Australian Government
Department of Education, Science and Training


# Teaching Reading

## Literature Review

A review of the evidence-based research literature on approaches to the teaching of literacy, particularly those that are effective in assisting students with reading difficulties

National Inquiry into the Teaching of Literacy
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# List of abbreviations

| | |
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| ACER | Australian Council for Educational Research |
| ADD | Attention Deficit Disorder |
| ADHD | Attention-Deficit/Hyperactivity Disorder |
| AEI | Australian Education Index |
| APA | American Psychiatric Association |
| BNR | *Becoming a Nation of Readers: The Report of the [US] Commission on Reading* |
| CCCH | Centre for Community Child Health (Victoria) |
| DEET | Department of Education, Employment and Training |
| DEETYA | Department of Education, Employment, Training and Youth Affairs |
| DEST | Department of Education, Science and Training |
| ERIC | Eduction Resources Information Center |
| ES | Effect size |
| LLANS | Longitudinal Literacy and Numeracy Study |
| MCEETYA | Ministerial Council on Education, Employment, Training and Youth Affairs |
| NICHD | National Institute of Child Health & Human Development (US) |
| NITL | National Inquiry into the Teaching of Literacy |
| NLNP | National Literacy and Numeracy Plan |
| NRP | National Reading Panel (US) |
| OECD | Organisation for Economic Co-operation and Development |
| PD | professional development |
| PISA | Programme for International Student Assessment (OECD) |
| PRD | *Preventing Reading Difficulties [in Young Children]* |
| SES | Socio-economic status |
| ZPD | Zone of Proximal Development |

# Summary

Underlying a key purpose of the present review is the conviction that claims about what constitute effective literacy teaching, and of reading in particular, should be grounded in findings from rigorous evidence-based research. To this end, the present review of the research literature on teaching practices for students, with and without reading difficulties, relies largely, though not exclusively, on well-designed meta-analytic syntheses that: (a) partial out methodological artefacts from the effect sizes; and (b) base their analyses on the actual procedures and components of instruction used in the studies reviewed.

Following a brief outline of the background and purposes related to the *National Inquiry into the Teaching of Literacy*, attention is given to the prevailing contexts of: the importance of literacy in schooling; the overlap between students' under-achievement in literacy (especially in reading) and their poor behavioural health and wellbeing; the complexities entailed in literacy teaching and learning; and contemporary understandings of effective teaching practice. Despite a lack of supporting evidence for its effectiveness, the prevailing educational philosophy of *constructivism* (as a *theory of knowing*) has had marked influences on pre-service teacher education, and subsequent professional practice, by shaping teachers' interpretations of how they should teach. However, there is a strong body of evidence that constructivist approaches to teaching, including whole-language, are not in the best interests of students with learning difficulties and especially for those with reading difficulties.

For beginning reading during the early years of schooling, findings from meta-analytic syntheses of a large volume of local and international evidence-based research consistently indicate that direct, systematic instruction in phonics makes significantly greater contributions to children's initial and subsequent growth in reading, writing, spelling and comprehension, than do alternative approaches involving unsystematic or no phonics instruction. Indeed, the evidence reviewed indicates that all students are provided with the best opportunities for success when teachers integrate the following skills via explicit instruction in: phonemic awareness, phonics, fluency, vocabulary knowledge and comprehension. Emphasis is given to: (a) the need for evidence-based pre-service teacher education and in-service professional development related to reading/literacy instruction; and (b) the need to provide teachers with training in the use of appropriate diagnostic and developmental assessment tools.

The review concludes by highlighting substantive issues related to the vital point that pedagogical practices and instructional strategies *per se* are not independent of the teachers who deliver them to students, whether or not those students experience reading difficulties. Thus, there is need for a major focus on *teacher quality*, and building capacity in teachers towards quality, evidence-based teaching practices that are demonstrably effective in maximising the developmental and learning needs of all students.

# 1. Background and contexts

## Background

A key policy priority for the Australian Government continues to focus on achieving sustained improvements in the literacy and numeracy skills of Australian children to prepare them for their futures. Achieving a goal of all children meeting appropriate standards in literacy and numeracy is critical in overcoming educational disadvantage.[1] The OECD Indicators 2005 report, *Education at a glance* (OECD, 2005a) shows that Australian school students compare well with the performance of students in other OECD countries. As a country, this is something we should celebrate. Even so, a significant minority of children in Australian schools continue to face difficulties in acquiring acceptable levels of literacy and numeracy.

This priority has been brought into sharper focus since the announcement of the *National Inquiry into the Teaching of Literacy* (NITL) by the Hon Dr Brendan Nelson MP, Australian Government Minister for Education, Science and Training, on 30 November 2004. The Terms of Reference for the Inquiry are available at: www.dest.gov.au/schools/literacyinquiry. In brief, the aims of the Inquiry are to inquire into:

- the teaching of reading in Australian schools;
- the assessment of reading proficiency including identification of students with reading difficulties; and
- teacher education and the extent to which it prepares teachers adequately for reading instruction.

The stated Objectives of the Inquiry are fivefold:

1. Review and analyse recent national and international research about literacy teaching approaches, particularly approaches that are shown to be effective in assisting students with reading difficulties.

[1] The National Literacy and Numeracy Plan is available at: http://www.dest.gov.au/sectors/school_education/policy_initiatives_reviews/key_issues/literacy_numeracy/national_literacy_and_numeracy_plan.htm.

2. Identify the extent to which prospective teachers are provided with reading teaching approaches and skills that are effective in the classroom, and have the opportunities to develop and practice the skills required to implement effective classroom reading programs. Training in both phonics and whole-language approaches to reading will be examined.
3. Identify the ways in which research evidence on literacy teaching and policies in Australian schools can best inform classroom teaching practice and support teacher professional learning.
4. Examine the effectiveness of assessment methods being used to monitor the progress of students' early reading learning.
5. Produce a report of the Inquiry's findings in the second half of 2005 and offer best practice in effective approaches to literacy teaching and learning, both at the classroom level and in the training of teachers.

The Committee of Inquiry's report, *Teaching Reading*, comprises the *Report and Recommendations*, a *Guide to the Report and Recommendations for Parents and Carers*, a *Literature Review, Submission Summaries* hyper-linked to Submissions to the Inquiry and *Site Visits*. These are available on the website established for the Inquiry at: www.dest.gov.au/schools/literacyinquiry.

The specification of the Inquiry's objectives has been influenced by the contents of an open letter from 26 Australian academics and reading researchers addressed to the Australian Government Minister for Education, Science and Training in March 2004.[2] This letter, titled: *Reading Instruction in Australian Schools*, expressed concerns about the way in which reading is typically taught in Australian schools, as follows:

> As researchers, psychologists, linguists and educators who have studied the processes underlying the development of reading, and who are familiar with the scientific research literature relating to the acquisition of reading, we are writing to you to express our concerns with the way in which reading is typically being taught in Australian schools. We would like particularly to draw your attention to the continuing discrepancy between the model of reading development that forms the basis for most of our current school curricula and teaching methods, and the model of reading development that is emerging as a result of the research into reading that has been undertaken over the past twenty

[2] See: Anderson *et al.* (2004). This letter and accompanying explanatory notes (de Lemos, 2004a) have since been published by the Reading Reform Foundation, based in the United Kingdom, available at: http://www.rrf.org.uk/the%20australian%20scene.htm.

> to thirty years. … Given the emphasis that is now being placed on evidence-based policy, we ask that consideration be given to setting up an independent review to examine the research evidence relating to the teaching of reading, and the extent to which current practices are based on this evidence.

The letter asserts that the predominant whole-language approach to the teaching of reading is both ineffective and inappropriate.[3] Moreover, it is claimed that because it is not based on findings from the available evidence-based research about how children best learn to read, poor reading skills are in most cases due to ineffective teaching practices endemic to whole-language approaches during the crucial early years of mainstream 'first wave' classroom teaching. Further, the letter claims that the initial gains made by students exposed to 'second wave' intervention programs are not sustained unless such students are located in classrooms with teachers who are skilled in providing further support in explicit, systematic phonics instruction for those students.[4] Effective initial teaching of reading, it is argued, would substantially reduce the need for costly remedial programs for under-achieving students. The same applies to 'third wave' intervention strategies for under-achieving students during the middle-years of schooling.[5]

Thus, the purpose of the present review is to meet Objective 1 of the *National Inquiry into the Teaching of Literacy*, noted above. That is: *Review and analyse recent national and international research about literacy teaching approaches, particularly approaches that are shown to be effective in assisting students with reading difficulties*. Whereas several reports and inquiries into the teaching of literacy, including its development and achievement, have been undertaken in Australia in recent years,[6] de Lemos (2004a) asserts:

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[3] This predominance has been documented in several sources, including: de Lemos (2002, 2004a,b); the 1992 Report of the House of Representatives Standing Committee on Employment Education and Training (*The Literacy Challenge: Strategies for early intervention for literacy and learning for Australian children*); in the Final Report of the NSW Parliament *Inquiry into Early Intervention for Children with Learning Difficulties* (2003); and in the review of literacy instruction in Australian primary schools by van Kraayenoord and Paris (1994). For a recent report of an investigation into the preparation of teachers to teach literacy (and numeracy), see Louden *et al.* (2005a).

[4] See, for example: Center, Freeman and Robertson (2001); Elbaum *et al.* (2000); Tunmer and Chapman (2003).

[5] See: Clay (1985); Snow, Burns and Griffin (1998). For examples of 'third wave' intervention strategies, see: Ellis (2005); Hoad *et al.* (2005); Purdie and Ellis (2005); Rowe and Meiers (2005); Rowe, Pollard and Rowe (2003, 2005); Rowe, Rowe and Pollard (2004); Wheldall and Beaman (2000).

[6] See, for example: DEET (1991); DEETYA (1998); Department of Education, Victoria (1997a,b); House of Representatives Standing Committee on Employment, Education and Training (1992); and New South Wales Parliament, Legislative Council Standing Committee on Social Issues (2003).

> … these reports and enquiries have not addressed the fundamental question of the effectiveness of the strategies used to teach reading, or the validity of the assumptions on which our teaching methods are based. It is for this reason that … a new approach to the investigation of reading instruction in our schools is required.
>
> What needs to be addressed is the critical question of whether the teaching of reading in Australia is based on scientific knowledge relating to how children learn to read, and whether the methods used to teach reading in our schools are based on empirical evidence as to the strategies that are most effective in teaching reading.

## The importance of literacy in the context of schooling

Australia's young people are the most valuable resource for the nation's social and economic prosperity. The key to such prosperity at both the individual and national level is the provision of quality schooling. The global economic, technological and social changes underway, requiring responses from an increasingly skilled workforce, make high quality schooling an imperative (Caldwell, 2004). Whereas OECD Education Ministers have committed their countries to the goal of raising the quality of learning for all, this ambitious goal will not be achieved unless all students receive high quality teaching.[7]

Most countries are seeking to improve their schools, and to respond proactively to higher social and economic expectations. As the most valuable resource available to schools, teachers are central to school improvement efforts directed at students' learning outcomes and achievement progress (Cuttance, 2001; Kennedy, 2001). However, because teaching is a highly skilled professional activity, improving the efficiency and effectiveness of schooling depends, at the outset, on competent people choosing to work as teachers, and that their pre-service and in-service education and teaching practices are of the highest professional standards.

Since the central aim of schooling is to generate and maintain efforts towards ongoing improvements in teaching and learning, it is vital that teachers are equipped with evidence-based teaching skills that are demonstrably effective in meeting the developmental and learning needs of the students for whom they have responsibility.[8] Nowhere is this more important than in the teaching of *literacy* (i.e., reading, writing, speaking and listening, and viewing) since literacy competence is foundational, not only for school-based learning, but also for students' psychosocial wellbeing, further

[7] See: Hattie (2003, 2005); Louden *et al.* (2005a); OECD (2005a,b); Ramsey (2000); Rowe (2003, 2004a-c).

