

Connections among school contexts, teaching contexts and the quality of teaching

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The question of "what matters most" in terms of impact on student achievement has long been an issue of political and academic focus in Australia, as elsewhere. Current debate separates this discussion into two main factions - those who do, and those who do not believe that quality teaching can compensate for the socio-cultural and socio-economic factors that impact on student achievement. The problem with a debate which separates belief in context and belief in teacher quality, is that it effectively removes consideration of the possible effects of the interaction between these factors, implying that they are mutually exclusive.

In this paper, we investigate the connections between socio-cultural and socio-economic factors as they impact on various school contexts, teaching contexts and the quality of teaching. By investigating these connections, not only do we inform the "what matters most" debate, but we provide insights to guide both local and systemic efforts to improve pedagogy that attend to the specifics of context.

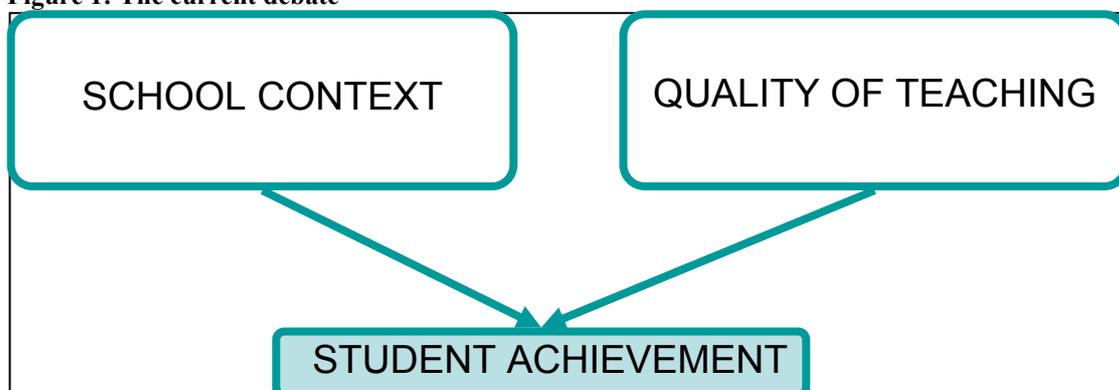
The question of "what matters most" in terms of impact on student achievement has long been an issue of political and academic focus in Australia, as elsewhere (Mortimore, Sammons, Stoll, Lewis, & Ecob, 1988; Rowe, 2003). While former Australian federal minister for education Dr Brendan Nelson used the issue to cherry-pick findings that supported his agenda not to inject more funding into public schools systems in Australia (Nelson, 2004), academics such as Rowe (2002; 2003) and Teese (2004) have contributed to what now might be perceived as a dichotomous issue. Current debate separates the "what matters most" discussion into two main factions. On one hand are those who believe that quality teaching cannot compensate for the socio-cultural and socio-economic factors that impact on student achievement. On the other hand are those who believe that quality teaching can have positive effects on student achievement above and beyond any socio-cultural or socio-economic factors.

This debate has been playing out in Australia for a number of years, and has escalated with the work of Rowe (2002; 2003). In examining boys' educational outcomes, Rowe put forward the claim that socio-cultural and socio-economic factors have very little effect upon student outcomes, and because class/teacher effects were measured to be larger, " 'what matters most' is quality teachers and teaching" (2003, p. 1). Rowe's findings mirror those of other research

(for example, Monk, 1992; Scheerens, 1993; Muijs & Reynolds, 2001, all cited in Rowe, 2003). Prominent researchers such as Richard Teese (2004) have hit out at these claims asserting it is ideological bias in such research that has seen the effects of students' background (and particularly socio-economic class) effectively ignored despite other research clearly showing it is a very important determinant of student success (for example, Ainley, Robsinson, Harvey-Beavis, Elseworth, & Fleming, 1994; Lamb & Fullarton, 2002; Teese, McLean, & Polesel, 1993). The United States (US) is not exempt from such a debate, either (Fitz, Davies, & Evans, 2006; Rothstein, 2005).

The problem with a debate which separates, with respect to student achievement, belief in context and belief in teacher quality, is that it effectively removes consideration of the possible effects of the interaction between these factors, implying that they are mutually exclusive, as illustrated in Figure 1. Notably, Lamb and Fullarton (2002), do not dismiss claims about class or teacher effects. They found that streaming or tracking processes lead to more educationally disadvantaged students in lower streamed classes, and the pooling of this type of cultural capital leads to further underachievement. In their research, teacher effects did exist, but were found to be much smaller than effects of organisational practices within the schools.

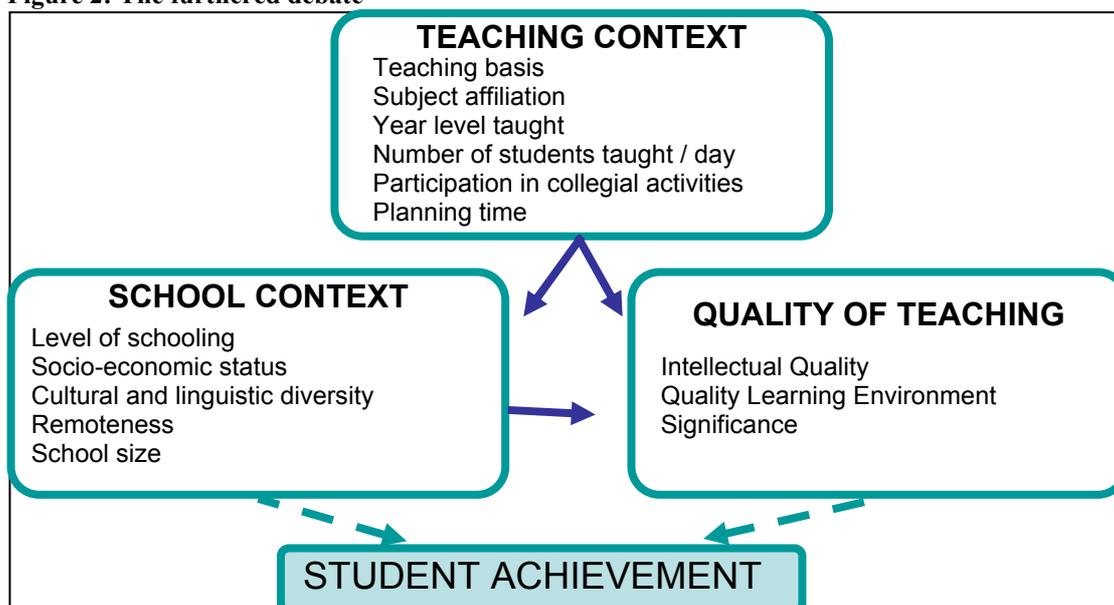
Figure 1: The current debate



In this paper, we do not attempt to contribute to an argument on either side of this debate. That is, we do not examine the effects of quality teaching or socio-cultural and socio-economic factors on student achievement. Rather, as illustrated in Figure 2, we contribute to the complexities of the debate itself, by investigating explicitly the connections between socio-cultural and socio-economic factors impacting various school contexts and the quality of teaching. We achieve this in three ways. First, we investigate the relationships between the quality of teaching and various school context factors that capture potential socio-cultural and socio-economic influences on student achievement. Second, we further current Australian consideration of this debate by considering how various aspects of the structure of teachers'

work, such as the basis of their employment and the amount of planning time they have per week, are related to measures of the quality of teaching. To clarify our analysis, we refer to the variables relating to the structure of teachers' work as the teaching context variables. Finally, and integrated with our discussion of the teaching context variables, we examine relationships between our school context and teaching context variables. For example, what interaction might exist between the remoteness of a school (as a school context variable) and the extent to which teachers are employed on a permanent or casual teaching basis (as a teaching context variable)?

Figure 2: The furthered debate



By investigating these three connections, not only do we inform the “what matters most” debate, we provide an opportunity for those interested in professional learning to develop a greater understanding of the school and teaching contexts in which teacher professional learning occurs, and how professional learning might best address the needs of teachers employed in various school and teaching contexts.

The system context in which this research was conducted is important to note. The most populated state of Australia, New South Wales, governs its 2200 public schools (providing for 760,000 students) with a single state authority, the NSW Department of Education and Training (NSW DET). Together with James Ladwig and Jenny Gore from the University of Newcastle, the NSW DET developed Quality Teaching, a model of pedagogy framed within three dimensions of Intellectual Quality, Quality Learning Environment and Significance. While the NSW DET has not mandated for teachers to implement Quality Teaching, the support provided to teachers from both central and school levels has highlighted Quality Teaching as a rigorous attempt at system wide pedagogical reform.

A second and equally important contextual qualification to note, particularly for international readers, is that while some school systems, such as those prominent in the US, are predominantly funded and heavily regulated at very local levels, there is a state-wide centralisation of the resources and policies of the 2200 public schools in the state of NSW. This centralisation means that resource allocation, including the funding of teachers' professional learning, is set at a state rather than school or district level, thus allowing for comparison and accountability across the state-wide public school system.

An example of the type of program that exists at a centralised level in NSW is the Priority Schools Funding Program (PSFP), which provides assistance in terms of state allocated grants and additional personnel to school communities to reduce student achievement in schools with high enrolment percentages of students from low socio-economic status backgrounds. The PSFP is focused on improving student outcomes for literacy, numeracy and school participation. There are currently 541 schools in NSW on the PSFP: 406 primary schools; 80 secondary schools; 20 central schools; and 35 schools for specific purposes (NSW DET, 2005a).

LITERATURE REVIEW

A great deal of educational research has focused on examining the relationships between varying school and student contexts, and the achievement of student outcomes. Much less research has focused on examining the relationships between the structure of teachers' work within given school and student contexts and teaching quality. It is true that school effectiveness research (such as that of Mortimore et al., 1988) has been concerned with isolating contextual and organisational factors which make schools more 'effective' in terms of student achievement, but more often than not this type of research places its focus on examining school context and student achievement, rather than examining the effects of context on the practice of 'good' or quality teaching (Teddlie, 1994). Thus, it is by implication rather than from evidence that we are to understand that school context influences teachers and the quality of their instruction, which in turn influences student achievement.

