


Research Highlights

Australian Council *for* Educational Research

ACER

Contents

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Australian Council for Educational Research

The Australian Council for Educational Research (ACER) provides state-of-the-art educational research, products and services.

Established in 1930, ACER has a long history and solid reputation as a provider of reliable support to education policy makers and professional practitioners. Today, ACER is one of the world's leading educational research centres, committed to creating and distributing research-based knowledge, products and services to improve learning across the lifespan in both formal and informal settings.

A research leader

ACER is a leader in the provision of quality educational research, both within Australia and internationally. As a national, independent research body, ACER brings a high level of expertise and objectivity to its work. Blending solid experience and creative talent with established methodologies, ACER is a full-service research consultancy specialising in collecting and interpreting information to shape strategic decision making.

ACER's research strengths are reflected in its seven research programs:

Assessment and reporting

ACER conducts research into, and develops methods to assess and report, a wide range of educational outcomes and psychological attributes.

Learning processes and contexts

Research seeks to identify ways of supporting learners and learning in school and non-school settings and investigates cognitive, affective and behavioural processes and factors affecting learning.

National and international surveys

ACER has an established reputation in large-scale survey research. Research in this area draws on staff expertise in sampling, survey management, the analysis of survey data and the interpretation and reporting of results.

System and school testing

ACER undertakes work to provide educational decision makers with improved information about student learning outcomes.

Teaching and learning

ACER has a special interest in the development of teachers as professionals and in the relationship between teacher learning and improved student learning.

Transitions and economics of education

Research investigates transitions among school, work, vocational education and training and higher education by exploring influences on the pathways taken by young people as they progress from school to work or training.

Early childhood education

This program undertakes research into young children's learning, development and care, addressing issues that include early childhood diversity, individual learner characteristics, 'at-risk' children and families, young children with physical and intellectual disabilities, children in poverty, and early intervention programs.

Professional resources

In addition to being a national and international centre for educational policy research and advice, ACER develops and provides a range of research-based products and services to support the work of practitioners. These include published resources, fee-for-service testing programs, library services and professional learning activities.

ACER publishes an extensive range of research-based resources including tests, kits, books and software to professional practitioners in education, psychology, parent education and human resources.

ACER provides secure, fee-for-service testing programs to schools, universities, employers and professional organisations.

The Cunningham Library provides educators and researchers with access to one of the most comprehensive collections of educational research material in Australia and a variety of online information services.

ACER also conducts workshops, seminars and conferences to support professional learning and research-based professional practice across a range of occupations.

ACER's international work

ACER works in an increasingly international context and is working to support educational reform and development in a number of countries. ACER provides support through consultancies and professional development programs to countries establishing national assessment programs and has undertaken a broad range of consultancy work to support aid-funded projects in several countries including Cambodia, Papua New Guinea, Indonesia, Bhutan and East Timor.

ACER is also involved in the management of international achievement studies including the OECD Programme for International Student Assessment (PISA) and International Association for the Evaluation of Educational Achievement (IEA) Trends in Mathematics and Science Study (TIMSS).

Future direction

ACER has experienced significant growth in recent years. ACER's ambition for the future is to enhance the solid reputation and expertise that has been developed over almost 75 years to continue its role as a major international provider of research-based information, products and services.

ACER will build its program of research and development in support of learning in vocational education and training and higher education institutions, while maintaining and expanding work in support of schools.

A priority of ACER over the next few years will be to support the professional work of practitioners, providing ready access to reliable, useable research information and research-based materials and services.

With increased world-wide demand for educational research and knowledge, ACER is well placed to provide leading-edge capabilities to improve learning – at home, in school, in tertiary education institutions and within the workplace.

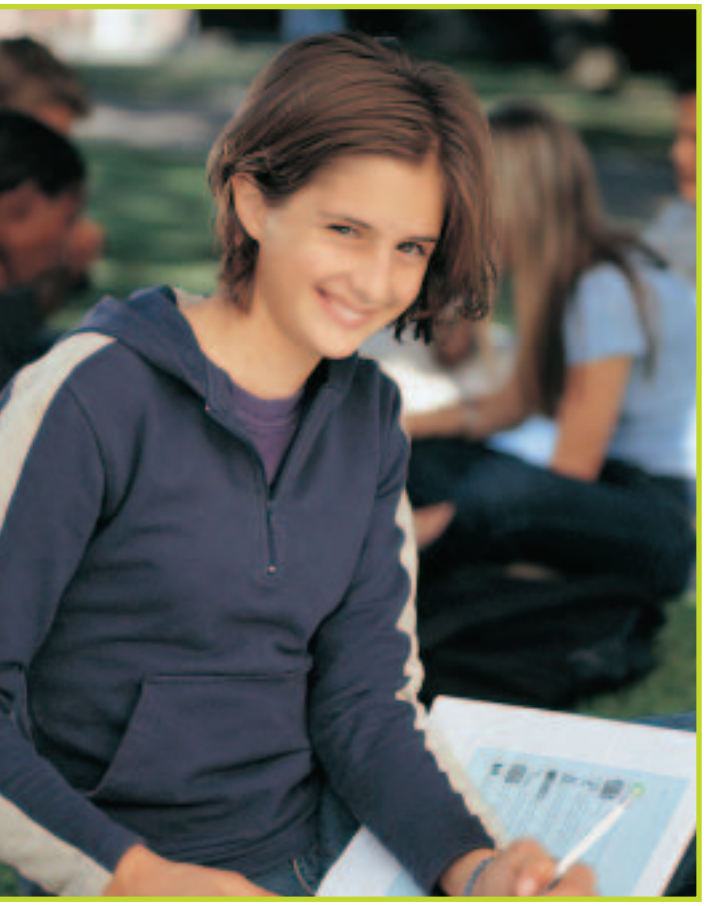
Helping international schools measure achievement