[8] For explications of the importance of evidence-based orientations to educational policy, practice and reform, see: de Lemos (2002); Fullan (1991, 1994, 2000); Masters (1999); Slavin (2005).

education and training, occupational success, as well as for productive and fulfilling participation in social and economic activity. The rapidly changing nature of computer-based technologies and global communication systems has given rise to demands for competence in increasingly complex multiliteracies (Cope & Kalantzis, 2000).

These assertions are supported by the work of Nobel Prize winning economist James Heckman's (2000, 2005) overview of the economic aspects of human skills formation. Heckman concludes that investment in the learning development of young children is crucial. For Heckman, literacy competence is an essential area of learning investment in the young, being a 'skill that begets many other skills' (an index of 'self-productivity', as he calls it), because it constitutes a 'key part of our capacity to increase our capacity'.

Given that competence in reading and writing is the foundation of educational provision, the present paper reviews findings from the local and international evidence-based research[9] that identifies effective pedagogical practices that maximise the learning and achievement progress of all students in literacy, and especially for those experiencing reading difficulties. Due to uncertainty about operational definitions of *learning difficulties* and *reading difficulties* in particular, however, it is difficult to provide authoritative estimates of the proportion of children who have such difficulties. Nonetheless, Louden *et al.* (2000) estimate that 80 per cent of students nominated by teachers as having learning difficulties are identified as having problems in mastering reading skills.[10] For related discussions, see: Elkins (2002); Ellis (2005); Hay, Elias and Booker (2005); Purdie and Ellis (2005); Rowe (2003a).

[9] The emphasis on findings from *evidence-based* research here is deliberate, since the field of educational provision and prevailing teaching strategies for students with and without learning difficulties is replete with untested anecdotal rhetoric that reflect ideological adherence to philosophical orientations to both teacher education and in-service professional development programs that have little evidential justification in terms of either their validity, reliability and/or generalisability (e.g., Wray & Medwell, 2001). The importance of 'evidence-based reform' in 'advancing the education of students at risk' is advocated strongly by Slavin (2005) as follows: '… genuine reform in American education depends on a movement toward evidence-based practice, using the findings of rigorous research to guide educational practices and policies … the evidence-based policy movement remains the best hope for genuine reform in US education' (p. 1).

For a comprehensive review of findings from the evidence-based research literature that highlight 'effective' intervention teaching strategies for Grade 4-6 students with learning difficulties in both literacy and numeracy, see: Ellis (2005); Purdie and Ellis (2005).

[10] It should be noted that an explication of the underlying 'causes' of such difficulties are beyond the remit of the present review. For recent and relevant treatments, see Coltheart (2005a) and Brunsdon (2005). However, factors contributing to such difficulties include: socio-economic and cultural impoverishment, indigenous status, neuro-physiological, neuro-psychological and psycho-behavioural factors, as well as inadequate and/or inappropriate teaching and learning provision.

International assessments of *reading literacy* during 2000 and 2003 indicate that although 15-year-old students in Australian schools perform notably better (on average) than the majority of their counterparts in other OECD countries, 12 per cent (ACT, WA) to 28 per cent (NT) are not developing the literacy skills needed for further education, training and work (defined as *low achievers*), particularly indigenous students (35%) and males (17%).[11] Similar estimates have been reported for achievement in reading comprehension of 14-year-old Australian students between 1975 and 1998, and, with few exceptions, the estimates have remained constant during the period.[12]

Furthermore, approximately 20 per cent of Australians aged 15-74 years have been identified as having 'very poor' literacy skills, with an additional 28 per cent who could be expected to experience some difficulties in using many of the printed materials that may be encountered in daily life (ABS, 1997, p. 7). Evidence from the 1996 *National School English Literacy Survey* (Masters & Forster, 1997b) indicated that the proportion of Year 3 and Year 5 students in Australian schools who did not meet minimum performance standards of reading required for effective participation in further schooling was estimated to be as high as 27 per cent at Year 3, and 29 per cent at Year 5 (Masters & Forster, 1997b, p. 15).[13] In 2003, the percentages of Australian students not achieving the minimum *National Benchmarks for Reading* are: ~8 per cent (Year 3) and ~11 per cent (Year 5 and Year 7).[14] By any criterion, these outcomes are unacceptable in terms of the educational, psychosocial wellbeing and life chances of these Australians, as well as the economic and social future of the nation.

[11] In the OECD Programme for International Student Assessment (PISA), the concept of *reading literacy* emphasises skill in using written information in situations that students may encounter in their life both at and beyond school. Thus, *reading literacy* is defined as: '*… understanding, using and reflecting on written texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society*' (OECD, 2003, p. 108). For the PISA 2000 and 2003 results relevant to Australia, see: Lokan, Greenwood and Cresswell (2001); Thomson, Cresswell and De Bortoli (2004).

[12] See Rothman (2002), who notes: 'For some groups, there has been improvement, most notably for students from language backgrounds other than English. For other groups, however, results indicate a significant achievement gap. The most significant gap is between Indigenous Australian students and all other students in Australian schools' (p. ix).

[13] Comparative international data are of interest. From the evidence cited in the report by British House of Commons Education and Skills Committee (2005), *Teaching Children to Read*, it is estimated that approximately 20 per cent of 11-year-old children in British schools do not achieve expected success in reading for their age. According to the National Center for Educational Statistics (US), 38 per cent of fourth graders (~9 year-olds) cannot read at a basic level – that is, they cannot read and understand a short paragraph similar to that in a children's story book (Lyon, 2003, p. 1).

[14] See MCEETYA (2005).

## The context of literacy and health outcomes

Literacy under-achievement has high social and economic costs in terms of both health and crime. The overlap between students' under-achievement and poor achievement progress in literacy (especially in reading) and their poor behavioural health and wellbeing, is problematic to the extent that what should be an education issue has become a major health issue (see DeWatt *et al.*, 2004). Dr Reid Lyon, Chief of the Child Development and Behavior Branch of the National Institute of Child Health and Human Development (National Institutes of Health, Bethesda, Maryland, US) notes:

> The National Institute of Child Health & Human Development (NICHD) considers that teaching and learning in today's schools reflect not only significant educational concerns, but public health concerns as well. Our research has consistently shown that if children do not learn to understand and use language, to read and write, to calculate and reason mathematically, to solve problems, and to communicate their ideas and perspectives, their opportunities for a fulfilling and rewarding life are seriously compromised. Specifically, in our NICHD-supported longitudinal studies, we have learned that school failure has devastating consequences with respect to self-esteem, social development, and opportunities for advanced education and meaningful employment. Nowhere are these consequences more apparent than when children fail to learn to read. Why? Simply stated, the development of reading serves THE major foundational academic ability for all school-based learning. Without the ability to read, the opportunities for academic and occupational success are limited. Moreover, because of its importance, difficulty in learning to read crushes the excitement and love of learning, which most children have when they enter school.
>
> … By the end of first grade, children having difficulty in learning to read begin to feel less positive about their abilities than when they started school. As we follow children through elementary and middle school, self-esteem and the motivation to learn to read decline even further.
>
> … It is important to note that this state of educational affairs describes an extraordinary and unacceptable number of children (with reading difficulties). According to the National Center for Educational Statistics, 38% of fourth graders nationally cannot read at a basic level – that is, they cannot read and understand a short paragraph similar to that in a children's book. … The educational and public health consequences of this level of reading failure are dire. Of the 10 to 15% of children who will eventually drop out of school, more than 75% will report difficulties learning to read. Likewise,

> only two per cent of students receiving special or compensatory education for difficulties learning to read will complete a four-year college program. Approximately half of children and adolescents with a history of substance abuse have reading problems. Failure to learn to read places children's futures and lives at risk for highly deleterious outcomes. For this reason the NICHD considers reading failure to reflect a national public health problem (Lyon, 2003, pp. 1-2).

Lyons' concerns apply equally in the Australian context. The increasing number of anxious parents seeking help from health professionals throughout Australia for their distressed children whose behaviour problems have arisen as a consequence of (or are exacerbated by) learning difficulties and failure to acquire functional literacy skills is disturbing.[15] Following Haggerty *et al.* (1975), Oberklaid (1988, 2004) appropriately refers to this phenomenon as the '*new morbidity*' in education and child/adolescent health. In commenting on a study related to the 'gap between health and education' by O'Keeffe and McDowell (2004), Oberklaid (2004, p. 251) asserts:

> The *new morbidity* is no longer new. Mainstream paediatrics has gone a long way to changing training and practice models to address children with developmental, behavioural and psychosocial conditions. … Perhaps one of the important next steps is to advocate for more systematic paediatric input into teacher training courses and ongoing professional development. In the same way as we now expect paediatricians to understand the classroom implications of organic and developmental disorders, it seems not unreasonable to expect teachers to have a sound knowledge base about children with special needs in their classroom.

Oberklaid's assertion is well supported from earlier comment arising from an extensive body of evidence-based research. For example, in highlighting issues related to 'future directions' for ADHD[16] research and intervention policies, Farrelly and Standish (1996, p. 81) note: 'The impact on mental health and educational systems needs to be examined'. The response to this recommendation is summarised by an edited extract from Rowe and Rowe (1999, p. 92), as follows:

[15] See, for example: Barkley and Pfiffner (1995a,b); CCCH (2004); DeWatt *et al.* (2004); Haggerty *et al.* (1975); Hinshaw (1992a,b, 1994); Lyon (2003); Oberklaid (1988, 2004); Rowe (1991); Rowe and Rowe (1992, 1998, 1999, 2000, 2002); Rowe, Pollard and Rowe (2005); Sawyer *et al.* (2000); Silverstein, Iverson and Lozano (2002).

[16] That is, Attention-Deficit/Hyperactivity Disorder (ADHD). For classification and diagnostic criteria details, see: *DSM-IV* (APA 1994, pp. 78-85).

> A central aim of educational systems is to generate, stimulate and maintain efforts towards the ongoing improvement of teaching and learning practices that link directly to the quality of educational outcomes for students. In our view, such improvements are not likely to be brought about by academic polemic, nor by the 'top-down-driven' administrative fiats of bureaucracies, since the products of these enterprises (mercifully, in most cases) have an established record of rarely penetrating the classroom door. Rather, with the 'informed' support of parents and health professionals, sustained improvement can be achieved via teacher professional development that maximizes their teaching and behavioral management skills in the classroom. It has been our experience that under such circumstances, teachers themselves become the empowered agents and purveyors of change, having consequent 'domino' effects on the teaching and classroom behavioral management practices of other teachers, and throughout the profession. Ultimately, of course, the measures of success or otherwise of such efforts, like all endeavours to improve the quality of school education, will be judged in terms of their impact on the key areas of improved student learning, behavior, and the enhancement of teacher professionalism.
>
> For what is demonstratively the most salient and problematic issue in child and adolescent mental health, the challenge into the 'new millennium' is to refocus the prevailing models accounting for the overlap between inattentive behavior problems and poor academic achievement – together with their related intervention emphases – to *educational ones*. In our view, the personal, social and financial costs of failure to meet this challenge will be both unsustainable and unbearable.

Given that the central aim of schooling is to generate and maintain efforts towards ongoing improvements in teaching and learning, as well as in students' social, behavioural and achievement outcomes, it is vital that educational 'fences' be built at the top of the 'cliff' in preference to the provision of belated and costly 'ambulance services' at the bottom. A *necessary* strategy in constructing such 'fences' requires building capacity in teacher expertise and professionalism by ensuring that they are at least equipped with evidence-based teaching strategies that meet the developmental and learning needs of the students for whom they have responsibility. Nevertheless, instructional strategies *per se* are **not** independent of quality teaching by teachers who deliver them to students, whether or not those students experience reading difficulties (Hattie, 2003, 2005; Louden *et al*., 2005b; Rowe, 2003b, 2004b,c) – a key point that is elaborated in more detail in Section 5 of the present paper. In the meantime, it is important to acknowledge the contexts of *literacy teaching and learning*, as well as *contemporary understandings of 'effective' teaching practice*.

