Balanced approach needed for students with learning difficulties
Training great teachers

Australian Council for Educational Research

Quality Assessment in Science Workshop for teachers
Dear Friends

It is with great expectations and enthusiasm that ACER-India brings you this Newsletter. Through this initiative we wish to invite / exchange ideas findings in the field of education.

Education has always played a very important role in bringing people together. Not only has it played a role in exchanging information and learning but has also been a medium to understand the culture of a country. It is the bridge that brings nations together and builds an understanding among its people. In recent times there has been growing international interest in how educational standards compare from one country to another and in what can be learnt from global experiences about effective educational practices.

In this first issue we introduce to you the organisation, the Australian Council for Educational Research and our work. This issue also lays the foundation of the knowledge base we plan to bring to you in our future editions with a peek into educational practices globally. In this issue we bring you a paper related to teaching children with learning difficulties. In future issues we will share information on the latest findings in educational research and invite your contributions about what is happening in our own Indian schools. We know some teachers in our own schools are doing wonders, some with recognition and some without. We offer this newsletter as a platform to show this work and recognise the efforts of our colleagues and to share our experiences, and discuss important issues.

We will look forward to receiving your contributions and suggestions to help us make this newsletter a success. I invite you to join with us to make this newsletter your own.

We hope you will enjoy reading this Newsletter. Have a great reading experience.

Cheers

Ratna Dhamija
ACER in India


For more than 75 years ACER has developed expertise and has undertaken extensive research in the following areas:

- Early Childhood Education
- Learning Processes & Contexts
- Assessment & Reporting
- National and International Surveys
- System & School Testing
- Teaching and Learning
- Transitions and Economics of Education

To date ACER has conducted assessment services and professional development programs in India. The Global Achieve assessment has been developed by ACER according to the highest standards governing the development of international assessments. An initial trial assessment was conducted in 2004 followed by further assessments in 2005 that were highly successful. The skill based assessment programs play an important role in providing dependable information for educational decision making to policy makers, school leaders, teachers and parents. ACER designed these programs to reflect and reinforce learning priorities. The next Global Achieve program will be offered in December 2006. For further details about the program we invite you to visit our site www.india.acer.edu.au.

We all need to upgrade our skills to keep up to date with the latest developments. In support we have introduced Professional Development training for our teachers. Through our training workshops we bring teachers the experience and of our researchers. In 2005 we conducted a specially designed training workshop in science for primary and secondary teachers in Delhi, Hyderabad and Pune. The objective of the workshops was to introduce simple, easy to implement and cost effective experiments to explain certain science topics. The outcome and teachers’ responses to the experiments was very interesting to observe. Not only were they forthcoming in identifying the topics they could teach with the help of the experiments, they also identified the classes where these could be implemented. The most important conclusion was that these could be implemented effectively considering that the number of students in a class in an Indian school is normally more than 40-45.

The enthusiasm of the teachers is worth mentioning. They enjoyed the sessions and named topics in which they wanted advice such as, Assessments and Question Building Techniques. Details of workshops for 2006 will be announced shortly. For updated information you are requested to visit ACER-India site periodically.

ACER’s International work

ACER leads an international consortium of research and other educational institutions and eminent individuals to deliver the International PISA project on behalf of the OECD. ACER’s work on PISA includes:

- leading the development of the methodology and procedures required to implement the PISA survey in all 59 participating countries;
- leading the development of all assessment instruments in Reading, Mathematics, Science, Problem Solving, Computer-based testing, background and contextual questionnaires;
- developing purpose-built software to assist in sampling and in data capture; and
- analysing all data and assisting the OECD in preparation of the international report.

ACER’s chief executive Professor Geoff Masters has been appointed as a member of the International Baccalaureate Organisation (IBO) research committee under the category of external expert for a three year term from May 2006.

