Partner focus
Measuring learning growth in a world of universal education

Policy
Assessments to support quality teaching and learning

Innovation
The cure for early grades assessment difficulties?
Take a tablet
The Australian Council for Educational Research (ACER) is one of the world’s leading educational research centres.

Our goal is to support every learner, every learning professional, every learning institution and our learning society through our work.

ACER has built a strong reputation as a provider of reliable support and expertise to education policy makers and professional practitioners since it was established in 1930.

As a not-for-profit organisation, independent of government, ACER receives no direct financial support and generates its entire income through contracted research and development projects, and through products and services that it develops and distributes.

ACER has experienced significant growth in recent years and now has more than 340 staff located in offices in Melbourne, Sydney, Brisbane, Perth, Adelaide, Dubai and New Delhi who are working on education projects across the world.

ACER provides research and assessment services, consultancy, support and professional development programs to governments and educational organisations in numerous countries. In addition, ACER develops, implements and evaluates regional, national and international assessment programs for a broad range of international clients. ACER has been engaged in significant collaborative work with the Organisation for Economic Cooperation and Development (OECD) as the leading partner in a consortium responsible for the Programme for International Student Assessment (PISA).

ACER also collaborates on a number of international development projects with organisations such as UNICEF, the World Bank, the Australian Department of Foreign Affairs and Trade, and the United Kingdom Department for International Development (DFID), contributing to educational evaluation and reform in a number of countries.

Further, ACER is the International Study Centre responsible for the IEA International Civic and Citizenship Education Study (ICCS) and International Computer and Information Literacy Study (ICILS), and jointly conducts the IEA Teacher Education Development Study (TEDS) with Michigan State University.

ACER in 2013 established four strategic centres, each tasked with leading research and development in a key area of ACER’s work. One of these, the Centre for Global Education Monitoring (GEM), is tracking progress in the provision and quality of schooling through the systematic and strategic collection of data on educational outcomes, and factors that influence these.

GEM aims to support improved policies, programs and practices in education and, ultimately, improved educational progress for all learners.
CONTENTS

In this issue...
Data to inform policy

Innovation
The cure for early grades assessment difficulties?
Take a tablet

Partner focus
Measuring learning growth in a world of universal education

Policy
Assessments to support quality teaching and learning

Snapshot
Current international projects
Data to inform policy

The ACER Centre for Global Education Monitoring supports the monitoring of educational outcomes worldwide. Ray Adams explains how the Centre’s systematic and strategic collection of data on educational outcomes, and factors related to those outcomes, can be used to inform policy aimed at improving educational progress for all learners.

ACER has established four centres to consolidate and enhance its position as an international leader in several key areas of expertise. The Centre for Global Education Monitoring (GEM) is one of these centres. The core aims of GEM are: to strengthen the capacity of national systems to implement educational assessments, and use the results in policy development; to conduct international assessment programs; to participate in the shaping of international learning goals; to develop and maintain indicators of educational outcomes; and to report on and analyse international educational outcomes.

In recognition of the importance of the GEM mission, particularly in the Indo-Pacific region, the Australian Department of Foreign Affairs and Trade (DFAT) became a founding partner of GEM in July 2014, when DFAT and ACER signed a three-year partnership agreement. DFAT’s support includes a $1.5 million grant that will help to enhance the effectiveness of the Australian Government’s development assistance in the education sector through GEM’s efforts to improve the...
such a way that student achievement can be benchmarked, tracked across grades and over time, and compared within countries and between countries. Strengthened assessment systems draw on background data to understand the contextual factors that affect student achievement. Strengthened assessment systems implement assessment programs that facilitate continuous internal capacity building, and also seek to build their capacity by drawing on external expertise when necessary.

GEM is working with DFAT to achieve the goals of the partnership in three focus areas. The first and central focus area is system strengthening for learning improvement, recognising that countries and education systems vary in their technical capacity to gather, process, analyse and interpret data in support of the review and development of educational policy. GEM will be working with education systems in: designing data collection activities; developing and implementing survey based assessment and reporting programs; and analysing, interpreting and disseminating assessment data.

