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The Problem of Underachievement in Numeracy: Using Bourdieu and Critical Theory to Interpret Academic Achievement

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Abstract: This paper considers the academic achievement gap experienced by Victorian public school students. The paper uses a methodological approach informed by critical theory to interpret achievement levels between students from high and low socio-economic status. It analyses and discusses documented data and in doing this, reflects upon the work of Pierre Bourdieu emphasizing the reproductive nature of contemporary schooling.

Keywords: Pedagogical Action, Educational Practice, Numeracy, Academic Achievement

Introduction

THIS PAPER CONSIDERS the problem of public school under-achievement. It employs a qualitative critical case study method of analysis informed by a critical theoretical framework. The paper focuses on data from the Victorian Auditor-General's Report (VAGR): Literacy and Numeracy Achievement (2009). A significant component and aim of this paper is to illustrate and explain in some detail, broader social, economic and political interactions that work to influence public school outcomes in terms of student achievement.

The paper is in three sections. The first discusses the theoretical standpoint of the paper. The epistemological foundations of the argument within the paper are made in this section reflecting a critical Constructionist theoretical perspective. This part of the paper refers to the interpretative nature of research inquiry and includes a short explication of critical theory and its relevance to matters of educational interest. It also includes a short discussion on the case study approach illustrating its usefulness to the question and problem under consideration. Section two focuses on the problem of student under-achievement and examines the specific case of numeracy within an Australian context, the State of Victoria. The specific case of numeracy is worth particular consideration. The argument in this section refers to the correlation between socio-economic status (SES) and individual learning outcomes. In general terms, low SES correlates to lower academic achievement. The VAGR suggests that students from low SES backgrounds significantly underperform in numeracy when compared against their higher SES counterparts. This is a surprising finding in some respects, taking into consideration recent attempts at intervention, including efforts to alter classroom instruction.

Over the last six years there has been a major focus on further developing the curriculum, school leadership and teaching and learning in government schools. There has also been \$42.1million invested in new initiatives specifically for schools with poor literacy and

numeracy achievement. This funding was in addition to the \$120 million spent annually to improve literacy and numeracy across all government schools. (VAGR, p. 1, 2009)

The reproductive aspects and processes of schooling practice should come as no surprise. Nevertheless, contemporary public education policy-making tends to ignore and dismiss key components of the work of schooling that reproduces failure. The emphasis by government at present appears to rest on targeting individual teaching practice and instruction as the way forward in addressing educational disadvantage. This has the added effect of heightening and accentuating accountability in public education. Section three examines this issue highlighting the importance and relevance of Bourdieuan analysis to matters of school system practice. The primary and central feature here is to defend and re-state Bourdieu's theoretical perspective on the reproductive processes inherent in systems of education.

The Interpretative Method

A critical theoretical framework utilising an interpretative method of data analysis has the "capacity to interpret and construct reality" (Patton, 2002, p.97). Its dialogical foundations and basis, the academic development of which has facilitated its application to matters of social phenomena recognises and is sensitive to the "importance of individuality" (Jay, 1996, p.46). It acts to ensure that the "demands of the totality" (Jay, 1996, p.46) do not entirely subvert or drench and so saturate and silence that very same unit of personal individuality. This is important in considerations involving matters of educational interest that relate to evaluations of performance. Moreover, as a theoretical tool, critical theory can be used to examine and interrogate data. It does this in order to overcome and make explicit and clear an empirical bias often shown and expressed by over-loaded use of rigidly held systematizing and fervently enacted forms of empiricism. Critical theory can investigate a reified subject-object dichotomy in education that often neglects the qualitative experiences of participants, something that is often overlooked when consideration of basic educational outcomes such as those expressed in state-wide tests of numeracy are considered. It guards against the "growing rigidity of abstract rationalism, and the concomitant standardization of individual existence" (Jay, 1996, p.48), the dominant mode of life under advanced capitalism. Indeed, the objectification of student academic achievement can act amongst other things to highlight the reproductive aspects of contemporary education, aspects that often marginalize the already disadvantaged. This represents a particular theme of the paper, and is discussed in further detail in the third section.

