# INQUIRY INTO THE EDUCATION OF BOYS

**Submission to the House of Representatives Standing Committee on Employment, Education and Workplace Relations**, by

Kenneth J. Rowe *PhD*, and Katherine S. Rowe *MD*

## Biographical information: Drs Ken and Kathy Rowe

**Dr Ken Rowe** [BA (Hons) *Melb*, MSc *London*, PhD *Melb*, DipGenStuds *Swin*, TPTC *Melb*] is a Principal Research Fellow at the *Australian Council for Educational Research.* Prior to this appointment, Ken was Principal Research Fellow and Associate Professor in the Centre for Applied Educational Research at The University of Melbourne (1993-99), Senior Research Officer in the Department of Education, Victoria (1986-92), Commonwealth Relations Trust Fellow at the University of London Institute of Education (1984-85), teacher and Principal in Victorian government schools (1967-83). Ken has also had Visiting Research Fellow appointments at the University of Twente (Holland, 1995) and at the University of London (UK, 1996). Ken received his undergraduate training in philosophy, psychology, sociology, statistical methods and teacher training at The University of Melbourne and at Swinburne University. His post-graduate training in research methodology and design, educational psychology, assessment, measurement, psychometrics, and advanced statistical modeling, was undertaken at the University of London, and his doctoral research at The University of Melbourne.

In addition to his research commitments, Ken is a national training consultant and instructor (since 1991) for the summer and winter programs conducted by the *Australian Consortium for Social and Political Research Incorporated* (ACSPRI) in advanced statistical modeling applications of multilevel and covariance structure analysis of data obtained from large-scale monitoring projects, as well as in explanatory educational, epidemiological, and psychosocial inquiry. His substantive research interests include: 'authentic' educational and psychological assessment; multilevel, 'value-added', educational/ organizational performance indicators and benchmarking; teacher and school effectiveness; differential gender effects of schooling in the context of *teaching* and *learning*; the impact of externalizing behavior problems on students' learning outcomes; and the educational implications of *Attention-Deficit/ Hyperactivity Disorder* (AD/HD) and *Chronic Fatigue Syndrome* (CFS) in children and adolescents. In addition to attempts to 'keep-up' with three active sons, Ken and his consultant pediatrician wife Dr Kathy Rowe (at the Royal Children's Hospital, Melbourne) are in high demand as a keynote speakers/presenters at local and international professional seminars and academic conferences, undertake collaborative research, and publish widely.
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Kathy has extensive clinical and research experience in the management of children and adolescents with behavioral and learning difficulties (including those with ADD and AD/HD), ear, nose and throat problems, as well as those with *Chronic Fatigue Syndrome* (CSF). Her clinics at the Royal Children's Hospital liase closely with the hospital's Learning Difficulties Clinic for assessment and intervention of children with complex and specific learning disorders, and functions as part of a multidisciplinary team including a Neuropsychologist, Child Psychiatrist, Audiologist and Speech Pathologist. As part of her 'management' of these children, she works closely with parents, teachers, school administrators, support services and special education settings. In addition to practicing 'practical paediatrics' at home with three active sons, Kathy is in high demand as a keynote speaker/presenter at local and international professional seminars and academic conferences. She undertakes collaborative research and publishes widely with her husband Ken.

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## Focus of the Inquiry

The Minister for Education, Training and Youth Affairs, the Hon Dr David Kemp, MP, has requested the House of Representatives Standing Committee on Employment, Education and Workplace Relations to inquire and report on:

> **The social, cultural and educational factors affecting the education of boys in Australian schools, particularly in relation to their literacy needs and socialisation skills in the early and middle years of schooling, and**
>
> **the strategies which schools have adopted to help address these factors, those strategies which have been successful and scope for their broader implementation or increased effectiveness.**

## Focus of the present submission

On the basis of our research and clinical experience that spans the past 25 years, we respectfully submit that the *Focus of the Inquiry* as stated in the submission request and reiterated above, is largely misplaced. The reasons for this are explicated in what follows. In outline, the present submission focuses on:

- The differential schooling performances and experiences of boys and girls throughout their primary and secondary schooling in terms of measured: academic outcomes, attitudes and behaviors
- Key reasons for these differences and their implications
- Identifying the major sources of variation in students' achievements
- Barriers to reform, and
- Suggested strategies for improvement.

Since most of the empirical evidence in support of the findings summarized here is already published, the source references are given for the related technical detail. In the case of yet to be published evidence, illustrative graphical presentations of the relevant data are provided. Further, to assist Committee members in their deliberations, transcripts of two of our recently published interviews have been attached as Appendices 1 and 2; and a brief manuscript of a non-technical paper under current review for publication is attached as Appendix 3.

## Differential schooling performances and experiences of boys and girls

The evidence indicating that boys, on average, achieve at significantly lower levels than girls on ALL areas of the assessed *cognitive* curriculum throughout their primary and secondary schooling is not in dispute. Moreover, this evidence is universal (Arnold, 1997, Carvel, 1997, Dean, 1998; Masters & Forster, 1997a,b; Millard, 1997; Rowe, 2000a; Sukhnamdan *et al*., 2000). Indeed, there is a widening gap between the academic performances of girls and boys here in Australia, as well as in English speaking countries world-wide (Cassidy, 1999; MacCann, 1995; MacDonald, 1999; McGaw, 1996; Rowe, 2000b; West, 1999). Furthermore, compared with girls, findings from the emerging evidence-based research consistently indicates:

- Boys are significantly more 'disengaged' with schooling and more likely to be at 'risk' of academic underachievement – **especially in *literacy*** (Bowne & Fletcher, 1995; Epstein *et al*., 1998; Fletcher et al., 1999; Hinshaw, 1992a,b; Irvine, 1992, 1999; MacDonald *et al*., 1999; McGee *et al*., 1988; McGee & Share, 1988; Rowe, 1997, 1998, 1999a);

