

Primary Schooling In Australia: Pseudo-Science Plus Extras Times Growing Inequality Equals Decline

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Abstract

Australian primary students are out-performed by their secondary peers in relative terms on international measures of student achievement. This paper explores some explanations for this discrepancy including the role of content knowledge in primary curricula, a general lack of an evidence base for teaching and learning in primary education with a propensity to adopt fads and fashions and the increasingly unrealistic and untenable expectations placed on primary teachers and schools.

A solid research evidence base for teacher pre-service and in-service teacher education is essential and there is a need to question from this basis of evidence current practices and untested assumptions underpinning primary teaching and schooling.

If such transformation can't be achieved, coupled with a rethinking of the expectations held for primary schools and primary teachers, then further decline in relative and absolute terms seems inevitable.

Introduction

There was concern when Australia's latest results for the international testing programs TIMSS (Trends in International Mathematics and Science Study) and PIRLS (Progress in International Reading Literacy Study) were released (Thompson, et al., 2012). In Year 4 TIMSS Australia came 18th out of 50 countries in mathematics and 25th out of 50 in science. However in Year 8 TIMSS, Australia did better in relative terms, placing 12th out of 42 participating nations in both maths and science.

In year 4 PIRLS a similar pattern was evident with Australia placed 27th out of 45 nations for reading. However for the most recently available PISA data (2012, for 15 year olds), Australia was placed equal 13th out of 53 for reading literacy (Thompson, et al., 2013).

Caution needs to be exercised when inferring from such rankings – differences between nations are sometimes small and the metrics are different – but the overall trends should be of concern. Why does Australia do relatively more poorly on these international measures of achievement in the primary years? For example, Australia outperforms both the US and England on every measure of PISA, yet is clearly outperformed by these

nations on Year 4 TIMMS and PIRLS. Why does Australia appear to make up ground against other countries between the middle primary and middle secondary years (although there is also a general decline for Australia's scores on PISA both absolutely and relatively against other nations) (OECD, 2011; Thompson, et al., 2012, 2013)?

Is this the result of 'poorer' teaching in the primary years and/or 'better' teaching in the secondary years, or are there other factors that might account for these differences?

Some Possible Explanations

There are a variety of possible explanations for the primary-secondary performance discrepancy but the following are offered for consideration as factors influencing the performance of primary age students in Australia.

Content Knowledge is Seen by Some as Problematic

Until the mid-1960s to 1970s, curricula in Australia tended to be centrally devised (at state or territory level) and content or knowledge centred, with frequent use of formal testing. Teachers knew what they had to teach and when to teach it, regardless of the background of their students, their school or its location. There was little recognition of individual differences in either students or school contexts and the notion of the development of values – let alone alternative values - was largely absent.

However from the 1970s new curriculum documents tended to de-emphasise knowledge and content and were based upon the principle of 'school based curriculum development' within broader frameworks, rather than centrally devised and assessed prescriptive content. In short, curriculum development moved from the 'centre' to schools and to teachers, a paradigm shift many educators were in favour of but few appeared adequately prepared for (Brady, 1987: 3-20).

The 1960s had been a time of social questioning, activism and change and this was reflected in school curricula which became more 'issues' based. The environment, multinational corporations, multiculturalism, rights of various types, to name only some issues, became part of the curriculum. New curricula recognised and privileged skills and values acquisition, diversity, experiential learning, cross-curricular thematic approaches, cooperative learning and 'group work', problem solving, critical thinking and more personalised learning. In literacy, the 'whole language' approach superseded 'phonics' – not for the first time – and the formal teaching of grammar receded (Scott, 2009: 81; McGuinness, 1997).

There had been of course a long history of 'progressivist', 'child-centred', 'constructivist', inquiry type approaches to teaching and schooling going back to the late 19th century but in schooling, things tend to go in and out of fashion before being 'rediscovered' (see Scott, 2009; Christodoulou, 2014: 11-14).

Unfortunately in education there is a tendency to formulate and advocate false dichotomies and the result in this instance was that content knowledge was seen by many as counter to the learning process. In primary education especially, this resulted in many cases in a largely 'content free' curriculum, particularly in the humanities where teachers had wide choice and little guidance. Learning processes, issues and activities tended to be privileged over knowledge and formal testing declined.