School Context

In terms of school context variables examined in such research, there has been considerable variety. Teddlie (1994) notes that school context variables most often examined in school

effectiveness studies were students' (and therefore schools') socio-economic status, grade level and location. These variables continue to be at the centre of such research.

Marston, Brunetti and Courtney (2005) detailed a number of differences between elementary and high school teachers, noting the disparate programs through which the two were most likely to have gained their teaching qualifications, and the differing structures of school days (in terms of teaching all subjects to one group of students and teaching one subject to many groups of students). Similarities are also noted in terms of, for example, the shared school calendar and salary schedule. Marston et al. highlight gaps in current research on differences in attitudes and performance of teachers in elementary and high school teaching contexts. Their own research examined, *inter alia*, differences between elementary and high school teachers and their attitudes to the subjects they taught, with the authors suggesting no marked differences between the orientation to subject areas of elementary and high school teachers.

The differences in the quality of pedagogy experienced by students and the student achievement attained in low socio-economic status (SES) schools has long been a focus in educational research (Carbonaro & Gamoran, 2002; Haberman, 1994, 2002; Heyneman, 2005; Knapp & Shields, 1990; Ladwig & Amosa, 2005; J. Lee & Wong, 2004; V.E. Lee & Smith, 1995). In 2003, an analysis of programs that attempted to support the quality of teaching and student achievement in schools with low socio-economic status in NSW was conducted and identified improvements in outcomes for students and teachers after school participation in centrally organised programs (Groundwater-Smith & Kemmis, 2003). While the findings from Groundwater-Smith and Kemmis's review suggest that, when participating in targeted programs, improvements in pedagogy can be achieved in low SES schools, research continues to note the disparity in the quality of pedagogy that is evident in poor schools (Fransoo, Brownell, Roos, Ward, & Wilson, 2005; Haberman, 2002; J. Lee & Wong, 2004).

Australia's students of Aboriginal and Torres Strait Islander descent (ATSI) continue to achieve at comparatively lower standards than their non-Indigenous counterparts. Reports from large international comparative studies such as the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) have highlighted such findings (for example, Thomson, Cresswell, & Bortoli, 2004).

During 2003 and 2004, a review of the New South Wales Aboriginal Education Policy was conducted. The Review (NSW Aboriginal Education Consultative Group Incorporated & NSW DET, 2004), in linking teaching practices with student outcomes found that Indigenous students needed to be more engaged, and that teachers need to convey higher expectations for

their work. Among recommendations focusing on the inclusion of cultural knowledge and closer ties with parents and community, were teachers' use of the Quality Teaching framework, focus on having high expectations of Indigenous students, and ensuring that tasks are challenging and meaningful.

Many of Australia's Indigenous students attend rural or remote schools (NSW DET, 2005b). Research investigating rural/remote schools' contexts and their relationships to the quality of teaching has been difficult to locate. The NSW DET provides incentives to graduate teachers to teach in rural and remote areas, as they are harder to staff, therefore a high proportion of teachers in these areas are young and relatively inexperienced. While these teachers might be young and inexperienced, Gore, Williams and Lagwig (2006) have noted that this inexperience does not translate to poorer pedagogy than what might be anticipated by more experienced teachers. A "transfer point" and "priority transfer" system, which ensures that teaching in rural and remote areas is rewarded (NSW DET, 2005c; 2005d; NSW Teachers Federation, 2005) works such that staff turnover in rural and remote schools is high. Teachers also have considerable difficulty in obtaining quality professional development, and if they do, they more often than not rely on infrequent visits from education consultants (Jarzabkowski, 2003). However, Jarzabkowski argues that the level of collegiality among teachers in these schools can be very high owing to their isolation.

In terms of school context, Estrada (2005) notes that, disproportionately, dedicated teachers and keen students in schools from low socio-economic-status areas with large numbers of students from culturally and linguistically diverse backgrounds fail to meet achievement standards. It is the school context here, and not the quality of teaching, which is seen to contribute to the students' underachievement. In contrast, Haberman (1994) and Knapp and Shields (1990) reported that students in schools characterised by poverty and cultural and linguistic diversity are victims to what Haberman names the "pedagogy of poverty" (1994, p.17). We found no empirical research in Australia has focused on the effects of cultural and linguistic diversity of a school and its relationship with the structure of teachers' work and the quality of their teaching.

School size has also been a focus of research into school contexts and student achievement. In their study of junior schools in London, Mortimore et al. (1988) came to the conclusion that to be effective in terms of students' cognitive progress, schools should be neither too small nor too large (less than 160 enrolments). Other research has focused on secondary school size. In the United States, Lee and Smith (1997), for example, advocate the most effective school size in terms of student achievement as falling between 600 and 900 student enrolments. Crosnoe, Johnson and Elder (2004) investigated the effect of school size on student outcomes by

examining interpersonal processes. They found that interpersonal climate was indeed better in smaller schools for all students regardless of racial or ethnic background. Again, little research in this area has focused upon the structure of teachers' work, or the actual quality of teaching.

Teaching context

While some educational research has focused on examining the relationships between varying school contexts, particularly with regard to characteristics of student populations and the quality of teaching, there has been even less empirical examination of possible relationships between the structure of teachers' work within school contexts and the quality of teaching. Studies that do address factors of teaching contexts, separate from school contexts, are often small in scale and more often than not identify the need for further research on the relationships between the structure of teachers' work, teaching quality and student achievement. For the analysis reported in this paper, a number of features of teaching contexts were examined. While research relating to all of the examined variables was not available in current literature, teaching context variables such as the basis of teaching, subject affiliation, class size, collegial activities and planning time provided an interesting background for consideration of the findings in the current study.

For many teachers, the basis on which they are employed is one of the defining characteristics of the structure of their work. In the context of teachers in NSW DET schools, there are three main categories of employment status: permanent full-time teachers (who usually have on-campus teaching responsibilities for approximately six hours each Monday through Friday); permanent part-time teachers (who hold continuing positions for set days or hours per week that are less than a full-time teaching load); and casual teachers (who may be employed on a daily, weekly, full term or full year basis pending the staffing needs of individual schools). It is important to note in the context of international casual or substitute teaching trends, that casual teachers in NSW DET schools must have teaching qualifications as would any teacher employed on a permanent basis.

Nidds and McGerald (1994) noted over a decade ago that there was an absence of research on substitute teaching. An examination of current research in the field reveals a similar trend. This lack of research is also characterised by a lack of attention to the quality of teaching in the basis of teachers' employment. Apart from a clear concern about classroom management for substitute teachers, for the participants in Nidds and McGerald's study (sample size unknown), the issues faced by substitute teachers were more related to administrative matters (such as seating plans and classroom routines) than pedagogical matters or any concern about

their competence in subject content knowledge. The participants noted that the primary teaching method required of them was the use of detailed reading and writing assignments. They perceived little scope for demonstrating any form of initiative in their teaching as they did any degree of accountability for the quality of their teaching practice. This is a concern also noted by Lassmann (2001) who suggested that it is difficult for substitute or casual teachers to improve on their classroom practice when they are unaware of the expectations held of them and separated from any school reviews of teaching effectiveness. The literature examined in terms of basis of teaching reveals no differences in the quality of teaching as performed by permanent full-time, permanent part-time or casual teachers and is characterised by a lack of any consideration of the need for and the practice of effective pedagogy for casual or substitute teachers.

Research related to comparative analysis of subjects taught and the quality of teaching is equally sparse. While studies and reports have examined trends in student performance in various subject areas (for example, Thomson et al., 2004), there has been little comparative analysis of the quality of teaching practiced in different disciplines. Recent discussion in the United States seems to focus on the attention attributed to those subject areas that are exempt from state and district standardised tests. An example of such a study is Volger's (2003) discussion of how the focus of teaching attention in the elementary school is now placed on those subjects that are tested in state and district standardised tests, such that subjects like social studies, for which teachers do not need to be accountable at district and state levels, are not given priority in the elementary classroom. Teachers in Volger's analysis reported use of lower-order teaching methodologies in social studies, such as textbook and vocabulary work, which was seen to be less time consuming than preferred pedagogical alternatives that would lead to more meaningful learning for students.

Regarding quality teaching practices in various subject areas, there seems to be a lack of research that compares different subject areas. There is no shortage of conclusions regarding quality teaching practices in individual subject areas. Some examples follow. Vandeweghe (2005) stated that students' substantive engagement is vital to quality teaching in English, citing The National Center on English Language and Achievement's finding that students' participation in discussion is the most important predictor of achievement growth. For mathematics, Hill, Rowan and Loewenberg (2005) noted the fundamental need for mathematics teachers at both elementary and secondary levels to have solid subject content knowledge and skills. Goya (2006) asserted the crucial need for improvements in the quality of mathematics teaching, and expressed concern regarding the emphasis of current mathematics education debates on curriculum and calculators. Finally, for physical education, Murray and Lathrop (2005) reported the importance of observation in physical education

pedagogy, while Stirling and Belk (2002) discussed the importance of effective teaching practice in the physical education classroom, noting the common lack of planning and programming in physical education classes. Our review of literature noted that, while discipline-specific research has been conducted, there is little examination of the quality of teaching between and among subject areas, or examination of measures that could be used to investigate such comparisons.

While research specific to the number of students taught each day was difficult to locate, especially across both elementary and secondary school contexts, differences in methodological and statistical approaches to studying the effects of class size have led to long-running debates on the importance of class size for students (for example, Biddle & Berliner, 2002; Borland, Howsen, & Trawick, 2005; Hanushek, 2000). In a recent study to determine an optimal class size, Borland et al. (2005) included teacher variables in their analysis. They found that teacher experience had significance in terms of students' achievement in each of the subject areas of mathematics, spelling, reading, language and science, however the variables of teacher rank, teacher salary and teacher union membership were not. The optimal class size, according to these researchers should be between 21 and 22 students.