The second focus area is developing and maintaining learning metrics and learning goals, where GEM is supporting the setting of the United Nations’ post-2015 education development goals. GEM is working closely with the UNESCO Institute for Statistics and the Brookings Institution, and contributing an academically rigorous and research-based perspective to setting goals and indicators.

The third focus area is researching, analysing and reporting on existing assessments and their findings. The dissemination of information about and results from large-scale international assessments is often limited to those countries that participate in such assessments. Similarly, information about and results from local and regional assessments are often not well-disseminated beyond their origins. Moreover, information, reports and papers produced by the organisations that oversee assessments rarely make connections between their assessments and findings, and other assessments and findings. GEM sees this as a missed opportunity. Given the wide array of assessment-related work that is being undertaken throughout the world, it should be easier to get access to information about the assessments and their findings in a readily consumable form. And given the often high costs of data collection activities, more use should be made of collected data. GEM will be providing mechanisms devoted to the wider utilisation and dissemination of assessment outcomes, especially those in the developing world.

In this issue of *International Developments*, we look at ACER’s work through GEM on the development of new ‘learning metrics’ – tools for measuring learning growth; assessments that support quality teaching and learning in response to the focus of post-2015 development goals on educational quality for all; assessment work in Afghanistan and Lesotho to inform policy makers and practitioners about the quality of students’ learning outcomes; and assessment, evaluation and capacity building projects in Africa, South East Asia, the Middle East and India.

For more on the Centre for Global Education Monitoring, visit www.acer.edu.au/gem

availability and quality of education data in the Indo-Pacific region.

The partnership agreement is an exciting opportunity for DFAT and ACER to work together to improve the quality of education monitoring. The formulation and evaluation of educational policy and practice requires evidence: assessment systems can provide this evidence. Strengthened assessment systems provide this evidence through the implementation of technically robust and appropriate measurement of learning outcomes. Strengthened assessment systems measure learning outcomes in
The cure for early grades assessment difficulties? Take a tablet.
Monitoring educational development in the early years of schooling is vital if practitioners, and policy makers, are to support students’ learning, but the assessment of student achievement in developing countries can be a logistical headache. Maurice Walker reports on an innovative approach to assessment using tablets that is addressing that.

ACER’s tablet-based literacy and numeracy assessments in the early years of schooling track progress in student learning in developing countries, and enable educators to monitor the impact of their teaching on individual students and the efficacy of their programs at the classroom, school and system levels.

Delivering early grades literacy and numeracy assessments via standalone tablets alleviates many of the logistical headaches of assessment, such as data entry, assessment security and mountains of paper. They are also fun for young learners.

Maurice Walker is a Senior Research Fellow in ACER’s International Surveys research program.

ACER has added offline tablet assessment tools to its computer-based assessment platform. The offline nature of the assessment and transportability of android tablets allows systems to monitor learning in even the remotest of populations.

The assessment, designed to monitor reading literacy and numeracy in the early grades, has been trialled successfully in Afghanistan and Lesotho in 2014. Afghanistan will implement the tablet assessment across the country in 2015.

Content coverage

The literacy assessments address the five key elements identified by Catherine Snow, Susan Burns and Peg Griffin in their report for the United States Committee on the Prevention of Reading Difficulties in Young Children as international best practice in teaching reading literacy, which have been widely used as a standard ever since:

- phonemic awareness
- phonics
- fluency
- vocabulary, and
- reading and listening comprehension.

All mathematics areas are represented in the numeracy content:

- number
  - place value and operations
  - fractions
  - patterns with digits and objects
  - money
- measurement
  - length
  - capacity
  - mass
  - time
- geometry and location, and
- statistics and probability.
Efficiency
An advantage of the tablet over one-to-one interview assessments is their relative efficiency. Our recent study comparing an interview-based method with tablet assessments found that on average it took about 80 minutes to assess a single child for both literacy and numeracy with the interview method, but only 45 minutes to assess the literacy and numeracy of six children simultaneously with the tablet method.

Audio prompting
Audio cues are provided for all elements of the assessment that are not directly related to assessing the student’s ability to read a specific word, sentence or longer text. All elements, including the response option, carry associated audio prompts. Each student is equipped with a pair of headphones to maximise sound quality, minimise background noise interference during group assessments and enable students to repeat the prompt as many times as they require.

