

SAVE OUR SCHOOLS

Research Paper

**Like School Comparisons Do Not
Measure Up**

**An Analysis of Flaws in Like School Comparisons on *My
School***

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Key Points

- *My School* makes misleading and unreliable comparisons of test results of so-called ‘like schools’ because its measure of like schools is flawed and omits many factors outside the control of schools which affect test results. It does not consistently compare like with like.
- The Index of Community Socio-Educational Advantage (ICSEA) which is used to measure the socio-economic status (SES) of schools is flawed. It attributes each student with the average SES of the area in which they live rather than the actual SES of their family. This leads to misclassifications of students because high and low income families often live in the same areas.
- The comparisons of ‘like schools’ systematically and unfairly favour private schools over government schools. The average SES of private schools is artificially lowered by ICSEA while the average SES of government schools is artificially inflated because high income families choose private schools at double the rate of low income families. This leads to comparisons of unlike schools rather than like schools.
- The ‘like school’ comparisons on *My School* are also misleading because they ignore other differences in the student composition of schools which strongly influence school test results, including differences by gender, ethnic sub-groups and students with disabilities.
- The ‘like school’ comparisons on *My School* do not take account of large differences in school funding between the states and between high SES private schools and high SES government schools.
- The ‘like school’ comparisons on *My School* do not take account of the impact of several other factors on school test results, including high student mobility between schools; school size differences, student selection and private tutoring.
- ICSEA is already 4 years out of date, being based on the 2006 Census data, and fails to take account of the changing social and economic circumstances of families and the areas in which they live, such as those arising from the global financial crisis.
- ICSEA may mismeasure the SES of some schools because it fails to distinguish between families with and without school-age children and because the family income and qualifications data it uses may be distorted by relatively high non-response rates to the Census questions.
- Comparisons of test results of ‘like schools’ can be distorted by schools manipulating and reporting their test results to artificially boost their rankings on school league tables.
- Because of its flaws and omissions, ICSEA exaggerates the differences in quality between ‘like schools’ and thereby misleads those who choose schools or make policy decisions based on these comparisons.
- An independent public review of ICSEA should be conducted to find a better way of determining like schools.

Summary

The *My School* website purports to enable comparisons of school results amongst socio-educationally similar schools - so-called 'like schools'. However, these comparisons are unreliable because the measure of like schools is flawed and it fails to take account of many factors outside the control of schools which affect test results. It does not consistently compare like with like.

There are four basic flaws in the so-called like school comparisons on *My School* which create much potential for schools to be wrongly and unfairly compared with schools that are significantly different:

- The Index of Community Socio-Educational Advantage used to determine like schools is an inaccurate measure of the socio-economic status (SES) of schools;
- Differences in school composition according to gender, ethnic sub-groups and students with disabilities, all of which influence school results, are ignored;
- Other factors outside the control of schools which influence school results, such as student mobility between schools and private tutoring of students, are ignored; and
- Differences between schools in funding, size and student selection practices also influence school results but are ignored.

ICSEA is an inaccurate measure of the socio-economic status of schools

ICSEA is an inaccurate measure of the school SES for several reasons, and therefore can lead to comparisons of unlike schools:

- It systematically over-estimates disadvantage in private schools and under-estimates disadvantage in government schools because high SES parents in low SES areas are more likely to enrol their children in private schools;
- It may under-estimate disadvantage in schools because many households fail to report their income and qualifications, and are not included in the data used to measure school SES;
- It does not distinguish between families with and without school-aged children;
- It does not fully measure family wealth;
- Schools with similar ICSEA ratings may have quite different SES profiles;
- The data used is out of date;
- The SES ratings are open to manipulation and fraud by schools falsifying student addresses.

The bias in the measurement of disadvantage in private and government schools is a major flaw in the comparisons of like schools on *My School*. It means that private schools are systematically favoured in comparisons with government schools because their average SES will be higher than as measured by ICSEA and the average SES of government schools with which they are compared will be lower than as measured by ICSEA. Private schools will then appear to have better average results than their 'like' government school counterparts because school results are strongly influenced by the SES composition of schools. Thus, 'like school' comparisons will be inaccurate and misleading.

This flaw in ICSEA occurs because each student is attributed with the average SES of the area in which they live rather than the actual SES of their family and because high SES families enrol their children in private schools at double the rate of low SES families.

The systematic bias in favour of private schools could be compounded if the relatively high non-response rates to Census questions on key ICSEA variables are concentrated among low SES families. In the 2006 Census, 13% of family households did not state, or only partially stated, their income while 18% of people in the 25-54 age groups did not state their non-school qualifications.

It is also a concern that ICSEA is already out of date because it is based on 2006 Census data and it will become even more out of date in the next few years. Census surveys are only carried out every five years and it takes up to two years for the SES data to become available after each Census. This means ICSEA will be seven years out of date by the time the data from the next Census becomes available. Significant social change can occur over such a period. For example, unemployment has increased significantly since the last Census due to the global financial crisis and this may affect the ICSEA ratings of schools.

Other key differences in student composition are ignored

While SES accounts for the large part of the influence of background factors on school performance, ICSEA ignores other background factors which also have a significant influence on school results. These include:

- Gender;
- Students from different ethnic backgrounds; and
- Students with disabilities.

The failure to take these differences in student composition into account is likely to invalidate many so-called 'like school' comparisons.

Girls consistently achieve higher literacy results than boys. This is likely to be very significant in comparing outcomes in all boy schools and all girl schools with similar SES profiles. On average, all boy schools will tend to have lower levels of average literacy achievement than all girl schools with a similar SES composition.

