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## Australian Science of Learning Centre

ACER CEO, Professor Geoff Masters, and Director of Educational Monitoring and Research, Dr Sue Thomson, presented at the Australian Science of Learning Centre earlier this week.

Based at the University of Queensland, the Centre is a collaboration between ACER and the Queensland Brain Institute (QBI), and is a cross-disciplinary initiative to investigate learning in partnership with education professionals.

The Centre comprises researchers with backgrounds in neuroscience, psychology, education, imaging and complex systems. It is focused on attention, and how it mediates learning in the sense of long-term memory formation, and promoting innovative problem solving.

Professor Masters presented at the Centre's first meeting on Wednesday 20 July on the topic of educational research and neuroscience and how emotions and beliefs play a key role in learning.

The meeting covered the emerging multidisciplinary field of the science of learning which integrates neuroscience, psychology, complex systems, educational research and classroom teaching practice. Brain imaging, neural recordings and design of learning technologies were among the many cutting-edge approaches also discussed.

Dr Thomson presented at the Centre's symposium on Attention and Learning on Thursday 21 July, which brought together researchers from across the broad spectrum of research.

The symposium had a particular emphasis on how research across the different levels can be integrated to improve delivery of learning in today's classrooms.

Dr Thomson looked at student's perceptions of barriers to paying attention in class citing a number of studies in this area, including results from Australian participants in a number of international studies managed by ACER.

Further information about the Australian Science of Learning Centre is available from <http://www.qbi.uq.edu.au/solc>

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## Education and training and the avoidance of financial disadvantage

ACER research released by NCVET in July investigates to what extent different types of education and training reduce the risk of experiencing financial disadvantage.

Education and training and the avoidance of financial disadvantage by ACER Principal Research Fellow Dr Gary Marks examined the relationship between post-school qualifications and financial disadvantage among adult Australians between 2001 and 2008 using data from the HILDA longitudinal study.

The study focused on four dimensions of financial disadvantage: income poverty; financial stress; unemployment; and low wealth. The post-school vocational education and training (VET) qualifications examined are certificates I/II, III/IV, diplomas and advanced diplomas. The university qualifications examined are: bachelor degrees, postgraduate certificates and diplomas, and higher degrees.

Marks found that post-school qualifications in education and training differ in their effects on the four dimensions of financial disadvantage.

For income poverty, defined as living in a household with an income of less than 50 per cent of median equivalised disposal household income, all post-school education and training reduces the risk of experiencing this type of financial disadvantage. This is because post-school qualifications enhance labour market outcomes such as increasing time spent working and promoting full-time work rather than part-time work or unemployment. Furthermore, Marks found that the higher the educational qualification, the lower the percentage living in income poverty. For example, in 2008, among those whose highest qualification was less than Year 12, 20 per cent were in poverty, compared to around 11 per cent of people with certificate I/II and less than four per cent of those with bachelor degrees.

Financial stress is defined in the study as two or more instances in a single year of cash-flow problems such as having trouble paying household costs and utility bills on time, going without meals, or asking for financial help. In general, the impact of post-school qualifications on financial stress was much weaker than their effects on income poverty, with no qualification able to significantly reduce the chances of experiencing financial stress. Marks suggests that this is because financial stress reflects consumption as well as income and includes financial management, making the concept quite distinct from income poverty.

For unemployment, only a bachelor degree, a VET diploma and a trade certificate were found to significantly reduce the chance of becoming unemployed. Marks found that this can be accounted for by the qualifications' promotion of higher levels of experience in work and, in the case of bachelor degrees, higher-status jobs.

Almost all post-school qualifications reduce chances of falling into the low-wealth group, defined in the study as those households with less than 25 per cent of median household wealth, adjusting for household size.

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Graduate diplomas or certificates, advanced diplomas and trade certificates could be said to moderately reduce the incidence of low-wealth, while weaker effects were found for bachelor degrees and entry-level VET certificates. Certificate III/IV qualifications, however, had no significant effects of reducing the incidence of low wealth.

Policymakers may be interested in the findings from fixed effects analyses which indicate that qualifications, net of all other stable influences, do not substantially reduce the probability of financial disadvantage. The notable exception is a bachelor degree for income poverty. Also of interest are the strong protective effects of marriage and partnering on reducing financial disadvantage.