- Boys exhibit significantly greater externalizing behavior problems in the classroom and at home (i.e., *anti-social*, *inattention*, *restlessness* – particularly *inattention* (Barkley, 1996; Collins *et al*., 1996; Hill & Rowe, 1996; 1998; Hill et al., 1996a,b; Hinshaw, 1992a,b, 1994; Rowe, 1991; Rowe & Hill, 1998; Rowe & Rowe, 1992a,b, 1997a,b, 1998, 1999);
- Fifty per cent of consultations to paediatricians at tertiary referral hospitals relate to *behavioral problems* (ratio: boys 9: girls 1); 20% of referrals relate to *learning difficulties* being made up of predominantly boys demonstrating ***poor achievement progress in literacy*** (Rowe & Rowe, 2000);
- In the early years of schooling, boys constitute between 75-85% of those children (usually in Grade 1) identified 'at-risk' of ***poor achievement progress in literacy***, and selected for participation in a *Reading Recovery* intervention program (Rowe, 1999a, 2000c).
- Boys have a higher prevalence of *auditory processing problems*. Unless appropriate classroom management strategies are put in place, these problems impact negatively on their early literacy achievement and subsequent progress, as well as their behaviors (Rowe, Pollard, Tan & Rowe, 2000; Rowe & Rowe, 2000 – see Appendix 3);
- Boys report significantly less positive experiences of schooling in terms of *enjoyment of school*, perceived *curriculum usefulness* and *teacher responsiveness* (Hill *et al*., 1996a,b; MacDonald *et al*., 1999; Rowe & Hill, 1998; Rowe & Rowe, 1999);
- Boys are more likely to 'drop out' of schooling prematurely. Recent Australian national estimates indicate that between 1994 and 1998, 30% of boys failed to complete their secondary schooling (cf. 20% girls – Marks *et al*., 2000). This results in reduced employment opportunities and general quality of life chances; and
- Comorbid with underachievement and aberrant behavior, boys are subject to more disciplinary actions during schooling (including bullying behaviors and expulsions), and are more likely to participate in subsequent delinquent behaviors, alcohol and substance abuse (Collins et al., 1996; Zubrick *et al*., 1997).

## Listening to the 'voices'

In addition to the empirical data reported in the studies and references cited above, comprehensive interview data have been collected from both students and teachers. A brief selection of these is sufficient to illustrate the consistency of sentiment that is experienced by students and teachers. For example, the following response from an articulate 13 year-old boy illustrates the dilemma faced by many boys and their teachers:

> My English teacher wants me to write about my ***feelings***, my History teacher wants me to give my ***opinions***, and my Science teacher wants me write on my ***views*** about the environment! I don't know what my ***feelings, opinions*** and ***views*** are, and I can't write about them. Anyway, they're none of their bloody business! I hate school!! I only wish I could write about the things I'm interested in like sport and military aircraft.

Another response from a 15 year-old boy:

> This is girl stuff! This school is **run** by girls **for** girls. I can't wait to get out!

From a girl in a Year 10 all-girls Maths class:

> It's **great** not being with the boys. We can talk with each other about what we're doing and ask questions of the teacher without being put down by the boys.

A comment by a female Year 9 Coordinator in a large coeducation secondary college illustrates a further dilemma faced by boys and their teachers:

> I'm really worried about the boys at this Year level – the girls give them a very hard time. The 'sisterhood' are bitchy, socially and sexually aggressive, and nastily intolerant of the boys' less competent verbal and academic skills. I'm having real difficulties dealing with the problem.

## Key reasons for differential performance (See Appendices 1 and 2)

Before outlining what we consider to be key reasons underlying the available and emerging evidence accounting for the differential schooling performances and experiences of boys and girls, it is important to locate this evidence in context.

Over the last 25 years there has been a notable shift in the pattern of educational performance on monitoring-type achievement tests and on public examinations, to girls outperforming boys on all areas of the assessed curriculum (Arnot *et al*., 1998; Gallagher, 1997; Rowe, 2000a; Warrington & Younger, 1997). Consistent with international trends, this shift has been particularly marked over the last decade in Australia (MacCann, 1995; McGaw, 1996; Rowe & Hill, 1996; Rowe, Turner & Lane, 1999, 2000; Teese *et al*., 1995; West, 1999). For example, in his review of the New South Wales Higher School Certificate, McGaw (1996, p. 108) notes:

> In 1991, males were over-represented at the top and bottom of the Tertiary Entrance Ranks, while females were over-represented in the middle ranges.
>
> By 1995, the position had changed markedly… Females are now over-represented in all the high Tertiary Entrance Rank ranges, and males are even more over-represented at the bottom.

Similarly, the gender effect in favor of females on achieved subject scores in the *Victorian Certificate of Education* (VCE) between 1994 and 1999 had an average magnitude of +0.26 standard deviation units per subject (Rowe, 1999b, Rowe, Turner & Lane, 1999, 2000). Indeed, since the publication of 'league-table'-type rankings of schools' Year 12 results in major daily newspapers in several Australian states (see Rowe, 1996, 2000d), senior staff of coeducational secondary schools have been acutely aware that their school average 'results' are "…dependent on the relative size of the female/male enrolments in a given year's cohort…" (Rowe, 1999b, p. 14). This superior performances of girls is further underscored by the differential effects of gender/class/school groupings – as shown in Figure 1 (from Rowe, 2000f).

