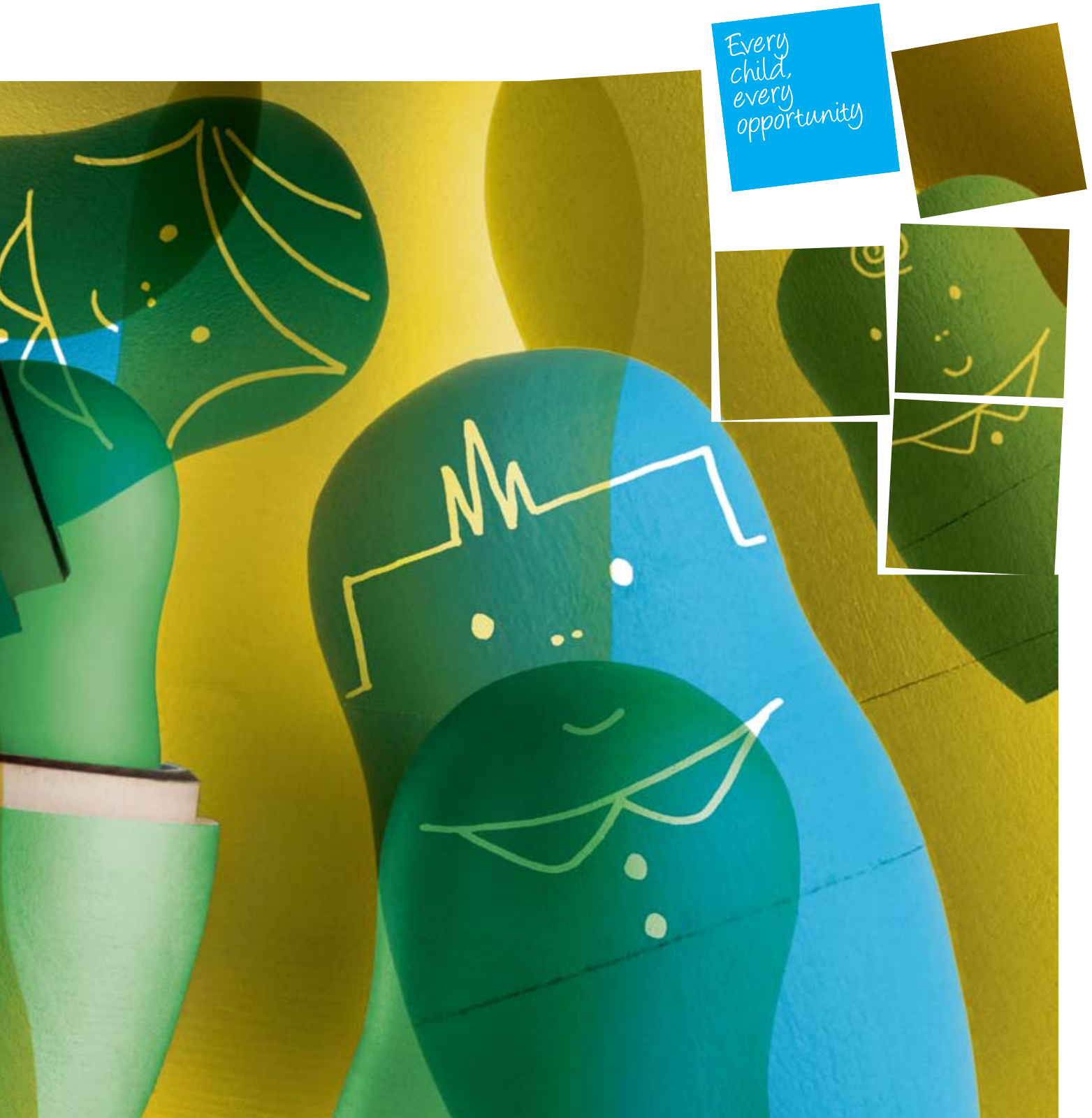
State Government Victoria

Department of Education and Early Childhood Development

Measuring performance fairly

Developing intake adjusted performance measures in Victorian government schools



Published by the Data, Outcomes and Evaluation Division
Office for Children and Portfolio Coordination
Department of Education and Early Childhood Development

Melbourne
Published November 2009

Authorised by the Department of Education and Early Childhood Development, 2 Treasury Place, East Melbourne, Victoria 3002.