In a pilot study for the New South Wales Department of Education and Training on class sizes, reported significant benefits were found for principals, teachers and parents in having smaller classes (Meyenn, 2003). In terms of teaching and learning, teachers involved in the pilot study indicated, among other things, that use of whole class discussion, use of higher order questions and support to students who need assistance occurred more often. Regarding assessment practices, the smaller class sizes led to teachers more closely aligning tasks to individual students along with more frequent and explicit instruction. Findings on teacher expectations were also reported. The study found that smaller class sizes which enabled teachers to more closely work with individual students they reported meant they raised expectations of students.

Research relating to teachers' planning time and their participation in collegial activities has identified trends, but rarely empirically examined relationships between these teaching context factors and the quality of teaching. The common theme in research related to planning time is its sheer absence. VanTassel-Baska and Stamboagh (2005) cited the lack of planning time as a key challenge for teachers. Furthermore, they cited DuFour and Eaker's (1998) research, which found that most planning time for teachers is dedicated to team meetings or collegial sessions where instructional planning is not on the agenda.

Research on collegial activities has identified a number of trends. Letman (2005) found that different kinds of collegial activities led to varying degrees of change in terms of teaching craft knowledge. Noting that collegial activities may take the form of planned, strategic or ad hoc meetings, Letman suggested that school contextual factors shape the efficiency of collegial activities. While metaphors of the role of collegial activities abound from O'Donnell-Allen's (2005) recycling of waste and ideas analogy to Hunt's (2005) suggestion that participation in effective collegial activities is "like climbing the high wire with a safety net" (p.102), analysis of the relationship between participation in planning and collegial activities and the measured quality of teaching does not seem to exist.

We identified throughout our review of literature that, while separately school context and teaching context variables have been associated with variations in the quality of teaching, these examinations have usually treated school contexts and teaching contexts as mutually exclusive ones. Furthermore, there has been little if any attempt to use shared measures of pedagogy when analysing the impacts of various school and teaching contexts on the quality of teaching. Finally, the implications for professional learning from any of the studies examined in this review have been ignored. These limitations provided us with an opportunity to contribute to current knowledge by investigating the connections between school context and teaching context factors as they impact on the quality of teaching, and addressing how professional learning efforts might best be tailored to various school and teaching contexts.

METHODOLOGY

This paper draws its data from a longitudinal research project (2004-2007) entitled, "Systemic Implications of Pedagogy and Achievement in New South Wales Public Schools" (SIPA). A collaborative study between NSW DET and the University of Newcastle, the purpose of SIPA is to examine, over time, the relationships between teachers' professional development, pedagogy and student outcomes. Having commenced data collection in 2004, SIPA is tracking three cohorts of students as they move from Year 3 to Year 6; Year 5 to Year 8; and Year 7 to Year 10. Thus, it is important to note in any review of the findings reported in this study that the data reported are baseline data for what will later be reported as findings in a longitudinal study.

Sample

The participants in the analysis reported in this paper were 988 of the teachers participating in the SIPA research project during 2004 and 2005. Just over half of the teachers (n=544) were from the 12 participating secondary schools and 444 were teachers in the 20 primary schools and one middle school that were participating in the study. For the participants for whom demographic information was available, 29.4 percent (n=278) of the participants were male and 70.6 percent were female (n=668). Twelve participants identified as being of Aboriginal or Torres Strait Islander descent and 14.9 percent (n=138) reported that a language other than English was spoken in their childhood home.

Data collection

The teaching and learning experiences of teachers and students are being captured by four data collection processes: collection of in-class assessment tasks and their resultant student work products; field visits to each of the 33 participating schools, involving classroom observations and teacher interviews; a four point longitudinal survey of all teachers in the participating schools (SIPAQ); and the collection of student demographic and prior achievement data. The first three of these data collection processes contribute to the analysis conducted for this paper, as detailed below.

Assessment task data

The collection and coding of assessment tasks and student performances at six points from 2004 to 2007 is replicating the procedures used in Newmann, Marks and Gamoran (1996) and subsequent studies led by Newmann (Newmann, Bryk, & Nagaoka, 2001; Smith, Lee, & Newmann, 2001). For each data collection, teachers in the targeted classes submit sets of student work on regular in-class assessment tasks. For this analysis, 199 assessment tasks from 137 teachers from the first two of these six collection points were coded using a manual for measuring pedagogy as represented in the quality of learning tasks, developed by Ladwig, Gore and the NSW DET as the third phase of the Quality Teaching initiative (NSW DET, 2004). The 14-item, three-dimensional Quality Teaching scale was used to code the degree to which the tasks exhibit high levels of quality pedagogy, within each of the three dimensions: Intellectual Quality, Quality Learning Environment, and Significance (cf. NSW DET, 2003b). Each of the 14 items (classified as elements) in the guide for coding assessment practice is coded on a one to five scale (see Appendix 1 for an overview of the 14 elements coded for assessment tasks and Appendix 2 for a sample of the coding scale for one of the assessment practice elements).

Field visits

In line with the longitudinal data collection processes inherent in the design of the SIPA research project, field visits conducted by a team consisting of researchers from the University of Newcastle and NSW DET personnel are conducting interviews of teachers and school executive, and direct observations of approximately 960 lessons throughout the course of the study (two observations per field visit per class), using a classroom observation manual based on the Quality Teaching framework (NSW DET, 2003a). For the 330 observations of 170 teachers' lessons analysed for this paper, the 18-item, three-dimensional Quality Teaching scale was used to code the degree to which the lessons exhibit high levels of quality pedagogy, again within each of the three Quality Teaching dimensions: Intellectual Quality, Quality Learning Environment, and Significance (see NSW DET, 2003b). Each of the 18 items (classified as elements) in the guide for coding classroom practice is coded on a one to five scale (see Appendix 3 for an overview of the 18 elements coded for classroom practice and Appendix 4 for a sample of the coding scale for one of the classroom practice elements).

The SIPA Questionnaire (SIPAQ)

Each year of the four year study, teachers in SIPA schools complete an extensive questionnaire that focus on teachers' reports of their in-class pedagogical practices and professional development experiences, the structure of their work and their goals of teaching. The analysis conducted for this paper focused on a selected number of items from this questionnaire to examine the following aspects of the structure of teachers' work: the basis of their employment; the number of students with whom they work each day; primary subject or discipline affiliations; the mean Year level taught; the amount of teachers' scheduled planning time; and the degree to which teachers participate in collegial activities focused on pedagogy.

FINDINGS

The findings reported in this paper are reported in two sections. The first section reports findings specific to school context variables. The second section reports findings from analysis of the teaching context variables as they relate to school context variables, and as they relate to other teaching context variables. In both sections, the findings reported form the baseline analysis for the larger longitudinal study. Thus, these findings should be interpreted as an initial, cross-sectional analysis for what will later be reported as the baseline data in analyses of change over time.

School context

Level of schooling

Table 1 highlights significant differences between the level of schools, as primary or secondary schools, and the Quality Teaching dimension scores for both classroom observations and assessment tasks.

Table 1: School level pedagogy t-test results

	Quality Teaching measures	School level	n	Mean	Std. Deviation	Sig (2-tailed)
Classroom observations	INTELLECTUAL QUALITY	Primary	60	16.28	3.64	
		Secondary	53	15.17	3.99	0.13
	QUALITY LEARNING ENVIRONMENT	Primary	60	17.57	2.97	
		Secondary	53	15.28	3.63	0.00**
	SIGNIFICANCE	Primary	60	14.31	2.78	
		Secondary	53	13.55	3.40	0.20
	QUALITY TEACHING	Primary	60	48.16	8.03	
		Secondary	53	44.00	9.57	0.01**
Assessment tasks	INTELLECTUAL QUALITY	Primary	44	13.38	4.63	
		Secondary	53	16.12	4.11	0.00**
	QUALITY LEARNING ENVIRONMENT	Primary	44	5.12	1.78	
		Secondary	53	6.68	1.65	0.00**
	SIGNIFICANCE	Primary	44	9.11	2.83	
		Secondary	53	9.92	2.30	0.13
	QUALITY TEACHING	Primary	44	27.61	8.27	
		Secondary	53	32.73	5.35	0.00**

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

We found that observation scores, which measure the quality of lessons, were higher for primary schools than secondary schools in terms of the Quality Learning Environment ($p < 0.01$) and for overall Quality Teaching ($p < 0.01$). However, the opposite is true for task Intellectual Quality, task Quality Learning Environment, and combined task scores. Tasks were significantly higher at Secondary schools than they were at Primary schools for Intellectual Quality ($p < 0.01$), Quality Learning Environment ($p < 0.01$), and overall Quality Teaching ($p < 0.01$). It is interesting to note that there were no significant differences for the Quality Teaching dimension of Significance for either classroom observations or assessment tasks.

