indirect data).

If the SEA value calculated using direct data is found to be accurate at the 95% confidence level, it is used in the formula. If the estimate is found to be less accurate, the indirect method is used. In the case of small schools, or schools with significant missing data, the indirect measure of SEA may give a better estimate than the direct measure.

The indirect method involves matching data for Census Collection Districts (CCD) collected by the Australian Bureau of Statistics and addresses from a school's enrolment records. CCDs cover on average 225 households.

For the indirect method the following steps are taken to calculate an ICSEA value for each school:

1. Addresses for each student at the school are gathered (without student names).
2. Each address is matched to its ABS Census Collection District.
3. The relevant SEA characteristics of the CCD in which each student at the school lives (known from ABS census data) are aggregated to the school level.

What are the variables used to develop the indirect measure of socio-educational advantage?

The indirect methodology is very similar to last year's (2009) calculation. A slightly amended formula is used in the *My School 2.0* calculation. A number of redundant variables have been removed to create a simpler calculation. The variable of Indigeneity has been removed from the calculation of the SEA value, but remains within the ISCEA calculation with an increased weight.

Table 3 below shows the CCD variables (indirect data) used for the SEA component and their corresponding weights in the formula.

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Variables	Weights used to calculate ICSEA
Education variables	
Percentage of people aged 15 years and over with a certificate qualification (CERT)	-.123
Percentage of people 15 years and over with no post-school qualifications (NOQUAL)	-.142
Occupation variables	
Percentage of employed people who work in a skill level 4 occupation (OCC_4)	-.177
Percentage of employed people who work in a skill level 5 occupation (OCC_5)	-.091
Others	
Percentage of families that are one parent families with dependent offspring only (ONEPAR)	-.244
Percentage of occupied private dwellings with no internet connection (NONET)	-.278

Table 3. CCD data sourced from the ABS

Can schools have confidence that the direct and indirect data are comparable?

To ensure the direct SEA measure and the indirect SEA measure are comparable they are placed on a common scale. These are then combined with the school variables in the ICSEA formula to calculate the ICSEA value for each school.

ACARA has tested the correlation between the values based on the ABS data and the direct data and has determined a correlation coefficient of 0.9 exists between the two calculations. This is very high.

Accuracy of the source data is ultimately the responsibility of parents who complete both ABS census forms and student enrolment information for their children.

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The ICSEA Formula

DIRECT FAMILY VARIABLES

School education variables

- Year 10 or equivalent
- Year 9 or equivalent or below

Occupation variables

- Associate professional
- Skilled non-professional

Non-school education variables

- Bachelor degree or above
- Advanced diploma/Diploma
- No non-school qualification

OR

INDIRECT CCD VARIABLES

Education variables

- People aged 15 years and over with a certificate qualification
- People aged 15 years and over with no post-school qualifications

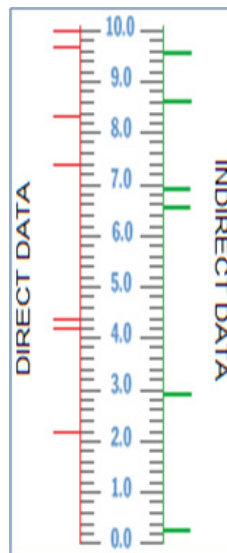
Occupation variables

- Employed people in a skill level 4 occupation
- Employed people in a skill level 5 occupation

Other variables

- Families that are one parent families with dependent children
- Occupied Private dwellings with no internet connection

COMMON SCALE OF VARIABLES



SCHOOL VARIABLES

- Percentage of Indigenous students
- Accessibility/Remoteness index
- Disadvantaged LBOTE students

My School

Student background 2010

Index of Community Socio-Educational Advantage (ICSEA)

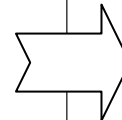
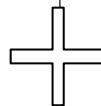
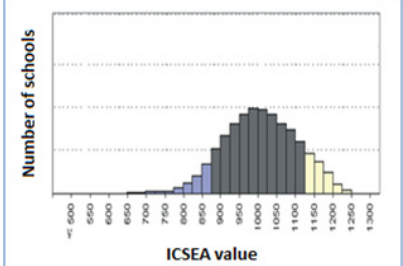
School ICSEA value 1176

Average ICSEA value 1000

Data source Parent information

Distribution of students	Bottom quarter	Middle quarters	Top quarter
School distribution	4%	12%	74%
Australian distribution	25%	25%	25%

Percentages are rounded and may not add up to 100



1. The direct and indirect student information is combined to create a common scale of comparable values.
2. These are combined with school specific variables to produce ICSEA values for all schools.
3. The values are used on www.myschool.edu.au to compare NAPLAN results among groups of schools serving students from statistically similar backgrounds.

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FREQUENTLY ASKED QUESTIONS

What processes have been undertaken to quality assure the new ICSEA methodology?

The ICSEA methodology has been revised by an expert panel that includes eminent academics external to ACARA. The panel supervised extensive statistical modelling to correlate family background data with NAPLAN data for hundreds of thousands of students.

ICSEA values for all schools have been checked with State and Territory governments, Catholic education commissions, and independent schools and their associations. ACARA worked closely with jurisdictions to review ICSEA calculations where data was not adequate or extraordinary circumstance meant the data did not properly reflect the background of students at an individual school.

A secure web-portal was set up to enable school principals to see their old and new values and to request a review, accompanied by supporting data. Where requested, ACARA has provided additional information including a summary of current data to assist schools understand how their data affects their ICSEA value.