Also published on http://www.education.vic.gov.au/about/directions/initiatives.htm

ISBN 978-0-7594-0585-1

Contents

1. Using data to improve

Victorian schools have been at the forefront of educational data use for many years. On a daily basis, data from a range of sources feeds into the decisions we make about our work – teachers use data to individualise learning and to monitor how effective they are in supporting every student to progress; school leadership teams use data to evaluate the success of their improvement strategies; and school councils use data to ensure their overall plans for the school are meeting the needs of their local community.

Victorian schools have also seen many innovations in data over the last decade, from the early days of "like" school groups through to the implementation of the Victorian Essential Learning Standards, NAPLAN and percentile comparison charts. And we have pioneered the use of attitudinal data from students, teachers and parents to develop a thorough understanding of our strengths and weaknesses.

We are now ready to take the next step.

Taking a comprehensive view of performance

When it comes to data, what we measure must be determined by what we value.

In Victoria, we are clear about the outcomes we are striving to achieve for our children and young people. From birth through to adulthood, the Blueprint for Education and Early Childhood Development makes it clear that we are not interested in simply getting students to attain higher test scores – we are aiming for much more than that. So we want our data to recognise the comprehensive range of outcomes we're aiming to achieve.

In Victorian government schools, the Accountability and Improvement Framework clearly articulates three outcome areas for students:

- student learning,
- student engagement and wellbeing, and
- student transitions and pathways.

To help us improve outcomes in all three areas, we need a sensitive and sophisticated way to understand our performance. To get this understanding it is important that we take into account the context of each school, the challenges it faces, and consequently the value it is adding in improving student outcomes.

Studies in Victoria and around the world tell us that a student's background makes a difference to his or her outcomes. This doesn't mean we should expect less of students from more disadvantaged backgrounds. Nor does it mean that the capacity of these students to achieve is necessarily less than others. But it does mean that if we are to judge each school's performance fairly – if we are to compare schools - then we first need to take account of students' differing starting points.

Two kinds of value added measurement

One way to do this is to track the progress of every student in every school over time and construct measures of how cohorts of students in each school progress, taking into account the rate at which students with similar characteristics progress in other schools. This type of measurement is referred to as “value added”.

Value added measurement in Victoria will become possible in the near future, once we have a unique identifier for every student and once we are able to use NAPLAN data to track cohorts over a three year period as they progress through their schooling from Year 3 to Year 5, from 5 to 7 and from 7 through to 9.

In the meantime, there is another type of value added measurement we can use – *contextual* value added. Recently, we have been working, with support from Professor Stephen Lamb from the University of Melbourne, to develop contextualised value added measures using data from Victorian government schools. Many of these developments draw on the work of Professor David Jesson from the University of York, UK.

Rather than looking at the growth in learning outcomes for individual students, contextual value added measures look at the differences in school performances across a range of outcomes after adjusting for differences in student background characteristics between the schools, including the student learning outcomes of each school’s students. We adjust for the social composition of the school and we adjust for the academic composition.

Importantly, contextualised value added measures allow us to do two things.

First, they allow us to look at outcomes beyond the student learning domains, so that we can understand how we’re performing against measures of student engagement and wellbeing and measures of students’ transitions and pathways. They allow us to measure all of what we value.

And secondly, they focus the measurement on the whole school performance, rather than on that of individual students or teachers. These measures cannot, for instance, be used to attribute performance to a particular cohort of students as they are never based on only one cohort; they use contextual data and broad measures of student outcomes across the entire school.

Intake adjusted performance measurement

We know that a multitude of factors influence school performance outcomes; from parent and community values, to teachers’ content

knowledge and instructional expertise, and through to the capacity of the school's leadership team. Some of these factors we can measure. Many we either cannot or do not. A key strength of contextual value added measures is that they take account of the factors we can measure and tell us how much variation between schools is explained by them. By inference, the unexplained component – the value added – can then be attributed to what we're not accounting for. A part of this is the performance of the school.

In Victoria, we plan to use the term *intake adjusted performance* to describe these measures, rather than 'contextual value added'. Doing so will reserve the term *value added* for the time when we can develop student level growth measures.

In one sense, intake adjusted performance measures are easy to explain: they measure the performance of each school after taking account of the factors we know make the biggest difference to the variations in outcomes between schools.

