

## The imperative of evidence-based instructional leadership: Building capacity within professional learning communities via a focus on effective teaching practice<sup>1</sup>

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**Abstract:** Following brief introductory comments and rationale for the present paper, prevailing policy contexts, and an outline of on-going controversies surrounding effective teaching practice, this paper focuses on evidence-based teaching strategies that are demonstrably effective in maximising the achievement progress of students during the early and middle years of schooling. Drawing from meta-analytic syntheses of more than 500,000 studies, as well as key findings from a recent national research project, it is argued that since teachers are the most valuable resource available to schools, an investment in teacher professionalism is vital. It is further argued that such professionalism can only be achieved by ensuring that teachers are equipped with a repertoire of pedagogical skills that **are** effective in meeting the developmental and learning needs of ALL students. Such outcomes underscore the imperative of evidence-based *instructional leadership* that maximises both teacher and student learning outcomes as mutual partners in professional learning communities.

### Introductory comments and rationale

The rationale for this paper has been motivated by at least three major considerations pertinent to Australian and international contexts. First, despite the existing and emerging research evidence for *educational effectiveness* in terms of *instructional leadership* and its impact on *teaching and learning*, there is a disturbing level of ignorance among school leaders and teachers at all levels of educational provision related to *what works* and *why*. Second, the prevailing ideologies in schools and universities surrounding *effective teaching practice* are typically not grounded in findings from evidence-based research. Such ideologies are not only endemic in Australian schools and higher education providers, but in many such institutions throughout the world (see Westwood, 2006), with the possible exception of China, Japan, South-East Asia and several Eastern European jurisdictions.

Third, current pre-service teacher education and subsequent in-service professional development is characterised by very narrow conceptions about how teachers should teach – aided and abetted by the content of curriculum documents. This has resulted in teachers not being equipped with an evidence-based repertoire of pedagogical skills that are demonstrably effective in meeting the developmental and learning needs of ALL students – regardless of students' intrinsic characteristics, socioeconomic and socio-cultural backgrounds (see: Loudon, Rohl *et al.*, 2005a-c; Rowe 2006a). Indeed, this is tantamount to what would be an incompetent attempt to negotiate the demands of an 18-hole golf course with just a putter.

These issues came into particularly sharp focus during 2004-2005 when the present author chaired the Committee for the Australian Government's *National Inquiry into the Teaching of Literacy* (NITL: see Rowe, 2005a,b). I and my fellow Committee members were appalled by the volume of non-evidence-based ideological rhetoric expressed in many of the 454 submissions to NITL – from teachers, educational administrators, and especially from education academics. Similar views were also expressed by senior representatives from regional Paediatric Chapters of

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the Royal Australasian College of Physicians concerned about the overlap between education and health. In this latter case, submissions from health professionals to NITL expressed considerable concern about the increasing numbers of referrals involving distressed children and adolescents whose behaviour and health problems have arisen as a consequence of (or are exacerbated by) learning difficulties and failure to acquire functional literacy skills.

Further, concerns expressed on behalf of their members by National Presidents of the Primary and Secondary Principal Associations during NITL were that during the past 10-15 years, pre-service teacher education courses have not prepared teachers *how to teach* (for more recent related comment, see Colheart & Prior, 2007). A consistent criticism was that beginning teachers know little more than how to provide *constructivist learning activities* – in the absence of first ensuring that students had been explicitly taught the basic skills required for productive engagement with the often rich and very useful constructivist learning activities provided by teachers; hence the focus of the present paper.

### **The importance of evidence-based foundations for *educational effectiveness***

Given the level of consensus regarding the importance of school and higher education as essential elements of micro- and macro-economic reform, policy issues surrounding *educational effectiveness* and *performance standards* throughout national and international systems are of particular importance – at the system, institutional and individual levels. However, much of the traditional and prevailing dogmas surrounding factors affecting students' experiences, motivations and outcomes throughout their pre-school, elementary, secondary and tertiary years of education – especially socio-cultural and socioeconomic factors – are being brought into question (e.g., Marks, 2005, 2006; Rowe, 2004a,b, 2006a). Such dogmas are beginning to be understood as products of conceptual inadequacy, underscored by methodological and statistical artefact – outcomes from which amount to little more than 'religious' adherence to moribund ideologies of *biological* and *social determinism*. Whereas useful contributions have been made towards clearer understandings of students' motivational goals, self-concepts, attitudes, behaviors and achievements in school contexts (e.g., McInerney, Marsh & Yeung, 2003), including the influence of socio-cultural family background (e.g., Suliman & McInerney, 2006), the resulting research and policy discourse continues to focus on the *who* of educational provision (i.e., students) at the expense of the *what* and *how*.

Above all, a good deal of this student-centred 'discourse' and its impact on policy and practice is not supported by existing and emerging findings from evidence-based research. This is a matter of major concern, particularly as it relates to issues of *educational effectiveness* in the context of schooling, and above all, *instructional leadership* for the provision of quality teaching and learning standards in education more generally (see Ingvarson & Rowe, 2007). Rather than a focus on teaching strategies that are demonstrably effective in meeting the developmental and learning needs of all students, regardless of their intake characteristics and backgrounds (see: Hattie, 2003, 2005; Rowe, 2006a,b), the prevailing research/policy focus is on learning and achievement outcomes for: boys; students from 'disadvantaged' backgrounds, including those from Indigenous backgrounds; as well as those with learning difficulties and disabilities (Purdie & Ellis, 2005; Rowe, 2006b, Westwood, 2006). This 'state of affairs' demands high quality leadership, and especially *instructional leadership* – informed by findings from evidence-based research.