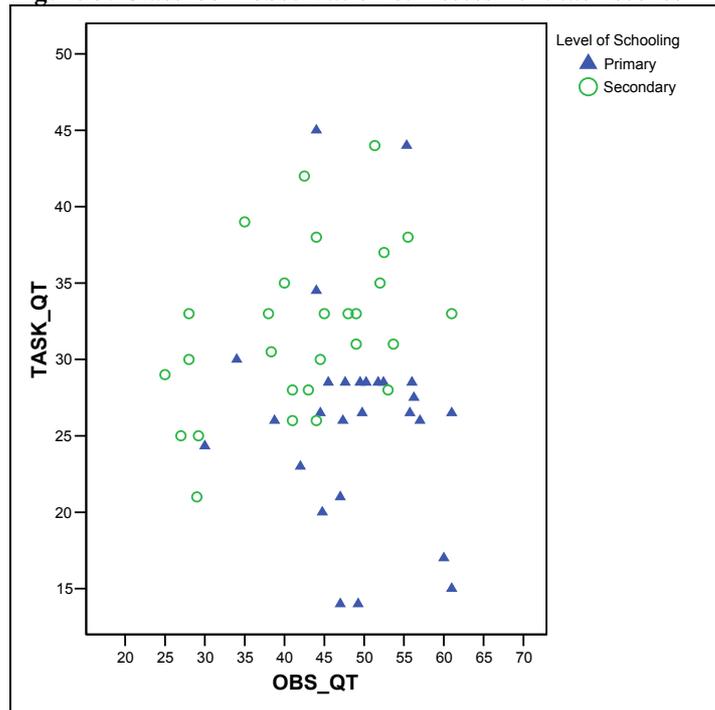
The disparity between observations and tasks at a school level with regard to Quality Learning Environment is worth noting. When considering Quality Learning Environment, lesson quality analysis covers student engagement, social support and student self-regulation as well as explicit quality criteria, high expectations and student direction. Only the latter three elements are measured for tasks when considering Quality Learning Environment

(hence, for lessons the maximum total score for this element is 30, whereas for tasks the maximum total score for this element is 15). Even relative to the highest scores attainable for Quality Learning Environment using the observation and task measures, primary school lessons scored higher on Quality Learning Environment than primary school tasks. Thus, the difference between the quality of lessons and tasks for this dimension between primary and secondary schools lies potentially in observable characteristics of the classroom environment which are not measurable in tasks.

Additionally, task Intellectual Quality for secondary schools in our sample was higher than task Intellectual Quality for primary schools. These differences in measured Intellectual Quality of tasks for primary and secondary schools could be the product of the specialist nature of secondary teachers' work. The implication here is not that primary school teachers know less about what they are teaching, and this therefore translates into less attention to Intellectual Quality of assessments, but that they perhaps may not relate as deeply to the subject at hand. The old adage 'primary teachers teach students, but secondary teachers teach subjects' may well have some impact in this sense! These significant differences between secondary and primary observation and task scores could be related to the differences in ages of students and teachers' expectations of them, with expectations in terms of Intellectual Quality placed on high school students more so than primary school students during assessment. One might find this quite unremarkable, and even natural, however, it is important to note that when gathering data, consideration of the age of students and the achievement level expected of them was taken into account. Interestingly, though, the difference between primary and secondary schools in terms of Intellectual Quality of observed lessons was not significant.

Finally, as evident in Figure 3, there is an apparent mismatch, in both primary and secondary schools between the overall quality of lessons delivered and the overall quality of tasks.

Figure 3: Classroom observation & Assessment task scores



Indeed, when plotting the entire sample of primary and secondary schools' tasks against lessons, no observable, nor measurable, relationship exists (Ladwig & Amosa, 2005). This phenomenon is beyond the analysis presented in this paper, but suggests that teachers may not align what and how they teach with what and how they assess.

As discussed in Griffiths, Gore and Ladwig (2006) it is important to consider the implications of the timing of the data collection for this analysis, which occurred just as the Quality Teaching resources materials were being released. While this consideration does, perhaps, contribute to an understanding in the differences between the effects of possible professional development on the pedagogy as measured in classroom and assessment practice, alone the timing of the data collection provides little explanation of the differences between the primary and secondary samples in their pedagogy scores. While research such as that reported in Gore and Ladwig (2006) suggests that, upon meeting certain qualifications, professional development in assessment practice might lead to enhances assessment practice, the gap between the classroom pedagogy scores for secondary and primary teachers is one that needs attention. It will be interesting to examine the trajectories of growth for secondary teachers in the quality of their classroom practice as the SIPA research study continue to track their performance over the longitudinal study.

School context socio-economic status

Schools' participation in the Priority School Funding Program (PSFP, as described on p. 4) was used to analyse possible relationships between schools' socio-economic status (SES) and

pedagogy measures. Table 2 identifies significant differences between the PSFP status of schools and the Quality Teaching dimension scores for both classroom observations and assessment tasks.

Table 2: SES pedagogy t-test results

	Quality Teaching measures	School level	n	Mean	Std. Deviation	Sig (2-tailed)
Classroom observations	INTELLECTUAL QUALITY	non-PSFP	82	15.71	4.01	
		PSFP	31	15.87	3.40	0.84
	QUALITY LEARNING ENVIRONMENT	non-PSFP	82	16.27	3.47	
		PSFP	31	17.10	3.49	0.26
	SIGNIFICANCE	non-PSFP	82	14.10	3.12	
		PSFP	31	13.58	3.06	0.43
QUALITY TEACHING	non-PSFP	82	46.08	9.24		
	PSFP	31	46.55	8.44	0.81	
Assessment tasks	INTELLECTUAL QUALITY	non-PSFP	72	15.63	4.20	
		PSFP	25	12.71	4.89	0.01**
	QUALITY LEARNING ENVIRONMENT	non-PSFP	72	6.40	1.81	
		PSFP	25	4.73	1.45	0.00**
	SIGNIFICANCE	non-PSFP	72	9.53	2.22	
		PSFP	25	9.61	3.46	0.90
QUALITY TEACHING	non-PSFP	72	31.57	6.10		
	PSFP	25	27.05	9.21	0.01**	

**Correlation is significant at the 0.01 level (2-tailed).

We have found no significant differences in the observation scores between schools participating in the PSFP (higher SES schools) and schools that were participating in the PSFP (low SES schools). However, for the quality of pedagogy as measured by assessment tasks, tasks were significantly higher at non-PSFP schools than they were at PSFP schools for Intellectual Quality ($p < 0.01$), Quality Learning Environment ($p < 0.01$), and overall Quality Teaching ($p < 0.01$). As with the school level findings, there were no significant differences between PSFP and non-PSFP schools for the Quality Teaching dimension of Significance for either classroom observations or assessment tasks.

This analysis of the relationship between the quality of pedagogy and schools' socio-economic status, as measured by the schools' participation in the PSFP, found little to suggest that students in high SES schools received better pedagogy as measured in classroom practice than students in schools in low SES schools, contrasting with the findings of much educational discourse (for example, Haberman, 1994; J. Lee & Wong, 2004).

These findings suggest a number of possibilities in relation to professional learning. First, the negligible difference between PSFP and non-PSFP schools in the quality of pedagogy as measured in classroom observations could reflect the effectiveness of the Priority School Funding Program itself, in terms of the effectiveness of the PSFP initiatives which include

training and development for teachers and sharing of effective practice in local networks of PSFP schools (NSW DET, 2005a). The significant differences highlighted between PSFP schools and non-PSFP schools in the quality of assessment tasks could well be linked to the contextual factor that, while the Quality Teaching resources for enhancing classroom practice (NSW DET, 2003a) were available to schools prior at the time of data collection, the Quality Teaching resources for enhancing assessment practice (NSW Department of Education and Training, 2004) were unlikely to have impacted on PSFP professional development initiatives before data was collected.

Table 3 details the correlations between continuous school level variables and pedagogy outcome variables.

Table 3: School context pedagogy correlations

School context variables		Classrooms observations				Assessment tasks			
		IQ	QLE	SIG	QT	IQ	QLE	SIG	QT
remote	Pearson Correlation	-0.07	-0.08	-0.10	-0.10	-0.23	0.02	-0.22	-0.22
	Sig. (2-tailed)	0.49	0.42	0.31	0.33	0.03*	0.86	0.04*	0.04*
	N	99	99	99	99	86	86	86	86.00
ATSI %	Pearson Correlation	-0.27	-0.19	-0.26	-0.28	-0.25	-0.16	-0.33	-0.31
	Sig. (2-tailed)	0.00**	0.04*	0.01**	0.00**	0.01**	0.12	0.00**	0.00**
	N	113	113	113	113	97	97	97	97.00
NESB %	Pearson Correlation	0.20	0.17	0.12	0.20	-0.14	-0.11	0.13	-0.07
	Sig. (2-tailed)	0.03*	0.06	0.19	0.04*	0.18	0.30	0.19	0.52
	N	113	113	113	113	97	97	97	97.00
total FTE	Pearson Correlation	0.16	0.04	0.08	0.11	0.25	0.17	0.23	0.28
	Sig. (2-tailed)	0.09	0.64	0.42	0.23	0.02*	0.10	0.03*	0.01**
	N	113	113	113	113	97	97	97	97.00

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

School remoteness

Remoteness was analysed using a NSW DET measure that indicates distance from urban centres of the state of NSW. In terms of geographical location, our analyses found that schools further from urban centres exhibited significantly lower task Intellectual Quality ($p < 0.05$), significantly lower task Significance ($p < 0.05$), and significantly lower overall task quality ($p < 0.05$). Although classroom observation scores were also found to be lower, these differences between urban, rural and remote locations were not statistically significant. These differences, again, are potentially due to differing levels of teacher access to and attendance at professional development sessions focusing on pedagogy.