Standardisation
A further advantage of the tablet over one-to-one interview assessments is their standardisation. All students receive exactly the same audio scripts in the same voice, and the same opportunities to explore and trial answers. In a one-to-one interview, the assessment content and the student’s response are mediated through the test administrator. Test administrators may interact differently with different students, differently to other test administrators, and differently from day to day. Young students may feel reluctant to ask the test administrator to repeat questions – but in a tablet mode the audio prompt can be repeated over and over again. Feedback from assessment supervisors is limited to helping the student to use the tablet and providing general encouragement.

Translation
In keeping with the philosophy of a paperless test, translation of the source English materials into the target test languages is facilitated through an online translation management system and the use of a computer-based translation editor, enabling a multi-step translation process to proceed with multiple users and full version control. Draft translations can be previewed in context and integrated seamlessly into the tablet delivery system. ACER has already successfully trialled translations into Dari and Pashto, both right to left languages, and Sesotho. Any language with a standardised font can be accommodated.

Test deployment
New tests or even modifications to existing tests are easily deployed. They can be downloaded to any tablet containing the test delivery application, anywhere in the world via an internet connection.

Data collection and security
Student responses are initially recorded on the tablet in real time. Following the assessment, the test administrator simply connects the tablet to the internet and uploads the data to ACER’s databases.

The ability to transfer the data immediately after the test offers strong data security as the results are immediately backed up on ACER servers.

The assessments themselves are secured through the use of encryption and user passwords while the students’ test results are also encrypted. Even if the tablet is lost, nobody can access the tests or results.

Responding
The student responds in a tactile manner to questions and tasks by touching a hotspot; or the drag-and-drop method.

Hot-spot selection sequence
Together with the audio prompt, the illustration indicates how students’ judgement of comparative quantity or size can be measured without reading or writing loads.

The student is faced with an item.
The student touches the audio button to hear the instruction, ‘Select the biggest tree.’
The student touches an element on the screen. The element is highlighted in yellow to indicate the student’s response.
**Drag-and-drop sequence**

Together with the audio prompt, the illustration indicates how students’ understanding of numeric sequencing can be measured without reading or writing loads.

The student is faced with an item.
The student touches the audio button to hear the instruction, ‘Put the numbers in the correct order.’
The student selects an element on screen by touching and ‘dragging’ it to the appropriate place and ‘dropping’ it there.

As well as receiving instructions from the test administrator, the students are guided through the initial part of the assessment by culturally appropriate, friendly onscreen helpers.

**Motivation**

Feedback from test administrators in Lesotho and Afghanistan indicates that the combination of interactive technology, playful and colourful design, and audio motivates students to participate. Students who were not sampled actually ask to be tested.

**Reporting**

The tablet-based assessments allow a wide range of content to be administered to students in an efficient manner. This in turn allows ACER to construct proficiency scales for reporting. Such scales describe what students at different levels of proficiency know and can do in a way that is meaningful to teachers, principals and other educational practitioners.

The goal of improving access to quality educational assessment and reporting of this kind is to support teaching in classrooms, schools and systems, and improve learning for all students, wherever they may be around the world.

**References**

Measuring learning growth in a world of universal education
ACER is leading the development of new ‘learning metrics’ – tools for measuring learning growth – as Ross Turner explains.

Ross Turner is a Principal Research Fellow in ACER’s International Surveys research program.

Staff at ACER’s Centre for Global Education Monitoring (GEM) in 2013 identified the need to build measurement tools to monitor learning growth that could be used across different year levels and in different national contexts.

One of those projects, under ACER’s Monitoring Trends in Educational Growth program, involved the development of an assessment program in Afghanistan at the Grade 6 level, which is now being extended to Grade 3 and later possibly to Grade 9.

At the same time, the Learning Metrics Task Force led by the UNESCO Institute for Statistics (UIS) and the Center for Universal Education at the Brookings Institution was progressing rapidly in its work to develop a framework that identifies education’s central place in post-2015 global development goals as well as the tools that would be needed to monitor progress against those goals, particularly in developing countries.
Monitoring learning progress in this way can provide rich information to teachers, schools and education systems about the most appropriate teaching and learning interventions for students.

With those post-2015 development goals soon to be adopted by the United Nations General Assembly, it is evident that the GEM approach to measuring learning progress is a timely development.