ACER has developed a unique assessment program that is designed especially for students in international schools.

The International Schools' Assessment (ISA) was developed in 2002 by a team of ACER researchers to measure the reading, mathematical literacy and writing achievement of students in Grades 3, 5, 7 and 9/10 in international schools worldwide.

ISA arose out of discussions with the Jakarta International School during which a need was identified for an external assessment program appropriate for students in international schools.

'Curriculum in international schools tends to be a mixture of curricula brought by English speaking teachers from Australia, New Zealand, the US, UK and Canada,' said ISA project director Juliette Mendelovits.



'It was difficult for international schools to find assessment materials that were relevant to all students in the school and have no cultural bias. For example, a mathematics item based on runs scored in a baseball or cricket game may be difficult to understand for students not familiar with those games. ISA was developed to meet this need for internationally-relevant assessment.'

ACER researchers set to work in 2002 to develop an international testing program that was culturally eclectic, and that addressed essential skills and competencies such as critical thinking, communication and problem solving, rather than being based on information retrieval or any one national syllabus. The assessment designs for mathematics and reading were based on the frameworks developed for the OECD's Programme for International Student Assessment (PISA), and some PISA tasks were used in the assessment for the upper grade levels. At the same time, ACER was mindful of international school interests: curriculum and standards documents widely used by international schools, such as the International Baccalaureate middle and primary programs and the McRel standards, were reviewed, along with several individual international schools' curricula. Trials for the test were undertaken in international schools and feedback from teachers and students was fed into the development process.

In October 2002 about 3700 students from 42 international schools in 21 countries participated in the first administration of ISA. The number of students taking part in 2003 was expected to almost double to around 7000.

The ISA is administered to classes by classroom teachers equipped with test administration manuals. There are two mathematical literacy sessions, one reading session and two writing sessions. Depending on the grade level, each assessment session takes 45 minutes to one hour to complete.

An international reference group with representation from schools, regional bodies and assessment agencies has been established to oversee the continuing development of the assessment program to ensure that test items are appropriate for students in international schools and are of the highest quality based on established international standards.

The main purposes of the ISA for international schools are to evaluate instructional programs against student performance, diagnose gaps and to measure growth in learning between grade levels, from year to year or within one grade level. To meet those purposes, schools participating in ISA receive a comprehensive suite of reports. Student-level information is provided to show what individual students know and can do. Information is broken down into broad strands within the domains of reading, mathematics and writing, so that students' achievement can be reflected on and strengths and weaknesses addressed. The ISA reports on the performance of particular sub groups to allow comparisons on gender or language group. Schools also receive information about growth over time and relevant comparisons between similar schools.

Since its successful international launch in 2002 the ISA has been adapted for a number of research projects within Australia. Education Queensland is using an adapted form of the ISA in its curriculum initiative, New Basics. The New Basics program is being trialed in around 35 schools. ACER was contracted to administer the ISA to a sample of Queensland Year 3, 6 and 9 students at two stages during 2003 with the purpose of investigating whether students undertaking different types of curriculum progress at different rates over the course of the year.

In Victoria, as part of an evaluation of the Achievement Improvement Monitor (AIM), Victoria's state-wide testing program for Years 3, 5 and 7, the Victorian Curriculum and Assessment Authority (VCAA) contracted ACER to administer the reading and mathematical components of ISA to evaluate the quality of the AIM in the light of international benchmarks.

In addition to these activities ACER is collaborating with European partners to translate the ISA into other languages for use as an international benchmarking instrument in several countries. Currently the ISA is being translated into German and pilot testing will take place in Germany and Austria during 2004.

Evaluating Australian teachers

ACER researchers Lawrence Ingvarson and Elizabeth Kleinhenz have investigated current Australian policies and practices in teacher evaluation and their relation to the improvement of teaching and learning.

The Australian Research Council funded project Teacher Evaluation in Australia was established to find answers to the following questions:

- Under what policies and through what kinds of processes are Australian teachers being evaluated?
- How well is Australian education being served by current approaches to teacher evaluation?
- What new approaches are emerging with greater potential to satisfy current imperatives?
- How well do current teacher evaluation methods fit with the goal of building schools as accountable professional communities?