To take a concrete example, we know that where students live can make a big difference to where they go after leaving secondary school. For instance there are often fewer further education and employment options in rural areas compared to metropolitan areas. So we take the rurality of the school into account when measuring the success of their post-school destination outcomes – we "adjust" for rurality.

But once we get past this basic notion – that we adjust for the factors we know make the biggest difference – things start to get more complex. This is because different factors affect different outcomes in different ways.

Taking another example, we know that the school completion rate of indigenous students is around half that of non-indigenous students. So we need to take account of the indigenous composition of each school's cohort in considering their post-compulsory outcomes. Add this to the adjustments made for rurality and other factors and things quickly get very complex.

Typical school intake characteristics that we measure and can take account of include:

- a measure of the school's academic composition
- the school's Student Family Occupation (SFO) Density
- the proportion of students funded under the Program for Students with Disabilities (PSD)
- the proportion of Indigenous students
- the proportion of refugee students
- the proportion of students with English as a Second Language (ESL)
- the school's rurality, and
- the school size.

The technical appendix at the back of this document gives a complete description of how the intake adjusted performance measures are calculated, including the intake characteristics that make a difference to each of our outcomes measures, and which measures of schools' academic composition are used for each outcome.

Presenting intake adjusted performance

With intake adjusted performance measures, what we're ultimately interested in is the extent to which each school is higher than, lower than, or broadly similar to the level of performance we might estimate given the intake characteristics of their student population.

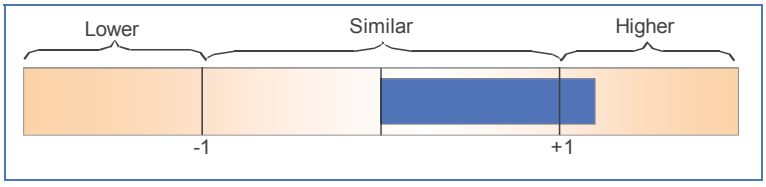
Based on what we know about the effect each intake measure has on each outcome, we can plot the estimated performance of a school and then measure the gap between that estimated performance and the actual performance. We call this gap the standardised residual, as it is measured in units of standard deviation.

For our purposes, a standardised residual between -1 and +1 means that the school is performing within a similar range to other schools given their intake characteristics. A standardised residual lower than -1 means the school is performing at a lower level, while a value of more than +1 means the school is performing at a higher level.

The standardised residuals tell us whether the school, taking into account the students it has, is performing higher than, lower than, or broadly similar to other schools, taking into account the students they have.

We can plot these residual scores on a chart. Figure 1.1 gives an example for a school's performance on the Year 5 NAPLAN Reading test.

Figure 1.1: Year 5 NAPLAN Reading: a school with intake adjusted performance at the higher level

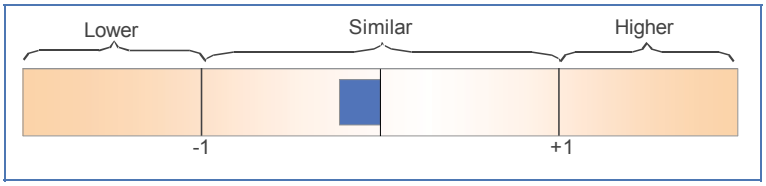


The critical factor in Figure 1.1 is not how far the blue bar extends to the right – away from the middle of the chart - but whether or not it crosses the +1 line. In this case it does, showing that the school's outcome is more than a full standard deviation higher than what we might estimate after adjusting for the appropriate intake characteristics.

Figure 1.2 shows another example. Even though this school's standardised residual is slightly negative – to the left of the middle of

the chart – the important thing is that it is still between -1 and +1, meaning that the school's intake adjusted performance is within a similar range after adjusting for its intake.

Figure 1.2: Year 7-10 Real Retention Rate: a school with intake adjusted performance at a similar level



The Details

The technical appendix to this document gives a detailed account of the principles and processes used to construct the intake adjusted performance measures, including which intake characteristics are adjusted for in the calculation of each outcome.

Using intake adjusted performance data

In Victorian government schools, we have long-established ways of working with different types of data – for instance, we favour consistent patterns in the data over point-in-time figures; we use absolute measures to monitor trends over time and relative measures to determine areas for improvement. We reserve judgement in our interpretations. We do not apportion blame for the past but instead focus on the desired future, seeking to answer the questions 'what would it take to improve these results?' and 'how will we know if it's working?'