An example of this paradigm was observed by the writer in an upper primary class a few years ago. Students in groups had been asked to research an aspect of Australian history and present this by means of an animation created using a digital camera. One group had chosen the First Fleet entering Sydney Harbour in January 1788. The small fleet of ships

was being heroically led by Captain James Cook. Unfortunately for both the students and Captain Cook, he had been killed in 1779. Was this error seen as significant? No, because ‘the most important thing’ was that the students had been ‘engaged in the process’. In this way, means and ends have been confused, with activity and ‘engagement’ seen as more important than actual learning outcomes achieved:

Subject content knowledge has been portrayed by some as rote learning and recitation of facts, names, dates and places, and is seen as less worthy than critical thinking and the acknowledgement of multiple social realities. Learning to learn is seen as preferable to learning. Teacher-directed learning is seen as old-fashioned, even harmful, while student activity and choice is championed, regardless of what that activity or choice might entail (Dinham, 2008a: 95-96).

Yet as Willingham (2009: 47) has commented:

Data from the last thirty years lead to a conclusion that is not scientifically challengeable: thinking well requires knowing facts ... The very processes that teachers care about most – critical thinking processes such as reasoning and problem solving – are intimately intertwined with factual knowledge that is stored in long-term memory (not just found in the environment).

This has taken a further twist with the widespread use of the internet. It is argued by some that the teacher as expert - the ‘sage on the stage’ - is no longer needed but rather teachers should be facilitators of learning – the ‘guide by the side’ – and in any case why should students need to learn anything when virtually all of human knowledge is only a mouse click away. However because of this context, the need for effective, knowledgeable teachers is greater than ever in order to assist students to navigate the mass of material ‘out there’. Further, it is not a matter of a teacher being an expert in either content or pedagogy. As Shulman (1986) pointed out long ago, teachers need to be masters of both through what he termed pedagogic content knowledge.

Knowledge/content versus activity/process is not the only false dichotomy of course. Student centred rather than teacher directed learning, as noted above, is another position many ascribe to but as research shows, the two do not have to be mutually exclusive (Christodoulou , 2014: 27-42; Ayres, Dinham & Sawyer, 2004; Dinham, 2008a: 95).

The Lack of an Evidence Base for Teaching and Learning: Fads, Myths, Legends, Ideology and Wishful Thinking

It is given that teachers want their students to learn. Anything that promises to aid in the achievement of this is therefore attractive. Unfortunately education is subject to the same sorts of fads and fashions as the rest of society but in the case of teaching, real harm can come from adopting an untested strategy. There are well developed protocols prior to the introduction of any new drug or treatment in medicine yet educators readily experiment upon students - a situation where lives are also at stake - with unproven (or even disproved) methods. This is compounded by the fact that a scientific approach is rarely taken. Rather than changing one variable and measuring its impact, the tendency is to change a range of things simultaneously and hope for the best.

One such approach is ‘discovery learning’ and its allied concept, ‘constructivism’. It has become an ideology or article of faith for some that it is ‘better’ if students can discover and construct their own learning. Writing in the *American Psychologist*, Mayer (2004: 18) reviewed the research evidence and concluded:

The debate about discovery has been replayed many times in education, but each time, the research evidence has favoured a guided approach to learning. ... Today's proponents of discovery methods, who claim to draw their support from constructivist philosophy, are making inroads into educational practice. Yet a dispassionate review of the relevant research literatures shows that discovery-based practice is not as effective as guided discovery. An important role for psychologists is to show how educational practice can be guided by evidence and research-based theory rather than ever-shifting philosophical ideology.

However unguided discovery learning, problem based learning, inquiry and constructivism are popular with many teachers and are common strategies in primary classrooms, with students receiving little or no guidance. A variation is social constructivism where students work in small groups trying to discover what they need to know. Hattie found from extensive meta-analyses that problem based learning has an effect size of only 0.16 whereas direct instruction, where the teacher is clear of his or her learning and teaching intentions and orchestrates the learning of the students accordingly, has an effect size of 0.59 (Hattie, 2009: 297, 300). Mayer concluded from his analysis that 'the formula *constructivism = hands-on activity* is a formula for educational disaster' (2004: 17).

This is not the full extent of the fads and fashions, however. There is a raft of other approaches for which a research evidence base is either lacking or non-supportive. These include learning styles, neuro-linguistic programming, multiple intelligences, 'thinking hats', brain exercise, emotional intelligence, the 'Mozart effect', so-called 21st century curriculum and associated skills and 'digital natives' (see Bennett, 2013; Scott, 2014).