These concerns extend to methodological issues related to measurement, data analyses, and fitting explanatory statistical models to educational performance indicator data obtained from research and evaluation projects – especially those studies that fail to account for the inherent hierarchical structure of the data (i.e., students within classes within schools, regions etc., or longitudinal, repeated measures clustered within students and higher level contexts) – with important implications for policy and practice (Goldstein, 1997, 2003; Khoo, West *et al.*, 2006; Rowe, 2001, 2003a, 2004a, 2007; Rowe & Lievesley, 2002). At this point, a brief explication of prevailing policy contexts and related research issues is instructive.

## Prevailing policy contexts

Educational provision is one of the most massive and ubiquitous undertakings of the modern state. Schools and higher education institutions account for a substantial proportion of public and private expenditure and are universally regarded as vital instruments of social and economic policy aimed at promoting individual fulfilment, social progress and national prosperity. Since educational institutions generate a substantial quantity of paid employment for teachers and administrators, it is not surprising that there has long been an interest in knowing how *effective* such provision is and how it can be improved. What is surprising is the shakiness of our knowledge about *educational effectiveness* and its links to persistent policy calls for the specification and maintenance of *curriculum* and *performance standards*. Even more intriguing is that the journey undertaken by researchers since the 1960's in search of answers appears, forty years later, to have only begun to cast light on what **really matters**, namely, the provision of *quality teaching* by *quality teachers* (Rowe, 2003b, 2004b, 2006b, in press).

Consistent with the adoption of corporate management models in educational governance and the prevailing climate of 'outcomes-driven' economic rationalism in which such models operate, policy activity related to issues of, *accountability*, *assessment*, *standards monitoring* and *benchmarking*, *performance indicators*, *quality assurance*, *school* and *teacher effectiveness*, are widespread (e.g., Access Economics, 2005; Fenstermacher & Richardson, 2005; Goldstein & Spiegelhalter, 1996; Ingvarson, 2005; Ingvarson & Rowe, 2007; Kleinhenz & Invarson 2004; Marsh, Rowe & Martin, 2002; OECD, 2005a,b; Rowe, 2000; Rowe & Stephanou, 2003). However, political, economic and industrial issues surrounding *educational effectiveness*, particularly related to *school* and *teacher effectiveness*, are especially sensitive ones, despite the level of non-partisan political consensus (at least in Australia) regarding the importance of quality teaching standards throughout school and higher education institutions in meeting the constantly changing demands of the modern workplace (e.g., Macklin, 2006; Nelson, 2002).

The global economic, technological and social changes under way, requiring responses from an increasingly skilled workforce, make high quality educational provision an imperative – especially high quality teaching. 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 learners, irrespective of their characteristics, backgrounds and locations, receive high-quality teaching (OECD, 2005a,b). Since teachers are the most valuable resource available to both schools and higher education institutions in the realisation of this goal, an investment in teacher professionalism is vital by ensuring that they are equipped with an evidence-based repertoire of pedagogical skills that are demonstrably effective in meeting the developmental and learning needs of ALL students for whom they have responsibility – regardless of students' backgrounds and whether or not they experience learning difficulties (Coltheart & Prior, 2007; Ellis, 2005; Farkota, 2005; Hattie, 1987, 2003, 2005; Hoad, Munro *et al.*, 2005; Purdie & Ellis, 2005; Westwood, 2004, 2006).

Despite the emphasis placed on the importance of *quality teaching* and *teacher quality* in recent OECD publications, as well as similar emphases underlying the *2001 No Child Left Behind Act* in the USA (see: Center on Education Policy, 2003; LaTrice-Hill, 2002; US Department of Education, 2002), the bulk of international scholarly discourse concerned with *educational effectiveness* and *standards* has largely ignored the importance of *instructional effectiveness* provided by schools, universities and teachers. With few exceptions, discussions informed by findings from evidence-based research that focus on the constituent elements of *instructional effectiveness* (i.e., *what* and *how*) are conspicuous by their absence. Rather, the dominant emphasis continues to be characterized by 'offerings' advocating *structural* changes for systemic, standards-based reform (including curriculum *deconstruction* and *reconstruction*) that have a long and not-so-distinguished history of rarely penetrating the classroom door. Since these emphases derive from *school effectiveness* research and the related *school improvement* movements, it is helpful to review the related contributions to prevailing understandings of *educational effectiveness* as they relate to the urgent need for quality *instructional leadership*.

## Contributions from school effectiveness research

Notwithstanding the difficulties entailed in defining an *effective school* or *quality teaching* (Sammons, 1996), the work on *educational effectiveness* to date has focused primarily on the search for ways to measure the *quality* of a *school* – defined almost exclusively in terms of students' academic achievement progress. Although the term *quality* is likewise problematic, the "...measurement of the quality of schooling is of critical importance at a time when so much school reform in so many parts of the world is being undertaken" (Mortimore, 1991, p. 214). For the past 30 years, concern about the *quality* of school education has become a high priority policy issue in all OECD countries where attention has focused on ways of assessing the *quality* of schools, of identifying factors associated with *effective schooling*, and on using such knowledge to achieve further improvements in quality.