Kincheloe and McLaren (2000, p.304) specify that there are particular and basic assumptions incorporated in critical theory and they are that:

1. all thought is fundamentally mediated by power relations that are social and historically constituted;
2. facts can never be isolated from the domain of values or removed from some form of ideological inscription;
3. the relationship between concept and object and between signifier and signified is never stable or fixed and is often mediated by the social relations of capitalist production and consumption;
4. language is central to the formation of subjectivity (conscious and unconscious awareness);

5. certain groups in any society and particular societies are privileged over others and, although the reasons for this privileging may vary widely, the oppression that characterises contemporary societies is most forcefully reproduced when subordinates accept their social status as natural, necessary, or inevitable;
6. oppression has many faces and that focusing on only one at the expense of others (eg: class oppression versus racism) often elides the interconnections among them; and,
7. mainstream research practices are generally, although most often unwittingly, implicated in the reproduction of systems of class, race and gender oppression.

Critical theory seeks to “explicate the nature of the relations between part and part, and parts and whole” (Peters and Olssen, 2003, p.4) incorporating a Constructionist dimension in that “social actors and realities are produced and shaped by historical forces and processes” (Peters and Olssen, 2003, p.4). This has consequences for classroom teacher practitioners. They often cannot control for contextual influences of a historical and social kind. In its ‘purest’ form, critical theory or the “critical theory of interpretation” (Rundell as cited in Crotty, 1998, p.91) expresses a need to know and explain in order to understand. But more importantly, it challenges in order to bring about change and in that sense, it does not merely interpret an imposed view or indeed necessarily accept the ‘status quo’. If particular views of reality are constructs generally derived through socially and culturally embedded practices and beliefs, then the views and beliefs of that particular reality will be those of the dominant social order.

Critical inquiry keeps the spotlight on power relationships within society so as to expose the forces of hegemony and injustice. (Crotty, 1998, p.157)

The invocation of scientific knowledge to express and maintain a particular hold or view reflects the dominant political and cultural position adopted by an individual. The consensus around interpretations of given data reflects the power exerted by pre-existing and socially constructed views of observations. “Critical theory is concerned with unravelling the contradictions between ideological representations and real states of affairs” (Peters and Olssen, 2003, p.7). It expresses a need to know and explain in order to understand. Thus, it questions basic education policy assumptions about the schooling system. It also helps to focus attention on the development of public education policy, the education system and the work of schooling as a particular case for study.

Critical Case Study

Yin (2009) states that case study research is a preferred method of analysis if and when: (a) how or why questions are posed, (b) a researcher has little or no control over events, and (c) a contemporary phenomenon within a real-life context is under focus and consideration (p. 2). A case according to Stake (2000), may be “simple or complex” (p.436) but resides within a “system” (p.436) that can be studied.

It is common to recognize that certain features are within the system, within the boundaries of the case, and other features outside. Some are significant as context. (Stake, 2000, p.436)

Public school classroom teaching practice is a complex activity and is influenced to a significant extent by external sources that can and often do impact upon the learning outcomes and academic achievement of individual public school students. Consequently, context matters. A critical case study approach to an investigation of public school under-achievement explores and can emphasize the connections between school system learning outcomes and relational issues of social class. Indeed, the critical examination and analysis of public school system under-achievement presents the critical theorist with a unique opportunity of case analysis.

At a minimum, every study is a case study because it is an analysis of social phenomena specific to time and place. (Ragin, 1992, p.2)

An interpretative method utilising case study analysis and informed by a critical theoretical framework highlights the significance of important educational issues, such as under-achievement. This may then allow for the re-conception, re-interpretation, re-formulation, re-analysis and re-examination of public school under-achievement by referring to the broader and greater scheme of the work of schooling and pedagogic action within specific economic and political contexts.