In addition, ACARA has reviewed data for all schools that have experienced a significant change in ICSEA values from *My School* 1.0 and has followed up with those for which there may be data issues or other factors that need to be taken into account in finalising the new value.

Where does the data used to calculate 2010 ICSEA values come from?

Parental background data are collected at enrolment. Most States and Territories and Catholic systems have provided ACARA with the data for all students in their schools collected in this way.

For some non-government systemic schools and most independent schools, direct data were only available for students who participated in NAPLAN in 2009 and 2010, collected and provided to ACARA by the Test Administration Authority in each state.

For states with Year 7 in secondary schools, data were available for students in Years 3, 4, 5 and 6 for primary schools and Years 7, 8, 9 and 10 for secondary schools. For Queensland, South Australia and Western Australia data were available for Years 3 to 7 for primary schools and Years 9 and 10 for secondary schools.

In addition, ACARA identified around 200 schools where this direct data were insufficient and these schools were contacted to provide additional direct student data.

Does data collected at enrolment become out-of-date?

Even though parental background data is collected at enrolment and is unlikely to be updated during the time that a student is enrolled in a school, it remains reasonably accurate.

The school education level of parents will only change for the very few parents that undertake further secondary-level schooling through TAFE or an equivalent. The non-school education level will only change for the relatively small proportion of parents who undertake formal post-school education.

Although many parents are likely to change jobs during the time that their children are enrolled in a school they are likely to remain within the same occupation category.

The one variable which may change is the 'Unemployed' variable. Many parents re-enter the workforce during the time that their children are enrolled in a school.

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This is particularly so for those who have been full-time carers of pre school-aged children. Accordingly, the unemployed variable has not been used in the final calculation of the ICSEA

Why has the change to direct data been made?

Analyses by the ICSEA Expert Panel convened by ACARA found the use of direct student data increases the explanatory or predictive power of ICSEA from 59% to 68%. Therefore, the direct method provides an even stronger measure of educational advantage.

Education Ministers determined that wherever possible student-level data on the occupation and education levels of parents or carers be used to calculate ICSEA, in place of CCD data.

For how many schools is direct data used?

A direct data source is used for the SEA component for 76% of schools, covering 92% of Australian students. For the remaining schools, CCD data is used.

What methodology was used for *My School 1.0*?

In 2009, the formula for ICSEA was:

$$\text{ICSEA value} = \text{SEA (CCD data)} + \text{Remoteness} + \text{Percent Indigenous}$$

The SEA component was made up of 14 separate variables from the 2006 Census conducted by the Australian Bureau of Statistics most highly correlated with student performance in NAPLAN testing. Data were available for almost all Census Collection Districts (comprising around 225 households) across the nation.

The address of each student was collected and geo-coding was then undertaken to link each student's address to the Census Collection District in which they lived. Each student was then assigned the characteristics of their CCD and an overall index calculated for each school.

The 2009 ICSEA proved to have high predictive validity with 59% of the variance in school NAPLAN scores explained by the index. However, there were some schools for which ICSEA did not provide a good measure of the educational advantage of students of the school. The review process led to some 6% of initial ICSEA values being adjusted in the light of additional or other data.

What other changes have been made to the ICSEA methodology?

In 2009 the 14 CCD data variables in the SEA component of the ICSEA calculation included a measure of the Indigenous status of students. In 2010 the SEA component does not include this measure because it has been determined that the percentage of Indigenous student enrolments in the school provides a more accurate measure than the inclusion of this variable in the indirect SEA component.

The ICSEA formula has been further strengthened by the inclusion of a factor related to language background other than English (LBOTE). The measure of student LBOTE contributes to the calculation of an ICSEA value only when it is combined with a measure of students' parent or carer education level. This combined variable is used in the calculation of an ICSEA value where LBOTE students have parents or carers who have completed school education up to or equivalent to Year 9. This is referred to as *disadvantaged LBOTE* in the formula.

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In what ways are the 2009 and 2010 ICSEA values different?

The correlation between 2009 and 2010 ICSEA values is 0.9, indicating that overall, the new formula produces very similar results to the old formula. The mean change in ICSEA values from 2009 to 2010 is shown in Table 4 below:

System	Mean change (units)
Government	-10.2
Catholic	15.7
Independent	24.3

Table 4. ICSEA change by school type from 2009 to 2010

For a small proportion of schools, the change from 2009 to 2010 ICSEA values is significant. Most schools (around 80%) have had changes in the order of 1 to 50 units.

Why have the ICSEA values for schools in the non-government sector generally gone up whereas the values for government schools have generally gone down?

The new formula leads to a higher average for ICSEA values of non-government schools. This would appear to reflect a number of factors that are more clearly shown when direct data is used.

Some key points that become clearer with the use of direct data include:

- Census Collection Districts are not homogeneous and students of non-government schools tend to come from the more educationally advantaged families within CCDs
- Both Independent and Catholic schools include higher proportions of parents in relatively high occupational groups than do government schools
- Independent schools have relatively lower proportions of parents in lower occupational groups than do government or Catholic schools
- Independent schools include significantly lower proportions of parents with incomplete secondary education
- Independent schools include higher proportions of parents with Bachelor degree or above non-school education.

Where can I find out more about ICSEA?

If you wish to learn more about the construction of ICSEA please consult the *2010 ICSEA Generation Report*.