The project was underpinned by an understanding that there are two imperatives for teacher evaluation:

- the need to safeguard the educational interests and welfare of all students (public accountability); and
- the need to ensure that teachers continually review and improve their practices in the light of contemporary research and professional standards (professional accountability).

The project commenced in 1999 at Monash University with Lawrence Ingvarson and Rod Chadbourne of Edith Cowan University in Western Australia. Part of the project was transferred to ACER a year later when Dr Ingvarson joined ACER's staff.

The project had three stages. In the first stage the investigators interviewed and collected documentation from education administrators in all states and territories who held responsibility for teacher evaluation in their systems. The aim of this phase was to research and document current teacher evaluation policies and practices across Australian states. In the second stage of the project, an attempt was made to evaluate the quality of these policies and processes in terms of a range of criteria for the conduct of personnel evaluation in education and comparable professions, such as the Standards for Personnel Evaluation, laid down by the Joint Committee on Standards for Educational Evaluation (1998).

In the third and final stage of the project, a series of case studies was undertaken in schools. The aim of this phase was to explore the relationship between some current teacher evaluation practices and the quality of teaching and learning. This research was conducted mainly in the form of interviews with teachers, principals, and other school personnel who were involved in school based teacher evaluation.

Elizabeth Kleinhenz presented findings of the research in papers delivered in 2001 and 2002 at the AARE conferences in Fremantle and Brisbane.

Dr Kleinhenz explained that a 'mapping' phase of the project identified ways in which Australian teachers are evaluated at four periods or 'phases' that correspond with their career paths.

'Our interest was in the evaluation of classroom teachers. Therefore we did not investigate the various ways of evaluating teachers for promotion positions.'

The four phases were:

Phase 1 Pre-service

Phase 2 Induction

Phase 3 Career progression

Phase 4 Accomplished practice

'We had a special interest in the use of standards for teacher evaluation,' Dr Kleinhenz explained. 'We found a very 'mixed bag', that ranged from brief and perfunctory generic criteria of the kind used, for example, to support some formative induction processes, to much more elaborately developed standards such as those used in Victorian Annual Performance Review processes, that were initially developed by the Standards Council of the Teaching Profession.

'There appeared to be little coherence or consistency in standards across states and systems, although quite a bit of use had been made of the National Competency Framework for Beginning Teachers, developed in the early nineties under the National Project on the Quality of Teaching and Learning.'

The examples of teacher evaluation that were found to be most common in government and non-government schools were those developed within various examples of performance management or 'Annual Review'. A related issue was that of evaluation for full teacher registration, carried out by registration bodies that are independent of employers. Evaluation for this purpose is now being carried out by the Board of Teacher Registration in Queensland and the Victorian Institute of Teaching in Victoria. In both states, the recommendation that a teacher is ready to move from provisional to full registration is made, after an induction period of approximately twelve months, to the registering authority by the school principal.

Teacher evaluation policies and practices in Australia, whether the responsibility of school principals or teacher registration bodies, were generally found to be at an embryonic stage of development.

Dr Kleinhenz said that teacher registration bodies are still finding their way. 'School site based evaluation by principals under the performance management umbrella vary greatly. Major questions remain in terms of validity, reliability, generalisability and consistency.'

The work completed by ACER on this project is proving timely in view of the burgeoning interest in the development of professional teaching standards and their application in teacher evaluation and professional learning. In 2002–03, the ACER Teaching and Learning research team responded to requests from the New South Wales Institute of Teachers and the Victorian Institute of Teaching (VIT) for advice on the development of their standards' frameworks. ACER has also worked closely with the VIT Standards and Professional Learning group in the design and implementation of professional development and assessment materials to support a pilot program in which 200 graduate teachers and their mentors prepare for an evaluation that will move them from provisional to full registration.

Tests of Reading Comprehension

ACER Press published the second edition of the popular Tests of Reading Comprehension (TORCH) in 2003 following major revisions to the original tests.

TORCH is a best selling Australian test used by teachers of students in Year 3 to Year 10 seeking information about the reading comprehension of their students. TORCH consists of a set of 12 reading tests for students in Years 3 to 10 that assess reading comprehension skills. Each of the 12 reading tests is made up of a reading passage and a corresponding answer sheet. The answer sheets resemble cloze passages. Each answer sheet has a 'retelling' of the corresponding reading passage with some words deleted. Students complete the test by reading the passage and filling in the gaps in the answer sheet using one or more of their own words.

TORCH provides an estimate of a student's level of reading comprehension. That is, information about the extent to which a student can construct meaning from text. These estimates are based on the student's performance on the sets of comprehension tasks from the TORCH tests.

The new edition is a significant revision of the earlier tests, with some new testing material with reading passages in fiction and non-fiction, a reworked manual and the provision of an individual student report form.

A major feature of the revised tests is a comprehensive set of normative data that helps teachers to compare the performance of their students with other students around Australia.

ACER researchers conducted extensive trial tests to collect the normative data in August 2002 from a nationally representative sample of primary and secondary school students. Data were obtained from 7561 students from Years 3 to 10 with students drawn from 83 schools across eight states and territories. All education sectors were represented in the sample.