It is also likely that, on average, all girl schools will have higher outcomes than schools with a similar SES profile with more or less equal proportions of female and male students. The male population of mixed schools is likely to lower their average achievement compared to all girl schools.

ICSEA fails to take account of differences in the ethnic composition of schools. This has also has important implications for the accuracy and validity of 'like school' comparisons because there are significant differences in the average results of students from different ethnic backgrounds. For example, the average results of Chinese students are well above those of Middle Eastern and Pacific Islander students. Schools with a similar ICSEA rating could have quite different average results simply because some have a high proportion of students of Chinese origin while others have a high proportion of Middle Eastern or Pacific Islander students.

ICSEA also ignores differences in the proportion of students with disabilities in so-called 'like schools'. Schools with higher proportions of students with disabilities participating in tests may have lower average results than other schools with a similar ICSEA value. Government schools could be disadvantaged by 'like school' comparisons because they have higher proportions of students with disabilities than private schools.

Other factors outside the control of schools are ignored

The 'like school' comparisons also ignore other factors outside the control of schools that influence school results, including differences in:

- Student mobility between schools; and
- Private tutoring of students.

Some schools with a similar ICSEA rating may have lower results because they have a high proportion of students who often change school. Students who move school often tend to have lower average results than other students.

Moreover, many families today engage private tutors for their children. Differences between schools in the proportion of families who resort to private tutoring may be reflected in differences in school results between so-called 'like schools'.

Other differences between schools are ignored

The 'like school' comparisons on *My School* also ignore other key differences between schools that are not related to teaching and curriculum, but which also influence school results. These include differences in:

- Funding;
- School size; and
- Student enrolment procedures such as the selection of students.

My School fails to report school funding. Schools with similar ISCEA values may have vastly different levels of funding which may contribute to differences in school results. For example, in 2007-08 recurrent expenditure per government secondary school student in Western Australia was 43% higher than in Victoria while expenditure per primary school student in the ACT was 48% higher than in Victoria. In addition, total funding per student in many high SES private schools is up to double or more that of high SES government schools.

My School does not take account of differences in schools size which can affect the comparison of school results. Very large schools tend to have lower average results than small to medium sized schools. Small schools are much more likely to report large changes in average results from one year to the next because their results can be heavily influenced by the results of only 4 or 5 students.

The 'like school' comparisons on *My School* ignore student selection by many private schools and some government schools. Some schools may achieve higher results than others with a similar ICSEA rating because they can select higher achieving students and exclude lower achieving students.

In addition to all these flaws, comparison of test results of 'like schools' can also be distorted by schools manipulating and rorting their test results to artificially boost their rankings on school league tables.

ICSEA misleads about differences in school quality

Because of its flaws and omissions, ICSEA exaggerates the differences in quality between 'like schools' and thereby misleads those who choose schools or make policy decisions on the basis of these comparisons. For example, the variables incorporated in ICSEA explain about 70% of the variation in aggregated primary school results, leaving about 30% implicitly

attributed to differences in teaching, curriculum, pastoral care and other features of schools. If factors such as gender, ethnic sub-groups, students with disabilities, student mobility, school funding, school size and student selection practices were included in ICSEA its explanatory power could increase to 85-90% of the variation in school results. This would leave only 10-15% of the variation in school results as explained by differences in school quality.

Many reports, including some commissioned by the national council of ministers, have acknowledged a number of these flaws as issues in developing valid measures of school performance. In particular, they have noted the problems in using area-based measures of SES and the need to include gender and ethnic composition of schools in measuring school performance, but which are omitted in the *My School* comparisons. Yet, this advice has been ignored. An especially puzzling feature of the failure to take this advice is that one of the co-authors of several reports is a member of the expert panel advising on the development of ICSEA.

ICSEA in its current format is entirely inadequate for determining like schools. It needs a major overhaul. The systematic bias in favour of private schools generated by the use of an area-based SES measure can only be resolved by developing a consistent measure of individual family SES. ICSEA should also be revised to include gender, ethnic sub-groups, students with disabilities, student mobility, school funding and student selection practices.

A better way of determining like schools should be investigated by an independent public review.

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An Analysis of the Flaws in Like School Comparisons on *My School*

1. Like school comparisons on *My School*

The My School website operated by the Australian Curriculum Assessment and Reporting Authority (ACARA) publishes literacy and numeracy results for similar schools (so-called ‘like schools’) across Australia. These are schools whose students have a similar social and economic background. The remoteness of schools and the proportion of Indigenous students is also taken into account in determining like schools. Each school is compared to up to 60 statistically socio-educationally similar schools (30 above and 30 below) as measured by their rating score on an Index of Community Socio-Educational Advantage (ICSEA) set with a mean value of 1000 [ACARA 2010a; 2010b; 2010c].

ICSEA is constructed from data on 14 key socio-economic factors that correlate with educational outcomes, as indicated by the National Assessment Program for Literacy and Numeracy (NAPLAN). The factors include 2 family income variables; 5 family education variables; 3 occupation variables, 1 unemployment variable and 3 other variables. The data for these variables are obtained from the 2006 Census of Population and Housing for census collection districts, areas consisting of about 225 households.

ACARA estimates that 68% of the variance in aggregated primary school outcomes is explained by the 14 socio-economic variables used to construct ICSEA together with the measure of school remoteness and the percentage of Aboriginal enrolments [ACARA 2010a]. It estimates that 59% of the variance in aggregated secondary school outcomes is explained by these factors. The implication is that the remaining 30 or 40% of the variance in school results is due to school quality factors.