## The literacy teaching and learning context

Literacy teaching and learning are complex tasks for both teachers and students (Ainley & Fleming, 2000, 2003; Ainley, Fleming & McGregor, 2002; Center, 2005; Coltheart, 2005a; Garton & Pratt, 1989). Whereas children enter school with varying degrees of competence in speaking their language, typically they have little knowledge about how to read and write. In this context, Center (2005, p. 7) notes:

> Speech may have to be learnt, but it does not have to be taught. On the other hand, reading and writing, for most people, will not be learned unless it is taught, and for some people, will not be learned unless it is taught well. It is *important* for teachers to understand the dissimilarities as well as the similarities that exist between speaking and reading/writing. *Without this understanding*, they could easily underestimate the difficulties some children will have in acquiring literacy [author's emphasis].

Thus, the purpose of early and subsequent literacy instruction in school education is to help students master the challenges of linking written and spoken language. These include acquiring knowledge about the alphabetic system, learning to decode new words, building a vocabulary that can be read on sight from memory, and becoming facile at constructing, integrating, interpreting and remembering meanings represented in text – in whatever form such representations are presented. For students, at any level, to be able to link their knowledge of spoken language to their knowledge of written language, they must first master the alphabetic code – the system of *grapheme-phoneme* correspondences that link written words to their pronunciations.

A characteristic feature of literacy teaching for more than 40 years has been the disagreements among educators about how beginning reading (as a central element of *literacy*) should be taught, and especially for students with reading difficulties (see Chall, 1967).[17] At the extremes of these disagreements are educators who advocate whole-language approaches, whereas others argue for systematic phonics approaches. In brief, the disagreements have focused on whether the teaching of reading should begin with: (a) *direct* or *explicit instruction* in orthographic symbol-sound correspondences

[17] Such disagreements have their origins in the 16th century. John Hart's (1569) *An Orthographie* and Richard Mulcaster's (1582) *Elementarie* both advocated the utility of the 'alphabetic principle' via explicit teaching of letter-sound relationships for beginning reading. In contrast, Fredrich Gedike (1754-1803) was prominent in advocating a 'whole-to-part' approach to the teaching of reading. For specific historical details, see Davies (1973). [Note: the Committee is grateful to Professor Max Coltheart for supplying this historical information]. Further, for a detailed account of reading instruction during the 20th century, see Pearson (2000).

and rapid whole word recognition; and (b) whether initial instruction should be *context*- and *meaning-centred* with symbol-sound correspondences taught incidentally in context as needed.

Key findings from extensive meta-analytic syntheses of evidence-based reading research – many of which are cited in this review – consistently indicate that since systematic, explicit phonics approaches are significantly more effective than non-systematic approaches for children with and without reading difficulties, it is vital that children should initially be provided with direct instruction in phonics as an essential part of a comprehensive and integrated reading program that includes *meaning-centred* approaches.[18] Coltheart (2005b, p. 5) notes:

> …there is now a very strong body of scientific evidence that children will be greatly assisted in learning to read if their reading tuition includes systematic, explicit direct instruction in how to read aloud a word that has never been seen before by using knowledge of the relationship between letters and sounds.

On the basis of a comprehensive synthesis of findings from the related evidence-based research, Center (2005) asserts that the systematic, explicit teaching of phonics is a ***necessary*** *condition* but not a ***sufficient*** *condition* for the teaching of reading. Since reading essentially involves two basic and complementary processes: learning how to decipher print and understanding what the print means, an integrated approach to reading instruction is mandatory. This assertion is consistent with key findings from Cowen's (2003) synthesis of six major research studies of approaches to beginning reading – each of which concur that reading for meaning and understanding cannot be taught separately from direct phonics instruction.[19] Likewise, and despite the cautions of Adams (1991) and Moats (2000), in making the case for a 'balanced approach to reading instruction', Strickland (1998) notes: 'Avoiding instructional extremes is at the heart of providing a balanced program of reading instruction' (p. 52). Further, and consistent with the earlier assertions of Spiegel (1992), Pressley (1998, p. 1) observes: 'Balanced-literacy teachers combine the strengths of whole language and skills instruction, and in so doing, create instruction that is more than the sum of its parts'. More recently, Center (2005, pp. 7-8) writes:

[18] See: Camilli *et al.* (2003); Center (2005); Coltheart (2005a-c); Cowen (2003); de Lemos (2004b); Ehri *et al.* (2001); Munro (1998); NRP (2000a,b); Pressley (1998); Purdie and Ellis (2005); Strickland (1998).

[19] These studies, which are commented on in more detail later, are: Adams (1990); Anderson *et al.* (1985); Bond and Dykstra (1967); Chall (1967); NRP (2000a,b); Snow, Burns and Griffin (1998).

> The strengths of a whole-language approach, as I see it, are its insistence on a print-rich environment to stimulate a child's desire for reading. The strengths of a skills approach are its insistence on the explicit instruction of sound-symbol associations, both in isolation and in context to foster a child's word recognition ability. … The need to include explicit decoding instruction when teaching beginners to read arises because difficulties at the word level often prevent children (particularly those at-risk) from becoming competent and interested readers. This is largely because speaking … does not automatically translate into being able to decipher print. However, having a good command of language will certainly enable children to understand the language written down, once they have learnt to decipher the print.

Given this context and the tasks entailed in literacy teaching and learning, particularly as they relate to reading, an outline of contemporary understandings of 'effective' teaching practice is helpful.

## The context of contemporary understandings of effective teaching practice

Teaching practices have long generated debate and ideological controversy, especially as to best practice for the teaching of reading. As indicated earlier, two clear theoretical orientations have provided the bases for this controversy: (a) explicit code-based instruction in phonics; and (b) implicit, 'holistic' or whole-language approaches. For several decades, *whole-language* has been the predominant approach for early literacy teaching and learning throughout English-speaking countries (Pearson, 2000; Westwood, 1999, 2004).

Essentially, the whole-language approach to teaching and learning reflects a constructivist philosophy of learning in which children are viewed as inherently active, self-regulating learners who construct knowledge for themselves, with little or no explicit decoding instruction.[20] However, there is a strong body of evidence that constructivist whole-language approaches are not in the best interests of children experiencing learning difficulties and especially those experiencing reading difficulties (Moats, 2000). Similarly, for children from disadvantaged backgrounds who often do not have rich phonological knowledge and phonemic awareness upon which to base

[20] For a comprehensive explication of *constructivism* and its application to teaching and learning, see: McInerney and McInerney (1998); Selley (1999); Von Glasersfeld (1995). For recent critiques of the inappropriateness of *constructivism* as an operational theory of teaching, see: Ellis (2005); Purdie and Ellis (2005); Wilson (2005).

new learning, being taught under constructivist modes has the effect of compounding their disadvantage once they begin school (Munro, 1998, 1999, 2000a). This is particularly the case for children from non-English speaking backgrounds including Indigenous children, where English may be their second or third language.

In contrast, code-based approaches focus on explicit teaching of the structure and function of written and oral language in ways that allow children, regardless of their backgrounds, to reflect on and consciously manipulate the language. This involves an awareness of phonemes, syllables and morphology. Thus, unlike whole-language approaches, code-based methods typically require a high degree of teacher-centred presentation of learning material, with an emphasis on explicit instruction, scheduled practice, and feedback (e.g., Center, 2005; Westwood, 2003a-c, 2004).

The key element in *constructivism* as a *theory of knowing* is that the learner is an active contributor to the learning process, and that teaching methods should focus on what the student can bring to the learning situation as much as on what is received from the environment. This approach has its origins in the work of Piaget, Vygotsky, and in Ausubel's (1968) assertion that 'the most important single factor influencing learning is what the learner already knows' (p. 332). Learning that builds effectively on the learner's current knowledge is said to be within the child's *zone of proximal development* (ZPD). The ZPD establishes what the learner already knows, and can do with minimal assistance by a teacher or peer – following which the individual is expected to undertake learning tasks independently.

Hence, the role of the teacher is to be a *facilitator* of learning (rather than a director), and to provide opportunities for individual learners to acquire knowledge and construct meaning through their own activities, and through discussion, reflection and the sharing of ideas with other learners with minimal corrective intervention (Cambourne, 2002; Daniels, 2001; Selley, 1999; Von Glasersfeld, 1995). Sasson (2001, p. 189) refers to *constructivism* as '… a mixture of Piagetian stage theory with postmodernist ideology' that is devoid of evidence-based justification for its adoption as an effective method of teaching. For example, in highlighting the inappropriateness of *constructivism* as an operational *theory of teaching*, Wilson (2005, pp. 2-3), argues:

> … We largely ignore generations of professional experience and knowledge in favour of a slick postmodern theoretical approach, most often characterised by the misuse of the notion of constructivism.

> … Australian operational views of constructivism … confuse a theory of knowing with a theory of teaching. We confuse the need for the child to construct her own knowledge with a form of pedagogy which sees it as the child's responsibility to achieve that. We focus on the action of the student in the construction of knowledge rather than the action of the teacher in engaging with the child's current misconceptions and structuring experiences to challenge those mis-conceptions. … The constructivist theory of knowing has been used to justify a non-interventionist theory of pedagogy, whereas it is a fair interpretation to argue that constructivism requires vigorous inter-ventionist teaching: how, after all, is a student with misconceptions supposed to challenge them unaided? How does she even know they are misconceptions?
>
> We need, instead, a view of teaching which emphasises that the role of the teacher is to intervene vigorously and systematically; that is done on the basis of excellent knowledge of a domain and of student conceptions and misconceptions in that domain, assembled from high quality formative assessments; and that the purpose of the intervention is to ensure that the child's construction of knowledge leads her to a more correct understanding of the domain.

These statements by Wilson are consistent with expressed concerns that too many faculties and schools of education in Australian universities currently providing pre-service teacher education base their programs on constructivist views of both learning *and* teaching.[21] Westwood (1999), for example, highlights the results of a South Australian study which found that most teachers (79%) had been strongly encouraged to use a constructivist approach in their initial teacher-education courses and during in-service professional development programs. Even more notably, 67 per cent of the teacher trainees in this study indicated that constructivism was the *only* teaching approach to which they had been exposed in their teaching method courses. Commenting on these findings, Westwood (1999, p. 5) notes:

> At the same time as constructivist approaches have been promoted, direct teaching methods have been overtly or covertly criticised and dismissed as inappropriate, with the suggestion that they simply don't work and are dull and boring for learners. The message that most teachers appear to have absorbed is that all direct teaching is old-fashioned and should be abandoned in favour of student-centred enquiry and activity-based learning.

This assertion corresponds with the purpose of the present paper, namely to review existing local and international evidence-based research findings that identify 'best practice' for students experiencing learning difficulties, especially in reading.

[21] See: de Lemos (2002, 2004a); Fielding-Barnsley and Purdie (2005); Louden *et al.* (2005a); Rohl and Greaves (2004); Westwood (1999, 2004).

# 2. Review method

To identify a broad range of studies, computer searches were conducted in the Education Resources Information Center (ERIC), PsychINFO, Professional Development Collection, and Australian Education Index (AEI) databases from 1960 to 2005. Several key words and terms were used to locate studies, such as *literacy teaching*, *reading instruction*, *learning difficulties*, *learning disabilities*, *reading difficulties*, or *at risk*, paired with variations of *approaches*, *interventions*, *treatments*, *instruction*, *meta-analysis*, *synthesis*, *primary* and *elementary school*. Several criteria were used to select research articles, namely, those that:

1. Related to students experiencing difficulties in literacy learning, and reading in particular. This included students with *learning difficulties* or *learning disabilities*, but excluded those with other forms of *disability* (such as physical or sensory impairment);
2. Included students of school age;
3. Were classroom-based (in preference to home-based or interventions provided by health professionals). This includes both experimental inter-ventions and research on teachers' regular classroom practices;
4. Related to literacy and reading, although some studies also reported findings in other areas such as mathematics and science; and
5. Were data-informed rather than theoretical or speculative in nature.