It has been noted frequently that school effectiveness research grew out of studies of *educational effectiveness* focusing on production functions (Fraser, Walberg, Welch & Hattie, 1987; Hanushek, 1979, 1985, 1986; Monk, 1992), and more especially out of the initial sociologically oriented input-output studies by Coleman, Campbell *et al.* (1966) and by Jencks, Smith *et al.* (1972). These researchers were interested primarily in issues of social 'equity' and the influence of the school relative to that of 'sociologically-determined' background characteristics of students. Their findings were interpreted as casting serious doubts on the capacity of schools to make a difference relative to the influence of the socio-cultural and economic capital of home background.

Indeed, during the past 40 years, the major theories (or models) of learning processes (e.g., Bennett, 1976; Bloom, 1976; Carroll, 1963; Von Glasersfeld, 1995), and the 'process-product' research generated by them (Brophy, 1986; Fraser *et al.*, 1987; Monk, 1992), have primarily focused on *school learning*, or "...holistic conceptions of student learning in classroom settings" (Boekaerts, 1986, p. 129). Curiously, such 'cages-for-ages-settings' via lock-step, age-stage sequence models of class-school organisation, have persisted since the 15<sup>th</sup> century despite consistent findings indicating that:

- compared with explicit teaching and supervised practice via disciple-apprentice models that date from antiquity, class/school organisational models are inefficient and largely ineffective; and
- class/school factors including, financial and material resources, class size, teachers' qualifications, classroom organization, and exclusive emphases on student-centred constructivist 'teaching' methods, account for less than 15 per cent of the variance in measures of student achievement (e.g., Hattie, 2005; Rowe, 2006b).

During the past 40 years, influential studies such as those reported by Coleman, Campbell *et al.* (1966) and Jencks, Smith *et al.* (1972), "...provided evidence that schools and teachers are not effective in enhancing achievement" (Hattie, 1992, p. 9). In fact, reported findings from these early studies suggested that school effects have little impact on students' learning outcomes. For example, after estimating that only nine per cent of the variance in student achievement measures was due to school effects, Coleman, Campbell *et al.* (1966) came to the somewhat depressing conclusion that "...schools bring little influence to bear on a child's achievement that is independent of his background and general social context" (p. 325). The consensus of findings from these studies was that ethnic and family socio-economic background factors constituted the dominant determinants of students' educational outcomes. Reynolds, Hargreaves and Blackstone (1980) summarized this consensus in the following terms: "...variations in what children learn at school depends largely upon variations in what they bring and not on variations in what schools offer them" (p. 208).

In what has become a familiar pattern, the conclusions arrived at by this early research were consistent with prevailing socio-political opinion. However, a growing number of researchers have since provided contrary evidence to the claims that relative to home background influences the effects of schooling are negligible (e.g., Cuttance, 2001; Scheerens & Bosker, 1997). Many

of these researchers have been critical of findings from studies such as those reported by Coleman and Jenks because the inherent hierarchical structure of the data had not been taken into account (i.e., students within classes, classes within schools, etc.; and/or repeated measures nested within students within classes and schools, regions, etc.).

Early studies of school effectiveness such as those by Brookover, Beady *et al.* (1979), Edmonds (1979a,b, 1981), and by Rutter, Maughan *et al.*, (1979), were conceived largely as a reaction to the conclusions of Coleman and Jenks. The Brookover, Edmonds and Rutter studies adopted a different starting point and focused on identifying contextual features of schools in which students were performing better than their counterparts in comparable schools, after adjusting for the effects of ‘intake’ characteristics. Given this starting point, the conclusions from such studies and the enthusiasm with which they were promoted were not unexpected. The key message from this work was that effective schools are characterized by an ‘ethos’ or ‘culture’ oriented towards learning, expressed in terms of high achievement standards and expectations of students, an emphasis on basic skills, a high level of involvement in decision-making and professionalism among teachers, cohesiveness, clear policies on matters such as homework and student behaviour, and so on. Moreover, ‘effective schools’ were also supposed to be characterized by outstanding educational leadership, particularly as implemented by the principal and directed at establishing agreed goals, increasing competence and involvement of staff and at clarifying roles and expectations. Edmonds (1979b) was the first to summarize these features into what has become known as the ‘five factor model’ of school effectiveness, namely:

1. purposeful educational leadership;
2. challenging teaching and high expectations of students’ achievements;
3. involvement of and consistency among teachers;
4. a positive and orderly climate; and
5. frequent evaluation of student progress.

This ‘five factor model’ continues to form the basis of what might be termed the *optimistic account* of school effectiveness – an account that presents a positive ‘picture’ of the role and efficacy of *structural* or *contextual* school influences. In addition to the well-known critiques of the ‘five-factor model’ (e.g., Ralph & Fenessey, 1983; Scheerens & Creemers, 1989), there are several problems with the *optimistic account*, not the least of which is that it was built upon an extremely fragile research base.

First, the little empirical evidence available was not extensive with most of the knowledge base being derived from small-scale case studies; but mostly from scholarly reviews and comment (e.g., Good & Weinstein, 1986; Purkey & Smith, 1993; Scheerens, 1993; Wilson & Corcoran, 1988). For example, the Rutter, Maughan *et al.* (1979) study was based on observations made in just twelve inner London schools. Banks (1992, p. 19) noted that: “...the relevant (research) literature on effective schools is not extensive, with scholarly comment and critique constituting the major proportion”.