The ICSEA rating for each school is obtained by matching the addresses of students at each school with its census collection district and attributing the socio-economic status (SES) characteristics of that area to each individual student. The data from each area from which the school population is drawn is aggregated up to the school level to obtain the average for each SES variable at the school level. The consolidated school level SES data is fed into the ICSEA formula to calculate the school ICSEA rating.

These ratings are used to construct groups of similar schools for each individual school, comprising 30 schools above and below each school’s ICSEA rating; that is, there is a different like school group for each school. *My School* provides a link from each school’s report card to the results for each of these 60 ‘like schools’ so that their results can be compared.

There are four basic flaws in these so-called like school comparisons which create much potential for schools to be wrongly and unfairly compared with schools that are significantly different:

- ICSEA is an inaccurate measure of the SES of schools;
- Differences in school composition according to gender, ethnic sub-groups and students with disabilities, all of which influence school results, are ignored;
- Other factors outside the control of schools which influence school results, such as student mobility between schools and private tutoring of students, are ignored; and

- Differences between schools in funding, size and student selection practices also influence school results but are ignored.

2. ICSEA is an inaccurate measure of the socio-economic status of schools

ICSEA is an inaccurate measure of the school SES for several reasons, and thus can lead to comparisons of unlike schools:

- It systematically over-estimates disadvantage in private schools and under-estimates disadvantage in government schools because higher SES parents tend to enrol their children in private schools;
- It may under-estimate disadvantage in government schools because many households fail to report their income and qualifications, and are not included in the data used to measure school SES;
- It does not distinguish between families with and without school-aged children;
- It does not include a measure of family wealth;
- Schools with similar ICSEA ratings may have quite different SES profiles;
- The data used is out of date;
- The ratings are open to manipulation and fraud by schools falsifying student addresses.

2.1 ICSEA over-estimates disadvantage in private schools and under-estimates disadvantage in government schools

ICSEA systematically over-estimates the level of socio-economic disadvantage in private schools and under-estimates disadvantage in government schools. Consequently, *My School* compares the test results of supposedly similar private and government schools, but which may have large differences in the SES composition of their enrolments.

This occurs because ICSEA is derived from area-based Census data and not data on individual families attending each school. In effect, each student is attributed with the average SES of the area in which she/he lives rather than the actual SES of each student's family. This creates the potential for students to be misclassified to a higher or lower SES than their family.

Assigning a value of socioeconomic status to a student on the basis of the area in which they live will introduce a potential error and the magnitude of the error will be greater when the social background of those living in the area is relatively heterogeneous. [Ainley & Long 1995: 53; see also Marks et.al.2000]

In some areas, the population may be clustered around the average SES score, while in others the distribution may be more diverse, that is, with significant proportions of both lower and higher SES households.

A relatively disadvantaged area is likely to have a high proportion of relatively disadvantaged people. However, such an area is also likely to contain people who are not disadvantaged, as well as people who are relatively advantaged. When area level indexes are used as proxy measures of individual level socio-economic status, many people are likely to be misclassified. This is known as the ecological fallacy. [ABS 2008b: 3]

Studies in Australia show that this effect exists. A study by the Australian Council of Educational Research (ACER) has shown that the correlation between individual and Census collection district measures of SES for a national sample of secondary school students was unacceptably low [Ainley & Long 1995].

The Australian Bureau of Statistics (ABS) has demonstrated that some highly advantaged families live in low SES areas and some disadvantaged families live in high SES areas. In an analysis of Census data for Western Australia it found that individual and family relative socio-economic disadvantage was quite diverse within small areas [Baker & Adhikari 2007]. About 20 per cent of people in the most disadvantaged quartile of the individual SES measure lived in Census collection districts that were in the highest three deciles of the area-based Index of Relative Socio-economic Disadvantage (IRSD). Over a third of people in the bottom quartile lived in areas in the top five IRSD deciles and six per cent of people in the lowest group in the individual based SES measure lived in collection districts found in the highest IRSD decile.

On the other hand, nearly 20 per cent of people in the most advantaged quartile for individual SES lived in areas that were classified in the bottom three deciles of the IRSD. Over a third of people in the most advantage quartile lived in areas in the bottom five deciles. Five per cent of people in the highest individual based SES group lived in the collection districts found in the lowest IRSD decile.

The analysis shows that there is a large amount of heterogeneity in the socio-economic status of individuals and families within small areas. These findings indicate that there is a high risk of the ecological fallacy when SEIFA is used as a proxy for the socio-economic status of smaller groups within an area and there is considerable potential for misclassification error. [Baker & Adhikari 2007: 1]

The potential for error in measuring the SES of schools by using area-based Census data is quite significant because high SES families enrol their children in private schools at double the rate of low SES families. In 2006, 47% of high income families across Australia enrolled their children in private schools compared to 24% of low income families [Preston 2007]. Fifty-five per cent of high income families enrolled their children in private secondary schools compared to 26% of low income families. It is likely that the rate at which high income families in low SES areas enrol their children in private schools is even higher than the average rate for Australia.

As a result, ICSEA artificially lowers the average SES of private schools and artificially raises the average SES of government schools. Private schools that attract high SES students from low SES areas will receive a lower ICSEA rating, thus over-estimating their actual level of disadvantage. The government schools serving these low SES areas will receive a rating which takes account of high SES families in the area. However, because children of these high SES families are not actually enrolled in the government schools their ICSEA value will be higher than their actual SES. The level of disadvantage in government schools is thus under-estimated by ICSEA.