ACER, in association with Cambridge, UK, has developed uniTEST, to assist universities with the often difficult and time consuming process of student selection. The test allows universities to bring greater transparency to these processes. The test has been designed to assess the kinds of generic reasoning and thinking skills that underpin studies at Higher Education and that are needed for students to be successful at this level.
Quality Assessment in Science Workshop for teachers
Workshop Objective

The main objective of the Quality Assessment in Science workshop is to improve and extend teachers’ skills in assessment. They improve their ability to make consistent judgements about student learning. Teachers practice matching student activities to curriculum outcomes and increase their understanding of students’ progression in learning.

Other objectives of the workshop are to increase the teachers understanding of the science demonstrated by each activity and to extend the range of science activities that teachers use in the classroom.

Benefits of the workshop methodology

The workshop provides opportunities for teachers to network and share classroom expertise in a structured setting. The methodology used throughout the workshop puts value on the skills of classroom teachers and aims to improve these skills.

The workshop structure models an inclusive pedagogy that values the ideas and input of all present. Teachers experience each activity by performing it in the same way as students would perform it. This allows them to fully judge both how students can learn from the activity and how the teacher can assess this learning.

The activities use readily available, inexpensive, everyday materials that teachers can use in their schools. These materials also allow teachers and students to experience the use of scientific thinking in life outside the classroom.

Benefits of the methodology in the classroom for learning

The students are actively engaged in the learning so that they retain more of the scientific content. They develop a deeper understanding of scientific principles. The activities are multilevel in that students at different levels of understanding in the same classroom can benefit from the same activity and so progress in their learning. Teachers can adapt the activities for use in lower or higher classes. The students see that scientific thinking can be used with everyday materials so that classroom science becomes relevant to their daily life.

Benefits of the methodology for assessment in the classroom

The assessment methodology presented in the workshop is in line with international trends in assessment. If students experience a degree of success they become more confident as learners so learn more effectively. Teachers see that they can apply this methodology in their classrooms.

A multilevel model of assessment is used so that one activity allows a teacher to judge different levels of achievement in the same classroom. The assessment is for learning (formative) showing student progression and allowing teachers to plan for further learning.
Balanced approach needed for students with learning difficulties.
As Professor Peter Freebody says in the foreword to the review, the issue of how we should teach entry-level literacy and numeracy is perhaps one of the most divisive topics in education. There are similar heated debates about the education of students with learning disabilities or difficulties. This review deals with both issues.

Concerns regarding the most appropriate methods to address the educational needs of students with learning difficulties are widespread among teachers. The Commonwealth government has a major policy objective to improve the literacy and numeracy skills of all Australian children. Its National Literacy and Numeracy Plan espouses the need for early identification of, and adoption of intervention strategies for, students with learning difficulties in order to improve their literacy and numeracy outcomes.

This review examines research, drawn largely from the field of educational psychology, in an attempt to identify methods that are effective for a wide range of students in mainstream classrooms, but are especially powerful for students with learning difficulties. The review provides detailed information on a range of teaching methods that have been used extensively and have been judged to be effective by research.

Instructional methods have generated much interest and heated controversy for several decades, particularly in the area of literacy. There has been much debate among professionals regarding the most effective instruction techniques for both mainstream students and for those with learning difficulties. Two prominent psychological theories, the behavioural and cognitive perspectives, have heavily influenced much classroom teaching practice. During the 1970s and throughout the early 1980s, behavioural approaches provided a structure and an optimism that were of immense influence on teachers. Two popular methods derived from this perspective include direct instruction and precision teaching. However, an increasing number of people began to criticise, either directly or by implication, the exclusive use of behavioural methods. As such, cognitive approaches have gained widespread use over the past 20 years; particularly by way of constructivism.

This review focuses largely on meta-analyses, many of which were undertaken in the United States of America. The intent was to identify the relative effectiveness of various teaching approaches. Meta-analysis is a research procedure used to aggregate findings across many studies. Unlike traditional reviews, meta-analyses can synthesise larger quantities of research.
findings and quantify the outcomes of, and make judgements about, the effectiveness of the strategy being researched. Meta-analyses are seen as providing a more objective, quantifiable summary of the evidence than individual research studies are able to provide. The number of meta-analyses published in education research has increased markedly over the past ten years.