And just as we would never use a single piece of assessment data to give a definitive understanding of a student's learning, we would not use intake adjusted performance as a definitive measure of our school. These data provide us with another perspective – they can highlight areas where we're doing well, and areas where we may need to focus additional attention and support. But they should always be interpreted alongside the other data we have in our schools.

Importantly, intake adjusted performance measures tell us how we're going after adjusting for our intake, but they do not tell us about our students' absolute outcomes and they do not replace or supersede those measures. The different types of data we have available are complementary, and it is the cumulative weight of the evidence we have about our performance that allows us to set out our improvement plans with confidence.

As always, in using these data we need to bear in mind that data alone never provides a complete picture of a school's performance – for that, we must always add our own contextual and professional knowledge to our interpretations. Intake adjusted performance data, as with all data, are only a starting point for the professional discussions about how we can further improve outcomes for students. These discussions must be moderated by the contextual factors that influence our work – the expectations of our local communities, the organisational structures that we work within, our shared goals and our professional practice itself – the factors that are not captured by the data.

Working towards value added performance measures

By late 2010, the first cohorts of Australian students will have undertaken two successive NAPLAN tests. These students will have progressed from Years 3, 5 and 7 in 2008, through to Years 5, 7 and 9 in 2010. It will be the first chance Australia will have to investigate the growth of students at a "whole-of-population" level.

It will also be an opportune time to investigate how value added measurement can best work in an Australian context. As part of a four-year plan to deliver the goals of the Melbourne Declaration on Educational Goals for Young Australians, governments around the country have agreed that they will, "where appropriate, develop value-added measures for schools' performance and analysing student results over time."[1]

These new value added measures will provide us with another useful perspective on the success of our teaching and learning. It is important though, that we don't lose sight of the other outcomes we value; those relating to students' engagement and wellbeing, and to students' transitions and pathways. The intake adjusted school performance measures will continue to provide us with a fair measure of our performance in these areas.

Ongoing development

The introduction of intake adjusted measures of school performance in Victoria is the first phase of an ongoing process of development. As we learn more about how these measures can be used to support schools in their improvement efforts, we will work to enhance the underlying statistics: using a wider range of intake measures where this makes sense and including new data sets as they emerge.

---

[1] MCEETYA four-year plan 2009 – 2012: A companion document for the Melbourne Declaration on Educational Goals for Young Australians, MCEETYA 2009 (http://www.mceetya.edu.au/verve/_resources/MCEETYA_Four_Year_Plan_(2009-2012).pdf)

2. Technical Appendix

Working parameters

This model of intake adjusted school performance measurement was constructed under a set of working parameters that influenced some of the methodological decisions.

Importantly, the intake adjusted measures were developed using real world data and as a result, are subject to all the characteristics of real world data including data entry errors, missing cases and even contextual circumstances in some schools that mean they simply don't fit "the model".

In a similar vein, it is worth remembering that the data used to construct the model were not originally designed for this purpose. This doesn't mean that they can't be used in a meaningful way to construct intake adjusted measures, but we do need to be mindful of any resulting limitations.

Design principles

Following are the principles under which the intake adjusted school performance measures were developed. Included under each principle is a short description or example of some of the implications the principle has for the overall model.

(1) The measures must be applicable to all Victorian government Primary, Secondary and Primary/Secondary schools wherever possible.

For this first iteration of these measures, only Primary, Secondary and Primary/Secondary school types have been included in the modelling. We will continue work to include other school types, such as Special schools, over time.

(2) Only existing, readily available data sets can be used.

Another way to put this principle is to say that new data could not be developed specifically for the purposes of constructing these measures – it is the principle of "collect once, use many times." In the interests of minimising school workload and using the available data for a multitude of purposes, what was available was used. The key implication for the methodology is that many of the data available to Victorian government schools are already aggregated; they are not reported at the student, or class, or teacher level and so the methodology could not take account of the multilevel nature of the data.

(3) The methodology must be replicable across a defined set of outcome variables relating to Student Learning, Engagement and Wellbeing, and Transitions and Pathways.

Finally, the methodology needed to be applied across the range of outcomes that are valued and measured in Victorian government schools. It was of little value, for instance, to develop a procedure to calculate intake adjusted performance measures for VCE that couldn't then be applied to attendance data.