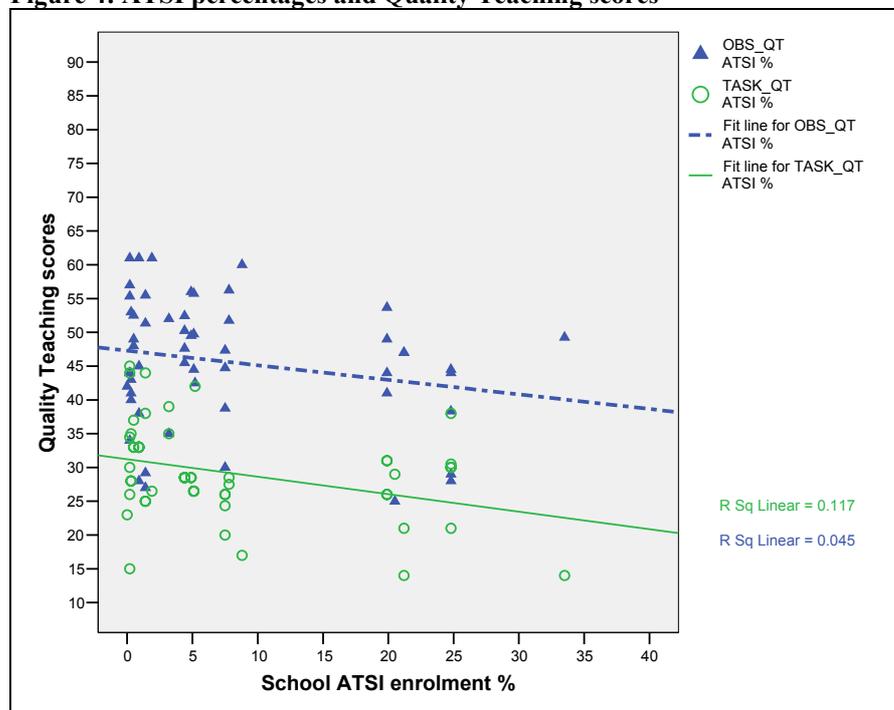
Jarzabkowski (2003) identified that there is considerable difficulty in rural or remote schools to receive professional development. One difficulty inherent in rural and remote location is that of schools being unable to access on-call casual teachers who would substitute for a

teacher undertaking some professional development. Another is the time cost of sending teachers to larger centres for training. These findings flag the need for considerations to be in place for enhanced access to and participation in professional development opportunities for teachers in remote schools.

School ATSI context

One of the most notable results for this sample were the significant negative correlations found between lesson and task quality and the number of Indigenous students enrolled in a school. Observations were significantly higher at schools with smaller enrolment percentages of students of Aboriginal or Torres Strait Islander descent for all dimensions of Quality Teaching: Intellectual Quality ($p < 0.01$); Quality Learning Environment ($p < 0.05$); Significance ($p < 0.01$), and overall Quality Teaching ($p < 0.01$). Task scores were significantly higher at schools with smaller enrolment percentages of students of Aboriginal or Torres Strait Islander descent for Intellectual Quality ($p < 0.01$); Significance ($p < 0.01$); and overall Quality Teaching ($p < 0.01$). These findings suggest that students attending schools with fewer students of Aboriginal or Torres Strait Islander descent received higher quality of pedagogy in both classroom and assessment practice. This finding is illustrated in Figure 4.

Figure 4: ATSI percentages and Quality Teaching scores



It is important to note that these findings are based on the number of Indigenous enrolments in each school, rather than the number of Indigenous students in the classrooms observed or students participating in the study. Hence, we cannot simply say that Indigenous students are being delivered lower quality tasks or lessons. Even so, findings here are disturbing,

considering that Australia's Indigenous students have been demonstrated to underachieve at school relative to Australia's non-Indigenous students (Thomson et al., 2004).

Findings of the Aboriginal Education Policy Review (NSW Aboriginal Education Consultative Group Incorporated & NSW DET, 2004) and recommendations associated with those findings, have focused on aspects which we have measured. Our findings support them, especially in terms of the need to include and require more challenging work for Indigenous students (Intellectual Quality), to have better focus on and higher expectations of Indigenous students (Quality Learning Environment), and to make school work more meaningful for Indigenous students (Significance).

School NESB context

Participating schools' enrolment percentages of students from non-English speaking background (NESB, as measured by the NSW DET) were analysed in terms of the quality of classroom and assessment practice. Observations were significantly higher at schools with larger enrolment percentages of student from non-English speaking backgrounds (NESB) for Intellectual Quality ($p < 0.05$) and overall Quality Teaching ($p < 0.05$). There were no significant differences identified between low and high NESB schools for the quality of assessment tasks.

These findings somewhat contradicts Estrada's (2005) observations that schools with high proportions of student from culturally diverse backgrounds are characterised by poor quality of pedagogy. It is important to note that in our sample, schools having high numbers of culturally and linguistically diverse students were statistically significantly more likely to be schools in more urban locations ($p < .01$ for NESB and remoteness) and higher SES schools ($p < .01$, for NESB and PSFP participation). These schools also tended to be larger schools (discussion of findings in this regard are below), and schools at which teachers report better access to professional learning sessions. Future multi-level modelling will explore these findings in more depth throughout the longitudinal study.

Schools' Full Time Equivalent (FTE) enrolments

The size of a school also seems to be related to quality of pedagogy. Significant positive correlations were found to exist between the number of full time equivalent enrolments and task quality for Intellectual Quality ($p < 0.05$); Significance ($p < 0.05$); and overall Quality Teaching ($p < 0.01$). Our analysis suggests for our full sample that the larger the school, the better the quality of tasks given to students (both at a school level and at task level of

analysis). When considering the full sample, we did not find the same when considering the quality of classroom practice.

Our analysis identified that differences exist between primary and secondary schools in terms of the quality of pedagogy and school size. Figure 5 illustrates that for primary schools, higher full-time equivalent enrolments did not have a significant effect on the quality of teaching as measured in classroom observations. For secondary schools, the larger the school in terms of FTE enrolments, the higher the quality of the pedagogy as measured in classroom practice.

Figure 5: School level, FTE and observation Quality Teaching scores

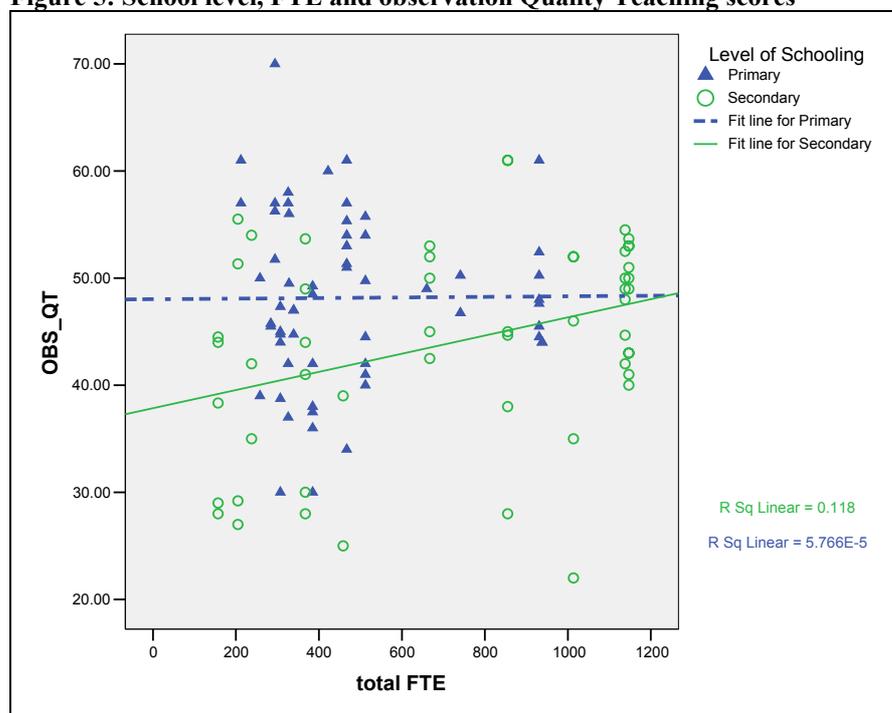
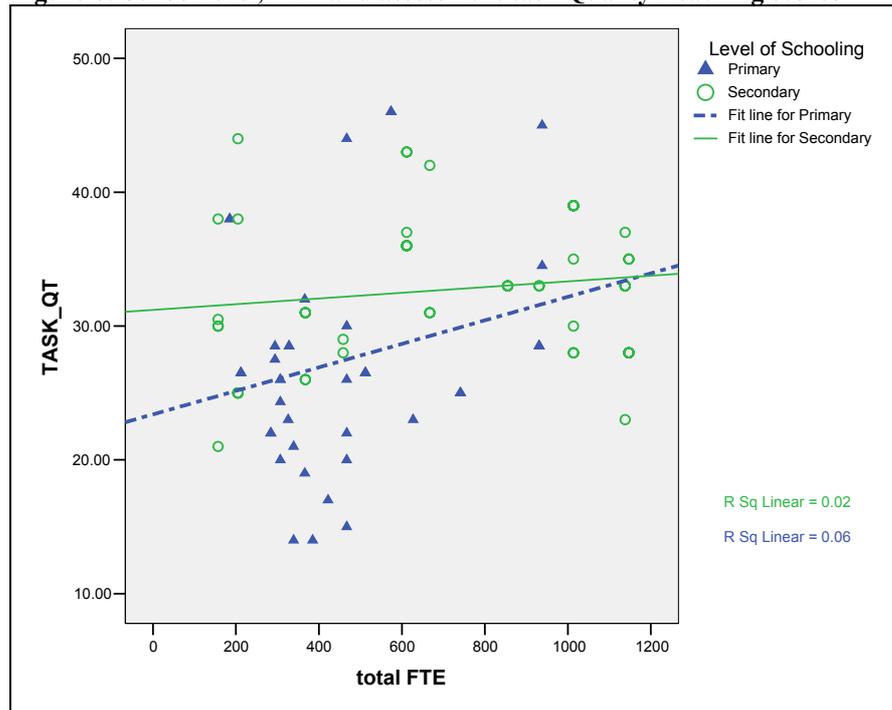


Figure 5 illustrates a small but notable difference supporting that fact that the larger the high school, but not the larger the primary school, the higher the quality of observed lessons. An alternative trend was identified for the quality of assessment tasks. Figure 6 illustrates that for secondary schools, higher FTE enrolments did not have a significant effect on the quality of teaching as measured for assessment tasks. For primary schools, the larger the school in terms of FTE enrolments, the higher the quality of the pedagogy as measured for assessment tasks.