GEM researchers presented an approach to measuring learning progress, based on similar work over many years and in many different contexts, to a meeting of literacy experts at the UIS in Montréal in March 2014. With encouragement from the UIS, GEM researchers have since then been working to develop learning metrics to quantify and describe growth in reading comprehension and in mathematical proficiency for students from early primary school level through to middle secondary school level.

**Learning metrics**

The process of building learning metrics begins with the analysis of a range of test items that have been used in different kinds of learning assessments designed to measure progress in a domain of interest, from a range of different countries, with the goal of encapsulating in short descriptions the essential aspects of the cognitive demand of each item.

Empirical data can then be used to identify items by increasing level of difficulty, after which descriptions of item difficulty can be used to build summary descriptions of learning achievement in the domain at different points along a line from a lower to a higher level of proficiency. These summary descriptions of growth, at defined points along the resulting measurement scale, will make up the learning metrics.

A subsequent step will be to identify benchmarks based on these learning metrics that can be used to define learning goals appropriate to students in particular countries and at different stages of education, so that learning progress can be monitored over time. These tools will be available for use in a variety of learning and assessment contexts, including for national assessment programs, regional assessment programs and assessments in a wider international context, as well as potentially being of use to international donor agencies and funding partners in monitoring the effectiveness of their aid investments.

Building the learning metrics is progressing in three phases. The first phase involves using existing data about items from a range of assessments to build draft learning metrics. This phase, supported by strategic funding from ACER and from Australia’s aid program within the Department of Foreign Affairs and Trade, is now almost complete.

The second phase will involve administering sets of items to students in order to collect empirical data that will be used to validate the resulting draft measurement scales. GEM researchers will shortly be able to identify a small set of developing countries to participate in this phase.

The third and far more open-ended phase involves using the learning metrics in a variety of contexts to measure student progress. For example, by embedding selected items in an existing national or regional assessment program, assessment outcomes could be mapped onto the common learning metric.

The expectation is that these tools will allow education authorities in a particular country, or across a number of countries, to locate students at points along a stable measurement scale. This would make possible comparisons among groups, and tracking of learning growth of individual students or groups of students.

Monitoring learning progress in this way can provide rich information to teachers, schools and education systems about the most appropriate teaching and learning interventions for students at particular points in their learning trajectories.
What does a learning metric look like?

The learning metric for mathematics at right illustrates the kind of measurement tool towards which GEM researchers are working.

The central element is the vertically graduated ‘Mathematics Scale’, which in this case goes from about 75 at the bottom to about 175 at the top. On the right hand side of the scale, nine bands are marked and labelled, with a short description for each band, summarising the kinds of mathematical knowledge, understanding and skill observed at different parts of the scale. These elements – the scale and descriptions – are the essence of the learning metric.

A student at level 5, for example, would typically be able to ‘solve simple word problems, distinguish between simple shapes, find the value of a simple algebraic expression, write ratios using small numbers in their simplest form’, and perform tasks described in the levels below level 5.

On the left side of the scale is additional information that shows how the metric could be used. In this case, a number of comparisons are shown.

First, sets of performance distributions are shown for two countries (here labelled as Country A and Country B but in the future identifying particular countries). Within each country, a distribution is shown for students in Grade 3, and for students in Grade 6. Those distributions show percentile points for students in the grade, from the fifth percentile at the bottom, to the 95th percentile at the top.

The Grade 3 distribution for Country A shows 50 per cent of students above 90 points on the scale and 50 per cent below; and also shows the mean for all Grade 3 boys, all Grade 3 girls, all rural students and all urban students in Grade 3. It also identifies a ‘Grade 3 benchmark’, sitting at 95 points on the scale, and shows that about 70 per cent of Grade 3 students in Country A lie below that benchmark.

The metric could be used to locate students from different grades in a particular school, and from similar or different schools in a district, province or state; the performance distribution for different districts or provinces, different countries, or different groups of countries; and to monitor changes over time, all on a single comparable metric.

The aim of ACER’s GEM research to develop new learning metrics that monitor learning progress is to help educators and education policy makers to identify learning goals appropriate to particular students. They can then identify the appropriate next steps to take, and resources to provide, to support those students in their learning progress.
The focus of post-2015 development goals on educational quality for all is directing attention to assessments that support quality teaching and learning, as Charlotte Waters explains.