The normative data from the reference group assist teachers in a number of ways says ACER's Research Director, Assessment and Reporting, Ms Margaret Forster. 'Norm scores are useful for identifying students who are performing well below or well above their expected reading comprehension level at a particular year level. They can also be used to inform decisions about selecting students into streamed or mixed-ability classes.'

TORCH also allows teachers to gain a diagnostic picture of their students' reading comprehension skills. Teachers can use this information to describe learning outcomes, inform teaching targeted to student needs and as a basis for reporting learning growth. Teachers are provided with an individual student report, which, together with the student's answer sheet, provides a record of the student's performance, bringing together normative and descriptive information.

The design of TORCH allows teachers to administer a single test to the whole group or class, or different tests to individual students during the one test session. This is an important feature of TORCH. If a test is far too difficult or far to easy for a student, the test will fail to produce a

clear picture of what the student is able to do. As there are often wide differences in reading comprehension levels within a single class, it can be less effective to give a single test to the whole class.

TORCH allows teachers to match the difficulty of the test with the expected level of achievement of each student, and if there is a mismatch (i.e a very high or a very low score) the teacher can re-administer TORCH using an easier or more difficult reading passage. This strategy is particularly useful for detailed diagnostic analysis of the skills of weaker students.

In response to the question, 'Why would a teacher want to use a test of reading?' Ms Forster says that TORCH contributes to a teacher's opportunities to observe students' reading achievement.

'In the course of their day-to-day work, teachers have various opportunities to observe students engaged in reading activities and judge their level of reading achievement. The advantages of TORCH are that it provides teachers with access to professionally developed reading assessments, which have been thoroughly pilot tested in Australian schools and a time effective measure of students' comprehension skills.'

TORCH can be used to

- Estimate reading achievement;
- Help assess the extent to which objectives of the school reading curriculum are being achieved;
- Confirm or supplement other estimates of a student's achievement in reading;
- Provide information which may be used in setting realistic goals and planning effective programs of work;
- Identify students who are making unsatisfactory progress so that they may be given special diagnostic and remedial attention;
- Locate areas of weakness and strength for individuals or within a class; and
- Monitor student reading achievement over time.

Key features

- Australian
- All new normative data
- More information for teachers to select reading passages that are appropriate for students
- Descriptive report to assist teachers to build a picture of a students' developing reading comprehension skills
- Graded fiction and non-fiction passages to meet class, group or individual needs
- Norm-referenced interpretation based report in percentiles and stanines at each year level
- Content-referenced interpretation based on described levels of achievement

Assessment content

- A set of 12 reading passages graded in order of difficulty, varying in length from 200 to 900 words, including fiction and non-fiction texts
- Students read a passage and then use a cloze answer sheet to retell the passage, filling in the gaps in their own words to demonstrate understanding.

Supporting Indigenous students in the early years

An ACER longitudinal study has been monitoring the growth in English literacy and numeracy achievement of a group of Indigenous Australian students through their first years of primary school.

The study was established in 2000 with the goals of identifying and monitoring development in Indigenous students' English literacy and numeracy skills in the first years of schooling and measuring growth in these skills over time. The study also investigates the factors which may be associated with the development of English literacy and numeracy skills, including effective teaching and learning practices as well as factors beyond schooling.

The survey of Indigenous children's literacy and numeracy skills is based on the larger ACER Longitudinal Literacy and Numeracy Survey (LLANS). This study has used specially designed assessment tasks to collect data each year from a national sample of 1000 children who commenced school in 1999 with the aim of monitoring growth in achievement over time. Assessment materials from the main LLANS project have been adapted for use in the survey of Indigenous children and comparisons have been made between results achieved by the Indigenous sample and the main LLANS sample.

The study is an initiative of ACER's Aboriginal and Torres Strait Islander Education Advisory Committee. It was felt that a longitudinal research project would provide an informative and rich picture of the development of Indigenous children in the early years of primary school. The study is being conducted with funding from the Ministerial Council for Education, Employment, Training and Youth Affairs (MCEETYA).

ACER researchers completed a report *Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years* detailing the findings of the first two years of the study in 2003.

In its first two years the project followed the progress of a group of 152 Indigenous students through their first three years of school. All of the students commenced school in 2000. They attend 13 different government schools that were nominated by education departments to participate in the study. Each school has significant numbers of Indigenous students and has been recognised for initiatives and programs that it has in place to support its Indigenous students. Several have been publicly awarded for their efforts. Five schools are located in metropolitan areas, four in large regional centres, two are in smaller more remote towns and two in very remote areas.

Indigenous students' developing English literacy and numeracy skills were assessed at five points over the first three years of school. Students completed English literacy and numeracy assessments in 2000, 2001 and 2002. In addition to the assessment tasks, Indigenous researchers

visited the schools and conducted interviews with members of the school communities including principals, Indigenous and non-Indigenous educators and parents.

Among the key findings of the first report is that Indigenous Australian children begin school with similar levels of literacy and numeracy to their non-Indigenous classmates but fall behind as they move through the early years.