Accounting for contextual influences often ignored in rigidly enacted research designs that purportedly measure the effectiveness of classroom teaching practice and individual student learning is difficult to achieve. Critical case study prepares and makes room for the “crucial importance of mediation (Vermittlung)” (Jay, 1996, p.54) between subject and object in order to formulate a more informed version of social phenomena. Its usefulness as a methodological tool of analysis in education resides in its ability to engage with aspects of real-life interactions that have an impact on outcomes attained. It incorporates the “constant interplay of particular and universal” (Jay, 1996, p.54). Public school teaching practice contained within the confines of the broader education system is shaped and characterised by real-life events. Individual student academic achievement needs to be judged based on an understanding of real-life actions and practicalities. A purely metricated assessment and understanding of individual student academic achievement lacks the necessary empirical validation and credit needed for authentic analysis. It needs thorough investigation. An investigatory procedure that overcomes the “mere immediacy of the empirical world” (Lukaacs, 1999, p.162) is warranted. In doing so, a basis for the evaluation of student academic achievement, one that is richer and more meaningful can be achieved.

Student Under-achievement: The Specific Case of Numeracy

A clear and “expanding achievement gap” (Sellar and Gale, 2009, p.103) is an obvious trend in Australian public schools. It is a trend that clearly demarcates between students of high and low socioeconomic status as shown by regular literacy and numeracy tests.

One of the enduring issues in schooling is the way in which it reproduces advantage and disadvantage in society, at the very least evidenced in the strong correlation between low socioeconomic class and low student achievement. (Sellar and Gale, 2009, p.103)

The recent VAG Report (2009) conducted on literacy and numeracy achievement highlights these significant disparities in terms of academic achievement and economic status. Indeed, the report in its executive summary, states that “over the 10–year period to 2007, DEECD’s efforts have not resulted in a marked improvement in average literacy and numeracy achievement across age groups” (p.2). Moreover, the report goes on to state that, “Students generally performed less well in numeracy than in literacy, with average student performance often further below the expected level, and with fewer improving trends apparent.” (p.2) Reports of this kind reflect and recognise the over-representation of particular social groups amongst low achieving students. The case for education system reform particularly in Victoria rests on an educational plan of action that seeks to make a difference.

There are still students who leave school early, with poor levels of literacy, numeracy and other core learnings. These poor student outcomes are concentrated in some schools and some regions. Data show high concentrations in some regions and schools of students who have poor outcomes in literacy and numeracy, high school absenteeism, poor VCE/Year 12 results and low school completion. There are high variations in student outcomes between classes within schools, which highlights the importance of quality teaching. Furthermore, there are many schools that achieve outstanding results, and others with similar student populations that do not. (Blueprint, 2003, p.9)

It can be argued on the one hand that this represents a firm political commitment to social justice and equity, in that public education policy is geared towards addressing educational disadvantage. It sits well with recent sociological research (Downey et al, 2004), disputing reproductionist theories of the relationship between schooling and inequality, although it must be said, that this very same research has not found that efforts to equalize school conditions and experiences reduces inequality (p.633), an important and key feature that the Victorian State Government Blueprint (2003) corroborates:

Despite all that has been achieved over the past four years, we need to concentrate further upon improved learning outcomes for students. Some groups of students continue to have poor levels of literacy and other basic skills. These students can be concentrated in particular schools and particular areas of the state. They tend to have high rates of absenteeism from school and are more likely to leave school early. There are also high variations in outcomes between classes within schools and between schools with similar student populations. (p.2)

This set of public school circumstances in which a concern with continued and seemingly irreversible low achievement, predominantly prevalent in particular and specific communities and schools has been given heightened governmental education policy-making attention, particularly of late.

The latest Victorian State government educational Blueprint (2008) aims to reverse and redress social disadvantage. Its mission is to:

provide high-quality universal learning and development opportunities, with a view to Victorian children and young people excelling by international standards. We recognise the needs of those who are at risk of being left behind. (p.12)

Education system reform is an important part of this mission. It is an educational mission, with a human capital component underpinned by a commitment to accountability and system performance.