Figure 6: School level, FTE and assessment task Quality Teaching scores



With respect to high schools, it appears that our findings are consistent with Lee and Smith (1997), however, we must note that their analysis found a non-linear relationship between student achievement and size of high school where schools having enrolment numbers between 600 and 900 were favourable. Their study, though, did not examine the quality of *teaching*, but rather focused on student achievement most likely related to interpersonal effects of school size. Further analysis over the life of our research is needed in order to ascertain whether similar findings apply when considering the structure of teachers' work and teaching quality.

Mortimore et al.'s (1988) finding that more 'effective' junior schools had enrolments of around 160 students is not consistent with our findings with respect to teaching quality. More high level observation scores were found at primary schools with enrolments between 200 and 400 students, however, more low level observation scores were also found in schools of this size. For assessment tasks, higher scores were recorded for primary schools having enrolments over 400 students following the trend for all schools combined.

It is perhaps possible to put forward the conjecture that good interpersonal relations evident in schools that are 'not too small' and 'not too big' have a positive effect upon the quality of assessment tasks. Exploring this further is beyond the scope of our analysis, but it appears to be an analysis worth undertaking.

Teaching context

Findings reporting the relationships between teaching context variables and the quality of pedagogy, as measured by classroom and assessment practice, reveal a number of interesting trends that are perhaps best interpreted in light of some of the school context variables. The absence of current Australian research regarding teaching contexts allows these findings to flag foci for future research in this area.

Teaching basis

Analysis of variance identified no significant differences between the basis of teaching and pedagogy outcome variables for either classroom observations or assessment tasks. That is, teachers' basis of employment in terms of their employment in permanent full-time, permanent part-time or casual capacities were not significant predictors of the quality of their pedagogy as measured in both classroom and assessment practice. While Nidds and McGerald (1994) and Lassmann (2001) noted the lack of attention on the quality of pedagogy for substitute teachers, it is noteworthy that no significant differences were identified for the quality of pedagogy as measured in the study. There was a significant relationship, however, between the basis of teachers' employment and the level of schooling ($\chi^2=21.74$; $df=2$ for $p<.01$). Secondary teachers were significantly more likely than primary teachers to teach on a permanent full-time basis.

Findings also revealed a highly significant relationship between the basis of the participants' employment and the percentage of students of Aboriginal or Torres Strait Islander (ATSI) descent enrolled at the school ($F = 9.22$; $df 2, 971$ for $p < .01$). A Scheffe test using a harmonic mean sample size of 148.57 revealed that significant differences existed between the permanent full-time teachers and the casual teachers, with casual teachers significantly more likely than permanent full-time teachers to be teaching in schools with a high percentage of students of Aboriginal and Torres Strait Islander decent.

Analysis of variance identified a highly significant relationship between the basis of the participants' employment and the remoteness of the school ($F = 3.14$; $df 2, 880$ for $p < .05$). A Scheffe test using a harmonic mean sample size of 127.77 revealed that significant differences existed between the permanent full-time teachers and the permanent part-time teachers, with permanent part-time teachers significantly more likely than permanent full-time teachers to be teaching in remote schools. A difference between school context and basis of teaching was also identified for the size of the school, measured by full-time equivalent enrolments ($F=7.29$; $df 2, 973$ for $p<.01$). Permanent full-time teachers were significantly more likely than permanent part-time teachers to be teaching in large schools.

These findings suggest that while relationships exist between school contexts variables and the basis of teachers' employment, the quality of pedagogy analysed for teachers' classroom and assessment practice does not vary according to the basis of their employment. While this finding might suggest that there is no need for specific professional development focusing on the pedagogical needs of casual or part-time teachers, it is important for schools to ensure that casual and part-time teachers have as much access to the professional development opportunities in their schools as do permanent full-time members of staff.

Main subject affiliation

As detailed in Table 4, while no significant differences were identified between subject affiliations for the quality of pedagogy measured by classroom observations, significant differences were identified for assessment task Intellectual Quality [$F(8, 61)=3.66, p<.01$], Quality Learning Environment [$F(8, 61)=8.18, p<.01$], and overall task Quality Teaching [$F(8, 61)=2.53, p<.05$].

Table 4: ANOVA for pedagogy and main subject affiliation

QUALITY TEACHING MEASURES		Sum of Squares	df	Mean Square	F	Sig.	
CLASSROOM OBSERVATIONS	INTELLECTUAL QUALITY	Between Groups	212.32	11	19.30	1.31	0.24
		Within Groups	973.52	66	14.75		
		Total	1185.83	77			
	QUALITY LEARNING ENVIRONMENT	Between Groups	168.04	11	15.28	1.40	0.19
		Within Groups	719.22	66	10.90		
		Total	887.26	77			
	SIGNIFICANCE	Between Groups	111.49	11	10.14	0.97	0.49
		Within Groups	692.84	66	10.50		
		Total	804.33	77			
	QUALITY TEACHING	Between Groups	1065.08	11	96.83	1.18	0.32
		Within Groups	5404.79	66	81.89		
		Total	6469.87	77			
ASSESSMENT TASKS	INTELLECTUAL QUALITY	Between Groups	402.14	8	50.27	3.66	0.00**
		Within Groups	838.14	61	13.74		
		Total	1240.29	69			
	QUALITY LEARNING ENVIRONMENT	Between Groups	65.45	8	8.18	3.19	0.00**
		Within Groups	156.35	61	2.56		
		Total	221.80	69			
	SIGNIFICANCE	Between Groups	37.19	8	4.65	0.75	0.65
		Within Groups	379.88	61	6.23		
		Total	417.07	69			
	QUALITY TEACHING	Between Groups	663.42	8	82.93	2.53	0.02*
		Within Groups	1996.45	61	32.73		
		Total	2659.87	69			

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Despite the differences reported earlier in this paper regarding the different pedagogical strategies that have been recognised to be important in the classroom practice of various subject areas (Goya, 2006; Hill et al., 2005; Murray & Lathrop, 2005; VanDeWeghe, 2005),

no significant differences were identified between subject areas when the same measures, in terms of dimensions of Quality Teaching, were used in this analysis. For assessment tasks, however, significant differences were identified. For example, tasks designed for Human Society and Its Environment (HSIE, a subject similar to studies of social science) scored significantly higher scores ($p < .01$) for the dimension of Intellectual Quality than did tasks designed for Physical Education, Health and Personal Development (PDHPE). Tasks designed for HSIE also scored significantly higher scores ($p < .01$) for the dimension of Quality Learning Environment than did tasks designed for mathematics. For Significance, tasks designed for PDHPE attained significantly higher scores than those designed for mathematics.

The implications of these findings for professional learning is that, particularly for assessment tasks, it is important for teachers to understand how the principles of Quality Teaching can best be applied to individual subjects areas, as well as pedagogy across the board. It will be interesting to note whether current professional development in SIPA schools that is highlighting how improvements made be made in the design of assessment tasks across the five subject areas under study might improve the assessment scores for certain subject areas in later years of the study.

Table 5 shows that significant correlations were identified between pedagogy scores and a number of additional teaching context variables.

Table 5: Teaching level pedagogy correlations

		CLASSROOM OBSERVATIONS				ASSESSMENT TASKS			
		IQ	QLE	SIG	QT	IQ	QLE	SIG	QT
Mean teaching year	Pearson Correlation	-0.14	-0.33	-0.17	-0.24	0.36	0.40	0.16	0.38
	Sig. (2-tailed)	0.14	0.00**	0.07	0.01**	0.00**	0.00**	0.12	0.00**
	N	112	112	112	112	96	96	96	96
Students taught each day	Pearson Correlation	-0.02	-0.23	-0.02	-0.11	0.25	0.36	0.26	0.34
	Sig. (2-tailed)	0.82	0.01**	0.85	0.26	0.01**	0.00**	0.01**	0.00**
	N	112	112	112	112	96	96	96	96
Collegial activities	Pearson Correlation	-0.12	-0.01	-0.06	-0.07	0.00	-0.07	0.14	0.03
	Sig. (2-tailed)	0.28	0.95	0.62	0.52	1.00	0.56	0.25	0.80
	N	81	81	81	81.00	71	71	71	71.00
Planning time	Pearson Correlation	0.17	0.15	0.15	0.18	0.20	0.04	0.09	0.17
	Sig. (2-tailed)	0.07	0.11	0.12	0.05*	0.05*	0.71	0.37	0.10
	N	112	112	112	112	97	97	97	97

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Mean Year taught

Much of the findings regarding the mean Year level taught were similar to the results from analysis of primary and secondary school level differences. As with the school level results,

the younger mean Year level, the significantly higher the observation Quality Learning Environment scores ($p < 0.01$) and overall Quality Teaching ($p < 0.01$). This significant correlation was not evident when examining within secondary and within primary samples. That is, the significant correlation between younger and higher Year levels for Quality Learning Environment and overall Quality Teaching in observations was evident across the whole sample, but not within the primary or secondary exclusive samples.

For teachers in secondary schools, this finding might be explained by the fact that the data for this analysis was collected from the first two years of the SIPA research project, in which there was a difference of only one Year level between the lowest and highest Year levels in which pedagogy was observed within the secondary context (Years 7 to 8). For teachers in primary schools, however, the first two years of SIPA data included data collection from two cohorts of students comprising observations of Years 3 through Year 6. Thus, and as discussed in the school context analysis of this paper, it may be concluded that observation scores were consistently higher across the four years of primary school (Years 3 through Year 6) than they were in lower secondary schools.

For assessment tasks, Intellectual Quality ($p < 0.01$); Quality Learning Environment ($p < 0.01$); and overall Quality Teaching ($p < 0.01$); were significantly higher for those teachers with higher mean Year levels taught. While this correlation was not identified within the secondary sample, significant correlations were identified within the primary sample, with tasks by teachers with higher mean primary Year levels scoring significantly higher than those of teachers with lower mean Year levels for both Intellectual Quality ($p < .05$) and overall task Quality Teaching ($p < .05$). While one might consider this finding to be predictable, in that it is reasonable to expect higher intellectual demands of students in later Year levels, it is important to note that the coding of classroom and assessment practice using the Quality Teaching measures is relative to the Year of study as mentioned in the earlier section.