After eliminating studies that did not meet these criteria, a large pool of studies remained. To access the literature in a convenient and economical way, priority was given to previously conducted syntheses and meta-analyses.[22] These reviews were supplemented by a selection of research reports. Selections were made via informed judgement among acknowledged experts and researchers in the field of early literacy/reading and learning difficulties. The research reviewed has been reported in a variety of formats, including journal articles, book chapters, reports, and dissertations.

[22] *Meta-analysis* is a statistical method used for summarising findings from many studies that have investigated a similar problem. The method provides a numerical way of assessing and comparing the magnitudes of 'average' results, known as 'effect size' (ES) – expressed in standard deviation (SD) units. An effect size is calculated as the difference in performance between the average scores of a group in a trial or experimental condition and those in a comparison condition, divided by the SD of the comparison group (or more often, divided by the pooled SD of both groups). An effect size ≤ 0.2 is regarded as 'weak'; 0.5 is considered 'moderate'; and 0.8 or larger as 'strong'.

# 3. Effective teaching practices for reading

Certain teaching approaches for the teaching of reading have emerged in the empirical literature as effective for all students, whether or not they experience reading difficulties.[23] This review (*inter alia*) summarises key findings from evidence-based research that identify teaching practices which have been shown to be effective in assisting students with and without reading difficulties. Evidence related to the particular components or activities that characterise effective instructional approaches is presented. The review concludes with a discussion of: (a) the implications for pre-service teacher education and in-service professional development; (b) assessment approaches that support teachers' work with students with and without reading difficulties; and (c) the importance of building quality teacher professional capacity.

## Effective practices during the early years

Contemporary reviews of the literature and meta-analyses of research findings indicate that considerable progress has been made in identifying key teaching practices that underlie effective reading and literacy instruction during the early years of schooling (e.g., Center, 2005; Louden *et al.*, 2005b). For example, a publication from the International Reading Association (Cowen, 2003) provides a summary and review of six influential research studies of beginning reading instruction in the United States of America (US). The following extracts from this summary are provided as a basis for what follows. Before doing so, Cowen's criteria for selecting the six studies are helpful:

- each study provides a synthesis of current knowledge about beginning reading instruction;
- each study contains elements of a balanced approach to reading instruction that can be construed as a recurring theme throughout;
- each study is supported by a nationally recognised and authoritative council, academy or research body;

[23] For example, see: Adams (1990); Anderson *et al.* (1985); Bond and Dykstra (1967); Camilli, Vargas and Yurecko (2003); Chall (1967); NRP (2000a,b); Johnston and Watson (2005a,b); Snow, Burns and Griffin (1998); Slavin (2005); Vaughn, Gersten and Chard (2000).

- each study is important not only to reading professionals, but continues to influence policy makers and the general public;
- each study is easily recognised by reading professionals, educators and policy makers and, therefore, provides credibility and authority in establishing future resources for literacy improvement programs and materials;
- the studies provide a high degree of converging evidence that can be distributed widely in building support for developing future exemplary literacy programs that will help meet diverse students' needs; and
- the studies as a whole serve as a retrospective screening process for analysing future beginning literacy research investigations that promote balanced literacy.

The six US studies reviewed by Cowen (2003) are based primarily on evidence-based empirical research restricted mostly to controlled groups and laboratory settings in contrast to qualitative, action research conducted in classrooms. Cowen's objective in undertaking this synthesis is expressed as follows:

> The synthesis of the research on balanced reading instruction for beginning readers can serve as a catalyst to provide greater dialogue and opportunity for putting an end to the senseless reading wars that have distracted and even disrupted our youngest children from learning to read successfully. The synthesis provided here should also provide a clearer perspective of current knowledge about beginning reading research, particularly in regard to findings on the importance of phonics instruction in creating a balanced approach to reading instruction (Cowen, 2003, pp. xii-xiii).

Cowen goes on to assert that, from the findings of many years of conclusive evidence-based research (and common sense), there is strong convergent evidence to convince reading professionals to put into practice what has been proven to work in helping all children to read successfully. A brief summary of the six studies follows.

***The Cooperative Research Program in First-Grade Reading Instruction*** (Bond & Dykstra, 1967). These 27 experimental studies among first-grade children were the first US national studies on beginning reading instruction. The findings indicated that a strong phonics emphasis is significantly more valuable than a basal-driven, meaning or sight-word approach to early reading instruction, while emphasising other important language factors that require more than just alphabetic code-breaking skills to support reading instruction. The conclusion that systematic phonics is a necessary and effective way to teach all children to read, regardless of method and students' socio-economic

background, was a major contribution to the teaching of reading. That is, Bond and Dykstra (1997, p. xx) conclude: 'We can summarize the results of 60 years of research dealing with beginning reading instruction by stating that early systematic instruction in phonics provides the child with the skills necessary to become an independent reader at an earlier age than is likely if phonics instruction is delayed or less systematic'.

***Learning to Read: The Great Debate*** (Chall, 1967). Chall set out to answer the question 'Do children learn to read better with a beginning method that stresses meaning, or with one that stresses learning alphabetic letter-sound correspondences?' Similar to Bond and Dykstra (1967), Chall reviewed relevant research from 1900 to 1965, and found converging evidence that the explicit teaching of phonics is essential for successful reading acquisition. Chall found that the emphasis on a systematic alphabetic code approach is more effective than using a basal reading series, which focused on reading for meaning, and concluded that learning the alphabetic code, combined with good teaching and the use of appropriate-level reading materials, leads to successful achievement. Chall is one of the first researchers to point out the importance of extensive reading for developing fluency and understanding, as well as the need to practice reading challenging texts to develop a fuller understanding of newly acquired skills. Chall also advocated the early use of direct, explicit instruction of the code prior to practising these skills (with a meaning emphasis soon to follow) through active engagement with literature, writing and comprehension.

***Becoming a Nation of Readers: The Report of the Commission on Reading*** (Anderson *et al.*, 1985). Using a 'methods-comparison' research design, findings from this research, known as the BNR, advocated that (a) phonics instruction should be taught explicitly and early, ending by second-grade for most children; and (b) provided insight into the need for teachers to pay more attention to students' comprehension as part of an integrated approach to the teaching of reading, including more time for students to read meaningful text and quality children's literature. Results of the BNR study point to the reciprocal impact that writing has in influencing reading, and how both conventional spelling and phonics instruction contribute to better reading achievement. BNR is one of the first reports to emphasise helping at-risk children learn how to read, a consequence, perhaps, of the US National Commission on Excellence in Education's (1983) highly publicised and controversial document, *A Nation at Risk: The Imperative for Educational Reform* (NCEE, 1983).

***Beginning to read: Thinking and learning about print*** (Adams, 1990). This book, about basic processes and instructional practices for word and letter identification in early reading, built on several new bodies of research, including phonemic awareness and invented spelling, orthographic knowledge, the importance of concepts about print, and the processes involved in learning to read and write. Although this study does not indicate that one reading approach is better than another, it does stress the value of teaching phonograms using a phonics approach with onset and rime. The study also confirms that letter recognition facility and phonemic awareness are necessary early code requisites for beginning reading success. In contrast to the three national studies mentioned above, Adam's findings more fully recognised the importance of the home and community on beginning reading preparedness, recommending the necessity of such mediated learning opportunities as (a) developing young children's literacy understanding through regular reading aloud, (b) the importance of the spoken word, (c) learning the letters of the alphabet, (d) learning how print and words 'work' on the page in a book, and (e) the importance of teaching children nursery rhymes as prerequisites to learning phonemic awareness and phonics.

***Preventing Reading Difficulties in Young Children*** (Snow, Burns & Griffin, 1998). This study (PRD) provides a synthesis of the available research on the best practices in teaching reading to children in preschool through Grade 3. The intended purpose of the study was to help prevent reading problems from arising, while at the same time identify methods of instruction that might work best for at-risk children and for other children demonstrating problems learning how to read. The findings and conclusion, however, indicate that there are few approaches that are more effective with high-risk readers compared with low-risk readers. In fact, PRD research concludes that excellent instruction is the best intervention for all children, including the need for intensive support with high-risk readers. Findings from the study indicate that progress in learning to read English (or any alphabetic language) beyond the initial level depends on:

- having a working understanding of how sounds are represented alphabetically;
- sufficient practice in reading to achieve fluency with different kinds of texts;
- sufficient background knowledge and vocabulary to render written texts meaningful and interesting;
- control over procedures for comprehension and repairing misunderstandings; and
- continued interest and motivation to read for a variety of purposes.

Whereas PRD's research basically supports the findings of its predecessors outlined above, it places greater importance on phonemic awareness and phonological knowledge, and the need to provide direct instruction in these basic skills. The study also established guidelines for literacy instruction beginning as early as preschool.

***Report of the National Reading Panel: Teaching Children to Read*** (NRP, 2000a,b) is perhaps the most influential investigation to date into the relative effectiveness of different approaches to the teaching of reading. In 1997, the US Congress directed the Director of the National Institute of Child Health and Human Development (NICHD), in consultation with the Secretary of Education, to establish a national panel on research in early reading development. The panel, consisting of 14 members, known as the National Reading Panel (NRP), was charged with conducting a thorough research study to determine what research findings were suitable for classroom application, and to recommend methods of dissemination. Known for its meta-analysis of findings from the scientific, evidence-based research literature, the report was published in two volumes: a *Summary Report* (NRP, 2000a), and a more comprehensive *Reports of the Subgroups* (NRP, 2000b) that presented findings and recommendations for classroom practice. The NRP was specifically assigned to analyse the findings designated by the National Reading Council's report (Snow, Burns & Griffin, 1998) as central to learning to read: *alphabetics*, *fluency* and *comprehension*. After public hearings were conducted, the Panel included two additional topics relating to reading instruction, namely: *teacher education* and *computer technology*.

Five approaches to the teaching of reading were eventually examined, and an influential report, *Teaching Children to Read* (NRP, 2000a) was released in December 2000. The report stirred much controversy among reading experts, and both critics and supporters have been highly visible at national and international levels (e.g., Coles, 2003; Ehri & Stahl, 2001; Garan, 2001, 2002; Krashen, 2000, 2001; Manzo, 1998, 2000; Meyer, 2003; Pressley & Allington, 1999). The report has played an important role in subsequent US federal policy regarding reading instruction (Manzo, 2002; Manzo & Hoff, 2003). One of the five areas of reading research examined by the NRP was phonics instruction. According to the NRP report:

> An essential part of the process for beginners involves learning the alphabetic system, that is, letter-sound correspondences and spelling patterns, and learning how to apply this knowledge in their reading. Systematic phonics instruction is a way of teaching reading that stresses the acquisition of letter-sound correspondences and their use to read and spell words (NRP, 2000b, p. 2-89).

Employing a meta-analytic research methodology (see footnote 22, p. 15), the NRP estimated the effect magnitudes of systematic phonics instruction compared to un-systematic or no phonics instruction on learning to read, across 66 treatment-control comparisons in 38 experimental or quasi-experimental studies. The results indicated that while the overall effect size (ES) of phonics instruction on reading was moderate (ES = 0.41), the positive effects persisted after instruction ended. Effects were larger when phonics instruction began early (ES = 0.55) than after first grade (ES = 0.27), benefiting decoding skills, word reading, text comprehension and spelling in many readers. Phonics helped low and middle socio-economic status (SES) readers, students for whom English was a second language, younger students at risk for reading difficulties, and older students with reading difficulties. Synthetic phonics and larger-unit systematic phonics programs produced a similar advantage in students' reading achievement progress. In sum, systematic phonics instruction helped children learn to read significantly better than all forms of control group instruction, including whole-language. The report concluded that since systematic phonics instruction proved to be universally effective, it should be implemented as part of literacy programs to teach beginning reading, as well as to prevent and remediate reading difficulties (see NRP, 2000b, p. 2-89). [24]

The NRP also provided evidence of how children's reading comprehension is developed as they build letter-sound links, vocabulary knowledge and fluency in reading. Similarly, the NRP highlighted evidence of how fluency can be developed through repeated readings, provided that children receive teacher feedback and encouragement. Fluency also is taught by helping children learn the value and importance of punctuation as it relates to reading for meaning. The NRP further identified specific text comprehension skills that enable children to develop higher order thinking skills, and how the integration of and comprehensive approaches to literacy enable children to develop reading for both learning and pleasure. However, this process is not established as discrete steps but as an integration of all the following skills via explicit instruction in: *phonemic awareness*, *phonics*, *fluency*, *vocabulary knowledge* and *text comprehension*. Like other studies before it, the NRP report emphasised that teacher professional development in literacy instruction is crucial to children's literacy achievements.