This systematic bias in the mismeasurement of the SES of government and private schools is not just a feature of low SES areas. It is repeated across all areas containing both low and high SES families. Therefore, government and private schools measured as similar by ICSEA are likely to be dissimilar.

This bias in the measurement of disadvantage in private and government schools has major implications for the comparison of 'like school' results. It will tend to systematically favour private schools which will appear to have higher average results than their 'like' government school counterparts because school results are strongly influenced by the SES composition of schools. Thus, the 'like school' comparisons will tend to be inaccurate and misleading.

ACARA has acknowledged this limitation of ICSEA, but its only response was to make secret adjustments to the like school comparisons where evidence was available that the area SES values do not accurately reflect the actual student composition of a school. Such adjustments are only likely to take account of the more obvious “Geelong Grammar” phenomenon whereby high SES farming families in low SES rural areas who enrol their children in wealthy private schools carrying their low SES area rating with them. Mismatches between area-based SES and actual school SES are likely to be much more extensive than such obvious examples because high SES families are more likely to choose private schools.

2.2 ICSEA is likely biased because many low income families do not reveal their income and qualifications

ICSEA is also likely to be biased because not all people return Census forms or fully answer Census questions and the response rates vary for different questions. The non-response rates for the factors used to construct ICSEA vary considerably. In particular, 13% of family households did not state their income or only partially stated their income while 18% of people in the 25-54 age groups did not state their non-school qualification and 8% of this age group did not state their highest level of school education [ABS 2007]. In addition, 7% of occupied private dwellings did not respond to the internet access question. In comparison, only 2% of people in the 24-54 age groups did not state their occupation and 5% did not state their language and proficiency in English.

Household income, non-school qualifications and the level of school education all have a significant influence on student achievement and the relatively high rate of missing data in the Census for these factors for could be a source of bias in the ICSEA ratings. For example, if it is assumed that those who did not state their income, non-school qualification and highest level of school education are all from low SES households, the proportion of these families nationally and in different regions will be under-estimated. Similarly, if it is assumed that non-responding dwellings do not have Internet access, there could be a corresponding upward bias in the estimated connectivity levels of about 7% at the national level. ACARA does not appear to have investigated the potential implications of this missing data for the ICSEA ratings of schools and comparisons of like schools.

There does not appear to be any direct evidence on the characteristics of those who failed to fully or partially answer these questions. However, there is some evidence to suggest that non-responses to surveys requesting information on income and education qualifications tend to be concentrated amongst low SES families. For example, there is a high non-response rate to questions on family income and occupations on school enrolment forms. According to NAPLAN [2009], 17 to 25% of families of students at different Year levels do not provide parent education and occupation information. The average literacy and numeracy results for students of these families (grouped as ‘non-stated’) are similar to those of students whose parents completed Year 12 and work in low skilled occupations.

This evidence suggests that the non-response rates for the Census data used to construct ICSEA could be largely due to non-responses by lower SES families. The absence of this data may have several implications. It may mean that the overall strength of the relationship between low SES and student outcomes is under-estimated as is the variance in aggregated school outcomes explained by the variables used to construct ICSEA. It may also mean that the number of families with low income, education and qualifications in low SES areas is underestimated so that the average SES of these areas is also under-estimated, the latter being

the weighted average of all the families in the area, including higher SES families, who responded to the Census questions.

In this event, the ICSEA ratings of government and private schools serving these low SES communities would be over-estimated, that is, the level of disadvantage in these schools is under-estimated. This would not affect like school comparisons if the non-response rates were similar across all low SES Census collection districts. However, this is unlikely to be the case. Significantly different response rates between low SES areas could result in some schools being given a higher rating than warranted and being wrongly compared to schools with a higher ICSEA rating.

If the non-responses to the Census questions on income and non-school qualifications are concentrated among low SES families, it could also compound the systematic bias in ICSEA which favours private schools in comparison with government schools because higher SES families are more likely to choose private schools.

It is possible that the missing data does not have any significant impact on the ICSEA ratings. However, ACARA does not appear to have done any sensitivity analysis on the ratings to establish their robustness in the presence of missing Census data. It is incumbent on ACARA conduct and report on such an analysis. The ICSEA ratings of schools have significant implications for the comparison of school results, the reputations of schools and funding by the Commonwealth Government.

2.3 ICSEA fails to distinguish between families with and without school-age children

ICSEA may also provide inaccurate measures of school SES because the version used to determine like school comparisons does not distinguish between families with and without school-aged students. This may have implications for the measurement of school SES in areas where there significant differences in the SES of families with and without school-age children. It may lead to some schools being defined as low SES because of high concentrations of pensioners and young unemployed in the area, while families with school-age children are well-off. In such cases, these schools would be incorrectly classified as low SES schools and wrongly compared to actual low SES schools when they should be compared with higher SES schools.

My School has acknowledged this problem, but chose to ignore it even though it increases the extent of the variance in school outcomes explained by the ISCEA variables.

2.4 ISCEA does not fully measure family wealth

A recent discussion paper published by the Commonwealth Department of Education notes that a number of studies have found that there is a high correlation between family wealth measures and educational participation and attainment [DEEWR 2009]. Wealth appears to exert a notable influence on education participation and achievement over and above that due to parent education and occupation.