The belief in and use of learning styles has been particularly pervasive. Stahl (1999: 1) has commented:

I work with a lot of different schools and listen to a lot of teachers talk. Nowhere have I seen a greater conflict between 'craft knowledge' or what teachers know (or at least think they know) and 'academic knowledge' or what researchers know (or at least think they know) than in the area of learning styles. ... The whole notion seems fairly intuitive. People are different. Certainly different people might learn differently from each other. It makes sense.

However there is a distinct lack of empirical support for the existence of learning styles:

The reason researchers roll their eyes at learning styles is the utter failure to find that assessing children's learning styles and matching to instructional methods has any effect on their learning (Stahl, 1999: 1).

An extensive review of the research evidence for learning styles concluded (Pashler, et al., 2008: 105):

Although the literature on learning styles is enormous, very few studies have even used an experimental methodology capable of testing the validity of learning styles applied to education. Moreover, of those that did use an appropriate method, several found results that flatly contradict the popular meshing hypothesis.

We conclude therefore, that at present, there is no adequate evidence base to justify incorporating learning styles assessments into general educational practice.

Yet as Scott has noted (2010: 8):

Failure to find evidence for the utility of tailoring instruction to individuals' learning styles has not prevented this term from being a perennial inclusion in discussions about and recommendations on pedagogy. It also continues to influence what teachers do in their day-to-day work. Practitioners from preschool to university level attempt to apply the theory in classrooms, administering the unreliable tests, criticised by so many, to their students, using the results as a guide to classroom practice and encouraging or requiring students to apply the results to understanding, controlling and explaining their own learning.

Bennett (2013) exposed both the lack of evidence for these fads and the harm they can do. Unfortunately, these approaches are popular, particularly in primary schools, and are often thrown together in what Howard Gardner of multiple intelligences (MI) fame terms 'dazzling promiscuity'. In fairness to Gardner, he is highly critical of how his work has been reified and misused in education (cited in Demos, 2004: 15):

I learned that an entire state in Australia had adapted an education programme based in part on MI theory. The more I learned about this programme, the less comfortable I was. ... much of it was a mishmash of practices, with neither scientific foundation nor clinical warrant. Left-brain and right-brain contrasts, sensory learning styles, 'neuro-linguistic programming', and MI approaches commingled with dazzling promiscuity.

Dekker and colleagues tested some of the 'neuromyths' held by teachers – which they define as beliefs 'loosely based on scientific facts' - and the possible effects of these on teachers and their teaching (2012: 1):

A large observational survey design was used to assess general knowledge of the brain and neuromyths. The sample comprised 242 primary and secondary school teachers who were interested in the neuroscience of learning. ... Participants completed an online survey containing 32 statements about the brain and its influence on learning, of which 15 were neuromyths. ... Results showed that on average, teachers believed 49% of the neuromyths, *particularly myths related to commercialized educational programs*. [Emphasis added] ...

These findings suggest that teachers who are enthusiastic about the possible application of neuroscience findings in the classroom find it difficult to distinguish pseudoscience from scientific facts. Possessing greater general knowledge about the brain does not appear to protect teachers from believing in neuromyths. This demonstrates the need for enhanced interdisciplinary communication to reduce such misunderstandings in the future and establish a successful collaboration between neuroscience and education.

As Stahl noted above (1999), these approaches are intrinsically appealing but the fact is that learning is not so simple. Aside from wasting teachers' and students' time and schools' money, the real cost of dabbling with such unsupported strategies is that students are not being taught what they need to know, coupled with the harm caused to them by arbitrary, invalid labelling and categorisation. Through such practices students can come to see their abilities as fixed or limited, something Dweck (2000) has termed

‘entity thinking’. This can powerfully constrain future learning. Those convinced that they have a natural, innate talent for something will be disappointed when they come to expect success without effort, whilst those who believe they don’t have a talent for something may be put off from even trying.

Hattie (2009: 297) found that not labelling students has a large effect size of 0.61 for student learning yet categorisation is something approaches such as learning styles, thinking hats, multiple intelligences, personality types (see Paul, 2004) and so forth are predicated on. A key point to consider: have students been asked what they think of all this, especially the use of categorisation? Their answers will be instructive.

Christodoulou (2014) has critiqued and refuted seven powerful myths about education that capture much of the above discussion:

1. Facts prevent understanding
2. Teacher-led instruction is passive
3. The twenty-first century fundamentally changes everything
4. You can always just look it up
5. We should teach transferable skills
6. Projects and activities are the best way to learn
7. Teaching knowledge is indoctrination.