[24] The findings of the National Reading Panel report on phonics, however, have not been without critique and controversy (e.g., Garan, 2001; Meyer, 2003).

These results are supported by findings from a more recent meta-analytic study of phonics (direct instruction) and whole-language (constructivist) approaches to the teaching of beginning reading undertaken by Camilli, Vargas and Yurecko (2003). The findings from this synthesis of 40 studies, involving a reanalysis of the data reported earlier by the National Reading Panel (NRP, 2000a,b) summarised above, indicate that a combination of tutoring (strategy instruction) and whole-language reading activities (print-rich and meaning-based) yielded effect sizes at least as large as systematic phonics alone. In addition, the findings suggest these effects are additive. That is, provided that phonics formed the basis of initial instruction, the combined effects of phonics and whole-language approaches yielded effect sizes (in some cases) up to four times greater than phonics instruction alone. Camilli, Vargas and Yurecko (2003) note that their findings for students with and without reading difficulties are consistent with two conclusions from the NRP reports:

> Programs that focus too much on the teaching of letter-sounds relations and not enough on putting them to use are unlikely to be very effective. In implementing systematic phonics instruction, educators must keep the *end* in mind and ensure that children understand the purpose of learning letter-sounds and are able to apply their skills in their daily reading and writing activities (NRP, 2000b, p. 2-96).

> Finally, it is important to emphasize that systematic phonics instruction should be integrated with other reading instruction to create a balanced reading program. Phonics instruction is never a total reading program (NRP, 2000b, p. 2-97).

Camilli, Vargas and Yurecko (2003) warn that if effective instruction in reading focuses on phonics to the exclusion of other instructional approaches, both policy and practice are likely to be misdirected. Program administrators and teachers need to understand that while 'scientifically-based reading research' supports the teaching of foundational reading skills promoted via phonemic awareness and systematic phonics instruction, it also supports a strong whole-language approach that provides individualised strategy instruction, especially for students during their middle years of schooling.[25] As such, it is important that teachers not over-emphasise one aspect of a complex process. This conclusion is consistent with the observations made in the

[25] In contrast to *direct instruction*, which focuses primarily upon the acquisition of foundational skills (a 'bottom-up' approach), *strategy instruction* aims to develop students' higher-order cognitive abilities (a 'top-down' approach) via the construction of meaning through the interrogation of existing and new knowledge, and the flexible use of cognitive and meta-cognitive strategies to foster, monitor, regulate and master comprehension. For an outline of the utility of both *direct instruction* and *strategy instruction* approaches, particularly for students with literacy learning difficulties, see: Ellis (2005); Purdie and Ellis (2005).

British report by the House of Commons Education and Skills Committee: *Teaching Children to Read* (March 2005, pp. 3-4), as follows:

> It is unlikely that any one method (of teaching reading) … would lead to a complete elimination of underachievement in reading; however, it seems at present around 20% of eleven-year-olds are not reading at an age-appropriate level. We recommend a review of the NLS [National Literacy Strategy] to determine whether its current pre-scriptions and recommendations (re: synthetic phonics) are the best available methodology for the teaching of reading in primary schools. Further large-scale, comparative research on the best ways of teaching children to read, comparing synthetic phonics 'fast and first' with other methods (for example analytical phonics and the searchlights model promoted in the NLS) is necessary to determine which methods of teaching are most effective for which children. It may be that some methods of teaching (such as phonics) are more effective for children in danger of being left behind.

Notwithstanding these conclusions, findings from the seven-year study undertaken by Johnston and Watson (2005a,b) clearly indicate the superior efficacy of synthetic phonics instruction,[26] and are worthy of mention here. This study was carried out in Clackmannanshire primary schools (Scotland) in mostly disadvantaged areas, with a few schools from moderately advantaged areas. Three training programs were conducted with 300 children for 16 weeks, beginning soon after entry to the first year of formal schooling. For 20 minutes per day, children were taught either: (a) by a synthetic phonics program; or (b) by an analytic phonics program; or (c) by an analytic phonics plus phonological-awareness training program.

At the end of these programs, the synthetic-phonics-taught group were: (a) reading words around seven months ahead of the other two groups; (b) were around seven months ahead for their chronological age in reading; (c) were spelling around eight to nine months ahead of the other groups; and (d) were again performing around seven months ahead of chronological age in spelling. The group taught synthetic-phonics also read irregular words better than the other groups, and was the only group that could read unfamiliar words by analogy.

[26] For the distinction between *analytic* and *synthetic phonics* instruction, see *Glossary* in the *Report and Recommendations*. Note that synthetic phonics is used in Germany and Austria and is mostly taught before children are introduced to books or reading. It involves teaching small groups of letters very rapidly, and children are shown how letter sounds can be co-articulated to pronounce unfamiliar words. In another version of synthetic phonics (i.e. the *Hickey Multi-Sensory Language Course*; Augur and Briggs 1992), the first block of letter sounds is 's', 'a', 't', 'i', 'p', 'n', which make up more three-letter words than any other six letters. Children are shown many of the words that these letters generate (e.g. 'sat', 'tin', 'pin').

By the end of the children's seventh year of primary schooling, the gains made in reading achievement by the children who had been taught synthetic phonics during their first year had increased six-fold, increasing from seven months to three years six months ahead of chronological age. The gain in spelling was 4.5-fold, improving from seven months to one year nine months ahead of chronological age. Johnston and Watson note that although children from disadvantaged backgrounds typically had poorer literacy skills at school entry, the children from less disadvantaged backgrounds who had initially been taught synthetic phonics were still performing at or above chronological age on word reading, spelling and reading comprehension. Johnston and Watson (2005b, p. 8) claim:

> It can be concluded that the synthetic phonics programme led to children from lower socio-economic backgrounds performing at the same level as children from advantaged backgrounds for most of their time in primary school. It also led to boys performing better than or as well as girls.

These results provide further support to findings from the extensive, evidence-based research supported by the NICHD cited earlier via the extended citation from Lyon (2003). This work is important in the context of the present review, since in response to the question: 'Can children with reading problems overcome their difficulties?', Lyon responds in the affirmative.[27] Consistent findings from this work indicate that the majority of children who enter the early years of schooling at-risk of reading difficulties **can** and **do** learn to read at average or above average levels:

> … but only if they are identified early and provided with systematic, explicit, and intensive instruction in phonemic awareness, phonics, reading fluency, vocabulary, and reading comprehension strategies. Substantial research supported by NICHD shows clearly that without systematic, focused and intensive interventions, the majority of children rarely 'catch-up'. Failure to develop basic reading skills by age nine predicts a lifetime of illiteracy. Unless these children receive the appropriate instruction, more than 74% of the children entering first grade who are at-risk for reading failure will continue to have reading problems into adulthood. On the other hand, the early identification of children at-risk for reading failure, coupled with the provision of comprehensive early reading interventions, can reduce the percentage of children reading below the basic level in the fourth grade (i.e. 38%) to six per cent or less (Lyon, 2003, pp. 3-4).

[27] Further details about findings from the reading research supported by NICHD derive from an interview between Dr Norman Swan and Dr Reid Lyon on ABC Radio National's *Health Report* on 17 January 2005. A full transcript of this interview is available at: http://www.abc.net.au/rn/talks/8.30/helthrpt/stories/s1266657.htm

Thus, the incontrovertible finding from the extensive body of local and international evidence-based reading research is that for children during the early years of schooling, they must first master the alphabetic code via systematic, explicit, and intensive instruction in: phonemic awareness, phonics, reading fluency, vocabulary, and reading comprehension strategies. Because these are *foundational* and *essential* skills for the development of competence in reading, writing and spelling, they must be taught early, explicitly, and taught well.[28]

Against the background of this evidence it is interesting to note the model of literacy acquisition initially proposed by Freebody and Luke (1990) and subsequently refined by Luke and Freebody (1999, pp. 7-9). Despite its lack of supporting evidence-based research, the 'four resources' model (which is cited below in full) is useful by postulating that effective literacy draws on a repertoire of interdependent practices that allow learners, as they engage in reading and writing activities, to:

1. ***break the code of texts*** by recognising and using the fundamental features and architecture of written texts including: alphabet, sounds in words, spelling, conventions and patterns of sentence structure and text;
2. ***participate in the meanings of text*** via understanding and composing meaningful written, visual and spoken texts from within the meaning systems of particular cultures, institutions, families, communities, nation-states and so forth;
3. ***use texts functionally*** by traversing the social relations around texts; knowing about and acting on the different cultural and social functions that various texts perform both inside and outside school, and knowing that these functions shape the way texts are structured, their tone, their degree of formality and their sequence of components; and
4. ***critically analyse and transform texts*** by understanding and acting on the knowledge that texts are not neutral, that they represent particular views and silence other points of view, influence people's ideas; and that their designs and discourses can be critiqued and redesigned, in novel and hybrid ways.

[28] It is worth noting that following the ground-breaking work of Liberman (1973), a comprehensive review of the research literature on the mental processing that underlies skilled reading and on how reading should be taught has been undertaken by a group of leading experts in the field under the aegis of the American Psychological Society (Rayner *et al.*, 2001). A more general article on the same topic by these authors was published in the following year in the March issue of *Scientific American* under the title *How should reading be taught* (Rayner *et al.*, 2002).

Luke and Freebody indicate that the underlying proposition of their model is that all of these repertoires are variously mixed and orchestrated in proficient reading and writing. Since the key concept in the model is *necessity* and not *sufficiency*, each practice is *necessary* for literacy in new conditions, but of themselves, none of the four practices is *sufficient* for literacy competence.

Commenting on this model, Hay, Elias and Booker (2005) note: 'Students with reading difficulties can have persistent problems in engaging with texts in these various ways, and teachers must be able to select and implement suitable interventions for them' (p. 5). However, whereas this 'four resources' model is widely acknowledged and espoused among Australian teacher educators and classroom teachers, concern has been expressed (as already mentioned) that many teachers do not have the necessary training, knowledge and teaching strategies to provide their students with the *essential* alphabetic code-breaking 'resources' (see, for example: Anderson *et al.*, 2004; Center, 2005; Coltheart, 2005b,c; de Lemos, 2002, 2004a,b; Louden *et al.*, 2005a; Rohl & Greaves, 2004; Westwood, 1999, 2004).

In concluding the present section related to the evidence base for *effective teaching practices during the early years*, especially for children experiencing reading difficulties, the summary provided by Hay, Elias and Booker (2005, pp. 4-5) is worthy of note. This summary applies to both early and subsequent development of reading competence during the later years of primary and middle years of schooling. To this end, the relevant text is reproduced below.

**Learning to read**

The ability to read and comprehend depends on the rapid and automatic recognition of single words. All words are visually unfamiliar when encountered for the first time and a powerful strategy in this situation is for the student to use phonological knowledge to identify the word. That is, students recognise the unfamiliar word by identifying and blending its phonological (sound) elements and comparing that sound pattern to the sound patterns of words in their oral/aural vocabulary. The beginning reader must learn to decode some thousands of words that are initially visually unfamiliar and to commit those visual patterns to memory.