Second, there have been relatively few large-scale studies capable of providing valid generalizations, and fewer still that have collected longitudinal data that are essential for the estimation of specific effects of schooling – over and above that which students bring with them (Raduenbush, 1989). Nuttall *et al.* (1989, p. 775) suggested that it is necessary to be cautious in interpreting “...any study of school effectiveness that relies on measures of outcome in just a single year, or stability over time”. While the advice is apt, the logistical problems in mounting and maintaining such studies entail severe practical constraints, resulting in a virtual absence of studies conducted over long periods of time.

Third, the methods typically used to analyse the derived data have not allowed for the modelling of complex interrelationships between inputs, processes and outcomes, including indirect and reciprocal effects; nor have they taken into account the inherent nested structure of schooling and the organization of students into classes taught by particular teachers (see:

Goldstein, 1997; Raudenbush & Bryk, 1988). In the preface to their edited collection of related research articles, Raudenbush and Willms (1991, p. xi) observed:

An irony in the history of quantitative studies of schooling has been the failure of researchers' analytic models to reflect adequately the social organization of life in classrooms and schools. The experiences that children share within school settings and the effects of these experiences on their development might be seen as the basic material of educational research; yet until recently, few studies have explicitly taken account of the effects of particular classrooms and schools in which students and teachers share membership.

These are problems that only relatively recent methodological advances have addressed. Two developments are worthy of comment. The first is the development of structural equation modelling techniques that enable simultaneous estimation of interdependent effects among variables within a framework that takes into account measurement error, as well as structural prediction residual (e.g., Jöreskog & Sörbom, 2005). The second is the development of multilevel modelling techniques that can account for the inherent hierarchical structure of the data, and enable estimation of the influence of variables operating at different levels of analysis (e.g., Goldstein, 2003; Rasbash, Browne *et al.*, 2005; Raudenbush & Bryk, 2002; Rowe, 2007).

Fourth, the criterion measures used in school effectiveness studies have typically been limited to un-calibrated raw scores on standardized tests of students' cognitive achievements (or on public examinations), with scant attention being paid (if at all) to other highly valued outcomes of schooling that include attitudinal, motivational, social and behavioural orientations. Whereas the use of scores on achievement tests for the measurement and identification of *educational effectiveness* is typically justified on the grounds of maximizing reliability, this has often been at the expense of validity. That is, while such tests have moderate correlations with measures of student intake characteristics and background factors, they are questionable in terms of their validity as measures of the curriculum taught and what has been learnt in classrooms within schools. Further, there has long been criticism of the utility of such tests as measures of either learning or competence (Darling-Hammond, 1994; Lacey & Lawton, 1981; Rowe & Hill, 1996, 1998). Such criticism has gained credence in the areas of standards monitoring and performance assessment, where new approaches to obtaining curriculum-specific and 'authentic' measures of students' learning and achievement progress have been attempted during the last 20 years (see: Embretson & Hershberger, 1999; Masters, 2004; Masters & Keeves, 1999), but it is a criticism that has been largely ignored in almost all studies of school effectiveness.

Nonetheless, methodological criticisms of the early school effectiveness research have provided the impetus for a relatively small number of 'second generation' studies and to an even smaller number of what Scheerens and Bosker (1997) have referred to as 'state-of-the-art' studies. These more recent studies consistently find that differences between schools, when relevant prior achievement and 'intake' characteristics of students are taken into account, are important but not especially large – a finding that is confirmed by results from comprehensive meta-analytic studies by: Bosker and Witziers (1995), Hattie (2003, 2005), and by Hattie, Biggs & Purdie (1996).

Furthermore, they are of an order of magnitude close to that estimated by Coleman and Jencks (i.e., ~ 9 per cent of the variance). At the same time, studies that have been designed to enable the estimation of class-level effects have consistently identified larger proportions of between-class/teacher variance (e.g., Hill & Rowe, 1996, 1998; Rowe & Rowe, 1999; Scheerens, Vermeulen & Pelgrum, 1989). This, in turn, has prompted a renewed focus on *teacher quality* in terms of *instructional effectiveness*, and to re-definitions of fundamental questions underpinning research in *educational effectiveness* (see: Creemers, 1992, 1994; Cuttance, 2001; Hattie, 2003, 2005; Rowe, 2004a; Rowe & Rowe, 2003; Slavin, 1994, 2005). At this point it is helpful to provide an outline of contemporary understandings of 'effective' teaching practice.

## Contemporary understandings of 'effective' teaching practice

Much of what is commonly claimed as 'effective teaching practice' and implemented in schools – at least throughout many English-speaking countries – is not grounded in findings from evidence-based research, including cognitive science (de Lemos, 2004a,b). Of particular concern in Australia, for example, is that despite a lack of supporting evidence for its utility, the prevailing educational philosophy of *constructivism* (an established *student-centred* theory of *learning* and *knowing* rather than a theory of *teaching*) continues to have marked influences on shaping teachers' interpretations of how they should teach.

Teaching strategies have long generated debate and ideological controversy, especially as to 'best practice'. Two clear orientations have provided the basis for this controversy: *direct* (or *explicit*) *instruction*, and student-centred *constructivist* approaches. Whereas neither of these teaching methods alone (or their variants) is appropriate for all types of student learning (see: Purdie & Ellis, 2005; Westwood, 1999, 2006), the widespread and mostly unquestioning adoption of *constructivist* orientations towards *teaching* in most areas of the curriculum in Western, English-speaking schools and higher education institutions is problematic.