**Direct Instruction and Strategy Instruction**

Direct instruction (sometimes referred to as explicit instruction) is a teacher-centred approach. Key features of direct instruction programs include: scripted presentation, teaching the essentials, small group teaching, rapid pacing and practice and drill.

An example of a direct instruction program designed for Australian schools is Elementary Math Mastery (EMM). EMM is a powerful diagnostic tool which clearly maps student progress, and can be used with both mainstream students and those with learning difficulties. EMM enables teachers to identify exactly where and when students experience difficulty in their learning. The daily incremental portions learned are small, and because they are reinforced and built upon in subsequent lessons they are more easily retained. The teacher models each scripted lesson in the prescribed format with whiteboard presentations being an integral component. Everything taught is revisited, developed further, and gradually integrated into the whole mathematical scheme.

Strategy instruction has usually been associated with constructivist models. However, proponents of strategy instruction do not assume that students with learning difficulties will independently discover effective learning strategies, nor do they believe that direct teaching is required. Learning strategies are tactics used by students to enhance their performance on a given task or tasks. Strategies are broadly classified as cognitive, metacognitive or self-regulatory. Cognitive strategies focus on developing or enhancing particular task-related skills such as underlining, note-taking, rehearsing and summarising. Meta-cognitive strategies are those that focus on the self-management of learning—planning, implementing, and monitoring one’s own efforts, and on the conditional knowledge of when, where, why and how to use particular strategies. Self-regulation strategies have been defined in terms of self-generated thoughts, feelings and actions, which are systematically oriented toward the attainment of students’ own goals.

The balanced approach can generally be described as a combination or alternation of various aspects of the curriculum and/or instruction. Balanced approaches can be applied to both what is taught (the curriculum) and how it is taught (the method of instruction). ‘Best practice’ is now generally recognised by classroom practitioners as the combination of instructional approaches which best fits the students being taught.

Moreover, advocates of balanced programs do not endorse a *laissez faire* combination of approaches, but rather a thoughtful, carefully integrated selection of validated instructional components. Many researchers believe that effective balance is achieved through the selection of methods of instruction that best suit the types of learning involved in a lesson, and that in deciding such matters the age, ability, and aptitude of the individual students should have been taken into account.

**What is best practice for students with learning difficulties?**

Essentially the research reviewed in this publication suggests that firstly, teaching approaches based on models of direct instruction and strategy instruction produce higher positive effects for students with learning difficulties than other approaches. Secondly, when a balanced approach is adopted, the outcomes for students are most positive. Thirdly, teachers need to have the necessary theoretical and pedagogical knowledge and skills to combine essential elements of both approaches. Fourthly, teachers need to have the attitude that all students can learn, even those who experience difficulties in learning.

The review emphasises that there is no one single instructional method that deserves sole claim to being ‘best practice’. Of course this will come as no surprise to teaching practitioners operating in the real worlds of their classrooms. Rather than single strategy solutions, the common wisdom of research in the field currently points to the need for *balanced* approaches, also known as ‘eclectic’ and ‘combined’ approaches, to accommodate the diverse needs of students.

The meta-analytic research reviewed in this publication, derived largely from the field of educational psychology, is described and analysed in considerable detail in the review. The findings are strongly supportive of the view that a combination of direct instruction and strategy instruction has a greater and more long-lasting impact in dealing with the academic problems of those with learning difficulties than any single-focused approach.

The review calls for an end to the continuing contest between the instructivist and constructivist teaching
‘camps’. The best research avoids the adoption of either/or positions. Such a contest limits the professional consideration by practitioners of the possibility of balancing instruction and it blinds educators to the value of different perspectives.

**What are the implications for teacher training?**

Most Australian university departments currently base their teacher education programs on constructivist views of learning and do not expose their students to a wide range of methods, including teacher-directed instruction. In view of the findings presented in this review, it is worrying that significant numbers of teachers in Australia are not being exposed to training and research that emphasises the importance of direct instruction.