Whereas most students achieve the necessary levels of phonological awareness, this is not the case for many students with reading difficulties. Improvements in phonological skills usually result in increases in students' ability to identify single words as well as enhancing their spelling skills (Schlagal, 2001). There is considerable debate in the

literature regarding the optimal levels and intensity of phonological instruction components in the total reading programme. The notion that any one intervention can be a 'one-size-fits-all' model denies the reality of the diverse range of problems within this group of students. Unless the student is able to read words fluently, heavy demands are made on memory during a slow and tedious word decoding process that requires the reader to identify each succeeding word (Spencer & Hay, 1998). As a result, memory capacity becomes overtaxed and comprehension is detrimentally affected. By the time these readers reach the end of a sentence, they have little or no memory of the text information that they identified earlier. One of the advantages in re-reading text is that the increasing familiarity of the material reduces the demands made on memory by the decoding process, thereby allowing students to attend to the meaning.

**Comprehension**

Reading, however, involves more than the rapid and accurate identification of individual words. Many students in the middle and upper school with reading difficulties cannot identify and process the information contained in phrases, sentences and relationships between sentences and so cannot comprehend the text. They do not understand the purpose of reading a particular text and are unaware that they are failing to meet the requirements of the reading task. Frequently, readers in the middle primary grades struggle to make the transition from learning-to-read, to being independent readers able to read to meet the various demands of the curriculum (reading to learn).

As successful readers process text, they are active, they skim the text and make predictions, they relate ideas in text to their prior know-ledge, they construct images, generate questions and summaries (Woolley & Hay, 2004). Furthermore, they identify the purpose of the reading task and the main ideas in the text, monitoring their ongoing understanding of the story or content, repairing breakdowns when comprehension failures occur and integrating the content of the text with what they already know. In addition, the reader monitors the effectiveness of their reading. This monitoring is referred to as metacognitive since it refers to the reader/learner 'thinking about thinking'. When the goals of the reading task are not being met, the successful reader modifies and/or substitutes strategies to remedy the situation (e.g., re-reading).

**Reading strategies**

There is considerable agreement among researchers that students with reading difficulties are frequently unable to use strategies that will best enable them to achieve the goals of the reading task (Duke & Pearson, 2002). For example, if students wish to monitor their own learning they may choose to summarise the text and identify the main ideas. Effective readers know what the strategies are, how to carry them

out and when and where to use them. Although their academically more successful peers often develop such strategies incidentally, these strategies must be explicitly taught to many children with reading difficulties. One contentious question concerns whether reading comprehension instruction should be taught in or out of the context of regular curriculum (authentic) tasks. For students with learning difficulties, another concern is the amount of time teachers should devote to teaching a particular strategy before aban-doning it if students fail to master it. Although some have suggested that the teaching of a particular strategy should be reconsidered after a period as short as two weeks, others have pointed to the difficulties associated with learning new strategies and propose that the learning of an unfamiliar strategy can take as long as six months and emphasise that too-early abandonment will confuse the student.

In summary, research indicates that students with learning difficulties make greater progress when instructional interventions are multifaceted combining a range of approaches. For example, some of the best results are achieved in intervention prog-rammes when they include a variety of elements such as awareness of sound and letter relationships, vocabulary development and strategy teaching (Jordan, Snow & Porche, 2000).

For a comprehensive review of findings from the evidence-based research for effective intervention teaching practices for students (during the middle years of schooling) with learning difficulties in both literacy and numeracy, see: Ellis (2005); Purdie and Ellis (2005).

# 4. Implications for teacher education and professional development

Quality teaching requires deep knowledge of content and extensive knowledge of how students learn that content. It also requires pedagogical content knowledge; that is, knowledge about how to teach the content. In the case of the teaching of reading, quality teaching involves knowledge of how students learn to read, knowledge of how to assess reading proficiency and growth (e.g., Griffin & Nix, 1991; Griffin *et al.*, 19995a,b; Rowe, 2005; Rowe & Hill, 1996), and knowledge of how to use assessment information to apply the appropriate strategies from a repertoire of practices that are demonstrably effective for teaching students to read. To sustain quality teaching in reading, ongoing professional learning is essential.

The provision of opportunities for professional learning, at all stages of a teacher's career, is vital to building capacity in teacher professionalism – provided that such professional learning is firmly grounded in findings from evidence-based research. Whereas professional learning commences in pre-service teacher education, it is crucial that it continue via ongoing professional development activities, including participation in school-based professional learning teams. Opportunities for professional learning can take many forms, including teachers' shared and collaborative learning in school, work in professional learning teams, and professional development for principals and school literacy leaders.

Findings from the evidence-based research reviewed here demonstrate that teaching approaches based on models of *explicit instruction* produce significantly higher positive effects for students with reading difficulties than other approaches. Furthermore, when an integrated approach is adopted in which teachers have the necessary knowledge and skills to combine the essential elements of explicit-based and meaning-based approaches, the outcomes for students are likely to be most positive. However, in designing pre-service teacher education courses, as well as in-service professional development programs that build capacity in teachers to maximise the schooling outcomes for students with learning difficulties, Spiegel's (1998) observation concerning student and task variation is worth noting:

> Learners, teachers, curricula, and schools vary. Not everyone learns in the same way; not every task requires the same strategies; not every teacher has the same talents; not every school has the same combination of learners and teachers. Rather than trying to shoot each child with the same silver bullet, we need to recognise, celebrate, and work with this wonderful diversity. A balanced literacy program allows each teacher to select what is right for each child and each task and to change the emphasis easily. A balanced literacy approach is flexible, and that flexibility empowers teachers to tailor what they do for each child each day.
>
> Because not all children, tasks, and teachers are the same, teachers must have a full repertoire of strategies for helping children develop literacy and a clear understanding of how and when to implement each strategy (p. 118).

As indicated by Purdie and Ellis (2005), although some educators have argued that a pure or radical form of constructivism is the key to addressing students' difficulties in learning, such assertions based on any single paradigm need to be treated with extreme caution. At the same time, the continuing need for stimulation and critical evaluation engendered by theoretical separation and competing models should be recognised and valued. An integration of knowledge and successful practices is critical in Australian schools – provided that such knowledge and practices are firmly grounded in findings from sound evidence-based research. For teachers of students with learning difficulties, such knowledge and practice relate to:

(a) literacy (and numeracy) processes *per se* (e.g., the reading process involves both knowledge of the written code *and* an ability to extract meaning from the written code (Center, 2005; Foorman *et al.*, 1998; Wheldall & Beaman, 2000); and

(b) students' developmental, cognitive, affective, social-behavioural processes and auditory processing abilities (i.e., students' ability to hold, sequence and process accurately what is heard) have strong effects on their literacy progress, attentive behaviours in the classroom and general wellbeing (Rowe, Pollard & Rowe, 2003, 2005; Rowe & Rowe, 1999; Rowe, Rowe & Pollard, 2004).

Thus, content of both pre-service and in-service teacher education should be informed by a thorough knowledge of *what* works, *why* it works, and *how* it works. To this end, the Australian Council for Educational Research (ACER), with funding support from the Australian Government Department of Education, Science and Training (DEST), has developed a trial teacher professional development package entitled: *Working-Out What Works* (WWOW) *Training and Resource Manual: A teacher professional*

*development program designed to support teachers to improve literacy and numeracy outcomes for students with learning difficulties* (Hoad *et al.*, 2005). The contents of this trial professional development (PD) program are informed by findings from the evidence-based research reviewed by Purdie and Ellis (2005), and in the present report as such findings relate to literacy teaching and learning.

Key findings from this research, particularly in respect of *reading*, consistently indicate that although systematic phonics approaches are significantly more effective than non-systematic approaches for all children (including those with reading difficulties), children should at least be provided with systematic phonics instruction as part of an integrated reading program that includes whole-language, meaning-centred approaches (e.g., Camilli *et al.*, 2003; Center, 2005; Ehri *et al.*, 2001; NRP, 2000a,b). In one sense, however, the evidence presented in this literature review can only alert to *what* works for all students, including those with reading difficulties. It is not possible to provide the detail of *what* and *how* teachers should implement effective teaching and learning strategies. Nevertheless, although the present review has focused on summarising the findings from research reports of effective teaching strategies, many of those reports provide valuable information of *how* the strategies were implemented, or have referred to other sources containing relevant detail.

Such limitations aside, there are key components that differentiate successful strategies from less successful ones, with important implications for teacher education courses, as well as in-service professional development programs. At the very least, such courses and PD programs should be designed to assist teachers of all students, including students with learning difficulties to:

- Use psychometrically sound diagnostic assessment tools that are capable of: (a) testing essential reading skills to identify students' learning needs, with specific implications for practical pedagogical interventions (e.g., Center 2005; Clay, 2002; Munro, 1997, 2000b) [29] and (b) locating students' achievement progress over time on qualitatively-described, developmental measurement scales (an example of this approach to monitoring student achievement progress has been outlined by Masters, Meiers & Rowe, 2003 – an adaptation of which is attached as an Appendix to this review).

[29] Two assessment scales from Clay (2002) that are used widely for such purposes include: *Hearing and Recording Sounds in Words* (HRSW) and *Concepts About Print* (CAP). Further diagnostic assessment approaches are provided by Center (2005, chp. 17, pp. 221-236).

- Engage with the evidence-based research literature on what works for students with and without reading difficulties, and understand what constitutes *evidence*.
- Avoid faulty assumptions about the nature of the skill to be taught (e.g., reading acquisition process) by being informed from the extensive body of related knowledge available from cognitive science research (e.g., Bates *et al*., 2004; Center, 2005; Coltheart, 2005a-c; Jackson & Coltheart, 2001; Rayner *et al*., 2001, 2002); that is, draw on: (a) the expert knowledge of reading researchers; and (b) education systems advisors (if available).
- Via structured observation, develop a deep understanding of how particular students best learn specific skills (e.g., Comber & Kamler, 2005).
- Develop a thorough and up-to-date knowledge of subject-matter knowledge, together with child and adolescent development.
- Avoid or question educational fads and ideologies that promote a philosophy or pedagogical approach that is not grounded in findings from evidence-based research.
- Be knowledgeable about a range of approaches from which to make informed pedagogical choices, depending on student and context characteristics.
- Practise using a range of approaches.
- Work in partnership with parents, other teachers, researchers and health professionals, to share expertise and seek solutions for particular problems (see: Fielding-Barnsley & Purdie, 2003; Rowe & Rowe, 1999).

# 5. Substantive issues and concluding comments

## Instructional effectiveness and teacher quality

Despite focus on the relative effectiveness of instructional strategies in the present review, it is important to stress that pedagogical practices and instructional strategies *per se* are **not independent** of the teachers who deliver them to students, whether or not those students experience learning difficulties and externalising behaviour problems. That is, educational effectiveness for all students is crucially dependent on the provision of ***quality teaching*** by competent teachers (especially in reading instruction) who are supported by capacity-building towards the maintenance of high teaching standards via strategic professional development at all levels of schooling (Darling-Hammond & Bransford, 2005; Hattie, 2003; 2005; Hill & Crévola, 2003; Kennedy, 2001; OECD, 2001, 2005b; Rowe, 2003b, 2004,b,c,d).[30] Such outcomes, however, call for major reform requiring an investment in teacher quality that can then be used to change the ways in which students are taught and learn. Sadly, many educational reforms stop short of changing what happens beyond the classroom door, and thus fail to deliver improved teaching and learning outcomes for teachers and students, respectively. Rather, real reform directed at improving outcomes for all students calls for substantial change in the quality of *teaching* and *learning* provision, but unless there is total commitment to new ways of working, reform efforts soon falter.