Until recently, the focus of governments of developing countries and the donor partners working with them has been on ensuring access to schooling, particularly at the primary level. The international community debate about post-2015 development goals indicates there is general agreement that ensuring access is a necessary but not sufficient condition for improving educational outcomes. If children are to benefit from education then attending school must involve learning.

Learning assessments enable the measurement of learning levels. But what kinds of learning assessment activities are suitable for different contexts and purposes? What do assessment results really reveal about an education system? How can assessment systems be strengthened so they can effectively inform the decision making that leads to changes in policy and practice? And, fundamentally, how can the quality of assessments and data be judged?

In the crowded and busy learning assessment space, governments, donor partners, and other interested stakeholders are asking questions like these. ACER is helping to answer them through several strands of review work.

**Reviews of major learning assessments**

ACER’s Centre for Global Education Monitoring (GEM) is investigating major learning assessments like the Programme for International Student Assessment (PISA), the Trends in International Mathematics and Science Study, the Early Grade

Charlotte Waters is a Research Fellow in ACER’s International Surveys research program.
How can assessment systems be strengthened so they can effectively inform the decision making that leads to changes in policy and practice?

Mathematics Assessment and Early Grade Reading Assessment, assessments of the Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación and Programme d’Analyse des Systèmes Educatifs de la CONFEMEN, and assessments of the Southern and Eastern Africa Consortium for Monitoring Educational Quality.

GEM is documenting the key features of these assessments and offering this documentation in a consistent format on its website. Visitors to this location can get a quick overview of the similarities of and differences between the reviewed assessments, download analyses that describe the assessments in more detail, and find out where to learn more.

**Reviews of foundational reading and mathematics assessments**

ACER has been collaborating with the Results for Development Institute on a review of four citizen-led, household-based assessments of foundational reading and mathematics, funded by the William and Flora Hewlett Foundation, by ASER in India, Berekunko in Mali, Jàngandoo in Senegal and Uwezo in Kenya, Tanzania and Uganda. ACER’s role in this strand has been to evaluate the testing tools and processes of these four assessments and recommend ways to improve the reliability, validity and utility of results. The four organisations responsible for these assessments will be assisted by ACER as they implement the recommendations.

Further activities in this work strand will include ACER field studies in Kenya to examine the concurrent validity and inter-rater reliability of Uwezo. ACER also stands ready to support new members as they join the ‘family’ of citizen-led, household-based assessments.

**Comparative reviews of learning assessments**

ACER has been contracted by the World Bank to undertake a comparative review of the component skills that are tested and the contextual data that are collected in learning assessments, the instruments and practices of which might inform the design and implementation of the PISA for Development initiative. PISA for Development intends to make PISA more relevant for the contexts found in developing countries.

**Life-long learning opportunities for all**

The fourth goal in the 17 proposed goals of the United Nations Open Working Group on Sustainable Development Goals, relating to education, aims to ‘Ensure inclusive and equitable quality education and promote life-long learning opportunities for all.’ That goal sees education taking a foundational place in the global development agenda.

In that global development agenda, learning assessments are vital tools for measuring the quality and equity of education systems. They will undoubtedly form a central part of the framework that supports countries in their efforts to attain this goal. But in order to be truly useful tools, they must be sustainable and build local capacity. They must also be appropriate for the contexts in which they are used, and embedded in the cycle of policy development and evaluation.

ACER’s review work supports the focus on access to quality education for all by helping to improve existing learning assessments, by informing thinking about nascent learning assessments, and by contributing to global awareness of and knowledge about these activities, all in pursuit of the ultimate goal: to support quality teaching and learning.

For more on the Centre for Global Education Monitoring, visit www.acer.edu.au/gem/reviews-of-learning-assessments
Research Conference 2015
Learning Assessments: Designing the future

Crown, Southbank | 16–18 August 2015 | Melbourne, Australia

Hosted by Professor Geoff Masters AO, CEO, ACER

Assessment needs reform and innovation
Teachers, community leaders, academics, policy makers and technologists: join with us to shape the future of assessment!