A key reason for this is that despite strong supporting evidence for the superior effects of teacher-directed approaches on student learning (outlined in more detail later), the philosophy of *constructivism* (a cognitive theory of *learning* rather than of *teaching*) has enduring influences on the content emphasis of pre-service teacher education courses (see: Louden, Rohl *et al.*, 2005a; Rohl & Greaves, 2004; Rowe, 2005b; Westwood, 1999). This emphasis is aided and abetted by prescribed literature such as: Cambourne (2002); McInerney and McInerney (2002, 2006), as well as via the content of in-service teacher professional development programs. Moreover, *constructivist* approaches to teaching prevail as predominant methods throughout school systems in many English-speaking countries, and are given high prominence in the content of curriculum standards (or *essential learning*) documents currently provided by all Australian States and Territory government departments of education and training.

However, there is a strong body of evidence that exclusive emphasis on *constructivist* approaches to 'teaching' are neither initially nor subsequently in the best interests of any group of students, and especially for those experiencing learning difficulties in reading and literacy more generally (see: Center, 2005; Moats, 2000; Swanson, 1999; Swanson & Deshler, 2003; Westwood, 1999, 2004, 2006). For children from disadvantaged backgrounds who often do not have rich phonological knowledge and phonemic awareness upon which to base new learning, being taught under *constructivist* modes has the effect of compounding their disadvantage once they begin school (Munro, 2000a,b).

This is particularly the case for children from non-English speaking backgrounds including Indigenous children, where English may be their second or third language. Indeed, Farkota (2005) argues that many cases of learning difficulty and related under-achievement can be attributed to inappropriate or insufficient teaching, rather than to deficiencies intrinsic to students such as cognitive, affective and behavioural difficulties, as well as their socio-cultural backgrounds and contexts, with *constructivist* approaches being major protagonists. A brief explication of *constructivist* approaches to 'teaching' is warranted here.

## The rationale for *constructivism* as a 'teaching' method

Teaching methods that are described as 'student-centred' tend to be aligned with *constructivism* – an established and widely espoused theory of *knowing* and *learning* – can be traced to advocates of active and experimental methods reflected in the work of educational theorists such as Ausubel (1968), Bruner (1961, 1966), Dewey (1933), Piaget (1954), Rousseau (1979) and Vygotsky (1978). More recently, advocates of *constructivism* have coined various labels for *constructivist* approaches to both learning **and** teaching, including: 'anchored instruction', 'situated learning', 'discovery learning', 'task-based learning' and 'scaffolding' – each of which share many common features. Further, as noted by Westwood (2006, p. 36): "problem-based

learning' (PBL) – also known as 'issues-based learning' – has gained popularity in recent years as a method for use in higher education, particularly in the medical, therapeutic and other professional fields where the 'problem' is often in the form of a 'case study'. PBL encompasses many of the 'student-centred' approaches to teaching and learning for which the underlying rationale is essentially twofold:

- students should be intrinsically motivated and actively involved in the learning process; and
- subject matter studied should, as far as possible, be 'authentic', 'interesting' and 'relevant'.

The implicit assumptions underlying such rationale are that 'intrinsically motivated' learners, independent of explicit instruction provision, have acquired sufficient prior knowledge and skills (particularly basic literacy, numeracy and study skills) to engage effectively and productively for generating new learning in a given subject matter domain. The compelling evidence that this is not the case for medical students in the acquisition of differential diagnostic skills, for example, applies equally for children learning to read, write, spell and undertake mathematical computation. In the case of medical students, the necessity of explicit instruction by subject matter experts for efficient knowledge acquisition in the basic sciences of anatomy, physiology, biochemistry and pathology is foundational. Similarly, for children learning to read, write, spell and compute, explicit instruction in the alphabetic principle of letter-sound relationships (especially in English) and the mathematical principles underlying computation in number operations, space and measurement, are also foundational to literacy and numeracy learning.

Despite strong evidence for the limitations of exclusive *constructivist* methods of teaching, they are widely endorsed and practiced. For example, in their opening chapter titled: *Effective teaching and learning—constructivist perspectives*, McInerney and McInerney (2006, p. 3) write:

These approaches explicitly emphasise the intrapersonal dimensions of learning and, in particular, posit that knowledge is not transmitted directly from one knower to another, but is actively built up by the learner through child-determined exploration and discovery rather than direct teaching.

With respect to *knowing* and *learning*, these comments have evidence-based legitimacy, but not so for *teaching* – on at least two grounds. First, they are not supported by findings from a large body of evidence-based research. Second, they give rise to deleterious effects of educators absolving their professional responsibility to be instructionally effective in teaching foundational knowledge and skills (e.g., Creemers, 1994; Müjls & Reynolds, 2001; Slavin, 2005).

### Features of *constructivism* and their limitations for teaching practice

The key element in *constructivism* 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 is expressed by Ausubel's (1968) contention 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 student'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* or an *orchestrator*), 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; McInerney & McInerney, 2002 2006; 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 exclusive adoption as an effective method of teaching. Similarly, in highlighting the inappropriateness of *constructivism* as an operational *theory of teaching*, Wilson (2005, pp. 2-3), posits:



... 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 misconceptions. ... 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 interventionist 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.

Similarly, Kirschner, Sweller and Clark (2004) note: "Not only is unguided instruction normally less effective; there is also evidence that it may have negative results when students acquire misconceptions or incomplete or disorganized knowledge" (p. 84). Indeed, there are strong grounds for heeding Mayer's (2004) recommendation that we "move educational reform efforts from the fuzzy and unproductive world of ideology – which too often hides under the various banners of constructivism – to the sharp and productive world of evidence-based research on how people learn" (p. 18).