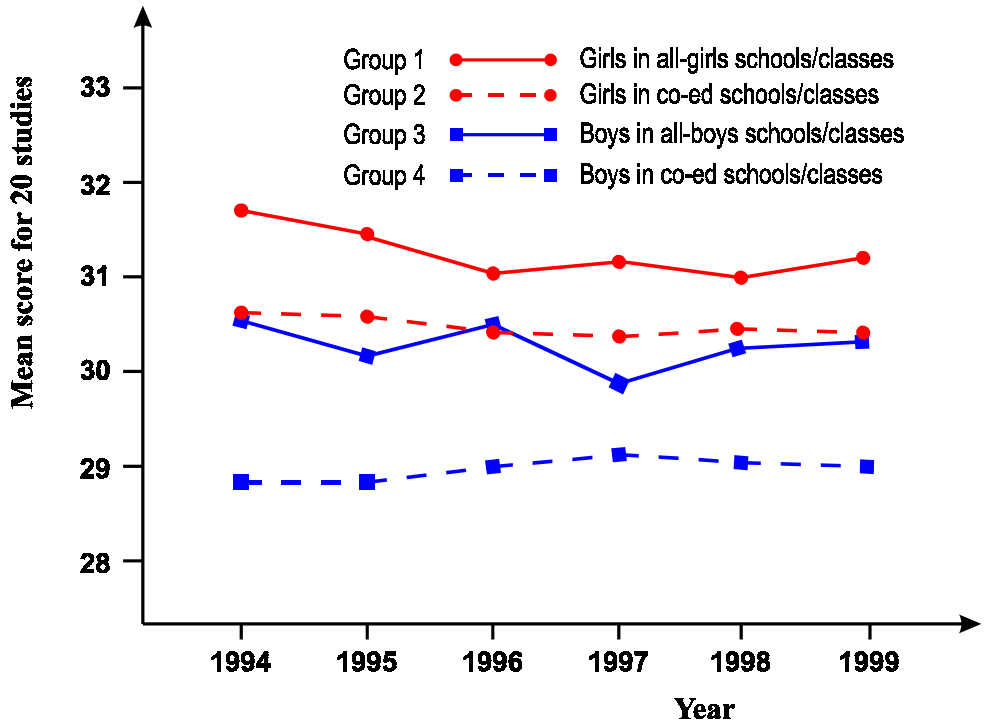


**Figure 1. Plot of mean 'ability-adjusted' VCE scores for 4 gender/school/class groupings of students on 20 studies with the largest enrolments (1994-1999) [N ≅ 270,000 students drawn from 600 VCE providers]**

Additional analyses of the data summarized in Figure 1 indicated that for those students taking 5 studies, females in all-female classes/schools achieved an average of 11.5 score points more than their male counterparts in coeducational settings, yielding a mean difference of > 20 percentile TER or ENTER ranks.[1]

Against the background of this evidence, several former all-boys schools in Victoria have chosen to become co-educational, whereas some coeducational schools have adopted single-sex class groupings. However, it is important not to over-interpret the 'importance' of these gender and gender/class/school-grouping effects, since they pale into insignificance compared with class/teacher effects – regardless of student gender (see below). Nonetheless, in commenting on McGaw's (1996) findings cited above, West (1999, p. 41) exclaims:

> Nobody seems to be able to explain satisfactorily what happened from 1990 onwards to assist girls, on average, to do better than boys and improve this performance year after year, nor why boys have begun to do so poorly, relative to girls.

**The importance of *literacy* and particularly, *verbal reasoning* and *written communication* skills**

In response to West, a key reason for the observed gender differences in performance, attitudes and behaviors, we argue, is that since the early 1990's there has been a notable increase in the demand for higher levels of operational **literacy** and especially, **verbal reasoning and written communication skills** in school education – areas in which girls, on average, have distinct maturational and socialization advantages (Hill & Rowe, 1998; MacDonald *et al*., 1999; Rowe, 1999c,d; 2000a; Rowe & Rowe, 1999). This demand is reflected in curriculum design and content, as well as the way it is taught and assessed – at all stages of primary and secondary schooling. It is evident in school-based assessment and standardized, statewide testing in the early and middle years of schooling, as well as in certifying examination programs at Year 12. For example, MacDonald *et al*. (1999) observe: "…recent changes in curricular design and assessment practices tend to favour the traditional strengths of girls" (p. 17).

The case of changes to mathematics curriculum and its assessment since the early 1990's is illustrative. Due to shifts in pedagogical emphasis from ***maths*** to ***numeracy*** by mathematics educators, the demand for verbal reasoning and written communication skills continues to be a feature of curricula content and assessment in mathematics. For Year 12 *4-Unit Mathematics* in NSW or *Specialist Mathematics* in Victoria, for example, there is a requirement for students to demonstrate extremely high levels of such skills. That is, the verbally presented, 'in-context' problems require to be read, understood, translated into relevant algorithms, solved, then explained and justified. Such a process requires extraordinarily sophisticated levels of both verbal reasoning and written communication skills – more ably handled by girls. Indeed, from Kindergarten to Year 12, girls on average, consistently outperform their male counterparts in literacy, numeracy, and in all other academic curriculum areas.

Consistent with a growing body of research, findings from a large-scale longitudinal study of factors affecting students' achievement progress indicated large differences between male and female students on all key factors affecting their learning outcomes (see Hill & Rowe, 1996, 1998; Hill *et al*., 1996a,b; Rowe & Hill, 1996, 1998). That is, girls indicated significantly higher levels of achievement and rates of progress than males (and demonstrated more *attentive behaviors* in the classroom). To illustrate this, Figure 2 summarizes both the cross-sectional and longitudinal data for the achievement levels of boys and girls in each of Years K to 11 on the *Reading* strand of the Victorian *English Profiles* (Victoria, 1991) in the form of 'box-and-whisker' plots – used to describe the 'shape' of the distributions for each Year Level.

[1] It should be noted that an important positive predictor of higher average VCE scores by females for English and for all other VCE subjects was their significantly higher scores on the *Written Communication* component of the *General Achievement Test* (GAT). Detailed accounts describing the use of the GAT in moderating students' school-based, common assessment tasks (CATs) in the VCE, are provided by: Hill, Brown, Rowe and Turner (1997), Hill and Rowe (1995), Rowe, Turner and Lane (1999, 2000), and by Turner (1998).

The 'boxes' in Figure 2 ('open' for males and 'shaded' for females) describe the range of achievement of the 'middle' 50 per cent of students at those Year levels. The top of each 'box' indicates the level of students achieving at the 75th percentile, the bottom of the 'box' shows the 25th percentile and the asterisk indicates the 50th percentile, or *median* value. The top and bottom 'whiskers' show the 90th and 10th percentile levels of achievement respectively.