'In general, for both English literacy and for numeracy the achievement of the Indigenous students began at a similar level to that of the main LLANS sample but by the time of the fifth assessment in the third year of school substantial gaps had emerged,' said ACER's deputy chief executive Dr John Ainley.

The study identified initial achievement, attendance, attentiveness in class, language background, region and school as factors influencing achievement.

Students who had higher attendance rates achieved at a higher level. Students from the more remote schools and those who did not speak standard English at home had lower average attendance rates. Students who attended schools from metropolitan and regional areas generally achieved at a higher level than those from schools in the more remote and very remote areas.

Students who spoke standard Australian English at home performed better on these tests than those who did not. Students who were rated as being more attentive in class in Year K also achieved higher results.

As for students in general, initial achievement was found to be the strongest predictor of achievement in later years. Those who achieved the best results in the first assessment also achieved the best results in the later assessments.

Dr Ainley said that the findings reinforce the importance of a strong start in the early years of school and measures must be taken to engage Indigenous children with learning.

'Once at school students need to be engaged in interesting and challenging lessons to stimulate learning and hopefully reinforce attendance and desire to come to school,' he said.

There was some indication that students attending schools that had successfully identified and addressed the specific learning needs of their Indigenous students achieved higher results.

'Researchers agreed that some schools appeared to operate more effectively than others,' Dr Ainley said. 'Their conclusions were consistent with a trend for some schools to have a higher average growth in student achievement than others.'

The schools that were seen by researchers to be most effective were those that had strong leaders and good teaching, had engaged their students in learning, achieved higher attendance rates and formed strong links with the Indigenous community.

This survey of Indigenous children's literacy and numeracy development is an ongoing project. In future phases of the study the number of children will be doubled and non-Indigenous students will also be assessed to allow comparisons to be made between Indigenous and non-Indigenous children within the same schools.

Supporting English Literacy and Numeracy Learning for Indigenous Students in the Early Years by Tracey Frigo, Matthew Corrigan, Isabelle Adams, Paul Hughes, Maria Stephens and Davina Woods is ACER Research Monograph number 57 published by ACER Press.

Video surveys aid study of classroom teaching

Videotaping classroom lessons for analysis is now recognised as a valuable tool in the study of learning and teaching.

Video preserves classroom activity so that it can be slowed down and viewed multiple times by many people with different kinds of expertise.

A major international video survey of Year 8 mathematics lessons in seven countries including Australia has revealed no single best method of teaching Year 8 mathematics in high achieving countries. Further analysis of Australian results found that Year 8 students might not be challenged sufficiently by their lessons.

Two major reports from the Third International Mathematics and Science Study (TIMSS) 1999 Video Study were released in 2003. The international report, *Teaching Mathematics in Seven Countries: Results from the Third International Mathematics and Science Study (TIMSS) 1999 Video Study* was released in Washington in March 2003. The study was conducted by LessonLab Inc., for the US National Centre for Education Statistics (NCES). ACER undertook the Australian component of the study with funding from the Commonwealth, states and territories. ACER released a second report focusing on Australian results in July.

The study involved 638 randomly selected Year 8 lessons in Australia, the Czech Republic, Hong Kong SAR, Japan, the Netherlands, Switzerland and the United States. Lessons were videotaped for analysis and comparison across the countries to investigate similarities and differences in teaching practices.

The report found that each country shared some general features of Year 8 mathematics teaching. However, each country combined and emphasised instructional features in various ways, sometimes differently from all the other countries, and sometimes similarly to some countries.

Video surveys are useful in aiding the research on classroom learning according to ACER's chief executive officer Professor Geoff Masters.

'Video technology is a powerful tool for studying teaching and learning in classrooms. Video records of what happens in classrooms can be examined from different perspectives to provide a comprehensive picture of classroom life. The technology provides opportunities to identify factors that enhance student learning opportunities,' Professor Masters said.

Australian-focused analysis and discussion of the results from the international study are contained in the Australian national report, *Teaching Mathematics in Australia*. Among the report's major findings is a suggestion that Australian mathematics teachers might be underestimating the ability of Year 8 students and not challenging them enough in class.

A typical Australian lesson was found to begin with a review of previously learned content (an average of 36 per cent of lesson time), followed by the introduction of new content (30 per cent of lesson time), and the practising of this new content (26 per cent of lesson time).

The Australian report, written by Hilary Hollingsworth with ACER researchers Barry McCrae and Jan Lokan, examined videotapes of 87 randomly selected Year 8 mathematics classes from around Australia.

Australia was found to have a significantly higher percentage of problems that students worked on for a very short time (less than 45 seconds) than was the case in higher-performing countries. More than three-quarters of problems set for Australian students were repetitions of one or more problems they had done earlier in the lesson, and a similar proportion could be solved in four or fewer small steps.

The report also notes that Australian teachers very rarely (two per cent of problems per lesson) made explicit the mathematical relationships and connections involved in problems when they discussed them with their classes. Instead, they were generally satisfied with giving students answers only, or simply stating the procedures used to solve the problems.