One of the policy recommendations from this study is that improving labour market outcomes, reducing the incidence of unemployment and increasing the time spent in full-time work are more direct policy initiatives for reducing financial disadvantage than simply increasing the levels of qualifications.

The research formed part of the Australian Government's National Vocational Education and Training Research and Evaluation Program, which is coordinated and managed by the National Centre for Vocational Education Research (NCVER) on behalf of the Department of Education, Employment and Workplace Relations (DEEWR).

The full report is available from [http://research.acer.edu.au/transitions\\_misc/9/](http://research.acer.edu.au/transitions_misc/9/)

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## Greater principal autonomy needed for partnership growth

School principals need greater autonomy and flexibility to develop school-community partnerships so that they can generate cooperation, trust and participation, an ACER review of research suggests.

In his Policy Brief, *Schools in their Communities*, ACER Principal Research Fellow Dr Robert Simons argues that the centralised model of governance that has traditionally characterised state jurisdictions tends to limit the leadership principals can provide in facilitating effective school-community partnerships.

The Brief considers three models of partnerships in schools and communities that have been developed in Australia during the last fifteen years, identifies the key factors in their success, then proposes policy recommendations in response to the key challenges faced in the continuing development of school-community partnerships.

Simons writes that, in response to a variety of national, regional, local and community initiatives for learning and wellbeing, three models of school-community partnerships have evolved. The 'School as a community hub' model facilitates the collaborative provision of a range of social services either in the school or in conjunction with the school. The model aims to have a simultaneous influence on learning and overall wellbeing, and is particularly relevant for disadvantaged and at-risk students.

The 'School as a community learning centre' model facilitates links with pre-schools, other schools and tertiary institutions, as well as complementary social supports, to create opportunities for lifelong learning. The model provides access for everyone in the community, not just children and their families.

The 'School as a centre of learning excellence' model facilitates the provision of support systems and services that are aimed at attaining achievement at or above national and international benchmarks. The model focuses on all students, not simply those who are disadvantaged and at-risk. Like the Schools as community learning centres model it emphasises the need for the capacity to continue learning in a global market for labour.

Simons notes that, despite differences in starting point and levels of priority assigned to particular goals and outcomes, the three school-community partnership models are complementary frameworks that can take in broader sets of goals and purposes as partnerships mature and develop.

In relation to these three models, Simons identified three key success factors for the establishment and continuing development of school-community partnerships. Successful partnerships have school principals who provide strategic leadership. School-community partnerships tend to be successful when they involve a local response to national goals, such as the Commonwealth Department of Education, Employment and Workplace Relations' commitment to improve student achievement in literacy and numeracy; and to halve the gap for Indigenous students in year 12 attainment or equivalent attainment rates by 2020.

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Successful partnerships have a publicly accountable, evidence-based monitoring process that allows assessment of whether or not particular initiatives are contributing to the achievement of the goal and partners are fulfilling their respective roles.

However, Simons' review of the research literature reveals that the continuing development of the models of school-community partnerships is dependent upon an education 'system re-design'. Simons recommends a decentralisation of governance so that principals are empowered to adapt administrative arrangements, be responsive to the complexities of managing school-community partnerships and enlist the best teachers and staff for the learning needs of the school and community. Simons also recommends that structures should be established to facilitate the dissemination and implementation of effective practice that assists teachers and school administrators to develop the skills and capacities for collaboration.

In conclusion, Simons recognises that school-community partnerships have the potential to contribute to improved student outcomes. The keys to realising this potential, Simons writes, are first, a policy framework to leverage the resources that are already present in many schools and communities and, second, leadership in re-designing school systems so that they can accommodate and support the growth and development of school-community partnerships.

The full Policy Brief, *Schools in their Communities* by ACER Principal Research Fellow Dr Robert Simons, is available from [http://research.acer.edu.au/policy\\_briefs/2/](http://research.acer.edu.au/policy_briefs/2/)

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## The Power of Expectation

*Nobody rises to low expectations.* Calvin Lloyd

Success in most fields of endeavour depends on an ability to visualise success. It has long been known that elite athletes mentally rehearse each performance prior to its execution. Advances in neuroscience show why this may be so important: the neurological processes involved in visualising a performance are almost identical to those involved in the performance itself. Indeed, simply watching somebody else perform activates 'mirror' neurons in the observer paralleling neuronal activity in the performer. [\[i\]](#) The ability to visualise success and an accompanying belief that success is possible appear to be prerequisites for most forms of human achievement.