Expectations on Primary Teachers are Unrealistic and Untenable

Primary schooling has suffered more than secondary when it comes to the overcrowded curriculum. Every time there is a problem in society there is someone advocating that it should be addressed within the primary curriculum, which in turn must be addressed in pre-service teacher education courses. Rarely is anything taken away to balance what is imposed. The results are an overcrowded and at times unbalanced curriculum, both in schools and in pre-service teacher education courses, putting pressure on teachers, time and resources.

Some of the ‘extras’ that society seems unable or unwilling to deal with include sex and sexuality, drugs, healthy food, homophobia, racism, environmental concerns, body image, bullying, bicycle safety, bomb education, weed identification, boys’ education, driver education, dog education, career education, manners, crime detection, stranger danger, child abuse, depression and forced marriage, to cite but a fraction of those advocated over the past decade.

It could be argued that each of these issues is significant but the cumulative effects are deleterious. As the primary school curriculum has become increasingly crowded with social ‘extras’, there has also been pressure imposed by greater external testing and reporting on the ‘basics’. It has thus become more difficult to train, professionally develop and support primary teachers. As the breadth of teaching increases, inevitably, depth and effectiveness decreases.

If it is deemed important that these issues are to be addressed during the school day, primary teachers and schools need the input and support of trained professionals to provide the specialised knowledge needed to fulfil these ‘social welfare’ expectations. The usual response is that there needs to be greater integration of these issues into the academic curriculum but something has to give; compromises and ‘watering down’ are inevitable. As it stands, the ‘academic’ and ‘social welfare’ workloads of the generalist primary teacher have made the role increasingly untenable, particularly in the context of greater external testing.

There is a further layer impacting on teachers' workloads and this concerns the increasing mandatory reporting and administrative burdens placed on teachers and schools (see Alexander, 2010: 444-445; Scott, Stone & Dinham, 2001).

A Degree of Specialisation is Needed in Primary Teaching

A point has been reached where if effective teaching and learning are to occur in the primary years, a degree of teacher specialisation needs to be introduced. This is increasingly common in the non-government sector but less so in government schools. Whenever this is mooted, a common reaction is dismay that primary schools could adopt the perceived worst aspects of high schools – multiple teachers, teaching subjects rather than students and the tyranny of the bells. After all, one of the principles of middle schooling is to ease the primary-secondary transition through making the middle years more like primary schooling (Dinham & Rowe, 2008). However there may be advantages in making the (upper) primary years more like secondary education. This could also make the primary-secondary transition less problematic, if in fact it is a problem.

High schools today are generally more orderly - academically speaking - than primary schools, although secondary teachers also suffer the effects of loss of teaching time through additional activities, issues and mandatory 'perspectives'. The primary school day is fragmented with numerous disruptions and changes of activity and these are more intrusive than in the typical high school where to some degree timetables and subject allocations afford protection against loss of time and focus. In primary schooling it is difficult to finish anything and being generalists, primary teachers struggle to master and cover all aspects of the curriculum (Dinham, 2007).

Science is particularly problematic, as many reviews have demonstrated (see Committee for the Review of Teaching and Teacher Education, 2003). Many primary teachers report they lack the knowledge and expertise to teach science effectively, resorting to 'cookbook' activities (see Goodrum, et al., 2001) and thus science receives less attention and effective treatment in the typical school day than is intended or desirable (Committee for the Review of Teaching and Teacher Education, 2003).

Maths or numeracy has also been highlighted as being problematic, with some primary teachers lacking a year 12 qualification in mathematics as well as confidence and competence in teaching the subject. Time devoted to preparation in maths and science content and pedagogy in primary pre-service teacher education is limited because of the necessity to cover all aspects of the primary curriculum, something compounded by the trend from four year undergraduate pre-service programs to two year graduate programs.¹

It is time the introduction of specialist maths and science primary teachers in government schools was seriously considered, especially given the shortages of secondary maths and science teachers (Productivity Commission, 2012, 64-65). As maths and science specialist teachers enter primary teaching this will enable other generalist teachers to specialise more through being released from some of their present, subject-based responsibilities. Generalist teachers could also be supported through team-teaching with these subject specialists. Primary students may well welcome the variety and challenge resulting from greater teacher specialisation. Under such an arrangement, primary school

¹ The University of Melbourne has introduced specialisations in maths or science primary teacher education from 2014. Selected candidates will still be generalists but will complete at least 25 per cent of their two year Master of Teaching in either maths or science primary teaching. Subjects will be designed and delivered through close cooperation of education academics with science and maths faculties and departments (see also <http://remstep.org.au/>).

students (and teachers) would have the benefit of working with someone with a greater depth of knowledge, both content and pedagogic, and hopefully passion for their specialisation, which would provide a firmer foundation for student success in the primary years of schooling and in later secondary education.