[30] It should be noted that *teaching quality* and *teacher professional development* constitute major foci of the 2000 US *No Child Left Behind* (NCLB) policy (for specific details, see: Center on Education Policy 2003; LaTrice-Hill, 2002; US Department of Education, 2002). The importance of these elements have been particularly evident in findings from a longitudinal evaluation of the *Restart Initiative* in Victorian government secondary schools undertaken and reported by Rowe and Meiers (2005). Reading pre-assessment was used to identify *Restart* students, who were the lowest achieving group, and a 'control' group, whose performance was slightly higher than the identified *Restart* group. Key findings from the evaluation of the *Restart Initiative* from 2002 to 2004 indicate that significant and sustained gains in reading achievement progress were achieved by students taught by *Restart* teachers, many of whom had been trained in strategic reading instruction techniques, and supported by professional development in explicit reading instruction strategies provided by Dr John Munro – a reading research specialist at the University of Melbourne.

Professor John Hattie from the University of Auckland (New Zealand) has provided compelling evidence for the importance of ***quality teaching*** via a meta-analytic synthesis of the relevant evidence-based research, drawn from an extensive review of literature and a synthesis of over half a million studies (Hattie *et al.*, 1995; Hattie, Biggs & Purdie, 1996). In drawing from this research, Hattie (2003, pp. 2-3) asserts:

> When I review the initiatives of the previous Ministries of Education up to a couple of years ago, and when I review the policies in so many New Zealand schools, I note that the focus of discussions are more about the influences of the home, and the structures of schools. We have poured more money into school buildings, school structures, we hear so much about reduced class sizes and new examinations and curricula, we ask parents to help manage schools and thus ignore their major responsibility to help co-educate, and we highlight student problems as if students are the problem whereas it is the role of schools to reduce these problems. Interventions at the structural, home, policy, or school level is like searching for your wallet which you lost in the bushes, under the lamppost because that is where there is light. The answer lies elsewhere – it lies in the person who gently closes the classroom door and performs the teaching act – the person who puts into place the end effects of so many policies, who interprets these policies, and who is alone with students during their 15,000 hours of schooling.
>
> I therefore suggest that **we should focus on the greatest source of variance that can make the difference – the teacher**. We need to ensure that this greatest influence is optimised to have powerful and sensationally positive effects on the learner. Teachers can and usually do have positive effects, but they must have **exceptional** effects. We need to direct attention at higher quality teaching, and higher expectations that students can meet appropriate challenges – and these occur once the classroom door is closed and not by reorganising which or how many students are behind those doors, by promoting different topics for these teachers to teach, or by bringing in more sticks to ensure they are following policy.

It is important to note that the 'myth' of *educational effectiveness* is grounded in a widespread failure to understand the fundamental distinction between *structure* and *function* in school education (e.g., Zvoch & Stevens, 2003). Whereas a key *function* of schools is the provision of quality teaching and learning experiences that meet the developmental and psychosocial needs of students is dependent on funding and organisational *structures* that support this function, the danger is a typical proclivity on the part of teachers and educational administrators to stress *structure* (e.g., single-

sex schooling, class size,[31] etc.) and pedagogical *strategies* at the expense of *function* (quality teaching and learning). Unfortunately, such emphases are indicative of a pervasive ignorance about what **really** matters in school education (i.e., quality teaching and learning), and the location of major sources of variation in students' educational outcomes (i.e., the classroom). It seems we need to be constantly reminded that schools and their structural arrangements are only as effective as the those responsible for making them work (school leaders and teachers) – in cooperation with those for whom they are charged and obligated to provide a professional service (students and parents).

Unfortunately, there continue to be several barriers to reform that: (1) perpetrate prevailing 'myths' of 'school effectiveness' (or 'ineffectiveness'); and (2) generate misinformed and/or misdirected rationalisations of students' differential experiences and outcomes of schooling. Perhaps the most pervasive of these is the widespread tendency to place undue credence on various outmoded forms of *biological* and *social determinism* which assume that individual children – whether they be boys or girls – do poorly or well at school because of developmental differences, because they are 'dumb' or 'smart' or come from 'disadvantaged' or 'advantaged' backgrounds. In this context, Edmonds (1978, p. 33) long ago made the following insightful comment:

> The belief that family background is the chief cause of the quality of student performance … has the effect of absolving educators of their professional responsibility to be instructionally effective.

The longstanding and widespread acceptance of these beliefs and their expectations at the teacher, school and system levels have little substantive justification in the light of findings from emerging evidence-based research. These findings provide strong

[31] For almost 70 years, the contentious issues surrounding the link between *class size* and students' educational outcomes have been hotly debated and extensively researched – particularly in the US and Britain. Reviews of this research, including rigorous meta-analytic syntheses, consistently indicate negligible improvements to student achievement outcomes, even when class sizes of 30 students are reduced to 15. The weight of evidence suggests that reductions in class size do not yield improvements to student learning independent of changes to teachers' classroom teaching practices, nor to students' behaviours in the classroom (e.g., Rowe, 2004b,c). That is, the personal and professional characteristics of the teacher appear to be key factors associated with notable gains in students' learning outcomes. Slavin (1990) argues that reducing class sizes is a low-yield and expensive policy option. Rather, he suggests that providing additional teachers for one-to-one tutoring in the early years of schooling yields far greater improvements in student achievement and is more cost effective. For relevant reviews of 'class size' issues and research, see: Blatchford and Mortimore (1994); Glass (1992); Glass and Smith (1979); Glass *et al.* (1982); Goldstein and Blatchford (1997); Harder (1990); Hattie (1987); Hill and Holmes-Smith (1997); Prais (1996); Robinson (1990); Slavin (1989, 1990).

support for the proposition that it is the identity of the class/teacher groups to which students are assigned that is a key determinant of their perceptions and experiences of schooling, as well as their achievement progress in literacy and attentive-inattentive behaviours in the classroom. For example, Professor David Monk cites a number of studies in support of the observation that:

> One of the recurring and most compelling findings within the corpus of production function research is the demonstration that how much a student learns depends on the identity of the classroom to which that student is assigned (Monk, 1992, p. 320).

Similarly, based on multilevel analyses of students' results on the Year 10 *General Certificate of School Education* and final year *A-levels* assessments in the UK, Tymms (1993, pp. 292-293) commented:

> In every case (subjects) more variance was accounted for by the departmental level (than between schools), and the proportion of variance accounted for at the *class level* was more than for the departmental level. A general principle emerges from data such as these and that is that the smaller the unit of analysis and the closer one gets to the pupil's experience of education, the greater the proportion of variance explicable by that unit. In accountability terms the models indicate that *teachers have the greatest influenc*e [author's emphasis].

More recently, and consistent with the longitudinal research findings reported by Hill and Rowe (1996, 1998) and by Rowe and Hill (1998), Cuttance (1998, pp. 1158-1159) concluded:

> Recent research on the impact of schools on student learning leads to the conclusion that 8-15% of the variation in student learning outcomes lies between schools with a further amount of up to 55% of the variation in individual learning outcomes between classrooms within schools. In total, approximately 60% of the variation in the performance of students lies either between schools or between classrooms, with the remaining 40% being due to either variation associated with students themselves or to random influences.

Likewise, from the related British research, Muijs and Reynolds (2001, p. vii) report:

> All the evidence that has been generated in the school effectiveness research community shows that classrooms are far more important than schools in determining how children perform at school.

In sum, teachers can and do make a difference – regardless of students' social backgrounds and 'intake' characteristics, and whether or not they have learning difficulties. As Slavin and colleagues' evaluations of the 'Success for All' program among low SES schools in Baltimore and Philadelphia have shown, students who, regardless of their gender, socio-economic or ethnic backgrounds (including 'compositional effects') are taught by well-trained, strategically focused, energetic and enthusiastic teachers, are fortunate indeed (Slavin, 1996, 2005; Slavin *et al.*, 1994, 1997).

In contrast to mainstream, ideologically-driven opinion, the empirical evidence indicates that the proportion of variation in students' achievement progress due to differences in student background (~9-15%) is considerably less important than variation associated with class/teacher membership (~30-55%).[32] Rather, the key message to be gained from *educational effectiveness* research is that quality teachers and their professional development *do* make a difference, and that it is not so much what students bring with them that really matters, but what they experience on a day-to-day basis in interaction with teachers and other students in classrooms. In providing advice to parents of children with ADHD about schooling, Barkley and Pfiffner (1995a, pp. 206-207) suggest:

> Teachers frequently respond to the challenging problems exhibited by children with ADHD by becoming more controlling and directive. Over time, their frustrations with these difficult children make them more negative in their interactions as well. While we are not sure how a negative child-teacher relationship affects the long-term adjustment of ADHD children, experience tells us that it can certainly worsen the already poor academic and social achievement of these children, reduce the motivation to learn and participate in school, and lower self-esteem. All of this could ultimately result in school failure and dropping out.
>
> A positive teacher-student relationship, to the contrary, improves academic and social adjustment, not only in the short term but also in the long term. Adults who had been hyperactive as children have reported that a teacher's caring attitude, extra attention and guidance were 'turning points' in helping them to overcome their childhood problems.
>
> *The fact is that the single most important ingredient in your ADHD child's success at school is your child's teacher* [author's emphasis]. It is not the name of the school program your child is in, the school location, whether it is private or public, whether or not it

[32] See: Cuttance (1998); Hattie (2003, 2005); Hill and Rowe (1996, 1998); Louden *et al.* (2005b); Rowe (2004b,c,d); Rowe and Hill (1998).

is relatively wealthy, or even the size of the class. It is first and foremost your child's teacher, the teacher's experience with ADHD, and his or her willingness to provide the extra effort and understanding your child will require to have a happy and successful school year.

## Concluding comments

So what matters most? Certainly not student compositional characteristics such as *learning difficulties, educational disadvantage, disruptive student behaviours*, nor school *structural* arrangements of interest to school effectiveness researchers, but the imperative of ***quality teaching*** and ***learning*** provision, supported by *teaching standards* and ongoing teacher professional development focused on evidence-based practices that are demonstrably effective in maximising students' learning outcomes and achievement progress. Since the most valuable educational resource available to **any** school is its teachers, the need for a refocus of the prevailing *educational effectiveness* policy and research agenda (e.g., Scheerens, 1993; Scheerens & Bosker, 1997) to one that focuses on ***quality teaching*** and ***learning*** provision is obvious (OECD, 2001, 2005a,b).

The fact that *teaching quality* has strong positive effects on students' experiences of schooling, including their attitudes, behaviours and achievement outcomes, is of vital importance with profound implications. At the very basis of the notion of *educational effectiveness*, however, is what students themselves nominate as key characteristics of effective teachers, and are particularly worthy of note. For example, evidence cited in the NSW *Report of the Review of Teacher Education* (Ramsey, 2000, p. 12) indicates that students want their teachers to:

- know and understand their subject(s);
- treat each student as an individual;
- make learning the core of what happens in the classroom; and
- manage distractions that disrupt and prevent learning.

Similarly, from the work of Rowe and Rowe (2002), Slade (2002),[33] Slade and Trent (2000), students consistently report that 'good' teachers are those who:

[33] From extensive interview data, Slade (2002, pp. 175-177) provides a list of 68 characteristics and practices of 'good teachers' reported by students. The chapter in which this list is provided (Chapter 10) is compelling reading that should be prescribed for pre-service teacher education courses.

- 'care about me and *encourage* me';
- 'know what they are doing, are enthusiastic about what they teach, and want me to share in their enjoyment of learning'; and
- 'are *fair*' [this is a particularly salient issue for boys at any school-age level in consequence of what is demonstrably shown to be a highly developed sense of 'injustice'].

While it is not feasible to legislate such *quality teaching* into existence, the fact that teachers and teaching make a difference should provide impetus and encouragement to those concerned with the crucial issues of *educational effectiveness, quality teaching* and *teaching standards*, to at least invest in quality teacher recruitment, pre-service education and professional development. In this regard, the work and contributions of Ingvarson and of Bond *et al.* (2000) are of vital importance. For example, in the Australian context, Ingvarson has long been an advocate for the necessity of establishing *teaching standards*, the *certification of highly accomplished teachers*, as well as strategic *teacher professional development* that are linked to both status and salary recognition (Ingvarson, 1998a,b,c, 1999a,b, 2000, 2001a,b, 2002a,b, 2003, 2005; Kleinhenz & Ingarson 2004).