It also is clear that the development of self-efficacy is strongly influenced by the attitudes and beliefs of others. In schools, high achievement tends to be correlated with high parental and cultural expectations. Parents, in particular, are powerful inculcators of values and aspirations. Highly influential teachers also are commonly described as individuals who communicate a 'belief' in their students and who build self-confidence through high expectations. However, just as some students live up to high expectations, so others live down to the low expectations held for them. In education, low expectations are the equivalent of bone pointing; all too often they become self-fulfilling prophecies.

Not surprisingly, students develop differing beliefs about their own abilities to learn. Some students appear to view ability as 'fixed' and something over which they have little control. Students who believe they have low fixed abilities tend to believe that effort will make no difference. Those who believe they have high abilities often underestimate the importance of effort. On the other hand, students with an 'incremental' view of ability have a deep belief that success is related to effort. Rather than interpreting past failures as indicators of a lack of ability, these students are more likely to explain failure in terms of a lack of effort. [\[ii\]](#) Interestingly, research has identified cultural differences in these beliefs. East Asian students tend to have more incremental views of their abilities than students of European origin. [\[iii\]](#)

Given its importance to ongoing learning and achievement, few outcomes of schooling are more important than the development of a belief in one's own capacity to learn. Because teachers and schools are in powerful positions to shape this belief – both positively and negatively – vigilance is required to ensure that educational practices do not unintentionally communicate and institutionalise low expectations of some learners.

One way in which educational practices can institutionalise low expectations is by *treating excellence as a limited resource*. There is general acceptance in society that not everybody can excel. Not everybody can be an Olympic athlete, just as not everybody can be tall. Indeed, if to 'excel' means to stand out from the crowd, then by definition, only some can excel. By analogy, it is argued, not everybody can (or even should) achieve excellence in the learning of mathematics or languages or science. Excellence in school achievement is a scarce resource available to only a few.

It seems likely that this deeply seated belief is driven in part by notions of intelligence. Beginning with Francis Galton in the mid-nineteenth century, it became common to identify and label varying levels of human intelligence, with each level representing an IQ range and a percentage of the population under the normal (bell) curve. A small percentage of 'geniuses' were at one extreme and small percentages of 'imbeciles' and 'idiots' were at the other. It was a small step from concluding that high intelligence was scarce to expecting excellence in school achievement also to be scarce.

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One of the clearest illustrations of the rationing of excellence is the process known as 'grading on the curve'. Under this process, the percentage of students achieving each available performance grade is pre-determined. For example, a decision might be made ahead of time to award the top ten per cent of students an 'A', and the next 15 per cent of students a 'B', regardless of their absolute levels of achievement. This practice, common in some higher education institutions, is intended to counter the possibility of 'grade inflation' (that is, an increasing percentage of students being awarded high grades with no accompanying increase in absolute levels of achievement). The rationing of top grades to fixed percentages of students sends a clear message that excellence in educational achievement is expected of only a few. There are many other, more subtle, ways in which educational institutions communicate the same message.

However, educational achievement is not pre-determined in the way that attributes such as height are pre-determined. Achievement is strongly influenced by the quality of teaching, parental support and expectations, and student effort. Educational achievement also is not a competition with limited spoils for the winners. Just as levels of health, wealth and educational participation have increased in the general population over time, there is no reason why the percentage of students achieving excellence also should not increase. In reality, there appears to have been a decline in absolute levels of performance in subjects such as mathematics and science in Australia over the past two decades. [\[iv\]](#)

The possibility of significantly larger numbers of students achieving excellence is made clear in international studies such as the IEA's Trends in International Mathematics and Science Study (TIMSS) and the OECD's Programme for International Student Assessment (PISA). In reading, mathematics and science, between 10 and 15 per cent of Australian students perform at 'advanced' international levels. Under the belief that excellence is a scarce resource, this percentage of advanced performers may seem about right. However, in East Asian countries between 35 and 50 percent of students perform at the same 'advanced' levels.