The mean Year taught variable was found to be statistically significant for a number of school context variables. Teachers teaching higher grade levels were more likely to be teaching in: low ATSI schools ($p < .01$); remote schools ($p < .01$); schools with higher FTE enrolments ($p < .01$); and higher SES schools ($p < .01$). Additionally, teachers teaching higher grade levels were significantly more likely to participate in collegial activities ($p < .05$) and work with more individual students each day ($p < .01$).

Number of students per day

For observations, the fewer students taught each day the higher the Quality Learning Environment scores ($p < 0.01$). For tasks, the more students taught each day, the higher the

Intellectual Quality ($p < 0.05$); Quality Learning Environment ($p < 0.01$); Significance ($p < 0.01$); and overall task Quality Teaching ($p < 0.01$). These findings fit within the results for school level, as independent t-tests confirmed a significant relationship between the school level and the mean number of students taught each day ($t(955) = -16.12, p < 0.01$), with secondary teachers having a significantly higher mean number of students taught each day than primary teachers.

It is important to note here that these findings do not suggest a causal effect between teaching high numbers of students each day and the quality of pedagogy. As Marston et al. (2005) noted, the disparate numbers of students taught by primary and secondary teachers is one of the most defining characteristics of the two sets of teachers, affecting the degree to which teachers are able to get to know their students. Our results supported Marston et al.'s finding for classroom practice, particularly in terms of the Quality Learning Environment that was significantly higher for primary teachers than it was for secondary teachers. The significantly higher Quality Learning Environment scores received by secondary teachers for assessment tasks may be attributable to the fact that Quality Learning Environment is measured for assessment tasks by three elements rather than the six elements that are coded for classroom practice as mentioned in the previous section. The three elements that are coded for classroom practice for Quality Learning Environment that are not coded for assessment practice are Engagement, Social Support and Student Self-regulation. It is conceivable that these three elements are more related to a teacher's familiarity with the students, as Marston et al, suggest, than are the shared elements of Explicit Quality Criteria, High Expectations and Student Direction.

The number of students taught each day was found to be statistically significant for a number of school context variables. Teachers who taught larger numbers of students each day were significantly more likely to teach at higher SES schools ($p < .01$) with less ATSI students ($p < .01$); with more NESB students ($p < .01$); that are less remote ($p < .01$); and with higher FTE enrolments ($p < .01$). Additionally, teachers teaching more students each day were significantly more likely to participate in collegial activities ($p < .01$); and teach a higher mean Year level ($p < .01$).

Collegial activities

A measure of collegial activities was calculated by adding the frequencies of a number of items from the SIPA Questionnaire (See Appendix 5 for the SIPAQ items that contributed to the collegial activity measure). Analysis of variance identified no significant differences between the extent to which teachers participated in collegial activities and pedagogy outcome variables for either classroom observations or assessment tasks.

The finding noting the lack of correlation between collegial activities and pedagogy outcomes flags a call for further analysis. According to these findings, heightened participation in collegial activities had no positive effect on the quality of pedagogy as measured for either classroom or assessment practice. This finding contrasts with that identified by Letman (2005), who found that different kinds of collegial activities led to varying degrees of change in teaching craft knowledge. Our findings highlight a need to ensure that collegial activities in which teachers participate, as a form of professional learning, are focused on teachers' core business of pedagogy in an attempt to lift the quality of both classroom and assessment practice.

Analysis identified that teachers significantly more likely to participate in collegial activities were from schools with higher percentages of ATSI students ($p < .01$) and higher FTE enrolments ($p < .01$). Teachers who participated in collegial activities were also significantly more likely to have more planning time than those teachers who did not participate in collegial activities ($p < .01$).

Planning time

A measure of planning time was calculated by adding the frequencies of a number of items from the SIPA Questionnaire (See Appendix 5 for the SIPAQ items that contributed to the planning time measure). While existing literature regarding planning time noted its general absence (VanTassel-Baska & Stambaugh, 2005) except for administrative or organisational planning (DuFour and eaker, 1998, cited in VanTassel-Baska & Stambaugh, 2005), our findings identified significant relationships between reported planning time and the quality of pedagogy. For classroom observations, teachers who reported having more planning time received higher overall Quality Teaching scores than those teachers who reported having less planning time ($p < 0.05$). For assessment tasks, a positive correlation was identified between the amount of reported planning time and task Intellectual Quality ($p < 0.05$). Teachers with more planning time participated in significantly more collegial activities than teachers with less planning time ($p < .01$).

Noting the significant relationship between teachers' participation in collegial activities and planning time, the positive correlations between teachers' planning time and the overall Quality Teaching scores for observations and the Intellectual Quality scores of their assessment tasks suggests that planning time, be it individual or cooperative, has a greater influence on the quality of pedagogy than does collegial activity. This finding could perhaps be influenced by the ambiguous connection between what teachers consider to be planning

time and what they consider to be collegial activity and what they actually do while participating in these activities.

CONCLUSION

While political and academic discourse has focused on school context variables and the quality of teaching as separate factors influencing student achievement, the research reported in this paper has identified vital links between aspects of the structure of teachers' work and the quality of teaching demonstrated in various school contexts that should be considered before attributing sole cause to the school or the teacher. The major implications of the findings reported in this paper are threefold.

First, the analysis of differences between primary and secondary schools and the quality of pedagogy as measured for both classroom and assessment practice signifies a need for teachers to engage in effective professional learning activities to enhance the quality of assessment tasks particularly for primary teachers, classroom practice, particularly for secondary teachers, and pedagogy which meets the qualities of the dimension of Significance for both primary and secondary teachers in both classroom and assessment practice. It will be interesting to examine the trends in the quality of classroom and assessment practice for primary and secondary teachers that will be recorded in the future years of the SIPA research project.

Second, the implications for the findings regarding the quality of teaching experienced in schools with high enrolments of students from Aboriginal and Torres Strait Islander descent suggest that there is a dire need for quality of pedagogy to be enhanced in such schools. With the recent release of the report of the review of Aboriginal education in NSW DET schools (NSW Aboriginal Education Consultative Group Incorporated & NSW DET, 2004) and the recommendations put forward in that report being implemented in the final two years of the SIPA study, the capacity of the SIPA study to track changes in the quality of pedagogy for students in high ATSI schools will be a vital feature of the longitudinal SIPA study's findings.

Third, while most aspects of school context are beyond the locus of control of individual teachers, aspects of the structure of teachers' work are open to change if school organisational and teaching practices are likewise. In particular, the finding that more planning time was significantly and positively correlated to higher observation scores for overall Quality Teaching above and beyond school context variables promotes a call for the inclusion of more planning time to be scheduled in the structure of teachers' work.

We note here a limitation in this paper. Throughout the analysis reported in this paper, we have not controlled for school level variables that might have accounted for some of the variations of Quality Teaching scores for the various school context and teaching context variables. For example, the observation that the quality of teaching in schools with high ATSI enrolments appears lower than that for schools with low ATSI enrolments could be an artefact of those schools' remote geographic locations. While forthcoming multi-level modelling will account for such controlling variables, we stress that identifying possible controlling effects of variables such as school remoteness does not change the reality for students who, as members of an identified equity group, are being subjected to pedagogy that is of poorer quality than that experienced by those students who are usually advantaged by our school systems (Ladwig & Amosa, 2005).

While Gore and Ladwig (2006) and Griffiths, Gore and Ladwig (2006) discuss conceptions of professional development and the effect of professional development on pedagogy, our research supplements these discussions with a focus on the extent to which various school context and teaching context factors are related to the quality of teaching, and highlight the ways in which providers of professional development opportunities should consider such school and teaching contexts to focus particular aims of pedagogical reform.

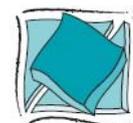
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The NSW model of pedagogy

The model of pedagogy presented in the *Quality teaching in New South Wales public schools: Discussion paper* (NSW Department of Education and Training, 2003) has three dimensions that represent classroom and assessment practices that have been linked to improved student outcomes. These three dimensions are:

1. Pedagogy that promotes high levels of **intellectual quality**.

Intellectual quality refers to pedagogy focused on producing deep understanding of important, substantive concepts, skills and ideas. Such pedagogy treats knowledge as something that requires active construction and requires students to engage in higher-order thinking and to communicate substantively about what they are learning.

2. Pedagogy that establishes a high **quality learning environment**.

Quality learning environment refers to pedagogy that creates classrooms where students and teachers work productively in an environment clearly focused on learning. Such pedagogy sets high and explicit expectations and develops positive relationships between teachers and students and among students.

3. Pedagogy that generates **significance** by connecting students with the intellectual demands of their work.

Significance refers to pedagogy that helps make learning more meaningful and important to students. Such pedagogy draws clear connections with students' prior knowledge and identities, with contexts outside of the classroom, and with multiple ways of knowing or cultural perspectives.

Each of the three dimensions of the NSW model of pedagogy is comprised of a number of elements. The 14 elements that pertain to assessment practice are presented in Table 1.

	Intellectual quality	Quality learning environment	Significance
Elements	Deep knowledge	Explicit quality criteria	Background knowledge
	Deep understanding	High expectations	Cultural knowledge
	Problematic knowledge	Student direction	Knowledge integration
	Higher-order thinking		Connectedness
	Metalanguage		Narrative
	Substantive communication		

Table 1: The dimensions and elements of the NSW model of pedagogy used in this guide

The discussion paper and other support materials related to *Quality teaching in NSW public schools* can be found on the web site:

<http://www.curriculumsupport.nsw.edu.au/qualityteaching/>



2.1 Explicit quality criteria

Description

High explicit quality criteria in a task is identified by detailed and specific statements about the quality of work required of students. Explicit quality criteria become a reference point for assessing student work when it is clear how those criteria will be used to assess students' work.