It has been demonstrated how important primary students' attitudes towards maths and science are in predicting later achievement in these subjects (Hattie, 2009: 50-51). Problems such as low secondary engagement and achievement in maths and science, reluctance of senior secondary students to take the higher and more difficult courses in maths and science, the decline in participation in undergraduate maths and science subjects and courses (Chinnapan, et al., 2007) and the shortages of applicants to maths and science teaching, have their origins in the teaching primary students receive in these subjects. It is a cycle that needs to be broken.²

Self-esteem Boosting and a Lack of Constructive, Developmental Feedback

Research shows that student self-esteem or self-concept can have moderate or greater effects on student learning (Hattie, 2009: 46-47). Some teachers have been convinced therefore that if self-esteem can be boosted to higher levels this will result in enhanced learning, a classic case of 'putting the cart before the horse' or confusing cause and effect. Conversely it is thought that any form of criticism, correction or failure will harm self-esteem and thus learning and should therefore be avoided. The downside of this is that students can gain an inflated view of their capacities which can lead to entity thinking mentioned previously (Dweck, 2000). The author has observed primary classrooms where no one receives a 'bad' or failing mark, red pens are not used to correct work because 'red is an angry colour' and 'merit' certificates are thrown around like confetti for meeting normal expectations. In short, rampant 'positive reinforcement' abounds.

However the best way to legitimately boost self-esteem is for students to receive regular constructive, developmental feedback, something known to have one of the most powerful effects on learning (Dinham, 2008b; Hattie, 2009: 173-178). If students can see and feel themselves achieving, even in small increments, this can then lead to an increase in self-concept which sets up a cycle for further improvement. However empty, inauthentic, unwarranted praise ultimately hampers both learning and self-esteem (Scott & Dinham, 2005; Dinham & Scott, 2007).

Authentic achievement, no matter how small, is thus the best way to engender self-concept and self-esteem. This can then serve as a foundation for further achievement. When students have their self-esteem boosted artificially in inauthentic ways, on the other hand, the air quickly comes out of the balloon when they hit the wide world and meet real-life challenges (Dinham, 2010). Thus unwarranted self-esteem boosting works against building perseverance and resilience in primary age children, qualities necessary to meet later challenges in schooling and life (see Stewart, et al., 2004).

² See *Reconceptualising Mathematics and Science Teacher Education Programs through collaborative partnerships between scientists and educators* <http://remstep.org.au/> for a current initiative designed to address some of these issues regarding maths and science teaching.

Discussion – Where Rethinking and Action are Necessary

This paper should not be construed as an intended criticism of either primary teachers or teachers in general. There has been too much of blaming teachers for things outside their control, coupled with simplistic measures purported to improve the quality of teachers and the quality of teaching through rewarding, testing, judging, ‘fixing’ or removing ‘underperforming’ teachers (Dinham, 2013a).

Whilst teachers might be the biggest *in-school* influence on student achievement (Hattie, 2009), they are not the only one, yet this finding has been misused to imply that it is the teacher’s fault when students fail to learn. The words ‘in school’ have been mislaid, by accident or design, and it is common to hear of the teacher being ‘the biggest influence on student achievement’. Instead of a collegial opening up of classrooms and professional practice, what follows is a view that because of their importance, we need greater control over and surveillance of teachers.

This raises questions about how primary teaching is conceptualised and enacted in schools given the increasing expectations held for both schools and teachers. There is a need for strong, evidence-based teacher pre-service education and on-going professional development. There is a need to question from a basis of firm evidence the foundations for what teachers do in schools and to test empirically what are presently regarded as ‘facts’ (see Sahlberg, 2014). There is a need to question from a basis of evidence and drive out the folklore, dogma, ritual and untested assumptions underpinning primary teaching and schooling. There is a need to reject the pseudo-science and the shiny products people want to sell educators.