Typically, income is used as a surrogate for wealth because data on family wealth is not available from the Census. However, while family income and wealth will often overlap as measures of SES, income is not fully adequate as a measure of the resources available to families. Low income does not necessarily consistently indicate low SES as some families can be income poor and asset rich. For example, some families who own businesses in

industries such as agriculture, mining, fishing, finance investment and tourism often experience widely fluctuating incomes over different periods and may have low incomes for several years, during which they are able to draw on their assets to support the education of their children in various ways.

If the period of low income coincides with the Census which *My School* draws on to construct its measure of SES some schools may be incorrectly assessed as low SES despite many of their families having considerable wealth.

2.5 Schools with similar ICSEA ratings may have quite different SES profiles

Schools having the same ICSEA rating may have significantly different student profiles which can lead to differences in average school results of so-called like schools.

Each school's ICSEA rating is a weighted average of the SES of the resident Census collection districts of its students. As such, it does not reveal differences in the proportion of students from areas with different SES scores. For example, one school with an ICSEA value of, say, the scaled mean of 1000, could have all its individual student addresses clustered around the mean while another with a similar score could have a large proportion of students resident in low SES addresses and a large proportion whose addresses are in high SES areas. It is possible that the average test results of the former could be significantly higher than the latter because of the latter's higher proportion of low SES students. Comparing the test scores of such schools could therefore be misleading.

2.6 ISCEA is already out of date

ISCEA is already out of date by nearly four years as it is based on 2006 Census data and it will become even more out of date before new Census data is available in 2013 or 2014.

Since the last Census, major changes have occurred that have potential to cause the actual SES of many schools to differ from their ISCEA value. For example, the global financial crisis has increased unemployment in Australia and the pattern of unemployment varies across different regions. This may mean that the actual SES of some schools in these regions is now significantly below their measured SES according to the 2006 Census data and below that of schools considered by *My School* to be statistically similar.

Ongoing changes in the demographic profiles of suburbs between Census dates may also change the actual SES of schools in some areas and invalidate the 'like school' comparisons determined by ISCEA values. A classic example from the past was the large scale movement of higher income families into inner suburban areas to replace low SES families. This is still going on in some cities. Such changes have the potential to cause the actual SES composition of some inner city schools to be significantly different from that indicated by their ISCEA value.

Social change is an ongoing phenomenon. Census data are collected every five years and it usually takes 2 or 3 years to construct the new SES index values. The next Census is in 2011 and new data will not become available for at least two years after that. It means that the *My School* measure of SES could become outdated by 7 or 8 years. Significant social change affecting school SES can occur within this period.

2.7 ISCEA ratings of schools are open to manipulation

ISCEA ratings of private schools are open to manipulation by submitting false student addresses to ensure a lower rating and favourable test score comparisons with lower SES schools. The SES funding model for private schools creates similar incentives for schools to submit false student addresses to ensure a lower school SES measure and therefore greater funding.

My School obtains residential addresses for private school students from the Commonwealth Department of Education. They are required to be submitted to the Department for the purposes of SES funding by the Commonwealth Government. A report last year by the National Audit Office found that there was scope for the Department to improve its procedures to check the accuracy of student enrolment data for private schools [ANAO 2009].

Addresses for government school students are supplied by state and territory education departments. These too could be open to manipulation as departments do not conduct close audits of information submitted by schools.

This may appear to be a somewhat fanciful or unrealistic possibility at this stage. However, overseas experience with comparisons of school results shows that schools are under extreme pressure to maintain or improve their ranking against other schools and often resort to underhand ways to manipulate their results to look better. Lax security and audit procedures create scope for fraudulent practices.

3. Like school comparisons ignore other differences in school composition

The *My School* comparisons of the test results of 'like schools' ignore other differences in the student composition of schools which have a significant effect on school results. While SES accounts for the large part of the influence of background factors on school performance, there are also other background factors which, if not taken into account, could invalidate like-school comparisons. These include differences in school composition by gender, ethnic sub-groups and students with disabilities.

Several studies, including studies co-authored by a member of the ICSEA expert advisory panel, have found these factors to be significant in explaining the variation in student achievement. It is strange that ACARA has not included these factors in the construction of ICSEA as it would increase the explanatory power of the index.

3.1 *My School* ignores differences in the gender composition of schools

Surprisingly, ICSEA ignores the impact of gender on school results. Many studies in Australia have highlighted significant differences in educational outcomes for females and males.

It is well recognised that females demonstrate significant and consistently higher levels of average literacy achievement than males [Marks et.al. 2001; Rothman 2002; Rothman & McMillan 2003]. There seems to be a consistent pattern across age groups [Cresswell et.al. 2002]. At the primary level, males have significantly lower levels of achievement in literacy than females. At the secondary school level, males are more likely than females to leave

school before completing Year 12, and average scores on end-of-school assessments are lower for males than for females.

These findings are confirmed by recent results. The latest NAPLAN results show that in each literacy domain at each Year level, the percentage of students at or above the national minimum standard is greater for females than for males [NAPLAN 2009]. Average results for females significantly exceed those for males. Similarly, the latest PISA results show significantly higher literacy outcomes for by 15 year old females than for males [Thomson & de Bortoli 2008]. Other information also indicates that the Year 12 results for government and private all female schools are significantly higher than those of all male schools in the same regions [Parker 2008].

On the other hand, there is evidence that males slightly outperform females in numeracy, although the evidence is mixed for different age levels [Rothman 2002; Rothman & McMillan 2003]. The most recent NAPLAN results show that average scores for male students are generally slightly higher than for females. However, there is little difference in the proportion of females and males at or above the minimum numeracy standards. The PISA results show slightly higher average achievement for males than for females [Thomson & de Bortoli 2008].