Victoria's ten year literacy and numeracy plan is based on what works best and is directed towards three important goals:

1. making sure we have the best teachers possible
2. fostering a culture of continuous improvement in our schools, and
3. targeting our resources to areas where they can most make a difference. (National Reform Agenda, 2008)

It is a systemic framework that makes a case for the amelioration of social, economic and cultural disadvantage. Change is sought by challenging and hopefully altering established pedagogic actions and practices that prevail and define the work of contemporary public schooling.

The idea that schooling practice has the capacity to 'make a difference' to individual student learning and academic achievement and improving one's life chances, is an implicit assumption in contemporary public education policy. The introduction of mass schooling the aims of which included, broadly speaking, "opportunities for the 'poorer classes'" (Taylor, Rizvi, Lingard & Henry, 1997, p.126) also involved provision of a more educated workforce for newly emerging industries. Access to a better life, primarily through attainment of a job came about or was at least made possible through some form of education or at the very least training. Schooling, considered as the "right of all" (Connell et al, 1982, p.15), including an expectation that all students should have access to equal opportunities in education, provides, it is hoped, the necessary tools and resources of academic engagement so as to make a difference to the life of an individual. Contemporary economic and political times, framed by narrow neo-liberal and neo-conservative ideologies, have not necessarily reflected some of the initial aims of mass public schooling. It "has not delivered all students with the necessary tools to embrace 'adulthood' in an increasingly capitalist society or the means to improve their lot in life" (Gale in Doecke et al, 2006, p.101), and they often struggle in a highly competitive and un-certain post-Fordist world. One could argue that changes in the "ideological environment of Australian schooling" (Connell, 2002, p.323), where public education policy-making and development has operated within an economic and political paradigm encompassing the "massive swing towards neoliberalism" (Connell, 2002, p.323), has also resulted in diminished educational returns in terms of individual learning outcomes. Indeed, if one considers the report compiled by the Victorian Auditor General (2009), significant educational deficiencies, in terms of achievement become apparent, particularly in numeracy.

- Achievement in the set of maths skills called 'Number' for Years 3 and 5 students showed some moderate improvements between 1999 and 2007, e.g., increasing by over half a term of learning at Year 3. Improvements in other areas of numeracy were slight.
- Numeracy achievement declined in recent years in some other areas of maths for students in Years 3 to 9 e.g., by four weeks of learning in Year 7, prior to 2007. In Years 11 and 12, although achievement in the more difficult maths studies improved, overall, achievement declined and was below the state average.

- Numeracy achievement declined more in Years 7 to 12 than Prep to Year 6. Average student performance also dropped further below expected levels each year from Year 3 to Year 9. (pp.4-5)

In terms of achievement for students from key economic groups, the report from the Victorian Auditor General states:

- The achievement gap between students from high-and low-SES schools was considerable at all year levels, e.g., representing 15 months of learning at Year 9 for both literacy and numeracy. These gaps had not narrowed over time for either literacy or numeracy.
- The Eastern Metropolitan region consistently outperformed all other regions. There were some improvements for students in the low-SES metropolitan regions, suggesting that initiatives targeted at low-SES schools may have had an impact, however student achievement declined in several non-metropolitan regions.
- The lowest-achieving students were well behind their higher-achieving counterparts. There were, however, some encouraging signs of improvement among the lowest-achieving students in literacy though not in numeracy. There was also improvement amongst the highest-achieving students in numeracy but not literacy. (p.5)

These levels of achievement illustrate that the education system and the work of schooling cannot be separated from the specific effects inherent in the mechanisms that define and propel its functions. Key aspects that form the pedagogic work of contemporary schooling, including pedagogic action and practice, and the authority bestowed by the school curriculum often through its communication and transmission, tends to tacitly ignore essential requirements needed for schooling success. In short, the work of contemporary public schooling has a contextual basis and operates within situational constraints that impact on those engaged in it-students and classroom teacher practitioners.