An outline of the model

The model is constructed using a series of multiple ordinary least squares linear regressions.

Regression analysis is a statistical technique that gives us an understanding of how one variable (the dependent variable) tends to change when a number of other independent variables are varied.

For simplicity, we can refer to the dependent variable as the outcome we're interested in (such as teacher judgements against the VELS), and the independent variables as the contextual intake measures we have for our schools, such as SFO, or school size.

One outcome of regression analysis is an equation that can be used to plot a regression line – a line on a chart that shows us how the outcomes tend to change along with the intake measures. The equation for this line can be used to estimate a school's outcome on a dependent variable given the various intake characteristics the school has. So we can plug in a school's values on each of the intake characteristics and calculate an estimate of the school's outcome value.

We can then measure the gap between a school's actual outcome and their estimated value from the regression equation. We call this gap the "residual" – it is a residual in that it measures the remainder, or the distance, between the estimated value and the actual value. The residual can be either positive (where the school is performing at a level higher than estimated) or negative (where the school is performing at a lower level).

Tables 2.1 and 2.2 give the complete details for how each of the outcomes measures and each of the intakes variables are constructed.

For each of the outcome measures, two regressions are run, one based on the latest year of data (LY) and one based on a four-year aggregate (4Y). This is done to account for the volatility in the data for smaller schools. Where four years of data are not available for a measure, as much data as possible is used, with the intention of building up to four years over time. For instance, since NAPLAN data is only available for 2008 and 2009, the 4Y measure has been replaced by a 2Y measure for this first version of the model.

As the outcome measures become available during the year at different times, the LY measures will never be based on the same calendar year. For example, the School Connectedness measure from the *Attitudes to School Survey* for 2009 is available in October 2009 but at that point in the school year, 2009 VCE results are not.

The four-year average is an average of each of the last four years, rather than an aggregation of four years worth of data – this eliminates

the chance of a single large cohort skewing the result and ensures the focus of the measure is on the school's performance over a four-year period.

For a primary school, there is a total of 16 regression equations and for a secondary school, 18 regression equations.

The standardised residuals for each equation tell us whether the school, taking into account the students it has, is performing higher than, lower than, or broadly similar to other schools, taking into account the students they have.

The model - intake measures

A range of data is used to describe the background characteristics of student populations. To get the most meaningful and useful information from the intake adjusted school performance measures, we need to adjust for the characteristics of the school that make the biggest difference to the outcomes we're interested in.

Table 2.1 describes all of the intake measures in detail.

It is important to highlight that for each regression equation, all of the intake measures, except one, describe the context of the school in terms of its socio-economic situation, student profile, geographic situation and school structure. The exception is the intake measure that describes the **academic composition of the school**. Table 2.3 shows which academic composition measure is used for each outcome.

Table 2.1: Intake measures

	Intake Measure (abbrev.)	Definition
All schools	SFO (SFO_LY and SFO_4Y)	The school's Student Family Occupation (SFO) index. For multi-campus schools, the school-level SFO density is calculated by taking an average of the multiple SFO scores weighted by campus enrolments.
	% Indigenous (pctIndigP6LY, pctIndigP64Y, pctIndig712LY, pctIndig7124Y)	The percentage of indigenous enrolments based on the August census enrolments for the whole school. This is constructed as a categorical variable to account for its non-normal distribution.
	Proportion Integration (PSDLY and PSD4Y)	The proportion of students in receipt of funding under the Program for Students with Disabilities (PSD), based on the February census enrolments for the whole school. This is constructed as a categorical variable to account for its non-normal distribution.

	Intake Measure (abbrev.)	Definition
	Remoteness (ARIA)	The rurality index of the school, based on the ABS ARIA codes, where: 1 = capital city (Melbourne) 2 = inner regional 3 = outer regional, and 4 = remote This is a categorical variable.
	Total Enrolments (enrolmentsP6_LY, enrolmentsP6_4Y, enrolments712_LY, enrolments712_4Y)	Total FTE school enrolments based on the February census. This is constructed as a categorical variable to account for its non-normal distribution.
	Mobility (MBsecLY, MBsec4Y) (used for real retention only)	Based on the August census, the proportion of students who are SRP funded and who enrolled between (not inclusive) the previous August census day and 1 December in the previous calendar year; and between (not inclusive) the February census day and the August census day (plus one day) in the current year. This is constructed as a categorical variable to account for its non-normal distribution.
	% Female Students (pcGirlsP6LY, pcGirlsP64Y, pcGirls712LY, pcGirls7124Y)	The percentage of female enrolments based on the February census.
	Proportion ESL (ESLLY, ESL4Y)	The proportion of ESL enrolments based on the August census. A student is defined as ESL if they come from a language background other than English, speak a language other than English at home as their main language, and have been enrolled in an Australian school for less than five years. This is constructed as a categorical variable to account for its non-normal distribution.
	Proportion Refugees (RefugeesLY, Refugees4Y)	The proportion of refugee enrolments based on the August census. This is constructed as a categorical variable to account for its non-normal distribution.