There is a need to equip teachers with knowledge and tools for effective teaching and learning and for teachers to adopt a clinical, diagnostic approach to individual student assessment and learning (McLean Davies, et al., 2013; NCATE, 2010). There is a need for teachers with high intellectual capacity and strong content and pedagogic content knowledge. It is not sufficient to just like young people and to want to be a teacher. There is also a need for school leaders with strong instructional leadership capability who can lead teaching and learning (Dinham, 2013b).

There is a need to rethink and reinstate the philosophical bases and moral purposes of primary education, key considerations that appear to have been lost and are now largely absent from primary curriculum documents and statements. There is a need to focus on agreed outcomes, not only academic but also personal and social (see MCEETYA, 2008) and not just activities in the hope these will ‘engage’ students. Too great a focus on external test results alone can be counter-productive (see Berliner, Glass & Associates, 2014: 12-17).

There is a need to use intelligently the vast amount of extant educational research rather than grasping at ‘quick fixes’ promoted by economists, policy advisers and the corporate sector to deliver enhanced learning. Complex problems require complex solutions. There is a need to break the cycle of teachers teaching the way they were taught. ‘Forget everything you’ve learned at uni’ and ‘don’t expect too much and you won’t be disappointed’ are not the ways to move teaching and learning forward, yet for beginning teachers this is frequently their introduction to teaching.

It is important to recognise the inequalities that exist in Australian society. Many young people enter primary education with disadvantages associated with health, poverty, family background, geographic location and the lack of any form of pre-school education. Primary teachers are in the front line of dealing with the effects of such

disadvantage as they attempt to meet the needs of their students and the expectations society has for them. Many primary schools serving such students are also disadvantaged and financially impoverished.

The primary years of schooling are vital in setting up young people for successful lives. There are wonderful practitioners in primary education and many pockets of excellence but as a whole we can do better. It is debatable whether primary education today is more effective overall than it was 50 years ago, in part because of the issues raised above. Competing dichotomous ideologies – the ‘literacy wars’ fought over ‘whole language’ versus ‘phonics’ for example - and the widespread unquestioned acceptance of educational fads, coupled with the overcrowding of the primary curriculum through the unreasonable shifting of expanding social responsibilities to schools has created an untenable situation. Teachers and young people deserve better.

Wilkinson and Pickett (2009) have demonstrated that inequality in society is worse for everyone – or in other words, as they put it in their book title, ‘more equal societies almost always do better’ - and their data indicate that Australia is becoming a less rather than more equitable society. This puts further pressure on schools and thus there is a need to ensure that primary schools are resourced as well and as equitably as possible according to need and that spending is targeted to those things that are known to add most value (see the ‘Gonski Report’, Australian Government, 2011; Gonski, 2014).

Ken Boston, a member of the Gonski review committee, is blunt in his assessment (2013: 16):

[T]he decline in the performance of our schools in reading, mathematics and science across the past decade or more ... [is a situation that] is entirely self-inflicted. ...

Independent international studies of Australian school performance show that we are in trouble and have been so for at least two generations of schooling. Our business model for school funding – based on the funding of sectors rather than the funding of schools according to the job to be done – has comprehensively failed in the long term.

It has failed for two reasons. First, it has led to Australia having one of the most socially segregated education systems in the OECD. Across the world, there is a positive correlation between socioeconomic advantage and educational performance: in Australia, socioeconomic disadvantage has a greater adverse effect on educational achievement than in any other comparable OECD country. ...

Second, there is no real competition between sectors. The sector-based business model has failed to create an even playing field on which government, Catholic and independent schools can compete to drive up school performance.

Conclusion

The biggest equity issue in Australian education is a quality teacher in every classroom (Dinham, 2011: 38). There is a need to ensure that those entering teaching are of the highest quality and that teachers are well trained and supported over their careers to be the best they can be. There is a need to ‘enable teachers to develop a critical attitude toward the information they receive and examine scientific evidence before including ... findings into their teaching practice’ (Dekker et al., 2012: 6).

Effective evidence-based pre-service and in-service professional learning is the key, coupled with developmental teacher feedback and appraisal processes to ensure that all teachers continue to improve their effectiveness and are recognised and rewarded appropriately for this (Dinham, Ingvarson & Kleinhenz, 2008).

If such transformation can't be achieved, coupled with a rethinking of the expectations held for primary schools and primary teachers, then further decline in relative and absolute terms seems inevitable.

Finally, this paper is not an argument or call for some form of 'back to basics' movement but more, as the late Garth Boomer noted, it highlights the need to 'go forward to fundamentals' (cited by Brock, 2005).

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