In contrast with the non-evidence-based contributions to the edited collection by Ewing (2006), these assertions from Wilson, Kirshner *et al.* and Mayer, are consistent with expressed concerns that most faculties and schools of education in Australian universities (and elsewhere in English-speaking countries) currently providing pre-service teacher education, base their programs on *constructivist* views of both learning *and* teaching (Coltheart & Prior, 2007; de Lemos, 2002, 2004a; Loudon, Rohl *et al.*, 2005a,b; Rohl & Greaves, 2004; Rowe, 2005a, Appendix 2; Westwood, 1999, 2004, 2006). Westwood (1999), for example, highlights the results of a small 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) declares:

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.

In commenting on what is arguably the most comprehensive report on initial teacher education and professional development compiled to date, namely, *Teachers Matter* (OECD, 2005b), Caldwell (2006, p. 112) observes:

The focus of training programs for teachers has been overwhelmingly on initial teacher education, which includes training on pedagogy, the subject matter that the pre-service teacher aims to teach and, often, subject-specific pedagogy. This report suggest that pre-service education needs to be more focused on the things teachers will be expected to know and do once in the classroom.

This is excellent advice, provided that teacher educators and in-service professional development providers base their curricular for teaching practice on findings from the extensive body of research evidence that clearly indicates *what works*. The fact that this is most often not the case is alarming (Rowe, 2005b, 2006b). For example, in highlighting the evidence indicating that

failure in student learning is strongly linked to deficiencies in teaching practice in many Australian schools, Wheldall (2006, p. 177) notes:

[A] necessary condition for learning to take place is effective instruction, but we hardly ever seem to employ it in schools! This is particularly evident in the teaching of reading. In spite of the failure of so-called *whole language* in teaching reading [a *constructivist* orientation], this is the approach that most teachers identify with and which dominates practice in our schools. ... This frustration with ineffective instruction in reading and related skills led to our development of MULILIT [Wheldall & Beaman, 2000]. By employing a rigorous, intensive, systematic, skills-based program of instruction, we have demonstrated that low progress readers can make extraordinary progress.

These observations correspond with the purpose of the present paper, namely to highlight local and international evidence-based research findings that identify ‘best’ teaching practice for student learning, and thus, *instructional leadership*, especially for those who experience learning difficulties. Compared with *constructivist* pedagogies, the key elements of *Direct Instruction* and the research evidence that support its utility are worth noting here – albeit briefly.

### Key features of *Direct Instruction* and its research-base

*Direct instruction* (DI) – sometimes referred to as *explicit instruction* – “is a systematic method for presenting learning material in small steps, pausing to check for student understanding, and eliciting active and successful participation from all students” (Rosenshine, 1986, p. 60). DI modes of instruction are well grounded in findings from evidence-based research in cognitive science, and give little attention to the ‘causes’ of under-achievement, learning difficulties, or to students’ underlying abilities (Casey, 1994; Coltheart, 2005). Thus, DI programs are designed according to **what**, not **who**, is to be taught. Individual differences among students are allowed for through different entry points, reinforcement, amounts of practice, and correction strategies (see: Engelmann, 1999; Hempenstall, 1996).

*Direct Instruction* is based on both the theory and evidence that learning can be greatly accelerated if instructional presentations are clear, minimise misinterpretations, and facilitate generalizations. The principles upon which DI approaches are based include:

- all children can learn, regardless of their intrinsic and context characteristics;
- the teaching of basic skills and their application in higher-order skills is essential to intelligent behaviour and should be the main focus of any instructional program, and certainly prior to student-directed learning activities; and
- instruction with students experiencing learning difficulties must be highly structured and permit large amounts of practice (Block, Everson, & Guskey, 1995; Bowey, 2000).

Evidence for the utility of DI for the acceleration of student learning has been well demonstrated in findings from *Project Follow Through*, the largest and most costly research study in the history of education, in which both *constructivist* ‘student-centred’ (or ‘student-directed’) models of teaching and ‘teacher-directed’ models were evaluated in terms of student learning gains (see: Kinder & Carmine, 1991; Stebbins *et al.*, 1977). The project began in 1967 with US President Lyndon Johnson’s ‘war on poverty’ and was government-funded until 1995. This massive government initiative was aimed at breaking poverty cycles by providing disadvantaged students with a ‘better education’. Over a period of almost 30 years and at cost of more than one billion US dollars, *Project Follow Through* included over 70,000 students in more than 180 schools.

The project’s objective was to identify teaching methods that are demonstrably effective in improving the academic performance of students in America’s underprivileged schools – from at and below the 20th percentile level to the 50th percentile levels (Adams & Engelmann, 1996). In the final analysis (Stebbins *et al.*, 1977) students being taught under the *Direct Instruction* model scored close to the 50th percentile in every subject, while for the other student-directed models, students consistently scored beneath the 20th percentile. Analysts of *Project Follow Through*

evaluation data were unanimous in their agreement that teacher-directed methods of instruction resulted in consistently stronger student learning gains than those obtained from student-directed methods (Bereiter & Kurland, 1981; Lindsley, 1992). An analysis of the comparison data reported by Engelmann *et al.* (1988) also showed that of all the teaching models evaluated in *Project Follow Through*, the student-directed models consistently obtained the lowest achievements in all subjects.