Finally, the summary of findings from evidence-based research for the effects of *quality teaching* on student outcomes provided by Linda Darling-Hammond at Stanford University (US) are pertinent and require emphasis:

> The effect of poor quality teaching on student outcomes is debilitating and cumulative. … The effects of quality teaching on educational outcomes are greater than those that arise from students' backgrounds. … A reliance on curriculum standards and statewide assessment strategies without paying due attention to teacher quality appears to be insufficient to gain the improvements in student outcomes sought. … The quality of teacher education and teaching appear to be more strongly related to student achievement than class sizes, overall spending levels or teacher salaries (Darling-Hammond, 2000, p. 3).

For the sake of Australia's students and teachers, let alone its social and economic future (or those of any nation), the enduring hope is that current emphases on the importance of *quality teaching* and *teacher quality* that continue to be granted strong support by the Australian Government, will be evident in the reality of major improvements to teacher professionalism and students' learning, behaviour, health and wellbeing outcomes. But such reality will not be realised until teachers are at least in receipt of quality pre-service education and in-service professional development

support that are commensurate with their essential status in terms of the invaluable contributions they are able to make to the enrichment of students' wellbeing and life chances, as well as to capacity-building for the nation's social and economic future[34]. Perhaps there is a need to be reminded that: 'Ultimately, most of what we do in school education – including our efforts to improve administrative structures and the quality of the teaching-learning environment – can be judged in terms of their implications for enhanced student learning' (Masters, 1994, p. 2).

[34] For example, see the offerings in: Cochran-Smith and Zeichner (2005); Darling-Hammond and Bransford (2005).

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# Appendix

## Assessment and reporting of learning progress: The importance of monitoring growth[35]

### The fundamental notion of *growth*

No concept is more central to the work of teachers than the concept of *growth*. As educators we use many different terms to describe cognitive, affective and personal growth, including *learning*, *development*, *progress* and *improvement*. However we describe it, the concept of individual growth lies at the heart of our work as a profession. It underpins our efforts to assist learners to move from where they are to where they could be: to develop higher levels of reading ability, broader social skills, deeper scientific understandings, more advanced problem solving skills, and greater respect for the rights of others.

Closely linked to the concept of individual growth is our fundamental belief that all learners are capable of progressing beyond their current levels of attainment – including those with learning difficulties. As educators we understand that children of the same age are at different stages in their learning and are progressing at different rates. Nonetheless, we share a belief that every child is on a path of *development*. The challenge is to understand each learner's current level of progress and to provide opportunities likely to facilitate further growth.

A professional commitment to supporting growth requires a deep understanding of growth itself. What is the nature of *progress* in an area of learning? What are typical paths and sequences of student development? What does it mean to *improve*? What can be watched for as indicators of progress, and what needs to be done to maximise progress? Teachers who are focused on supporting and monitoring the long-term growth of individuals have well-developed understandings of how learning in an area typically advances and of common obstacles to progress—tacit understandings grounded in everyday observations and experience, and perhaps also informed by theory and research.[36]

[35] Adapted from Masters, Meiers and Rowe (2003).

[36] For a longitudinal, essentially qualitative study of factors affecting children's educational progress during the early years of schooling, see: Hill *et al.* (1998, 2002).

## The assessment and monitoring of progress

Monitoring individual learners and their progress over time requires assessments of students' progress on well-constructed, common, empirical scales (or quantitative 'maps') that are qualitatively described. The use of such 'maps' enables the monitoring of both individuals and groups across the years of schooling (and sometimes beyond school). Such 'maps' and their reporting products (see Figure 1) provide deeper understandings of learning progress than can be obtained from 'cross-sectional snap-shots' that merely assess the achievements of different students at different times. Moreover, the 'maps' are a major aid in monitoring progress with students, as well as communicating with parents and other teachers.

Further, by tracking the same individuals across a number of years it is possible to identify similarities in learners' patterns of learning and achievement progress. Assessments of this kind show that, in most areas of school learning, it is possible to identify typical patterns of learning, due in part, no doubt, to natural learning sequences (the fact that some learning inevitably builds onto and requires earlier learning), but also due to common conventions for sequencing school learning and teaching.

The fact that most students make progress through an area of learning in much the same way makes group teaching possible. However, not all children learn in precisely the same way, and some children appear to be markedly different in the way they learn. An understanding of typical patterns of learning facilitates the identification and appreciation of individuals who learn in uniquely different ways, including those with learning difficulties.

## The utility of progress 'maps'

Based on the notion of *developmental assessment*,[37] a 'map' of typical progress through an area of learning provides a useful framework for measuring, describing and monitoring growth over time at the individual and group levels, as illustrated in Figure 1. Such 'maps' make explicit what is meant by *growth* (or *progress*) and introduce the possibility of plotting and studying the growth trajectories for both individuals and groups of learners.

[37] See: Forster, Mendelovits and Masters (1994); Masters (2004); Masters and Forster (1996a,b, 1997).

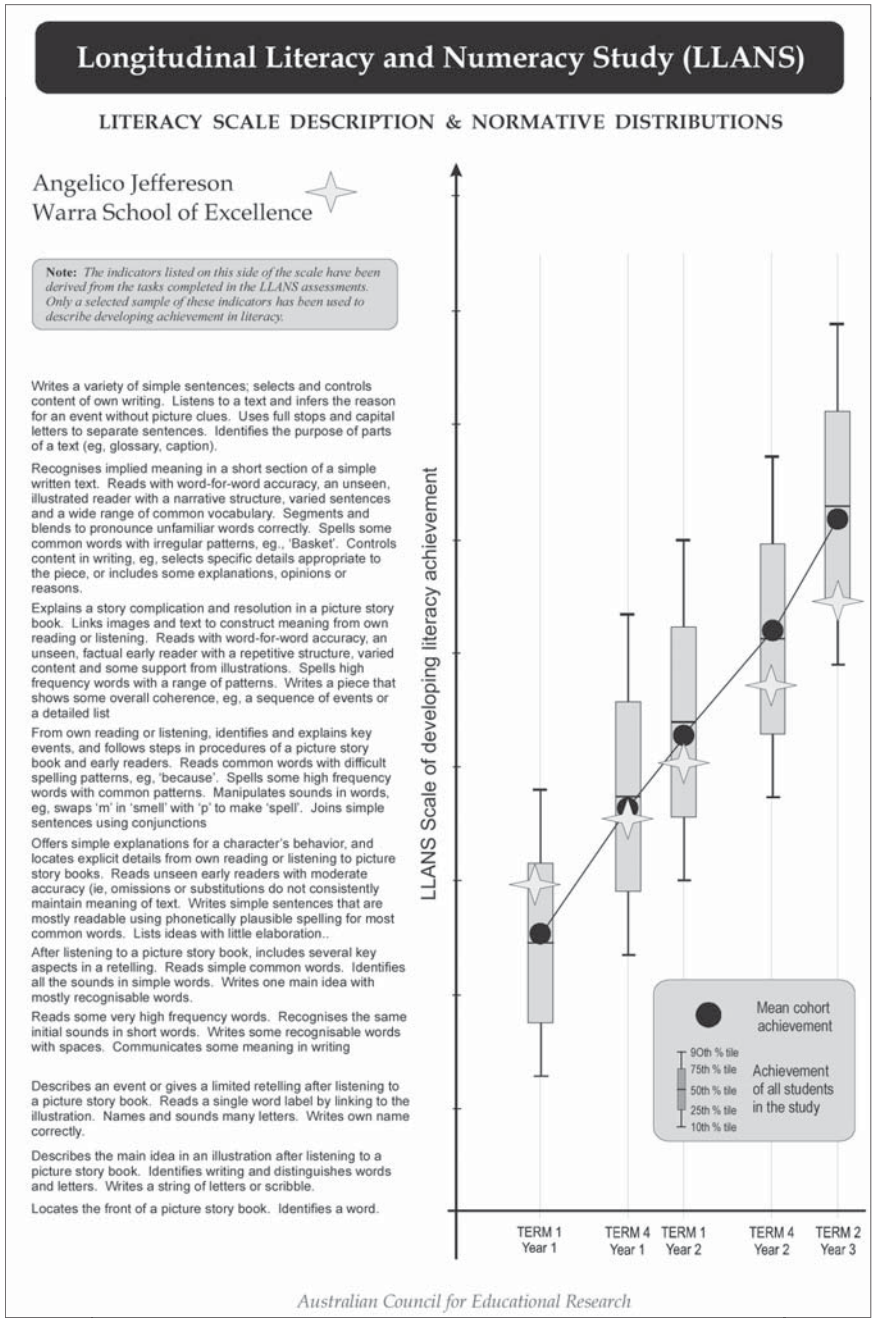


Figure 1. A growth map of achievement progress in literacy showing individual and norm-referenced growth against descriptions of domain-referenced criteria

Figure 1 illustrates the progress 'map' of literacy learning during the early years of school – developed as part of the *Longitudinal Literacy and Numeracy Study* (LLANS).[38] Using modern measurement theory (or more particularly, *Rasch measurement*),[39] the map describes how the literacy skills of participating children typically developed over their first few years of school.[40] Growth in literacy is described on the left of each map, from early skills at the bottom to more advanced competencies at the top. These summary descriptions are valuable in that they provide a 'window' that 'opens-up' to more detailed information about what students have actually achieved – as documented in portfolio records, class/school-based assessments, etc.

The literacy achievement progress of children in the LLANS study on five occasions is shown on the right of Figure 1. For example, the map shows that: (a) on average, children's literacy skills developed steadily during their first three years of school; and (b) the achievement progress of *Angelico Jefferson* indicates less-than-expected progress during the second and third years of school.

## Concluding comments

The LLANS example provided here illustrates three important advantages of monitoring children's learning and achievement progress over time. First, the focus is on understanding learning as it is experienced by the learners. Through such approaches an attempt is made to understand the nature of growth within an area of learning across the years of school. The use of 'progress maps' of learning to monitor and study children's progress stands in contrast to more traditional curriculum-based approaches that impose a list of learning objectives (or outcomes) that students are expected to learn, followed by assessments to determine the extent to which these objectives have been achieved.

Second, empirically-based 'maps' of learning provide a basis not only for charting individual and group progress, but also for studying influences on children's learning trajectories – similar to those reported by Hill *et al.* (1998, 2002). The potential of such

[38] For specific details of this ongoing study, see: Meiers (1999a,b, 2000); Meiers and Anderson (2001); Meiers and Forster (1999); Meiers and Rowe (2002); Stephanou, Meiers and Forster (2000). Note also, the LLANS assessment instruments were used in Louden *et al.* (2005).

[39] See: Embretson and Hershberger (1999); Masters (1982); Masters and Keeves (1999); Masters and Wright (1997); Rowe (2002, 2005); Wilson (2005); Wright and Mok (2000).

[40] Note that the initial sample of 1000 children was drawn from a national, randomly-selected sample of 100 government Catholic and independent schools.

'maps' lies in the opportunity they provide to identify and understand the nature of factors associated with successful learning and rapid progress, as well as those that work to impede student growth. Third, such 'maps' provide a valuable framework for: (a) actively engaging students in the monitoring of their own learning progress; (b) reporting to parents; and (c) communicating with other teachers in the same school or those in different schools.

Clearly, these advantages point to important implications for how educational progress is measured, monitored and reported over time. In contrast, when evidence about a student's achievement is reduced to a yes/no decision concerning a year-level performance standard, valuable information about that student's learning is lost. Rather, the improvement of students' school learning and its reporting depends on an understanding of the variation in students' levels of development and achievement; a willingness to monitor and report individual growth in an area of learning across their years at school; and a commitment to tailoring learning activities to students' current interests and levels of achievement regardless of their age or grade levels.

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