There were indications also that the curricular level of the Australian Year 8 mathematics lessons, particularly the algebra content, was lower than in most of the other six countries that took part in the international study.

Australian students perform well in international mathematics studies. According to Dr Hollingsworth, the video study findings suggest that with more exposure to more challenging material, at all levels but particularly in classes of more able students, it seems likely that Australia would perform even better.

'Australian students would benefit from more exposure to less repetitive, higher-level problems, more discussion of alternative solutions and the mathematical reasoning involved in the solutions, and more opportunity to explain their thinking,' she said.

Dr Hollingsworth said there is no reason for Australian Year 8 mathematics teaching practices to be abandoned in favour of adopting methods used somewhere else. However, there are some strong threads running through the study's findings that indicate that some overhaul of Year 8 mathematics teaching in Australia is warranted.

Teaching Mathematics in Australia by Dr Hilary Hollingsworth, Dr Jan Lokan and Associate Professor Barry McCrae includes a CD-ROM containing eight of the lesson videos (four from Australia, and one each from the Czech Republic, Hong Kong SAR, Japan and the Netherlands).

School non-completers can do well in the workforce

A large-scale national study of school leavers' experiences has found that many school non-completers progress well in the first few years after leaving school.

The study, undertaken by ACER researchers as part of the ongoing Longitudinal Surveys of Australian Youth (LSAY) program, compared the experiences of students who did not complete Year 12 (non-completers) with those who completed Year 12 but did not go on to university (completers). A group of almost 8000 young Australians who were in Year 9 in 1995 was involved in the study. Their transitions from school to work were followed annually until late 2000 when most of the participants were 19.

School non-completion and the transition from school to work have been of policy interest to successive Australian governments over several decades. The report looked at the characteristics of those who did not complete school and then followed their progress from school to the workforce in the immediate post-school years.

Most of the study's participants did complete school. Seventy-nine per cent of the cohort remained in secondary school until the end of Year 12 (completers). Nine per cent left school on or before the completion of Year 10 (early school leavers) and a further 13 per cent left before the completion of Year 12 (later school leavers).

An examination of which young Australians become school non-completers found that during the 1980s and 1990s, young people with one or more of the following characteristics were on average, less likely than other young people to complete Year 12: males, Indigenous Australians, those from low socio-economic status family backgrounds, from English-speaking backgrounds, those from non-metropolitan areas, from government schools, and with lower levels of literacy and numeracy.

The majority of the school non-completers who had been in Year 9 in 1995 reported that they had left school for positive reasons such as a desire to secure an apprenticeship or other job. Just under a third of the non-completers (or 6 per cent of all school leavers), said their main reason for opting out of school was related to performing poorly in school, not enjoying school, or being dissatisfied with the courses offered by the school.

A major concern of this research was to examine the transition that young people make from school to employment. The post-school outcomes of three groups – early school leavers, later school leavers and school completers who had not entered higher education – were compared. School completers who had entered higher education were not included in the analysis as the majority were still engaged in full-time study at the time of data collection.

ACER chief executive Professor Geoff Masters said the findings show that there are both positive and negative outcomes for school non-completers. 'While unemployment rates were higher for non-completers than school completers, those non-completers who had successfully gained employment were more likely to be working full-time, received higher earnings, displayed greater job stability and reported being in the type of job they would like as a career,' he said.

The majority of non-completers obtained full-time employment and, with each passing year, levels of full-time employment increased. Of the three groups of school leavers, early leavers were the most likely to be in full-time employment, followed by later leavers and then completers. In 2000, 71 per cent of early leavers, 65 per cent of later leavers, and 61 per cent of completers who had not entered higher education were employed full time. On the negative side substantially higher proportions of non-completers than completers were unemployed (not working but looking for work). In late 2000, 10–11 per cent of early and later leavers, compared with only 6 per cent of completers outside higher education were unemployed. Non-completers were also more likely than completers to be outside of the labour force and not studying.

Apprenticeships were found to be an important link between school and the workforce. Completing an apprenticeship halved the risk of unemployment for non-completers. Of those in the labour market in 2000, 13 per cent of non-completers without an apprenticeship were unemployed compared to six per cent of non-completers who had finished an apprenticeship. In comparison, eight per cent of school completers not in higher education were found to be unemployed.

The report also noted that disengagement from school is not the same as disengagement from education. In the year after leaving school, around half of all non-completers were engaged in some form of education or training.

'Education does not necessarily only take place in the classroom,' Professor Masters said. 'Therefore it is important to make sure that relevant education and training pathways are available to all young people, and that they are structured to assist in the transition from school to employment.'

Some of the report's findings question the widespread belief that all students who leave school before Year 12 struggle to make a successful transition into the workforce. One likely explanation for the advantages experienced by some non-completers is the additional time spent in the workforce. In late 2000, the majority of school completers had been out of school for two years and non-completers had been out of school for up to five years. Having spent more time in the workforce, non-completers had gained more work experience and therefore had advantages in competing for jobs and in achieving higher incomes. The cohort also benefited from the improved, post-recession economic conditions of the late 1990s.