	Intake Measure (abbrev.)	Definition
	School Type (schoolTypeP6, schoolType712)	The school type, where the categories are: Pri/Sec Primary (Prep – Year 6) Secondary (Year 7 – Year 12) Secondary (Year 7 – Year 10) Senior Secondary (Year 10 – 12 or Year 11 – 12) Select Entry
Academic Composition measures - Primary Only	P-2 Assessment of Reading (AoR90pc_LY_P12, AoR90pc_4Y_P12)	Aggregate percentage of Prep to Year 2 students reading appropriate text levels (5 for Prep, 15 for Year 1 and 20 for Year 2) with >=90% accuracy. This is constructed as a categorical variable to account for its non-normal distribution.
	NAPLAN Year 3 (NAPLANyr3Read_LY&2Y, NAPLANyr3Num_LY&2Y, ZNAPLAN_Y3_LY&2Y) Where: Read = Reading Num = Numeracy ZNAPLAN = average of the standardised (z-score) NAPLAN literacy (reading, writing, spelling, grammar and punctuation) and numeracy (mathematics) tests	The mean NAPLAN scale score achieved by all Year 3 students in the school. Both the latest Year (LY) and two-year (2Y) figures are used. When sufficient data are available, these data will be replaced by 3-Year (3Y) and then 4Y measures.
Academic Composition Measures - Secondary Only	NAPLAN Year 7 (NAPLANyr7Read_LY&2Y, NAPLANyr7Num_LY&2Y)	As above, for Year 7 students.
	NAPLAN Year 9 (ZNAPLAN_Y9_LY&2Y)	As above, for Year 9 students.
	AIM Year 7 (ZAIM_Y7_LYL5_LY&2Y) (used for VCE only)	The Year 7 AIM scores obtained by students who have at least one VCE study score, regardless of which school the student was enrolled at in Year 7. If these AIM score cannot be determined for more than 50% of the VCE cohort, the school's average Year 7 AIM scores (five years prior) are used. If there is no AIM data five years prior, the school's average Year 7 AIM scores four years prior are used. The AIM scores (for each test) are then standardised. These standardised scores are then averaged across all literacy and numeracy tests.

The model – outcome measures

The Accountability and Improvement Framework for Victorian government schools defines three broad and interrelated areas of student outcomes:

- student learning
- student engagement and wellbeing
- student pathways and transitions.

Within these broad areas, we measure outcomes using a defined set of indicators that are generally well understood across our schools. But there are many ways to represent performance using these indicators, so it's worth being precise about how each outcome is defined. Table 2.2 sets out these definitions.

Table 2.2: Outcome measures

	Measure (abbrev.)	Definition
Primary - Student Learning measures	Teacher assessments against the VELS – English and Mathematics (TJEngMathsP6LY, TJEngMathsP62Y)	Across Prep to Year 6, of the two possible progression points that equate to a C grade at each year level, the lower C grade is set to zero. The school's mean score is then calculated relative to this zero point. E.g. a score of 0.25 is 0.25 of a VELS level above the lower C grade. The mean was then calculated for the each dimension of the English and Mathematics domains. To give equal weighting to English and Mathematics, the mean of the two means was calculated.
	Teacher assessments against the VELS – Other (TJotherP6LY, TJotherP62Y)	As above, for all domains of the VELS other than English and Mathematics. All domains are equally weighted.
	NAPLAN Year 3 (NAPLANyr3Read_LY&2Y, NAPLANyr3Num_LY&2Y) Where: Read = Reading Num = Numeracy	The mean NAPLAN scale score achieved by all Year 3 students in the school. Both the latest Year (LY) and two-year (2Y) figures are used. When sufficient data are available, these data will be replaced by 3-Year (3Y) and then 4Y measures.
	NAPLAN Year 5 (NAPLANyr5Read_LY&2Y,	As above, for Year 5.