These differences in gender achievement are unlikely to be significant for like school comparisons involving schools with similar proportions of female and male students. However, they are likely to be very significant in comparing outcomes between all male schools and all female schools with similar SES profiles. On average, all male schools will tend to have lower levels of average literacy achievement than all female schools with similar SES composition. It is also likely that, on average, all female schools will have higher outcomes than schools with a similar SES profile but which have more or less equal proportions of female and male students. That is, the male population of these schools is likely to lower their average achievement compared to all female schools. Similarly, all male schools may have slightly higher levels of numeracy achievement than all female schools.

Thus, ICSEA should take account of significant variations in the proportion of female enrolments between schools in order to ensure a better measure of 'like schools'. Inclusion of a gender variable would increase the explanatory power of the index.

3.2 *My School* ignores differences in the ethnic composition of schools

My School does not distinguish the ethnic profile of schools. Children from particular ethnic groups are often concentrated in particular areas and schools, and children from some ethnic communities are highly concentrated in government schools. Performance disparities between 'like' schools may reflect differences in ethnic composition rather than differences in school practices.

The ethnic background of students is excluded from ICSEA because the correlations between the percentage of people who do not speak English well and student achievement were below statistical significance [ACARA 2010]. This is not surprising because when all students from ethnic backgrounds, or from non-English speaking backgrounds, are considered as a group they achieve at similar levels to students of Australian-born parents [Cresswell 2004; Cobbold 2009]. There is little evidence that students with language backgrounds other than English have poorer educational outcomes. This has been the case for many years [Sturman 1997; Ainley et.al. 2000].

However, there are significant differences in student achievement between different groups of students from non-English speaking backgrounds. ACARA has mistakenly analysed only a very broad category of people and ignored differences within the group of people who do not speak English well. Asian students, in particular, Chinese students, appear to achieve at higher levels than other groups. Students from some ethnic groups achieve much lower average results.

There is evidence that the average results of Lebanese students and Pacific Islander students are well below those of Chinese students. A study of Year 10 Certificate results for English, Mathematics and Science in three high schools in south-western Sydney found substantial differences between the results of students from different ethnic backgrounds [Suliman & McInerny 2006]. It found a much higher percentage of Lebanese students were achieving in the lower grades in all subject areas than Chinese and Vietnamese students. A much lower percentage of Lebanese students achieved the top grades than Chinese and Vietnamese students. The average results of Lebanese students were significantly below those of Chinese and Vietnamese students.

An analysis of data from the Longitudinal Surveys of Australian Youth shows that achievement in literacy and numeracy in Year 9 varies widely among students from language backgrounds other than English [Marks & McMillan 2000]. When ethnic background was measured by nine categories relating to father's country of birth, some ethnic groups showed higher Year 9 achievement levels than those students with fathers born in Australia, while students from other groups showed lower Year 9 achievement levels. This finding was confirmed by further analysis of university entrance scores. It found that students classified as Asian performed substantially better than students whose fathers were born in Australia when adjusted for socio-economic background [Marks et.al. 2001]. On the other hand, the mean scores of students with Middle Eastern, North African and Pacific Islander ancestries were significantly below those of Asian students.

A study carried out by ACER for the National Education Performance Monitoring Taskforce of the Ministerial Council for Education, Employment and Youth Affairs shows that average numeracy test scores for Year 9 students from the Middle East, North Africa and the Pacific Islands are significantly below those of Asian students [Ainley et.al. 2000].

A later ACER report which analysed the 2000 PISA results for Australian immigrant children found that average reading and mathematics scores for Chinese and other Asian language students were significantly higher than for students with Middle Eastern home languages [Cresswell 2004]. In terms of proficiency levels, nearly 50% of Chinese students and 29% of Other Asian students achieved at the top two reading levels compared to 15% of Middle Eastern students. In contrast, only 9% of Chinese students did not achieve expected minimum standards compared to 24% of Middle Eastern students.

Such disparities in outcomes for students from different ethnic backgrounds are concealed by aggregate measures as used by ACARA. The ACER report to the Performance Monitoring Task Force stated:

...it needs to be acknowledged that there is a great diversity in the educational outcomes of students from ethnic minorities. Students from some ethnic or language backgrounds perform better than others and the use of aggregated data conceals these differences. Consequently, it is important to collect detailed data on the cultural and language backgrounds of students. [6]

It recommended that when using country of birth and language measures to report educational outcomes, students should be grouped into several categories [Ainley et.al. 2000: 32]. It is curious that this recommendation was not adopted by ACARA when one of the co-authors of the report is on the expert advisory panel for ICSEA.

A recent report by ACER to the MCEETYA Expert Working Group on reporting for school evaluation and accountability also recommended that national reporting on school performance should include the language backgrounds of students in schools should be taken into consideration in any evaluation of school performance [ACER 2008: 24].

The failure of ICSEA to take into account the different ethnic composition of schools has important implications for the accuracy and validity of like school comparisons. Performance disparities between so-called like schools may reflect differences in ethnic composition rather than differences in school practices. For example, schools with a similar ICSEA ranking could have a high proportion of students of Asian origin while others have a high proportion of Middle Eastern or Pacific Islander students which accounts for the difference in average results. Parents and others using the like school comparisons of My School could therefore be misled about the comparative quality of teaching and curriculum in these schools.