Meta-analytic syntheses of findings from more than 500,000 evidence-based studies of influences on student learning outcomes, including teaching methods, provide support for these results.<sup>2</sup> From such syntheses, Hattie (2003) has rank-ordered average *effect sizes* of commonly studied influences on student learning, as summarised below in Tables 1a and 1b.

**Table 1a Stronger Influences on Student Learning**

Influence	Effect Size	Source of Influence
<b>Feedback</b> (instructional & assessment)	<b>1.13</b>	<b>Teacher</b>
Students' prior cognitive ability	1.04	Student
<b>Instructional quality</b>	<b>1.00</b>	<b>Teacher</b>
<b>Direct instruction</b>	<b>0.82</b>	<b>Teacher</b>
<b>Remediation feedback</b>	<b>0.65</b>	<b>Teacher</b>
Students' disposition to learn	0.61	Student
Class environment	<b>0.56</b>	<b>Teacher</b>
Challenge of Goals	<b>0.52</b>	<b>Teacher</b>
Peer tutoring	<b>0.50</b>	<b>Teacher</b>
Mastery learning	<b>0.50</b>	<b>Teacher</b>
Parent involvement	0.46	Home
<b>Homework</b>	<b>0.43</b>	<b>Teacher</b>
<b>Teacher Style</b>	<b>0.42</b>	<b>Teacher</b>
<b>Questioning</b>	<b>0.41</b>	<b>Teacher</b>

**Source:** Adapted from Hattie (2003, p. 4).

From Tables 1a and 1b, several features of the data are notable. First, of the 32 'influences' listed, 29 have positive effects – 20 of which are related to teachers (i.e., 69%). Second, of the 14 stronger effects given in Table 1a (ES > 0.4 SDs), 11 (~79%) are influenced by teachers. Third, teacher-directed practices that constitute key features of *Direct Instruction* modes of teaching have strong effects on student learning outcomes (i.e., ES > 0.65 SDs), namely: *Instructional & Assessment Feedback*, *Instructional Quality*, *Direct Instruction*, and *Remediation feedback*.

In commenting on these findings, Hattie (2003, p. 4) notes:

... the focus is to have a powerful effect on achievement, and this is where excellent teachers come to the fore – as such, excellence in teaching is the single most powerful influence on achievement. As can be seen from a sample of the possible influences, the major influence near the top of this chart [Table 1a] is in the hands of the teacher. (Although we note some at the bottom, which highlight that it is excellence in teaching that makes the greatest differences, not just teachers).

<sup>2</sup> *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* ≤ 0.3 is regarded as 'weak'; 0.5 is considered 'moderate'; and ≥ 0.8 as 'strong'.

**Table 1b Weaker Influences on Student Learning**

Influence	Effect Size	Source of Influence
Peer effects	0.38	Peers
Advance organisers	0.37	<b>Teacher</b>
Simulation & games	0.34	<b>Teacher</b>
Computer-assisted instruction	0.31	Teacher
Testing	0.30	<b>Teacher</b>
Instructional media	0.30	<b>Teacher</b>
Aims & policy of the school	0.24	School
Affective attributes of students	0.24	Student
Physical attributes of students	0.21	Student
Programmed instruction	0.18	<b>Teacher</b>
Ability groupings	0.18	School
Audio-visual aids	0.16	<b>Teacher</b>
Individualisation	0.14	<b>Teacher</b>
Finances/money	0.12	School
Behavioural objectives	0.12	<b>Teacher</b>
Team teaching	0.06	<b>Teacher</b>
Physical attributes (e.g., class size)	-0.05	School
Television	-0.12	Home
Retention	-0.15	School

**Source:** Adapted from Hattie (2003, p. 4).

Given the compelling findings of Hattie's work (as well as that of Swanson, 1999; Swanson & Deshler, 2003), the results of *Project Follow Through* outlined above, together with the syntheses of research on effective methods for the teaching of reading documented in the reports of the *National Reading Panel* (see: NRP, 2000, and the related research including: Camilli, Vargas and Yurecko, 2003; Ehri *et al.*, 2001; and reviewed by Rowe, 2005b, pp. 20-23), one might well ask why these findings have failed to impact the policies and practices throughout the educational community.

In an analysis of why the results of *Follow Through* were not acted on, Watkins (1995) asserted that: "parochial vested interests that work to either maintain the *status quo* or to advance self-serving models can prevent the implementation of teaching methods, approaches, or practices that clearly have an impact on student learning outcomes" (p. 61). Vested interests can be those of policymakers, faculty staff in higher education institutions, teachers, school district administrators, publishers, and the general public. For instance, Watkins observed that policymakers frequently develop policy that is based on public support, or the ideological views of academic, social and political pressure groups, rather than on empirical evidence. They often rely on inaccurate or incomplete information that others provide. Stakeholders who exert power but ignore the evidence, all too frequently influence them unduly.