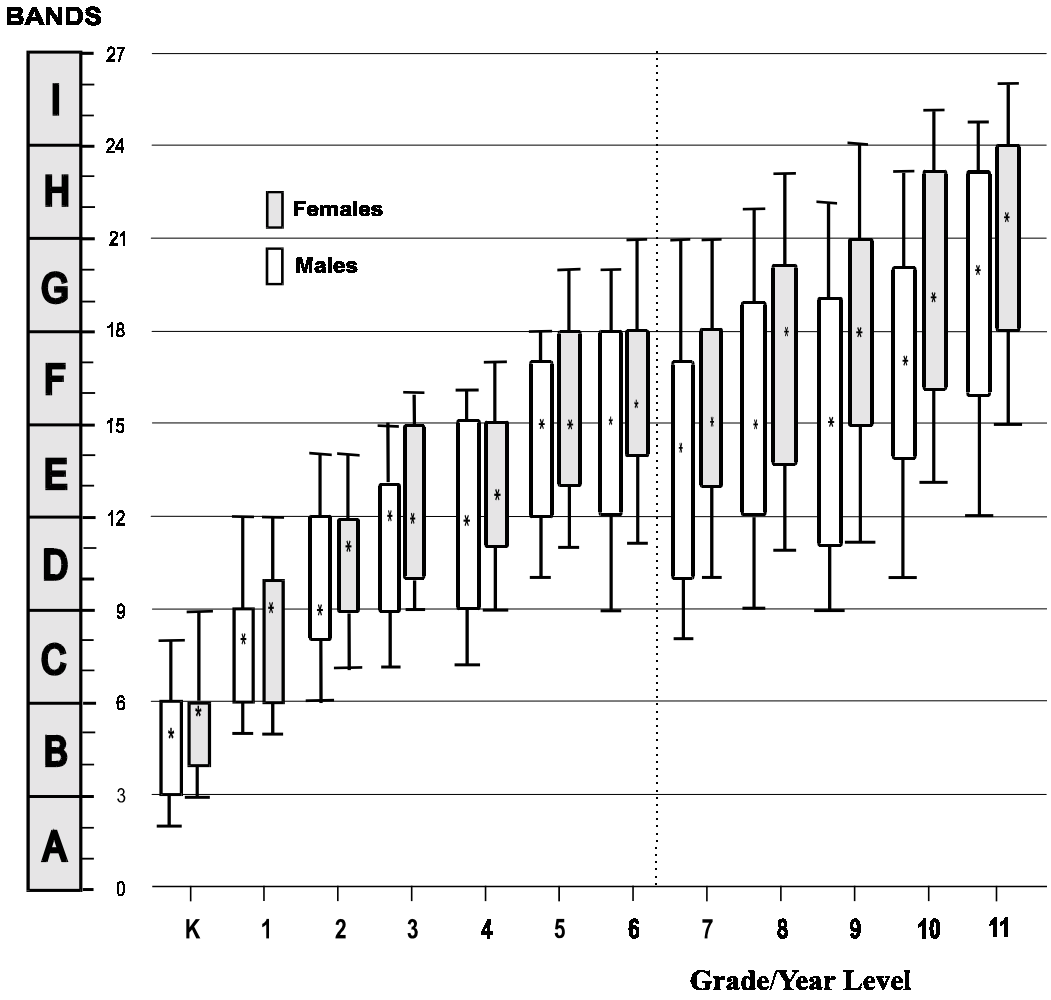


**Figure 2. Box plots showing distributions for male and female students' progress on the *English Profiles - Reading Strand*, by Grade/Year Level (n = 13,700)**

From Rowe and Hill (1996, p. 335)

The distributions shown in Figure 2 for the *Reading* strand indicate a period of rapid growth in both girls' and boys' achievements during the first few years of schooling, coinciding with the period during which students acquire basic skills, and thereafter show a consistent rate of growth to Year 9. In addition to the marked gender differences in achievement, it is noticeable that the range of achievement increases markedly over the years of schooling, with more than four band widths separating Year 9 students at the 10th and 90th percentiles.

Figure 2 also provides evidence of a discontinuity between primary and secondary schooling for *Reading* achievement, with a 'dip' in the rate of progress of students in the first year of secondary school (Year 7). This pattern has been observed in several studies using common measures over primary and secondary schooling (e.g., Elly, 1992; Lunberg & Linnakylä, 1993; Purves, 1973). An interesting feature of this pattern is its striking similarity with that shown by paediatric percentile growth-charts for height and weight during the pre-pubertal to early adolescent period of development. In commenting on this phenomenon Rowe (1995) notes: "It is possible that what has become known as an 'educational phenomenon' [i.e. 'apparent dips' in

literacy performance during the transition from primary to secondary schooling] may also have developmental psycho-physiological correlates" (p. 78).

Of particular concern is the flattening out of the 'growth trajectory' at the 10th percentile (particularly for boys), indicating a trend of less than one '*band* width' of growth from Year 4 to Year 9. Note also, the minimal growth between Years 9 and 10 – especially for boys. It should be noted that while similar findings applied to the two additional measures of Literacy in this study (namely, the *Writing* and *Spoken Language* strands), both the higher achievement levels and rate of growth indicated by girls compared with boys were even more evident on these two strands.

In reporting key findings from this study in terms of students' achievement progress in ***literacy***, Hill and Rowe (1998, pp. 326-327) note:

> Of the predictors of student ***Literacy Achievement***, the most salient was students' attentiveness in the classroom. By far the major proportion of the variance in student ***Attentiveness*** was found to be at the student-level and the most influential predictor of ***Attentiveness*** was ***Gender***, with female students being significantly more attentive than male students. Whereas the higher attentiveness levels of girls is familiar to most teachers, the implications for literacy curriculum and its assessment may not always be recognized.
>
> In recent years, there has been a greater emphasis within Australian elementary schools, both in approaches to teaching and learning and to assessment of student achievement, on activities that require high levels of sustained attention. Such activities include on-task-demanding behaviors such as the production of written portfolios, the writing of extended pieces of prose, and the completion of written research projects. There has been a corresponding move away from short answer and 'check the box' type activities to tasks requiring increasingly higher levels of verbal reasoning skills – activities in which girls have a well-established achievement and maturational advantage. It is possible that these changes in pedagogy may have placed, albeit inadvertently, a greater premium on ***attentiveness*** that have contributed to the phenomenon of substantial gender differences in students' literacy progress, mediated especially through ***Attentiveness*** (see Rowe, 1991; Rowe & Rowe, 1992b).