	Measure (abbrev.)	Definition
	NAPLANyr5Num_LY&2Y)	
Primary - Student Engagement and Wellbeing	Student absence Prep to Year 6 (studabs_P6_LY&4Y)	The average number of absent days per student for Prep to Year 6 students, where absences are those not related to the curriculum (e.g. sickness, extended family holidays). 4Y aggregates use an FTE count of students from 2006 onwards and a headcount prior to 2006.
	School Connectedness – the extent to which students feel they belong and enjoy attending school. (CtoS_LY_56, CtoS_4Y_56)	Mean scale score on School Connectedness factor of the student *Attitudes to School* questionnaire, across Years 5 to 6.
Secondary - Student Learning	Teacher assessments against the VELS – English and Mathematics (TJEngMaths710LY, TJEngMaths7102Y)	Across Year 7 to Year 10, of the two possible progression points that equate to a C grade at each year level, the lower C grade is set to zero. The school's mean score is then calculated relative to this zero point. E.g. a score of 0.25 is 0.25 of a VELS level above the lower C grade. The mean was then calculated for the each dimension of the English and Mathematics domains. To give equal weighting to English and Mathematics, the mean of the two means was calculated.
	Teacher assessments against the VELS – Other (TJother710LY, TJother7102Y)	As above, for all domains of the VELS other than English and Mathematics. All domains are equally weighted.
	NAPLAN Year 9 (NAPLANyr9Read_LY&2Y, NAPLANyr9Num_LY&2Y) Where: Read = Reading Num = Numeracy	The mean NAPLAN scale score achieved by all Year 9 students in the school. Both the latest Year (LY) and two-year (2Y) figures are used. When sufficient data are available, these data will be replaced by 3-Year (3Y) and then 4Y measures.
	VCE Allstudy (VCE_LY&4Y)	The average VCE study score achieved by all students in the school across

	Measure (abbrev.)	Definition
		all studies.
Secondary - Student Engagement and Wellbeing	Student absence Year 7 to Year 12 (studabs_712_LY&4Y)	The average number of absent days per student for Year 7 to Year 12 students, where absences are those not related to the curriculum (e.g. sickness, extended family holidays). 4Y aggregates use an FTE count of students from 2006 onwards and a headcount prior to 2006.
	School Connectedness – the extent to which students feel they belong and enjoy attending school. (CtoS_LY_712, CtoS_LY_4Y)	Mean scale score on School Connectedness factor of the student *Attitudes to School* questionnaire, across Years 7 to 12.
Secondary - Student Transitions and Pathways	Year 7 to 10 Real Retention (RR710pct_LY&4Y)	The proportion of students retained in the school from Year 7 in the reported year minus three to Year 10 in the reported year.
	Percentage of positive exit destinations. (pctExits_LY&4Y)	Based on data collected by each school in February, the percentage of Year 10 to 12 students from the previous year's cohort who exited to either continue their education and training or to pursue a full time job. The denominator excludes unknown destinations. Destinations not considered "positive" are *unemployed – seeking work, unemployed – not seeking work* and *employed – part-time*.

The model – matching academic composition measures to outcomes

As stated above, the regression models for each outcome measure are based on a standard set of independent variables plus one other intake measure to account for the school's academic composition.

The selection of the academic composition measure for each outcome is far from arbitrary. It must make sense and it must be based on evidence. Faced with a choice of academic composition measures, the alternatives were tested to see which of them accounted for the most variation in outcomes between schools. So, for example, the question of whether P-2 Assessment of Reading or Year 3 NAPLAN accounted for more of the variance between schools' Year 5 NAPLAN scores was tested before selecting the Year 3 values. Table 2.3

shows which academic context measure is used for each outcome measure.