From their analyses of findings from *Project Follow Through*, Bereiter and Kurland (1981) also noted competing pedagogical philosophies that prevailed at the time. But, "Philosophies don't teach kids. Events teach kids..." (p. 16). The events that need to happen for students with and without learning difficulties are those devised by teachers for implementation in their classrooms. Above all, these events should be informed by a thorough evidence-based knowledge of *what* works, *why* it works, and *how* it works. To this end, the Australian Council for Educational Research, with funding support from the Australian Government Department of Education, Science and Training (DEST), has developed an evidence-based teacher professional development (PD) package entitled: *Working-Out What Works (WOWW) Training and Resource Manual* (Hoad, Munro *et al.*, 2005, 2007). The first edition of this manual (Hoad, Munro *et al.*, 2005) was used in a recent and highly successful national 'Third Wave' research

project aimed at improving the literacy and numeracy achievement outcomes of students with learning difficulties in Years 4, 5 and 6 in mainstream government, Catholic and independent schools (for specific details and findings from this project, see Rowe, 2006b; Rowe, Stephanou & Hoad, 2007).

### Concluding comments

Findings from such research are entirely consistent with those from a large body of evidence-based research that indicates superior effects of initial *direct instruction* and *strategy instruction* approaches on student learning. So what makes the difference to students' learning and achievement progress? Simply, when teachers are taught **how to teach** by first employing *direct/explicit instruction* teaching methods prior to expecting productive student engagement with useful constructivist learning activities.

In this context, it is worth noting the outstanding success of the transformational *instructional leadership* provided by John Fleming, former principal of Bellfield Primary School – one of the most disadvantaged government schools in Victoria, Australia (Caldwell, 2006, pp. 139-142). Of particular relevance here is that Fleming, during an initial and subsequent visit by members of the Committee for the *National Inquiry into the Teaching of Literacy* during 2004-2005 (Rowe, 2005a), made it clear that regardless of teachers' practical experience and the content of training received by the higher education institutions in which they obtained their pre-service education, he and several senior members of staff provided all incoming teachers with professional learning in the demonstrably effective evidence-based teaching strategies of *direct/explicit instruction*.

Thus, despite focus on the relative effectiveness of instructional strategies in the present paper, 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. That is, *educational effectiveness* for all students is crucially dependent on the provision of *quality teaching* by competent teachers who are equipped with effective, evidence-based teaching strategies that *work*, and are supported by *instructional leadership* that focuses on teacher capacity-building towards the maintenance of high teaching standards via strategic professional development at all levels of schooling (Darling-Hammond & Bransford, 2005; Ingvarson & Rowe, 2007; OECD, 2005b).

Further, it is important to note that the relative utility of *direct instruction* and *constructivist* approaches to teaching and learning are neither mutually exclusive nor independent. Both approaches have merit in their own right, provided that students have the basic knowledge and skills (best provided initially by *direct instruction*) **before** engagement in 'rich' *constructivist* learning activities. The problem arises when student-centred *constructivist* learning activities precede explicit teaching, or replace it, with the assumption that students have adequate knowledge and skills to effectively engage with *constructivist* learning activities designed to generate new learning. In many instances, this assumption is not tenable, particularly for those students experiencing learning difficulties, resulting in low self-esteem, dysfunctional attitudes and motivations, disengagement, and externalizing behaviour problems at school and at home (DeWatt, Berkman *et al.*, 2004; Hinshaw, 1992a,b; Rowe & Rowe, 1992, 1999, 2000; Rowe, Pollard & Rowe, 2005, 2006; Smart, Sanson & Prior, 1996). Deleterious outcomes of these kind arise as a direct consequence of 'putting the cart-before-the-horse', such that *educational effectiveness* for both teacher and student is denied.

It is also 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 education. Whereas a key *function* of education is the provision of quality teaching and learning experiences that meet the developmental and learning 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, etc.) at the expense of *function* (quality teaching and learning). Unfortunately, such

emphases are indicative of a pervasive ignorance about what **really** matters in 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 *educational 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 and moribund forms of *biological* and *social determinism* (as noted earlier) which assume that individual students – whether they be males or females – do poorly or well 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 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 ideological beliefs and their expectations at the teacher, school leadership, university and system levels have little substantive justification in the light of findings from both existing and emerging evidence-based research, including those from the 'Third Wave' Project. These findings provide strong 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 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).

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 experience learning difficulties (Cuttance, 2001; Rowe, 2004b; Rowe & Rowe, 2002). As Slavin and colleagues' evaluations of the 'Success for All' program among low socioeconomic schools in Baltimore and Philadelphia have shown, students who, regardless of their gender, socio-economic or ethnic backgrounds are taught by well-trained, strategically focused, energetic and enthusiastic teachers, are fortunate indeed (Slavin, 1996, 2005).

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. 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 on-going 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, 2001, 2002, 2005; Ingvarson, Elliot *et al.*, 2006; Ingvarson & Rowe, 2007).

Finally, the summary of findings from evidence-based research for the effects of *quality teaching* on student outcomes provided by Professor Linda Darling-Hammond at Stanford University 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 students and teachers, let alone the social and economic future of any nation, the enduring hope is that the importance of *quality teaching* (pedagogical knowledge and practice) 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, evidence-based pre-service education, *instructional leadership* 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 national social and economic futures (e.g., Cochran-Smith & Zeichner, 2005; Darling-Hammond & Bransford, 2005).

As indicated earlier, the realisation **must** be that since teachers are the most valuable resource available to schools, an investment in teacher professionalism is vital by ensuring that they are equipped with a repertoire of pedagogical skills that are demonstrably effective in meeting the developmental and learning needs of ALL students. 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). Clearly, the key to such *educational effectiveness* involves an operational understanding of the fundamental importance of evidence-based teaching practices for the provision of quality teaching and learning standards in education. Such standards underscore the imperative of *instructional leadership* that maximises both teacher and student learning outcomes as mutual partners in professional learning communities.

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