3.3 My School ignores students with disabilities

While there is provision for students with disabilities to be exempted from national tests this is not automatic and they are encouraged to participate by all Australian governments. These students receive special assistance for the tests. The results of schools serving these students are reported in the same way on *My School* as for other schools [ACARA 2010b].

Many schools have higher proportions of students with disabilities than others. Schools with higher proportions of students with disabilities participating in tests may have lower average results than other schools with a similar ISCEA value. A report by ACER to the MCEETYA Expert Working Group on school evaluation and accountability stated:

...in schools with large percentages of students with special needs, this variable may need to be taken into account in understanding average levels of school attainment....Care also is required in comparing outcomes for schools with significant proportions of special educational needs students. [Masters et.al. 2008: 25]

In addition to the bias inherent in the ISCEA ratings, government schools could be disadvantaged by 'like school' comparisons because they have a higher proportion of students with disabilities than private schools. For example, the proportion of students with disabilities in total government school enrolments in NSW and Victoria is over 5% compared to about 1% in Anglican schools.

4. My School ignores the influence of other outside factors on school results

4.1 My School ignores differences in student mobility between schools

The 'like school' comparisons on *My School* ignore the impact of differences in student turnover in schools. Some schools may have lower results because they have a high proportion of students who often change school.

Student mobility in Australia can be high. For example, a Queensland study has shown that 16% of all primary school students moved school 2 or 3 times in five years and 4% moved school 4 or more times [Simons et.al. 2007]. Other data shows that nearly 40 per cent of students in the Northern Territory change schools in any one year, apart from those who go on to a higher stage of schooling [Dunn 2009]. Even in a high income city such as Canberra, there are schools where annual turnover is over 30% at times.

While student mobility is higher amongst low SES families than for high SES families, it is also significant for high SES families. For example, the Queensland study found that nearly 30% of low SES primary school students and 13% of high SES students changed school 2 or more times in five years.

Many studies show that students who move school often tend to have lower average results than students who remain at the same school; although there is also evidence that it has little effect [Sorin & Iloste 2006; Simons et.al. 2007]. A recent syntheses of research studies on the effects of school mobility on achievement and dropout rates found that the large majority of studies conclude that children who move school 3 or more times have significantly lower reading and mathematics achievement and are more often to drop out of school [Reynolds et.al. 2009].

Thus, schools with similar ISCEA values could have large differences in average literacy and numeracy test scores because of differences in the proportion of students who often change schools. It also begs the question of the extent to which NAPLAN results can be credited to a school when a significant proportion of its students are only recent enrolments.

4.2 My School ignores the impact of private tutoring

The use of private tutoring by families is so extensive that it has been called a ‘shadow education system’ [Watson 2008]. The use of private tutoring by school-aged children in Australia is increasing and expenditure on private tutoring is increasing as a proportion of total household expenditure on children’s education [Watson 2008]. Private tutoring tends to be used more by higher income families. The wealthiest households (those in the top 20 per cent of the income distribution) spend double the amount of an average household on private tutoring.

Differences in the extent to which families resort to private tutoring outside school is another factor affecting ‘like school’ comparisons. Schools with the same ISCEA value may have different proportions of students engaged in private tutoring. This may be a factor influencing comparisons of government and private schools with the same ISCEA value. Higher SES families can better afford private tutoring for their children A private school may achieve higher results than a government school simply because a larger proportion of its families use private tutoring.

In addition, changes in school results from one year to the next may be influenced by changes in the proportion of families who use private tutoring. If a higher proportion of families engage private tutoring in any one year a school will receive a boost to its measured performance compared to another ‘like school’ even though there was no change in teaching effectiveness during the year.

5. Like school comparisons ignore many other different features of schools

Schools differ in many ways apart from their socio-economic composition and the influence of other outside school factors. Some other key ways in which schools differ and which may influence school results are ignored by My School in providing comparisons of test results between so-called 'like schools'. These include differences in funding, size and the selection of students.

5.1 My School ignores vast funding differences between schools

My School fails to report school funding. Schools with similar ISCEA values may have vastly different levels of funding which may contribute to differences in school results.

There are very large differences in recurrent expenditure on government schools in different states. For example, in 2007-08 recurrent expenditure per government secondary school student in Western Australia was 43% higher than in Victoria while expenditure per primary school student in the ACT was 48% higher than in Victoria [Productivity Commission 2010]. In addition, total funding per student in many high SES private schools is up to double or more that of high SES government schools [Cobbold 2010].

Comparing the results of schools with similar ISCEA values while ignoring such vast expenditure differences between schools is not comparing like with like. It is comparing unlike schools.

The Federal Minister of Education has long promised that school funding levels would be reported on My School. However, the Government reneged on this promise. It is now only promised at a future date and may not come to fruition because of strong opposition from private school organisations.

5.2 My School ignores the impact of differences in school size

My School comparisons of 'like schools' ignore the impact of school size. It allows comparisons of large and small low SES schools and comparisons of large and small high SES schools.

Many research studies suggest that smaller primary and middle schools have higher levels of student achievement than very large schools while the findings for high schools are mixed [Garrett et.al. 2004; Howley 2002a; Hicks & Rusalkina 2004; McMillen 2004; Stevenson 2006]. These findings confirm earlier reviews of the research literature [Fowler & Walberg 1991].

There is also an extensive research literature which shows that students from low SES backgrounds achieve better results in smaller schools [Cobbold 2006]. Small schools with high concentrations of students from low SES backgrounds tend to have higher average results than large schools with similar concentrations.