More recently, in a report of key findings from the 1998 statewide Literacy and Numeracy Assessment Program for Year 3 and Year 7 students in Tasmanian schools, Rowe (1999c, p. 39) makes the following summary comments:

> Given the limitations of the 'one-off', cross-sectional nature of the present data, the implications of the findings in terms of both policy and practice, are clear. In addition to the annotations noted in the body of the analyses presented above, the following comments are noteworthy.
>
> At the **student-level** (regardless of students' background or 'intake' characteristics), it is **vital** that teaching and learning priorities be focussed on the development of individual students' ***Literacy*** skills and achievements – especially in **reading** (READ) – since reading (albeit mediated by ***inattentiveness*** – INATTEN) is the foundation competency that has the dominant effect on **all** other literacy and numeracy achievements. Moreover, the development of number skills and ***working numerately*** (WRKNUM) underlies all other numeracy competencies. Note also the strong reciprocal effects between READ and INATTEN, suggesting the importance of reading competency in reducing the negative effects of inattentiveness.
>
> As already noted for the comparable Year 3 findings, it is important to emphasize that the 1998 Year 7 numeracy test items all had excessive requirements for high levels of verbal reasoning skills. As such, the composite constructs of ***Literacy*** and ***Numeracy*** are confounded – as evidenced by the strong positive correlation between the two variables ($r$ = 0.607; see Fig. 1, p. 6). In such circumstances, it is vital that invalid inferences are **not** made about students' levels of achievement in ***mathematics*** (per se). Whereas the postmodern 'information society' is requiring increasingly higher levels of verbal reasoning 'abilities' (VRA) of persons in the workplace and in educational settings, there is a danger of over-emphasizing VRA to the detriment of developing equally important non-verbal reasoning skills – especially in educational performance assessment and monitoring. As recommended previously, to minimize this problem in future monitoring projects, it is recommended that numeracy test items in each domain be included that place minimal demands on students' verbal reasoning 'abilities' and skills. Such items are typically presented in simple symbolic or algorithmic forms.

> In respect of students' ***inattentive*** behaviors in the classroom, we know from large-scale, longitudinal research that students' early growth in reading skills have a strong and enduring effect on reducing their current and subsequent inattentive behaviors, and have positive impacts on their achievements in cognitive areas of the curriculum, as well as in affective and behavioral domains. The findings related to analyses of the Year 7 data have provided strong support for this proposition.

In brief, the research evidence suggests that throughout the entire duration of their schooling for a large proportion of boys, the verbal reasoning requirements and general literacy demands of school curricula and assessment are beyond both their developmental capacity and normative socialization experiences to cope successfully. Bray *et al*. (1997) suggest that a key socialization factor contributing to boys' literacy underachievement compared with girls is their relative **reluctance to read**. Bray *et al*. (1997) identify the increasing prevalence of video and computer use by boys as being particularly erosive to boys' propensity to read, and note that there are major differences between adolescent girls and boys in their patterns and quality of interpersonal communication among their peers. That is, girls are more likely to have social lives that revolve around verbal discussion and communication, whereas at this developmental stage boys were more likely to have socialization experiences that revolve around play. In commenting on these phenomena, MacDonald *et al*. (1999, p. 15) record:

> The increasing use of solitary computer games, more favoured by boys than girls, can only exacerbate these differences. Patterns of behaviour outside school could either contribute to girls' greater ease with language, or be a reflection of it.
>
> Whatever the case, "large numbers of boys can be said to fall into the category of 'underachieving readers', in the sense that they can decode print but cannot read in a sustained and flexible way, using a variety of contextual clues to extract meaning in the fullest possible sense.

This underachievement by boys and inability to 'cope' with the operational literacy demands of school curricular and assessment, we suggest, are frequently manifested in boys' 'acting-out' behaviors, low self-esteem and disengagement or withdrawal from willing participation in schooling. We have commented elsewhere (see Appendix 1) that among the reasons for higher incidence of problem behaviors among boys in the middle and later years of schooling is that they frequently express feelings of alienation from a school curriculum that has become increasingly 'contextualised', and (in their words) "feminised". In interviews, for example, boys frequently express disenchantment about their academic progress, particularly in ***literacy*** and following the transition from primary to secondary schooling. This is especially evident in coeducational secondary schools where, for example, a boy in Year 7 claimed recently:

> I'm a second class citizen here; the girls get all the positive vibes from teachers because they talk and write better.

To compensate for this, many such boys place a premium on success in sport and some of the more macho (and often delinquent) activities that yield positive feedback from their peers, rather than recognition from school staff – most of whom (the boys note) are women.

## Implications

There are two major implications arising from the evidence summarized above that warrant emphasis here. These are:

1. At the outset, it should be stressed that the demand for enhanced operational literacy and related verbal reasoning and written communication skills by students throughout their schooling is consistent with that required for functional and effective participation in a postmodern, 'information-rich' society. Given this, it is vital that curriculum planners, designers and teachers do **not** 'dumb-down' the curriculum or its assessment to meet the differential needs of boys – or indeed, any other sub-group of students. Rather, with consideration given to the particular interests and needs of such student sub-groups in an

overcrowded curriculum (Hill, Hurworth & Rowe, 1999), **the provision of quality teaching and learning in *literacy* must be given the highest priority**.

2. Of crucial importance is the need to maximize the literacy skills of ALL students (boys **and** girls) **as early as possible**, since what should be an **education issue** will become a major **health issue** – even more than is currently the case. The ever increasing number of anxious parents seeking help from paediatricians and other health professionals for their distressed children whose learning difficulties and behavior problems have arisen as a consequence of (or are exacerbated by) failure to acquire literacy skills is, we contend, a **massive problem** (Rowe & Rowe, 1997b, 1988, 1999, 2000). Since 'prevention' has always been more cost-effective than 'cure', governments and their school systems will stand condemned for their neglect if they merely provide 'ambulance services' at the bottom of the 'cliff' when they should have first built a 'fence' at the top.