In order to move closer towards the adoption of the ‘best practice’ for students with learning difficulties, it is critical that teachers be trained in the use of all teaching practices that have been shown to be effective. Thus, tertiary teacher-training courses and inservice professional development programs must incorporate training in the use of direct instruction and strategy instruction, as well as the training in constructivist methods currently provided. This will provide teachers with the skills/competencies in the paedagogic/teaching practices most necessary for those with learning difficulties. Only then will they be provided with a conceptual understanding, attitude and level of competence that will enable them to freely exercise the choices associated with best practice.

**Future research**

The review urges an end to the either/or debate regarding teaching methodology. In Australia, direct instruction is the under-researched and under-resourced half of the balanced approaches equation. Since this review has established its important role in effective teaching for students with learning difficulties, more research into its effectiveness should be undertaken. Currently there have been few Australian studies specifically designed to compare the effectiveness of direct instruction with constructivist instruction. In order to move forward, further research comparing the effectiveness of the different methods of instruction in Australian classrooms is necessary.

The evidence presented in the review also casts light on the relative neglect of numeracy research in comparison with literacy research in Australia and other Western countries. Further research into the numeracy field is required to obtain a clearer picture of ‘best practice’ for teaching literacy and numeracy. If such work were undertaken, it may be found that much of the research findings in literacy are replicated, but there may also be unique characteristics to numeracy learning.

Research that would enable the research community to determine the extent to which Australian teachers implement integrated approaches when teaching students with learning difficulties should also be conducted. Findings from such research would enable teachers of students with learning difficulties to be more confident about what constitutes ‘best practice’ with these students.

An evaluation of what is currently taught in teacher-training courses is vital. It is critical that teachers be trained in the use of all teaching practices that have been shown to be effective, so they will be able to exercise the choices associated with best practice.

**Further information**

Balancing approaches: Revisiting the educational psychology research on teaching students with learning difficulties, by Louise Ellis was published by ACER in October 2005 as Australian Education Review Number 48. The review can be purchased from ACER Press or downloaded from the ACER web site at [www.acer.edu.au](http://www.acer.edu.au)
Teacher education is high on the political agenda in Australia, with several government inquiries on the topic currently underway. These inquiries reflect, in part, dissatisfaction among many school principals with the preparedness of graduates.

Dr Lawrence Ingvarson asks how well new teachers feel they have been prepared for their vital role.
A recent survey asked teachers about how well their teacher education had prepared them for the demands of teaching. ACER surveyed the teachers at the start of their second year of teaching for the Victorian Institute of Teaching in 2004. Teachers who completed a four-year undergraduate course generally reported more favourably on their course than teachers who completed a post-graduate degree. On a four point scale, teachers generally rated their courses slightly below a three, except in the area of working with and reporting to parents, which scored near a two on average.

School experience was rated higher than other elements of teacher education programs, but teachers from most courses made frequent mention of unsatisfactory arrangements, including the selection and preparation of teachers supervising the practicum experience in schools.

Most universities are having difficulty in finding schools and teachers who are able and willing to provide quality practicum experiences for their students, and in ensuring that those experiences link productively with the theoretical components of their courses.

Differences in practicum arrangements were not related to the reported effectiveness of teacher education programs. This is not to say that the practicum is unimportant—rather it appears that links are generally poor between the practicum and what students are learning in the university component of the course. It is hard for universities to find supervising teachers with the training to be an effective student-teacher supervisor in a school.

There were three main features of teacher education programs that were associated with the preparedness of teachers:

**A strong focus on the ‘content to be taught’**

Courses with a strong content focus enabled future teachers to:

• gain a deep understanding of the content knowledge they were expected to teach;
• make clear links between content or subject matter units and units about how to teach the content;
• make clear links between theoretical and practical aspects of teaching;
• develop a sound understanding of how students learn the specific content that they were expected to teach;
• learn how to probe students’ prior understandings of content they were about to teach;
• learn how to present content in ways that built on students’ existing understanding; and
• learn methods of teaching specific to the content they were expected to teach.

**Assessment and curriculum planning**

Opportunity to learn ‘how to assess student learning and plan curriculum units’ was also strongly associated with preparedness in the areas of professional knowledge and knowledge of students in the first year of teaching. However, less than 20 per cent of teachers said their courses had prepared them, to a major extent, in this area.