Notwithstanding this, contemporary educational practice is confined within political and economic considerations characterised by an emphasis on post-Fordist shifts in employment under-pinned by neo-liberal de-regulationist structural movements in production. There are two parts to this post-Fordist shift; one that is essentially labour oriented, the other associated with aspects of human identity in a society characterised by “risk” (Beck, 1992, p.19). Changing worldwide forces that writers (Giddens, 2003, Smyth, Dow, Hattam, Reid, and Shacklock, 2000) variously describe as ‘economic globalisation’ exert influence on all facets of schooling. Smyth et al (2000) characterize these changing global forces and new and changing circumstances in labour. They write that crucial shifts, particularly in terms of work organisation and workplace skill levels are defined by:

1. flexible post-Fordist forms of production and restructured workplace organization;
2. a greater reliance on market forces as a mode of regulation, rather than rules, regulations, and centralized bureaucratic modes of organization;
3. more emphasis on image and impression management as a way of shaping consumers;
4. a re-centralization of control in contexts where responsibility for meeting production targets is devolved;
5. resorting to increasingly technicist ways of responding to uncertainty, and,

6. a greater reliance on technology as the preferred means for resolving complex and intractable social, moral and political problems. (p.3)

The dominance of a neo-liberal economic market ideology stressing a post-Keynesian framework emphasizes a “restructured managerialist, competitive and performative state apparatus” (Lingard, 2000, p.29) including a heightened preponderance of intrusive and frequent performance assessments and measures “redolent of the performativity” (Lingard, 2000, p.29) expected in contemporary times. Capitalism’s latest incarnation which requires “endlessly adaptable” (Goddard, 2008, p.9) selves with the capacity to cope and manage various levels of “change and insecurity” (Goddard, 2008, p.9) forms part of this neo-liberal new order of economic and labour oriented systemic framework. The preservation of various taken-for-granted regularities, be they institutional, familial, and workplace under the new neo-liberal economy and mode of production either no longer exist or are at the very least, under severe strain.

If the social goals of prosperity and freedom are to be achieved individuals must constantly reinvent themselves, must seek to enhance and promote their talents in response to the challenges of the market and must be happy to abandon previous versions of self, to live without the consolation of a long-term life narrative and to accommodate themselves to the disrupted social relations that must proceed from resignation to a reality of flux and dislocation. (Goddard, 2008, p.9)

The hope of modernist Australian education policy development and contemporary public schooling is to ensure that all students as subjects of the education system, regardless of socio-economic status have the opportunity to gain the necessary skills and knowledge set that will enable them to navigate the post-Fordist economic and employment landscape.

It is becoming increasingly clear nowadays that what is important is to teach everyone the best way to learn. In other words, each individual must be provided with the intellectual apparatus that will enable him, as and when needed, to acquire knowledge that is in a constant state of evolution. (Paye, 1989, p.7)

This feature reflects the contemporary responsibility thrust upon the education system by the neo-liberal shift in economic and political ideology. Yet, as aforementioned reports suggest, many public school students appear to be losing out in gaining the necessary “intellectual apparatus”, and furthermore, are deficient in required skills. This phenomenon is even more perplexing considering recent efforts within education to concentrate and focus attention on techniques and strategies aimed primarily at effective classroom instruction for meaningful understanding.

The specific case of school mathematics reform is of note in this instance, and worthy of some further inspection. Slavin and Lake (2008) suggest that there are three approaches to mathematics reform characterised by: (a) change to the curriculum, (b) supplementation of the curriculum with computer-assisted instruction and (c) changes to classroom practices (p.430). The identification of effective practices in mathematics teaching nonetheless is difficult. The most significant difficulty resides in establishing validity of research outcomes. Schoenfeld (2006) suggests that the identification of best practice teaching of mathematics is usually derived from high-stakes testing. But, this may be indicating teaching practice of