Invited researchers from Australia and overseas will present research on:
• alternatives to A-E grades
• stealth assessment through gaming
• assessing 21st century skills and general capabilities
• a growth mindset in assessment
• innovation to involve the community
• technologies to inform assessment and teaching

Professor Geoff Masters AO
CEO, ACER
Assessment Reform & Innovation: Designing the future

Professor Val Shute
Florida State University, USA
Stealth Assessment in Video Games

Dr Rukmini Banerji
Director of the ASER Centre, Pratham, India
Community Participation in Learning Assessments

Emeritus Professor Dylan Wiliam
IOE, University of London, UK
Conversation (Pre-Recorded) with

Research Conference 2015 is a highlight in ACER’s Rolling Summit on Assessment Reform and Innovation.

Registrations now open: www.acer.edu.au/rc

Enquiries
Margaret Taylor
+61 (03) 9277 5403
margaret.taylor@acer.edu.au

Marketing & Sponsorship
Liam Hensel
+61 (03) 9277 5468
liam.hensel@acer.edu.au

Join the conversation
@acereduau #RC2015
www.facebook.com/acereduau
http://acer.ac/linkedin

Australian Council for Educational Research
Analytical and capacity development in Indonesia

ACER is undertaking two significant evaluation studies in Indonesia as a member of a consortium led by Cambridge Education. The projects are part of the Analytical and Capacity Development Partnership (ACDP), supported by the Department of Foreign Affairs and Trade and EuropeAid, and managed by the Asian Development Bank. ACER is undertaking an evaluation of a national principal leadership training program; and an evaluation of information and communication technology in schools in Papua province.

National assessment in Saudi Arabia

ACER has been supporting the Public Education Evaluation Commission (PEEC) in Saudi Arabia to establish a national assessment program. ACER’s role includes reviewing capacity within PEEC and linked organisations, and working with local experts to build capacity, establish a national sample monitoring program and develop a set of instruments that will generate baseline statistics of student performance across a range of grade levels and subject domains. ACER’s role in the first phase is to support PEEC in implementing a national assessment field trial program to determine the item set that will be used to inform possible curriculum reform and student learning interventions at national, zone and school level.

Learning in Laos

ACER has been engaged by UNICEF Laos to review the current status of student learning outcomes within primary education for the Lao Ministry of Education’s curriculum review process. Findings and recommendations from the analysis will provide guidance for further improvement of the student learning outcomes framework.

Measuring primary school learning in Southeast Asia

ACER is assisting UNICEF in the development of a pilot assessment of the literacy, numeracy and global citizenship skills of primary school students in Southeast Asia, with the three-country pilot expected to be extended to 15 countries.
Tracing the impact of early childhood care and development in the Philippines

ACER is conducting a tracer study for UNICEF Philippines to investigate the impact of the Early Childhood Care and Development (ECCD) program on the learning experiences and outcomes of students in the early years of schooling. Longitudinal assessments will be conducted across Kindergarten and Grade 1 to provide perspectives on the effectiveness of the ECCD program and provide evidence to guide the implementation of the Philippines Early Years Act 2013 and Enhanced Basic Education Act 2013, and to inform curriculum development and professional learning programs for teachers.

Investigating learning data in Kenya

ACER has been engaged by UNICEF Southern Africa Regional Office in Nairobi to develop a more in-depth understanding of existing data on student learning outcomes at the primary school level and how this data may better inform education policy in the Southern African region. The project will provide support on the development of effective student assessment data collection tools.

Public-private partnerships in India

ACER in partnership with Gray Matters India is conducting research for New Delhi-based not-for-profit, the Education Alliance, investigating the efficacy of various public-private partnership models for school management in India. The study uses the Indian Progressive Assessment Scale to assess student outcomes in different school types. The research will document best practices in public-private partnerships, and make findings about these available to government departments, school operators, philanthropic foundations and other social enterprises, and academic researchers.

Evaluating teacher development interventions

ACER is conducting an evaluation of the implementation of quality teacher development interventions and outcomes achieved for Australian Aid through the Department of Foreign Affairs and Trade. Examining 29 current and recently completed investments in teacher development, the evaluation will investigate the effectiveness of models of support for education aid and compare this to known good practice.