In any event, issues related to the formulation and implementation of strategies to ensure that **all** students maximize their **literacy learning** potential require urgent attention – especially for boys. In this context, and drawing on the work of Teese (2000), Milburn (2000) refers to "…chronic illiteracy is a shameful and damaging secret" and writes: "In the outer west of Melbourne more than 40 per cent of boys and more than 20 per cent of girls fail VCE English" (p. 4). In response, we reiterate the following from Rowe and Rowe (1999, pp. 78-79):

> It is now well established that strategically-designed initial teacher training and subsequent professional development programs in both early and later literacy teaching and learning have major positive impacts on both teacher competence and student performance. In particular, unequivocal evidence from research related to the efficacy of Professor Marie Clay's ***Reading Recovery*** intervention program (Clay, 1993a,b) points to its efficiency and effectiveness in relocating students identified as being "at risk" (mostly boys) on a positive growth trajectory that is sustained (Askew & Frazier, 1997; Lyons, 1997; Rowe, 1995). Moreover, the use of similar methods by teachers in whole-class settings has been demonstrated to have profound 'value-added' effects on students' learning outcomes (Crévola & Hill, 1997, 1998a; Hill & Crévola, 1997b), as well as significantly reducing both the salience and incidence of inattentive and disruptive behaviors in the classroom (Hill et al., 1996a; Rowe, 1997a; Rowe & Rowe, 1992b, 1997c, 1998).
>
> Further evidence from this research strongly supports the benefits of strategic approaches to: (1) early identification and intervention for "at risk" students, (2) on-going teacher professional development, and (3) a relentless commitment by the whole school community, including the direct involvement and participation of parents, to ensure that success for **all** students becomes a reality. Above all, this evidence suggests that unless resources are directed at targeted professional development (PD) programs for teachers, the "literacy priority" that is central to current efforts directed towards the restructuring of schooling – and loudly espoused by national governments throughout the world – will remain as mere rhetoric. Moreover, it is our contention that unless the content of this PD is informed by sound empirical research from cognitive and behavioral science, and transcends the crippling ideological partisanship that has for too-long been endemic to teacher education in literacy (see: Singer & Ruddell, 1985; Stahl, 1992; Stahl & Miller, 1989), such PD will be a waste of time.
>
> That is, if we are genuinely serious about improving students' literacy achievements and their attentive behaviors in the classroom, it is vital that PD support strategies be provided to assist teachers in maximizing their own 'efficacy' and student learning – especially those that are firmly grounded in research evidence. **If we are not serious, what should be an education issue will become a major health issue – even more than is currently the case**. The ever increasing number of anxious parents seeking help from pediatricians and psychologists for their distressed children whose behavior problems have arisen as a consequence of (or are exacerbated by) learning difficulties and failure to acquire literacy skills, is a massive problem (Barkley, 1995; Lyons, 1997; Rowe & Rowe, 1997c, 1998). In highlighting issues related to "future directions" for ADHD research and intervention policies, Farrelly and Standish (1996, p. 81) note: "**The impact on mental health and educational systems needs to be examined**."
>
> Fortunately, at least one Australian State government has recently recognized this problem (NSW, 1997, p. 1) – expressed in the following terms:

> Improved literacy levels have the potential to increase students' self-esteem and their achievement in all key learning areas, and to contribute to the ***reduction of behavioral problems*** that impede the learning of individual students and disrupt the learning of others. … Sound literacy development in the early years is essential for students' future success in schooling and lifelong learning. ***Literacy development remains a priority for all students as they progress through the grades*** (their emphasis).

In advocating that priority be given to a "whole-school focus on literacy improvement", this government document (NSW, 1997, p. 19) emphasizes the crucial need for: (1) "professional development on literacy teaching practice", (2) the importance of establishing and maintaining "effective partnerships between teachers, parents and students", and (3) the implementation of "appropriate intervention strategies" that "***recognize the links between poor literacy skills and inappropriate behavior or poor attendance***…"

Further, an edited extract from Rowe and Rowe (1999, p. 92) reads:

> A central aim of educational systems is to generate, stimulate and maintain efforts towards the on-going improvement of teaching and learning practices that link directly to the quality of educational outcomes for students (see Hill, 1997a,b,c; Crévola & Hill, 1998b). In our view, such improvements are not likely to be brought about by academic polemic, nor by the 'top-down-driven' administrative fiats of bureaucracies, since the products of these enterprises (mercifully, in most cases) have an established record of rarely penetrating the classroom door. **Rather, with the 'informed' support of parents and health professionals, sustained improvement can be achieved via teacher professional development that maximizes their teaching and behavioral management skills in the classroom**. It has been our experience that under such circumstances, teachers themselves become the empowered agents and purveyors of change, having consequent 'domino' effects on the teaching and classroom behavioral management practices of other teachers, and throughout the profession. Ultimately, of course, the measures of success or otherwise of such efforts, like all endeavors to improve the quality of school education, will be judged in terms of their impact on the key areas of improved student learning, behavior, and the enhancement of teacher professionalism.
>
> For what is demonstratively the most salient and problematic issue in child and adolescent mental health, the challenge into the 'new millenium' is to refocus the prevailing models accounting for the overlap between inattentive behavior problems and poor academic achievement – together with their related intervention emphases – to **educational ones**. In our view, the personal, social and financial costs of failure to meet this challenge will be both unsustainable and unbearable.

## Identifying the major sources of variation in students' achievements

It is now well documented that studies of *educational effectiveness* in terms of estimating the effects of schooling on student learning over time "...share two key features: the fact that student growth is the object of inquiry, and the fact that such growth occurs in organizational settings" (Raudenbush & Bryk, 1988, p. 424). Raudenbush and Bryk go on to note that these features correspond, in turn, to two of the most troublesome and enduring methodological problems in educational research, namely: (1) the problem of measuring change, and (2) the problem of analyzing multilevel data. In the preface to their book, 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.