Thus, some differences in results between schools with the same ICSEA ratings may be due to size differences or to the interaction of school size with socio-economic composition.

In addition, the results of small schools may significantly be affected by the results of only a few students. Studies show that small schools are much more likely to report large changes in

average results from one year to the next, both positive and negative [Kane & Staiger 2001; Linn & Haug 2002; Wu 2009]. School results can be heavily influenced by the results of 4 or 5 students in schools with small numbers of students in each year level and by the transfer of students between schools. Such volatility can lead to misleading and unfair comparisons between schools of different size but with the same ISCEA value.

5.3 *My School* ignores student selection by private schools

The ‘like school’ comparisons on *My School* ignore differences in enrolment practices by government and private schools which can affect comparisons of test results between schools with the same ICSEA value.

Private schools generally exercise control over which students they enrol. There is no requirement on private schools to accept all comers as is the case with government schools, apart from a small number of selective government schools. Private schools can also set their fee levels in a way that serves to exclude some students.

Private schools can use their control over enrolments to maximise their school results by selecting higher achieving students and excluding lower achieving students, an option not generally available to government schools. Thus, private and government schools with similar ICSEA values could have significantly different results because of differences in their ability to select their students.

6. Like school comparisons are affected by manipulation and rorting of school results

Extensive academic studies show that test results are manipulated and rorted by schools in various ways to improve their ranking [Cullen & Reback 2006; Figlio 2006; Figlio & Getzler 2002; Jacob 2005; Nicholls & Berliner 2007; Reback 2008].

There is evidence of this already happening in Australia at the senior secondary level. For example, many private schools make excessive use of special dispensations for Year 12 exams [Patty 2008; 2009a; 2009b; Tomazin 2009]. Some West Australian schools are pushing Year 12 students to choose easier subjects so that they can avoid exams that are used to rank school performance [Hiatt 2009]. Some Sydney private schools have forced some of their Year 11 students to change schools or do their HSC at TAFE because they may not achieve high enough results [Patty 2009c; Thompson 2009].

Following the overseas experience, it can be expected that Australia will soon see a variety of practices to manipulate school results. Practices commonly used in England and the United States include poaching high achieving students from other schools, denying entry to, or expelling, low achieving students, suspending low achieving students on test days, increasing use of special dispensations for tests, encouraging students to take courses whose results are not used to compare schools and outright cheating.

Differences in the extent of such manipulation of school results will invalidate comparisons of test scores between schools with similar ISCEA values.

7. Conclusions

There are an extensive number, indeed, a litany, of flaws in the like school comparisons on *My School*. As a result, *My School* does not consistently compare ‘like’ with ‘like’. A number

of examples where comparisons between supposedly ‘like schools’ involve comparisons between very unlike schools have already come to light in newspaper reports around Australia.

Some of the flaws in the *My School* comparisons are more significant than others. A major flaw is the use of an area-based measure of SES which could substantially distort comparisons of schools, especially between government and private schools because higher SES families are more likely to choose private schools than low SES families.

Another major flaw is the exclusion of differences in the gender and ethnic composition of schools, factors which have been shown to have a significant effect on school results. Similarly, schools with higher proportions of students with disabilities participating in the national tests are likely to be unfairly compared with similarly rated schools with lower proportions of these students.

The failure to take account of student mobility, especially for small schools, large differences between schools in funding and size and student selection by some schools could also generate comparisons between very unlike schools.

The omission of these and other variables affecting school outcomes is quite significant for the comparison of like schools. It means that a substantial part of the variation in school results is incorrectly attributed to differences under the control of schools, for example, better teachers, curriculum, pastoral care, etc., instead of to omitted variables.

The technical analysis carried out by ACARA shows that much of the variation between schools can be explained by the factors incorporated in the ICSEA. According to ACARA, the socio-economic and other variables included in ICSEA explain nearly 70% of the variation in aggregated primary school outcomes. The remaining 30% of the variation is unexplained and implicitly attributable to differences in the quality of ‘like schools’.

If gender, ethnic sub-groups, students with disabilities, school funding, school size, student mobility, school size and student selection were all properly taken into account, the index could well lift its explanatory power to 85-90% of the differences in school results. This would leave about 10-15% of the variation in school results to be explained by quality and other features of schools instead of the 30% currently implied by ICSEA. That is, ICSEA incorrectly attributes about half or more of the unexplained 30% to differences in school quality when it should be attributed to other factors outside the control of schools.

In other words, ICSEA exaggerates the extent of differences in quality between ‘like schools’ and misleads those who choose schools or make policy decisions on the basis of these comparisons.

It is notable that many reports, including some commissioned by the national council of ministers, have acknowledged a number of these problems as issues in developing accurate measures of school performance. In particular, they have noted the problems in using area-based measures of SES and the need to include gender and ethnic composition of schools in measuring school performance, but which are omitted in the *My School* comparisons. Yet, this advice has been ignored. An especially puzzling feature of the failure to take this advice is that one of the co-authors of several reports is a member of the expert panel advising on the development of ICSEA.

It is clear then that ICSEA in its current format is entirely inadequate for determining like schools. It needs a major overhaul. The systematic bias in favour of private schools generated by the use of an area-based SES measure can only be resolved by developing a consistent measure of individual family SES. ICSEA should also be revised to include gender, ethnic sub-groups, students with disabilities, student mobility, school funding, school size and student selection practices.

An independent public inquiry should be established to review the flaws in ICSEA and the failure of *My School* to consistently compare like with like.

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