Table 2.3: Academic composition measures against Primary and Secondary Outcomes

	Outcome measure (Dependent Variable)	Academic Context Measure (Independent Variable)
Primary Outcomes	TJEngMathsP6LY	ZNAPLAN_Y3_LY
	TJEngMathsP62Y	ZNAPLAN_Y3_2Y
	TJotherP6LY	ZNAPLAN_Y3_LY
	TJotherP62Y	ZNAPLAN_Y3_2Y
	NAPLANyr3Read_LY	AoR90pc_LY_P12
	NAPLANyr3Read_2Y	AoR90pc_4Y_P12
	NAPLANyr3Num_LY	AoR90pc_LY_P12
	NAPLANyr3Num_2Y	AoR90pc_4Y_P12
	NAPLANyr5Read_LY	NAPLANyr3Read_LY
	NAPLANyr5Read_2Y	NAPLANyr3Read_2Y
	NAPLANyr5Num_LY	NAPLANyr3Num_LY
	NAPLANyr5Num_2Y	NAPLANyr3Num_2Y
	studabs_P6_LY	ZNAPLAN_Y3_LY
	studabs_P6_4Y	ZNAPLAN_Y3_2Y
	CtoS_LY_56	ZNAPLAN_Y3_LY
	CtoS_4Y_56	ZNAPLAN_Y3_2Y
Secondary Outcomes	TJEngMaths710LY	ZNAPLAN_Y9_LY
	TJEngMaths7102Y	ZNAPLAN_Y9_2Y
	TJother710LY	ZNAPLAN_Y9_LY
	TJother7102Y	ZNAPLAN_Y9_2Y
	NAPLANyr9Read_LY	NAPLANyr7Read_LY
	NAPLANyr9Read_2Y	NAPLANyr7Read_2Y
	NAPLANyr9Num_LY	NAPLANyr7Num_LY
	NAPLANyr9Num_2Y	NAPLANyr7Num_2Y
	VCE_LY	ZAIM_Y7_LYL5_LY
	VCE_4Y	ZAIM_Y7_LYL5_2Y
	studabs_712_LY	ZNAPLAN_Y9_LY
	studabs_712_4Y	ZNAPLAN_Y9_2Y
	RR710pct_LY	ZNAPLAN_Y9_LY
	RR710pct_4Y	ZNAPLAN_Y9_2Y
	pctExits_LY	ZNAPLAN_Y9_LY
	pctExits_4Y	ZNAPLAN_Y9_2Y
	CtoS_LY_712	ZNAPLAN_Y9_LY
	CtoS_4Y_712	ZNAPLAN_Y9_2Y

Addressing differences between Primary and Secondary schools

All regressions are split into two groups: one for schools with Prep to Year 6 students and one for schools with students in Years 7 to 12.

The regression analysis requires that, for any outcome measure, the school has all the intake measures. If just one intake measure is missing, no result is calculated. Therefore it is necessary to create separate models for schools with P-6 and 7-12 students. Schools with students in both categories (such as P-12 and P-10 schools) will get results from both models.

Addressing differences in school size

To help address the effect of school size, three approaches have been taken. Firstly, four-year averages are being used (see tables 2.1 and 2.2, above). Second, the number of school enrolments is included as an intake measure. Third, each regression is performed separately for large and small schools (where small schools are those with enrolments less than 101 for Primary schools and less than 301 for Secondary schools). Even then, the measures are less robust for very small schools. As with all school data, context knowledge of the school needs to contribute to the overall interpretation of the data.

New schools

Recently opened schools will not have data available for all years.

Privacy

For schools with less than three students in an outcome measure, the intake adjusted school performance results are suppressed.

Outliers

To address the question of outliers (outliers are the data that deviate markedly from the vast majority of schools – they usually represent a one-off occurrence and can have a distinct impact on the overall measures if included), where a school's standardised residual is > (abs+/-3), the school was removed from the analysis and given a standardised residual of +/-3 as appropriate.

Output from SPSS

The SPSS output from all the regressions is available upon request. Please email the School Performance Data unit (school.performance.data@edumail.vic.gov.au) to request the output.

The model - possible future enhancements

Mobility as intake measure

The current mobility measure (based on the August census, the percentage of students who had enrolled in the school after the February census of the same year) is used as an intake measure in this first version of the model for real retention only. The measure is considered to be a fairly weak measure of mobility. A much stronger measure would be the retention of students from years 3 to 5, or 7 to 9

according to NAPLAN. When 2010 NAPLAN data becomes available a new mobility measure will be developed and tested in the model.

New data sets

As they become available, new data sets will be incorporated into the intake adjusted school performance modelling (e.g. English Online Interview).

Note that data sets can only be added if state-wide data is available. For example, On Demand Testing is not a required data collection and therefore could not be included.