Professor Masters said that this study showed that it was not all 'doom and gloom' for school non-completers. However, he cautioned that the study took a five-year snapshot in the lives of young Australians and more research into this group would be necessary in the future to identify long-term outcomes.

School Leavers in Australia: Profiles and Pathways by Dr Julie McMillan and Dr Gary Marks, is research report number 31 in the Longitudinal Surveys of Australian Youth (LSAY) research program jointly managed by ACER and the Commonwealth Department of Education, Science and Training (DEST).

Impact of school libraries on student achievement

Research shows that school libraries can have a positive impact on a range of learning areas, including reading scores, literacy, and broader learning.

ACER Research Fellow Dr Michele Lonsdale conducted a review, *Impact of School Libraries on Student Achievement: A Review of the Research*, for the Australian School Library Association.

The roles of school libraries and teacher librarians in Australia have changed significantly in recent years. There has been a decline in the number of qualified teacher librarians employed in school libraries, an explosion in information production and the development of increasingly sophisticated information and communication technologies. There have also been changes in educational philosophy and practice, including a greater focus on learning outcomes, inquiry-based learning, evidence-based practice and school accountability.

Dr Lonsdale said, 'It is important that these changes to library practice are monitored. Research has shown that school libraries do have an impact on achievement, so changes to library practice could therefore be expected to affect achievement.'

Much of the research relating to school libraries and achievement has been conducted overseas. From this there is evidence to show that, among other things, a strong library program can lead to higher student achievement regardless of the socio-economic or educational levels of the adults in the community.

'The research has also shown that collaborative relationships between classroom teachers and teacher librarians have a significant impact on learning, particularly in relation to the planning of instructional units, resource collection development, and the provision of professional development for teachers,' Dr Lonsdale said.

In addition, there is evidence to show that

- a strong computer network connecting the school library's resources to the classroom and laboratories has an impact on student achievement;
- a print-rich environment leads to more reading and free voluntary reading is the best predictor of comprehension, vocabulary growth, spelling and grammatical ability and writing style;
- the extent to which books are borrowed from school libraries shows a strong relationship with reading achievement while borrowing from classroom libraries does not;
- integrating information literacy into the curriculum can improve students' mastery of both content and information seeking skills;
- a positive difference can be made to student achievement when school libraries co-operate with public libraries; and
- school libraries can make a positive difference to students' self-esteem, confidence, independence and sense of responsibility in regards to their own learning.

However, despite the accumulated evidence, and despite the common sense assumption that school libraries could be expected to have a positive impact on student learning, the contribution of school librarians to student achievement is still not widely recognised, according to Dr Lonsdale.

'It is interesting that after five or six decades where research has consistently shown a positive relationship between student achievement and school libraries, that the 'case' for teacher librarians still needs to be made. Why are practitioners still needing to convince decision makers and administrators of the positive correlation between school library services and student achievement?'

Given the lack of national data about the current state of school librarianship, particularly in relation to teacher librarians and how they are being used in schools, it may be useful to obtain a snapshot of what is currently happening around Australia in relation to school library staffing.

Anecdotal evidence, and information from some state surveys indicates there is a shortage of teacher librarians; schools sometimes use librarians rather than teacher librarians, or staff with no teaching or library qualifications at all; it is an ageing profession, with insufficient graduates to replace retirees; and teacher librarians often have added responsibilities in terms of technology maintenance and student use of technology.

One survey of Victorian primary schools revealed that some individuals who called themselves librarians did not always have any library qualifications and some who called themselves teacher librarians did not always have a teaching qualification.

There is still a need for further research. Dr Lonsdale said, 'Much of the research so far focuses on primary rather than secondary students, but the impact of school libraries appears strongest at primary and junior high school and weakest at the upper levels of secondary school.

'It would also be useful to know why students come to the library, and to determine the relative roles of teachers and teacher librarians and their effectiveness in providing information literacy.'

Impact of School Libraries on Student Achievement: A Review of the Research is published by the Australian School Library Association.

Boys in school and society

There is a growing perception that girls have become more successful in pursuing their educational goals than boys, raising concern for boys' education and development.

An ACER report, *Boys in School and Society*, draws on a range of ACER and other Australian research in examining the difference between boys' and girls' achievement.

ACER Senior Research Fellow and one of the authors, Dr John Cresswell said, 'Literacy achievement is an important indicator because achievement of fundamental literacy and numeracy skills in early childhood and early schooling is strongly correlated with successful educational outcomes in later years.'

Another author, and ACER Principal Research Fellow, Dr Ken Rowe highlights the extent of this concern: 'In the early years of school, boys constitute between 75 and 85 per cent of those children, usually in Grades 1 or 2, identified as 'at-risk' of poor literacy, and selected for participation in a Reading Recovery Intervention program.'

The difference between boys' and girls' success becomes greater as they progress through the primary school years. Two Australian studies have found that males consistently perform worse than females on the literacy benchmarks in primary schools. At secondary level, another study showed that over the period 1975 to 1995 the proportion of 14-year-old males who demonstrated mastery of reading tests fell from 70 per cent to 66 per cent, while females attaining mastery changed from 73 per cent to 74 per cent.