Low explicit quality criteria in a task is identified by an absence of written reference to the quality of work expected of students. Reference to technical or procedural requirements only (such as the number of examples, length of an essay or the duration of a presentation) is not evidence of explicit quality criteria.

Coding scale

To what extent does the task provide explicit criteria for the quality of work students are expected to produce, and use those criteria as a reference point for assessing the student work?

Explicit quality criteria

- ① No explicit statements regarding the quality of work are made. Only technical and procedural criteria are made explicit.
- ② Only vague statements are made regarding the desired quality of work.
- ③ Clear statements are made regarding the quality of work but there is little elaboration of what it means to do well.
- ④ Clear statements are made regarding the quality of work and there is some elaboration of what it means to do well.
- ⑤ Statements regarding the quality of work are made explicit and it is clear how these criteria will be used in assessing student work.



QUALITY LEARNING ENVIRONMENT

Notes

1. Designating what students are to do in order to complete a task does not by itself clarify what counts as high quality work. Merely outlining what students are supposed to complete is procedural. Explicit quality criteria, on the other hand, clarify for all students what the teacher expects in terms of a high quality completion of a task.
2. Teacher modelling of a task does not constitute clear quality criteria as students may merely mimic what they have observed. However joint construction with the teacher, or a group of students, where students are engaged in producing their own model of what constitutes a high quality response to a task, can be regarded as high in explicit quality criteria.
3. In some practical creative tasks, it may not be possible to develop explicit quality criteria for particulars of the required product, as students may create their own work by determining the style, genre and materials they select. However, it is still possible to provide some general criteria which may be refined as the students develop their work.
4. While the coding scale places value on the articulation of detailed criteria, simply listing detailed criteria may not give a full picture of what constitutes high quality work. For instance, at times when the "whole is greater than the sum of the parts", it may be useful to clarify the difference between a holistic impression in contrast to a point by point analysis. In the construction of a holistic grading rubric associated with a set of marking criteria, clear connections should be made between the elements within a rubric and the separate criteria. Holistic rubrics should make clear how credit is given to the components within the rubric.

Suggestions

- As you design the task, keep in mind the questions: *What do I expect the students to produce? and How well do I expect them to do it?*
- When devising rubrics for assessment, consider whether the criteria refer to the quality of the work explicitly, or merely give procedural or technical instructions.
- Involve students in joint construction of clear criteria for the task that explicitly describe the quality of work expected. If the students have some control over the development of the assessment rubric they may have a greater understanding of what quality means.
- Use the criteria to assess student work and to provide feedback during development, as well as on completion of the task.
- Provide annotated exemplars, work samples or models that illustrate high quality student performance based on the criteria. These exemplars could be in the form of work from past students and/or other sources.
- Be clear about what counts as a high quality performance and communicate these criteria clearly so that all students know what quality work looks like, rather than spending lots of time articulating different bands or levels of performance.



The NSW model of pedagogy

The model of pedagogy presented in the *Quality teaching in New South Wales public schools: Discussion paper* (NSW Department of Education and Training, 2003) has three dimensions that represent classroom practices that have been linked to improved student outcomes. These three dimensions are:

1. Pedagogy that promotes high levels of **intellectual quality**.

Intellectual quality refers to pedagogy focused on producing deep understanding of important, substantive concepts, skills and ideas. Such pedagogy treats knowledge as something that requires active construction and requires students to engage in higher-order thinking and to communicate substantively about what they are learning.

2. Pedagogy that establishes a high **quality learning environment**.

Quality learning environment refers to pedagogy that creates classrooms where students and teachers work productively in an environment clearly focused on learning. Such pedagogy sets high and explicit expectations and develops positive relationships between teachers and students and among students.

3. Pedagogy that generates **significance** by connecting students with the intellectual demands of their work.

Significance refers to pedagogy that helps make learning more meaningful and important to students. Such pedagogy draws clear connections with students' prior knowledge and identities, with contexts outside of the classroom, and with multiple ways of knowing or cultural perspectives.

Each of the three dimensions of the NSW model of pedagogy is comprised of a number of elements. These elements are presented in Table 1.

	Intellectual quality	Quality learning environment	Significance
Elements	Deep knowledge	Explicit quality criteria	Background knowledge
	Deep understanding	Engagement	Cultural knowledge
	Problematic knowledge	High expectations	Knowledge integration
	Higher-order thinking	Social support	Inclusivity
	Metalanguage	Students' self-regulation	Connectedness
	Substantive communication	Student direction	Narrative

Table 1: The dimensions and elements of the NSW model of pedagogy

The discussion paper and other support materials related to *Quality teaching in NSW public schools* can be found on the web site:

<http://www.curriculumsupport.nsw.edu.au/qualityteaching/>



INTELLECTUAL QUALITY

1.1 Deep knowledge

Description

Knowledge is deep when it concerns the central ideas or concepts of a topic, subject or KLA and when the knowledge is judged to be crucial to the topic, subject or KLA. Deep knowledge is evident when either the teacher or the students provide information, reasoning or arguments that address the centrality or complexity of a key concept or idea, or when relatively complex relations are established to other central concepts.

Knowledge is shallow or superficial when it does not concern significant concepts or key ideas of a topic, subject or KLA, or when concepts or ideas are fragmented and disconnected from a central focus. Knowledge is also shallow when important ideas are treated superficially by the teacher or students, or when there is no clear focus on an important idea or concept. This superficiality can arise from trying to cover large quantities of fragmented information that results in the content covered remaining unconnected to central ideas or concepts.

Coding scale

To what extent is the knowledge being addressed focused on a small number of key concepts and the relationships between and among concepts?

Deep knowledge

- ① Almost all of the content knowledge of the lesson is shallow because it does not deal with significant concepts or ideas.
- ② Some key concepts and ideas are mentioned or covered by the teacher or students, but only at a superficial level.
- ③ Knowledge is treated unevenly during instruction. A significant idea may be addressed as part of the lesson, but in general the focus on key concepts and ideas is not sustained throughout the lesson.
- ④ Most of the content knowledge of the lesson is deep. Sustained focus on central concepts or ideas is occasionally interrupted by superficial or unrelated ideas or concepts.
- ⑤ Knowledge is deep because focus is sustained on key ideas or concepts throughout the lesson.



INTELLECTUAL QUALITY

Notes

1. The essential difference between deep knowledge and deep understanding is that deep knowledge is about how **content** is presented in a lesson, while deep understanding is about the **learning** students demonstrate. It is possible for deep knowledge to be presented (by the teacher, students or guest speakers), but for students to demonstrate only superficial understanding, or vice versa.
2. In curriculum debates, a strong distinction is often made between **depth** and **breadth** of knowledge, which at times pits one against the other. It is important to recognise that substantial syllabus content coverage (some breadth) is necessary in order to achieve depth of knowledge. Consequently, depth cannot be achieved simply by focusing on "less" content.
3. The main issue related to deep knowledge is one of **quality**. Deep knowledge requires relevant syllabus content to be organised and taught in such a way that a small number of ideas or concepts are clearly established as the focus of the lesson. Depth is present if the content of a lesson is structured such that the central focus brings coherence and purpose to the lesson.

Suggestions

- Identify and review students' prior knowledge as a starting place for addressing deep knowledge.
- Identify significant concepts in syllabuses by reviewing objectives, outcomes, content (e.g. *learn about* and *learn to* statements) and stage statements. Reflect on how the syllabus content can explicitly illustrate the concepts.
- Identify the key concepts and relationships to be addressed by asking the questions: *What do I want the students to learn?* and *Why does that learning matter?*
- Check that you have identified the key concept or relationship by asking the question: *How well does the concept or relationship draw the content together?*
- Map outcomes and content during unit planning so that each lesson focuses on illustrating significant concepts while addressing manageable amounts of content.
- Connect key concepts being addressed from lesson to lesson.
- Use learning tools in both planning and teaching to connect, identify and clarify knowledge, e.g. concept maps which explain relationships within a complex issue or topic.
- Select specialised resources carefully to build deep knowledge. These could include field experts, the local community and services, the Internet, multimedia and out-of-school visits.
- Provide unit or module overviews for students so that they can see how the concepts fit into the overall picture.

Collegiality

Since the beginning of this year, how often have you visited another teacher's classroom to observe and discuss his or her teaching (exclude observations of student teachers or those for formal evaluations)? (Never; 1 time; 2 times; 3 times; 4 times; 5 times; 6 times; 7 times; 8 times; more than 8 times).

Since the beginning of this year, how often has a colleague come to your classroom to observe your lesson (exclude visits by student teachers or those for formal evaluations)? (Never; 1 time; 2 times; 3 times; 4 times; 5 times; 6 times; 7 times; 8 times; more than 8 times).

Since the beginning of this year, how often have you:

- a. received useful feedback on your performance from your supervisors, executive or peers?
- b. received useful suggestions for curriculum materials from your immediate colleagues?
- c. received useful suggestions for teaching practice or learning activities from your colleagues?
- d. met with colleagues to discuss specific teaching strategies?
- e. received useful suggestions for assessment materials from your colleagues?

(Never; Once; Twice; 3-4 times; 5-9 times; 10 or more times; Not applicable to me).

On average, how often do you meet with other teachers for a planning period? (Less than once per week; Once per week; Twice per week; 3-4 times per week; 5 or more times per week).

Planning

Since the beginning of this year, about how much time per month (on average) have you spent on the following? a.lesson planning; b.curriculum development; c.planning assessments. (None; Less than one hour; 1-2 hours; 2-3 hours; 3-4 hours; 4-5 hours; 5-6 hours; 6-7 hours; 7-8 hours; 8-9 hours; 9-10 hours; More than 10 hours)