Unfortunately, relatively few studies have been undertaken that have accounted for the inherent nested or multilevel organizational structure of schooling with students grouped into classes and taught by particular teachers, despite mounting evidence for the importance of instructional effects at the class/teacher-level (Hill *et al.*, 1996; Hill & Rowe, 1996, 1998; Schaffer,

Nesselrodt, & Stringfield, 1994; Scheerens & Bosker, 1997; Rowe & Hill, 1998; Rowe & Rowe, 1999; Teddlie, 1994). Indeed, a powerful conclusion arising from this research is that much of the between-school variation in students' achievements is in fact due to variation among classes. That is, when the organization of students in classes is taken into account, the unique variation due to differences between schools over and above that due to class/teacher-differences is very small indeed. This conclusion is exemplified in a comprehensive review of research into education production functions by Professor David Monk (1992), who cited 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 (p. 320).

One of the more significant studies to provide evidence regarding the importance of class/ teacher effects was that of Scheerens *et al*. (1989). This study presented findings from a secondary analysis of data from the Second International Mathematics Study (SIMS). The findings, as summarized in Table 1, indicated that for eight of the nine countries for which between-class/teacher information was available, estimates of the proportion of variance in students' achievements due to class/teacher effects in several countries exceeded 40%, while school effects were significantly smaller, ranging between 0-9%.

**Table 1. Comparison of Class/Teacher- and School-Level Effects in Eight Countries***
(Secondary Mathematics scores adjusted for father's occupation)

| Country | Class/Teacher Effects (%) | School Effects (%) |
|---|---|---|
| Canada | 17 | 9 |
| Finland | 45 | 0 |
| France | 16 | 6 |
| Israel | 21 | 8 |
| New Zealand | 42 | 0 |
| Scotland | 31 | 5 |
| Sweden | 45 | 0 |
| USA | 45 | 9 |

* Source: Scheerens *et al.* (1989), p. 794

In reviewing this study and related research, Reynolds and Packer (1992, p. 173) observe:

> On the causes of school effects, it seems that early beliefs that school influences were distinct from teacher or classroom influences were misplaced, since a large number of studies utilizing multi-level modeling show that the great majority of variation between schools is in fact due to classroom variation and that the unique variance due to the influence of the school, and not the classroom, shrinks to very small levels.

Similarly, Scheerens (1993, p. 20) noted:

> ...teacher and classroom variables account for more of the variance in pupil achievement than school variables. Also, in general, more powerful classroom level variables are found that account for between-class variance than school level variables in accounting for between-school variance.

Findings from the *Victorian Quality Schools Project* (VQSP) have confirmed this phenomenon (see Hill & Rowe, 1996, 1998; Hill *et al*., 1996a; Rowe & Hill, 1998; Rowe *et al*., 1993; Rowe & Rowe, 1999). When the variance in students' achievement data for English and mathematics were analyzed by taking into account the organization of students within classes within schools, estimates of the proportion of residual variance due to school and class/teacher differences were

obtained, as summarized in Table 2. The residual variation at the class/teacher-level ranged from 38-45% for English and 53-55% for mathematics, whereas school effects *over and above* those due to differences at the class/teacher-level shrank to 4-9%. This is not to say that differences among schools were not substantial in terms of their effectiveness, but rather that these differences were largely accounted for by internal within-school variation among classes and teachers.

**Table 2. Proportional Class/Teacher and School Effects for Victorian Schools: Achievement Adjusted for Prior Achievement**

(13,700 students in 90 primary and secondary schools)

| | | Class/Teacher Effects (%) | School Effects (%) |
|---|---|---|---|
| English | | | |
| | Primary | 45.4 | 8.6 |
| | Secondary | 37.8 | 7.4 |
| Mathematics | | | |
| | Primary | 54.7 | 4.1 |
| | Secondary | 52.7 | 8.4 |

The findings summarized in Table 2 – of large class/teacher effects and small to insignificant school effects, we suggest – are primarily a reflection of variations in ***teaching quality***, and point to the conclusion that it is primarily through the ***quality of teaching*** that 'effective' schools make a difference. In an early paper reporting these results from the VQSP, Rowe, Holmes-Smith and Hill (1993, p. 15) suggested that: "…on the basis of our findings to date it could be argued that effective schools are only *effective* to the extent that they have *effective teachers*" (p. 15).

Even more compelling evidence for the influence of class/teacher-effects on students' achievements derive from the *VCE Data Project* (Rowe, 2000f; Rowe, Turner & Lane, 1999, 2000). This population study of 270,000 Year 12 students' achievements on 53 subjects over a 6-year period (1994-1999) has yielded several findings of interest. Whereas there were strong gender effects in favor of girls (~ + 0.3 standard deviation units), as well as gender/ class/school-grouping effects in favor of single-sex classes/schools (see Figure 1), the magnitudes of these gender-related effects on students' achievements paled into insignificance compared with class/teacher effects. After adjusting for measures of students' 'abilities', gender and school sector (government, Catholic and independent), class/teacher effects consistently accounted for an average 59% of the residual variance in students' achievement outcomes, compared with a mere 5.5% at the school-level.

That is, there was significantly more variation *within-schools* than *between-schools*, indicating that the quality of teaching and learning provision was by far the most salient factor accounting for variation in students' achievements at Year 12. Above all, such findings serve to emphasize that it is at the level of the classroom that learning takes place and that there can be very substantial differences in the progress made by students in different classes within the same school. Indeed, **teachers make a difference – regardless of student gender!**

In summarizing key findings from a literature review of research related to boys' achievement progress, motivation and participation at school, MacDonald *et al*. (1999, p. 17) draw a similar conclusion in the following terms:

> The role of the teacher was particularly highlighted in influencing boys' propensity to read as well as their choice of reading. Teachers' attitudes more generally may diminish or increase the problem of underachievement. The role of the teacher is crucial in helping pupils develop a positive attitude to learning.

## Barriers to reform

There continues to be several barriers to reform that in our view generate misdirected and misinformed strategies that flounder on the vagaries of anecdotal rhetoric and regnant opinion. Perhaps the most notable of these is a persistent tendency to place undue credence on various outmoded forms of *biological* and *social determinism* which assume that individual children – whether they be boys or girls – do poorly or well at school because of developmental differences, because they are 'dumb' or 'smart' or come from 'disadvantaged' or 'advantaged' backgrounds. The empirical evidence suggests that the proportion of variation in students' achievement progress due to differences in student background and ability (~ 9-15%) is considerably less important than variation associated with class/teacher membership (> 30%). Indeed, the key message to be gained from the school effectiveness research cited above, is that schools and especially teachers *do* make a difference and that it is not so much what students bring with them but what they experience on a day-to-day basis in interaction with teachers and other students in classrooms that really matters.