A second way in which low expectations can be institutionalised in educational practice is by *placing ceilings on learning*. It is well known that students are more likely to learn successfully when engaged and motivated and when provided with learning opportunities appropriate to their current levels of achievement and learning needs. Students are less likely to learn when given work that is much too easy or much too difficult for them, meaning that 'differentiated' teaching is important when students are at widely varying levels of achievement. However, expectations are lowered for students when they are assigned to classes or streams that place a ceiling on what they are able to learn or how far they are able to progress. In an effort to provide 'relevant' learning experiences appropriate to students' abilities and interests, educational courses often protect participants from intellectual rigour and limit what they are able to learn.

For example, in mathematics – which often labours under the belief that it is inherently difficult, obscure and of limited relevance for many students – it is common to create easier streams for less able students. But these easier streams, with their focus on low-level, applied learning often have low expectations of the quality and quantity of mathematics learning and deny students access to the essence and beauty of this subject. Recent growth in secondary school completion rates in Australia has been accompanied by increases in the numbers of students taking lower level courses of this kind. Since the mid-1990s, the percentage of Year 12 students taking elementary mathematics has grown by 30 per cent while the percentages taking intermediate and advanced mathematics have declined by 22 and 27 per cent respectively. [\[v\]](#)

A third way in which low expectations can be institutionalised is through the *prejudging of students' capabilities based on their group membership*. When students are grouped according to demographic characteristics, it is clear that some student groups have higher average levels of achievement than others.

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For example, students living in rural and remote areas tend to have lower average achievement levels than students living in urban areas. Girls tend to outperform boys, particularly in language-rich subjects. Non-Indigenous students outperform Indigenous students, and students from high socioeconomic backgrounds outperform students from low socioeconomic backgrounds. In some cases, these gaps are the equivalent of two or more years of school. The problem arises when expectations of individuals are then lowered on the basis of the group/s to which they belong.

In educational practice, there is often a small step from observing a correlation – for example between socioeconomic background and achievement – to treating this observation as an ‘explanation’. Low socioeconomic status is regularly invoked as an explanation for low achievement, despite the fact that some students from low socioeconomic backgrounds can be found among the highest achievers in our schools and universities, and some students from high socioeconomic backgrounds can be found among our lowest achievers. And from ‘explanation’, it is another small step to ‘expectation’ and beyond that to ‘excuse’. School principals who have led significant improvements in low socioeconomic areas often report that their first challenge was to confront low staff expectations. In these schools, teachers had come to expect low achievement on the basis of students’ backgrounds.

And there are other, more subtle, ways in which observed correlations can lead to lowered expectations. For example, it is a small step from comparing schools with statistically similar student intakes to concluding that students in a particular school are performing well ‘given their socioeconomic backgrounds’ or ‘given the proportion of Indigenous students in the school’. Conclusions of this kind border on what is sometimes referred to as the ‘soft bigotry’ of low expectations. Prejudging and ‘prejudice’ have identical etymological origins: both can be the result of ignoring individuality and assigning individuals the presumed characteristics of a group.

There is a long history in school education of observing differences in average group performances and then designing programs and initiatives to address the needs of specific student groups (for example, the needs of boys, Indigenous students or students from low socioeconomic backgrounds). However, there is little evidence that the achievement gaps such programs and initiatives were designed to address have closed significantly in recent decades. More generally, there is a question as to whether emphasising group membership is counterproductive. A preoccupation with demographic distinctions may serve only to highlight existing differences and cement future expectations.

A fourth way in which low expectations can be institutionalised is by *prejudging students’ capabilities on the basis of their age or grade*. Schools continue to be organised on traditional lines with students grouped and taught in grades based on age. Under this ‘assembly-line’ model, students move in a lock-step fashion from one year to the next, with teachers at each stage delivering the curriculum for that grade.<sup>[vi]</sup> This model has been strengthened in recent years with the development of explicit grade-based curricula with accompanying assessments to establish how much of the curriculum for their grade students have mastered. This practice is another example of the use of group membership to set expectations for student learning.

The reality in learning areas such as mathematics and reading is that, despite this lock-step model, students in the same grade currently vary in their achievement levels by as much as five or six years of school. As Dylan Wiliam has observed, in practice there is only a loose relationship between educational achievement and age.<sup>[vii]</sup> If teachers treat all students of the same age as equally ready for the same grade-based curriculum and teach to the middle of the grade, then some lower-achieving students are likely to be left behind. There is evidence that many of these students fall further behind with each year of school.