**Feedback**

Opportunity to receive feedback was also significantly related to the reported effectiveness of courses. Students in the most highly rated courses were much more likely to mention the opportunities they had had for gaining timely and useful feedback from lecturers and practicing teachers as helpful features. Feedback on practice has long been recognised as a vital requirement for professional learning but teachers reported receiving little feedback from university staff as they were learning to teach. One of the key elements in linking theory to practice is feedback. Current levels of funding for teacher education do not make it easy for university staff to provide feedback to students about their developing practice. However, the low level of feedback about practice may point to a significant weakness in current approaches to teacher education.

Teachers who reported that they felt well prepared had completed courses that gave them deep knowledge of what they were expected to help students learn, and how students learned it, as well as skill in diagnosing students’ existing levels of understanding of the content to be taught, planning activities that would
promote further development and assessing the extent to which development had taken place.

These professional capabilities appear to remain the necessary, though not sufficient, foundations in preparing teachers to meet the wider demands of the job, from establishing a productive learning environment to working effectively with parents.

The findings of this study do not provide support for those who think that making teacher education “practical” and “school-based” is the answer. Teacher education programs that might be highly “practical”, in the sense of giving heavy emphasis to skills in classroom management for example, will not make up for a deficiency in the aspects of content knowledge identified in this study.

A national approach

Unlike other professions, teacher education has relatively weak forms of external assessment and accreditation by professional bodies at the state level. There is no equivalent of the Australian Medical Council, a national body that assesses and accredits initial medical training courses using visitation panels made up of experts in medical education and medical practice and ensures cross-fertilisation of ideas across states. Nor is there any equivalent to the Teacher Training Agency in England with its capacity to adjust funding to providers on the basis of their capacity to prepare teachers well.

However, now that each state has a statutory authority responsible for teacher registration we are much closer to the situation that applied in medicine in 1985 where the state governments and medical boards agreed to establish the Australian Medical Council. The newly established National Institute for Quality Teaching and School Leadership would appear to be a suitable body to take up a parallel role in the field of education.

Teacher education research and evaluation

ACER is currently involved in other projects focused on teacher education. ACER conducted an evaluation of the Bachelor of Learning Management at Central Queensland University (CQU) in 2005. The Bachelor of Learning Management is a four year initial teaching degree which aims to prepare “workplace ready” and “futures-oriented” graduates who have a strong sense of social and educational vision, responsibility and change. The course aims to better prepare teachers for the needs of contemporary schools and to address the challenges of learning in a knowledge-based economy at a time of rapid and substantial social change.

The results of this evaluation also emphasised the importance of a strong focus on content and content-specific pedagogy. It was noted that the Bachelor of Learning Management is one of the few courses that has a unit of study titled “Teaching Reading”.

The evaluation found that teacher education courses need to make explicit the fundamental principles of sound pedagogy and the methods they will use to ensure future teachers will learn to implement them.

In addition, the preparation of teachers should be genuinely based on a partnership between the profession, employers and the universities, one that is reflected both in decision making and allocation of funding for teacher education.

ACER is also advising the National Institute for Quality Teaching and School Leadership on the development of a national system for the accreditation of pre-service teacher education programs. The project will be completed in December 2005.

The International Association for the Evaluation of Educational Achievement Teacher Education Study (TEDS) study began in September 2005 and will compare policy, practices and outcomes of programs for preparing teachers of mathematics in up to 30 countries. The study, which may continue for up to three years, will be jointly managed by ACER and Michigan State University (MSU), in collaboration with Data Processing Centre, Hamburg. It is hoped that Australia will participate.

The current parliamentary Inquiry into Teacher Education covers the scope, suitability, organisation, resourcing and delivery of teacher training courses in Australia’s public and private universities. The inquiry is also to examine the preparedness of graduates to meet the current and future demands of teaching in Australia’s schools. The issue of teacher education is clearly one of great importance, and is currently receiving a lot of attention in various research and evaluation studies. There will undoubtedly be further discussion when the Inquiry into Teacher Education concludes.

Further information

http://www.acer.edu.au/research/
Click on Teaching and Learning in the Research Programs section.