Another barrier to reform is the persistent tendency for Statewide curricula (e.g., the *Curriculum Standards Framework* in Victoria) to treat learning as continuous and cumulative rather than recognizing the different *interest* and *learning needs* of students in Years 5-9 – for both girls and boys. In this context, MacDonald *et al*. (1999) argue: "Too many strategies are put in place based on untested assumptions about what boys think, do and feel" (p. 17). This has lead to a plethora of 'popular' literature – replete with lists of largely untested *intervention techniques* for dealing with the claimed educational 'needs' of boys. While some of these techniques **may** be helpful, their 'evidential status' is often little more than aspirational. Clearly, research into educational effectiveness cannot be reduced to simple 'blueprints' or 'recipes' for improvement such as enhancing the achievement progress of boys. Nevertheless, there are some powerful messages for policy-makers, school administrators and teachers seeking dramatic improvements in learning outcomes for both boys and girls. Foremost among those messages is that there are strong empirical grounds for believing that schools and teachers can and *do* make a difference and that consistent high-quality classroom teaching, supported by on-going teacher professional development (PD), *can* and *does* deliver dramatic improvements in student learning (Crévola & Hill, 1998; Rowe, 1997; Rowe & Hill, 1998 Rowe & Rowe, 1999).

Another important message relates to the power of information about *educational effectiveness* as a catalyst for improvement and reform. All too frequently systems, schools and teachers have lacked credible information regarding the magnitude of their relative contributions to performance and effectiveness. Fortunately, this is changing. The trend now is towards the development of indicator systems that facilitate benchmarking of performance against external standards or reference points (Hill & Crévola, 1999; Masters, Forster & Rowe, 2000). The evidence from systems that have put in place indicator systems and more especially from schools that have begun to collect and use such outcomes measures, is that such information is a powerful stimulant to improvement (Coe & Visscher, 2000; Rowe, Turner & Lane, 2000). Sadly, little if any use of 'value-added' measures of effectiveness occurs outside research projects, and there is notable reluctance by some within the profession to countenance any systematic collection of comprehensive and comparable student achievement data. However, with increasing recognition of the power of information to motivate and shape improvement efforts, this situation is changing rapidly.

A further barrier to reform relates to a key reason why so many improvement initiatives in education fail to live up to initial expectations. Hill (1998) observes that most reforms in education are directed at the *preconditions* for learning rather than at influencing *teaching* and *learning* behaviors within the classroom. For example, many schools see the 'middle years problem' of schooling, or the 'education of boys' as a *structural* one, leading to the establishment of *middle schools, P-12 colleges*, special *transition* programs, and *single-sex classes/schools* (Rowe, 2000). With the possible exception of the differential effects of specific gender/class/school groupings (see Figure 1), research-based evidence indicates that such

structural interventions are *preconditions*, and their effects on learning *per se* are negligible. By contrast, effective improvement initiatives such as strategic teacher PD (see Crévola & Hill, 1998; Rowe, 1997) are concerned not just with establishing *preconditions*, but with making teaching and learning more effective. They typify attempts to make strong connections between knowledge about school and teacher effectiveness and the design of effective improvement programs and initiatives aimed at the enhancement of student achievement progress – especially in ***literacy*** and the related skills of ***verbal reasoning*** and ***written communication***.

Similarly, while it may be desirable that schools have flexibility in the ways in which they utilize resources at the school level, including flexibility in the use of staffing resources, improvements in students' learning are not a guaranteed outcome of providing such flexibility. This will only occur if the *preconditions* for learning (eg., on-going teacher PD) are then used to effect changes in the way in which students are taught and learn in and outside the classroom. Many reforms stop short of changing what happens beyond the classroom door and thus fail to deliver improved teaching and learning outcomes for teachers and students, respectively. Rather, real reform calls for substantial change in *teaching and learning strategies*, but unless there is total commitment of all staff to new ways of working, reform efforts soon falter.

## Suggested strategies for improvement

The fact that teacher-factors have strong positive effects on students' attitudes, behaviors in the classroom and achievement outcomes is of vital importance, with profound implications – for the education of both boys and girls. As Slavin and colleagues' evaluations of the "Success for All" program among low SES schools in Balitmore and Philadelphia have shown, students who, regardless of their socioeconomic and ethnic backgrounds, are taught by well-trained, strategically focussed, energetic and enthusiastic teachers, are fortunate indeed (see Slavin, 1996; Slavin *et al*., 1997). While it may be difficult to legislate such factors into existence, the fact that teachers and schools make a difference (as summarized above) should provide impetus and encouragement to those concerned with the crucial issues of *educational effectiveness*.

At the very basis of the notion of *educational effectiveness*, however, operational ***literacy***, ***verbal reasoning*** and ***written communication skills*** are crucial, and need to be emphasized as keys to improving the achievements and experiences of boys throughout their primary and secondary schooling. To this end, we concur with MacDonald *et al*. (1999, pp. 18-19) in outlining the following as being effective strategies that support the learning needs of boys:

- Focus on **support for literacy** across the curriculum
- Early diagnosis and intervention for those 'at-risk' of literacy underachievement
- Highly structured instructions and lessons
- Greater emphasis on teacher-directed work in the classroom in preference to 'group' work
- Clear objectives and detailed instructions; explicit criteria for presentation of work
- Short-term, challenging tasks and targets with frequent changes of activity
- Establishment of assessment and monitoring systems designed to identify underachievement in key skills across the curriculum, as well as in individual subjects
- Regular personal interviews for the purposes of target-setting
- Positive reinforcement: immediate and credible awards for quality work, increased effort and/or improved behavior
- Providing opportunities for extra tuition/revision
- Planned program of differentiated personal and social development
- Meaningful work experience placement aimed at informing students about changing roles in adult and working life.

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