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At the same time, expectations are lowered for higher-achieving students when learning is limited to the completion of class work targeted at the middle of the grade. It is not uncommon to hear of classes in which more able students, rather than being challenged and extended, are given 'free time' once they have completed set class work.

In spite of limiting beliefs and practices of this kind, many teachers, school leaders and parents share powerful alternative beliefs about student learning. These include beliefs that every individual is capable of learning, with no natural limits on what most individuals can learn; that at any given time, students are at different points in their learning and may be progressing at different rates, but that all are capable of further progress if motivated and if provided with learning opportunities appropriate to their readiness and needs; that individual differences in ability to learn are readily compensated for by effective teaching; that starting points for teaching are best established individually rather than inferred from group membership; and that excellent, ongoing progress is a more appropriate expectation of every learner than the expectation that all students of the same age/grade will be at the same point in their learning at the same time. In situations where teachers, school leaders and parents share beliefs of this kind, expectations are raised and students perform beyond the limits imposed by the rationing of excellence, low-level courses that deny access to high achievement, reduced expectations of particular demographic groups and grade-based assembly lines.

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## ACER Update

### **NAB Schools First applications closing soon**

Only one week remains to apply for a share in \$5 million in funding available to outstanding school-community partnerships. Applications for the 2011 NAB Schools First Seed Funding and Impact Awards close at 5:00pm (AEST) on Friday 29 July 2011. This year, 60 established partnerships will each win a \$50 000 Impact Award and 50 new or developing partnerships will each win a \$25 000 Seed Funding Award. The winners will be announced on 15 September, followed by the announcement of State and National Awards in October and November. To find out more about NAB Schools First visit [www.schoolsfirst.edu.au](http://www.schoolsfirst.edu.au) or call 1800 649 141.

### **Principal for a Day**

Time still remains for business and community leaders to register to become a Principal for a Day on Tuesday 23 August 2011. Principal for a Day is a collaboration between schools and their communities that aims to increase and strengthen relationships, based on knowledge and understanding, between the private sector and education. It is a unique opportunity for business and community leaders to shadow a school principal to gain a first hand behind-the-scenes experience of the strengths and challenges facing our schools every day. The program is a joint partnership between ACER and the Victorian Department of Education and Early Childhood Development (DEECD) and has been running in Victoria since 2001. Schools and community and business leaders interested in participating can obtain more information from [www.acer.edu.au/pfad](http://www.acer.edu.au/pfad) or by contacting Ms Viv Acker on 03 9277 5617 or email [\(JavaScript must be enabled to view this email address\)](mailto:.(JavaScript must be enabled to view this email address)).

### **Leading Learning in Education and Philanthropy**

Schools are being invited to give their feedback on their experiences of grant seeking from philanthropic Foundations / Trusts by completing the Leading Learning in Education and Philanthropy (LLEAP) survey. The first national study of its kind, LLEAP aims to build knowledge and improve outcomes for schools and philanthropic supporters. The project will deliver a practical LLEAP toolkit to improve the way education and philanthropy work together for maximum impact. LLEAP is an initiative of Tender Bridge (an ACER research and development service) and The Ian Potter Foundation. Anyone wishing to learn more about this project can visit [www.acer.edu.au/lleap](http://www.acer.edu.au/lleap) or contact the Project Director Dr Michelle Anderson via email [\(JavaScript must be enabled to view this email address\)](mailto:.(JavaScript must be enabled to view this email address)).

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## Research Conference 2011

The ACER Research Conference 2011 Indigenous Education: Pathways to success will be held in Darwin on 7-9 August. Presenters will highlight the conditions, contexts, curriculum, pedagogy and practices that establish pathways to success for Indigenous students. Further information including the full conference program is available from <http://www.acer.edu.au/conference>.

A new book, *Two Way Teaching and Learning: Towards culturally reflective and relevant education* by Hannah Rachel Bell, ACER Principal Research Fellow Dr Nola Purdie and ACER Indigenous Liaison Officer Gina Milgate, will be launched at the conference. The book focuses on policy issues, strategies to improve outcomes for Indigenous students, and ways in which people of different cultures can learn from each other. *Two Way Teaching and Learning* is available for purchase from the [ACER Press online shop](#).

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