In recent years the curriculum has become more contextualised, with a focus on applying knowledge and skills to everyday situations.

'This requires sophisticated levels of literacy, including verbal reasoning and written communication. These are areas in which girls, on average, seem to have distinct maturational and socialisation advantages,' Dr Cresswell said.

The OECD Programme for International Student Assessment (PISA), a large-scale study that Australia participated in, found that boys' performance on assessment items relating to continuous texts (such as prose and narrative) was not as good as their performance on non-continuous texts (such as timetables and lists). The same study also found that boys do not read for pleasure as much as girls do – 40 per cent of boys said they never read for enjoyment, compared to 25 per cent of girls. Boys' reluctance to read may be a key factor in their lower levels of reading achievement.

In mathematics there appears to be no significant difference in the achievement of boys and girls at either primary school or early secondary school. In fact, Australia appears to be one of the few countries in which the difference between boys and girls in mathematics achievement is negligible.

Beyond school

At secondary school level, boys are more likely than girls to leave school before completing Year 12. Recent Australian estimates show that between 1994 and 1998, 30 per cent of boys failed to complete their secondary schooling, compared with 20 per cent of girls. This results in reduced employment opportunities and general quality of life. In addition, average scores on end-of-school assessments are lower for boys than for girls.

Beyond school, a smaller percentage of boys than girls progress to higher education, although a larger proportion of boys participate in vocational education and training programs. In addition there is evidence that boys regard their school experiences less favourably than girls and are less strongly engaged in the work of schools.

Boys are also over represented in relation to behavioural problems. Dr Rowe said, 'Fifty per cent of consultations to paediatricians at major hospitals relate to behavioural problems, including Attention-Deficit Disorder and Attention-Deficit/Hyperactivity Disorder. Of these, there are nine boys for every girl. Further, 20 per cent of consultations relate to learning difficulties – being made up of predominantly boys demonstrating poor achievement progress in literacy.'

Boys are more likely to participate in delinquent behaviours, alcohol and substance abuse, and during adolescence, are up to five times more likely than girls to suffer from depression and commit suicide.

Supporting boys' learning

Schools, teachers and parents can implement strategies to support the learning needs of boys. (See box.)

'Having good teachers is of great importance. It appears that the major area of potential difficulty at school for boys is literacy. Operational literacy, verbal reasoning and written communication skills are crucial for educational effectiveness. These are the keys to improving the achievements and experiences of boys throughout their primary and secondary schooling,' Dr Cresswell said.

Boys in School and Society, by John Cresswell, Ken Rowe and Graeme Withers, was developed in response to a request from the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA).

Practical strategies

Some of the strategies that support the learning needs of boys suggested in various studies are

- early diagnosis and intervention for those 'at-risk' of literacy underachievement;
- curriculum content and resources which will interest both boys and girls;
- highly structured instructions and lessons;
- greater emphasis on teacher-directed work in the classroom in preference to group work;
- clear objectives, detailed instructions and explicit criteria for presentation;
- short term, challenging tasks with frequent changes of activity;
- phrases and techniques like 'word attack skills' which appeal to boys' sense of competition;
- positive reinforcement;
- opportunities for extra tuition and revision;
- meaningful work experience informing students about changing roles in adult and working life; and
- explaining to parents the importance of their role as listeners and readers, especially the importance of fathers reading with their sons and role modelling.

New database of research on international education

ACER's Cunningham Library has been contracted by AEI – The Australian Government International Education Network of the Commonwealth Department of Education, Science and Training (DEST) to develop a database of research on international education.

The Database of Research on International Education is a searchable web database that contains details of books, articles, conference papers and reports on various aspects of international education from publishers in Australia and overseas published from 1990 onwards. It is the only known database that is dedicated to the study of international education as an industry. The database helps map what research is happening in the area of international education to help identify gaps in research.

The major subject strengths of the database relate to international students, international education, university teaching, distance education, English as a second language, second language teaching, study abroad, international cooperation, exchange programs and marketing of education services.

'This database will be a useful resource for everybody involved in the international education industry including student advisers, international liaison officers, marketers and others,' said Cunningham Library Manager, Mrs Margaret Findlay. 'It will help people to look after international students better.'

While ACER has developed a number of databases in the past for its own customers and clients, including the successful Australian Education Index, this is the first time ACER has been contracted to build a database for an external organisation.

Material in the database is drawn from the Australian Education Index with additional material sourced from a variety of international organisations and publishers.

'This database builds on the strength of the Australian Education Index,' Mrs Findlay said.

'DEST selected ACER to undertake the project based on our recognised expertise in indexing materials.'

As well as indexing material, the database will also include links to the websites of relevant publishers and organisations.

The database can be searched by keyword, or advanced queries. The database contents can also be browsed by country, institution, subject and recent additions. Documents noted in the database can be sourced from the publishers, libraries or, in many cases, are available for free download or for online purchase.

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