a particular type, suited to outcomes of a particular kind and tailored narrowly for state-wide and national testing purposes. Indeed, the important and broader benefits of mathematics education including a propensity for problem solving, analysis and conceptual identification, characteristics that are regularly mentioned as vital aspects of contemporary learning, are not adequately evaluated during one-off system assessments of achievement. Competent learning of mathematics incorporating mathematical proficiency spans a number of key areas including but not necessarily limited to: conceptual understanding of curriculum content, procedural fluency, strategic thinking, analysis, adaptive reasoning and problem solving. A deep understanding of mathematics and the conceptual processes that underpin it as a school discipline, necessitates students of numeracy to grapple with a range of teaching processes aimed at developing their confidence in its manipulative expression. This can occur if there is an emphasis and focus on the conceptualisations of mathematics incorporating contextual utility, followed by skill development. The segregation of either is undesirable.

In addition, attempts at state-wide testing of student achievement as an indicator of instructional effectiveness does not advance the evaluation of teaching and learning. The statistical enshrouding that invariably define the testing models adopted are complex and convoluted often obfuscating understanding of core educational functions and components of teaching practice. Contextual variables and influences, usually ignored, are only incorporated if researchers consider them worthy of inclusion. The basis of inclusion is disclosed if cause and effect relationships are assumed. Difficult to measure influences and variables if not entirely ignored are given a statistical and mathematical assignment based on system imposed approximations. The individualized classroom teaching and learning context is removed. Classroom teacher involvement and judgement is relegated substituted by system generated descriptions and evaluations of expected performance. Darling-Hammond (1997) provides some insight into this issue of testing and its focus.

Is it real? Is the system really measuring the quality of schooling or teaching? Or is it measuring something else, such as changes in student population or artefacts of the assessment methods? (p.248)

Apple (1989) reminds us that education is not a neutral endeavour but is “inextricably connected to the forms of domination and subordination in a society” (p.1), and is captive to a constant interplay of conflict and contestation. The inevitable fight for control, particularly over curriculum and teaching, aims, goals and ends of education, and the “cultural policy and economic outcomes of the school” (Apple, 1989, p.1) represent core features of contemporary schooling. In any close scrutiny of public education and the schooling system, the wider and more significant query about “who benefits” (Apple, 1989, p.1) is never far from consideration. Indeed, the globally powerful and distinctive political and economic “structural crises” (Apple, 1989, p.4) that has also characterised the post-Fordist Australian polity and society brings with it an education policy-making style and approach based on a fundamental duopoly emphasizing quality and commitment. A seemingly constant concern about falling educational standards leads to mandated curriculum goals and objectives, and furthermore, edges parts of the school curriculum, particularly at the post-compulsory end, towards the needs of industry. The contemporary educational landscape dominated by the “terrain of standardization, productivity and industrial needs” (Apple, 1989, p.7) reflects the problems of public education. Central to this point is the post-Fordist context and process of accumu-

lation expressed and given priority by public education policy in terms of skill acquisition. The core and characteristic treatment of this movement in public education policy, that Dale (1989) describes as a “shift in the rationale for education” (p.48), has the individual at its centre. It is as Dale (1989) describes a shift in educational emphasis:

from an implicit rationale that education is for the development of the individual to the explicit rationale based on the contribution of education to national survival. (p.48)

But, it is the very emphasis on how the education system and the work of schooling should prepare individuals for a post-Fordist world that remains doubtful. Whilst expectations of education remain fixed on reified and abstract characteristics, including but not necessarily limited to notions of the adaptable and flexible individual (employee), with a capacity for independence and autonomy and a flair for productive innovation, it fails to acknowledge inherent and inextricable relationships between itself and the broader “national, cultural and administrative” (Dale, 1989, p.64) whole that is the modern post-Fordist State. The fluid dynamic of education and what constitutes its aims, goals and objectives in a post-Fordist world do not stay fixed, but continuously change and evolve. Schools as Dale (1989) states:

cannot bring about equality or even equality of opportunity. Some expectations cannot be met because they contradict other expectations, e.g. the identification and cultivation of the brightest talent and the boosting of all children’s self-esteem. This inevitable and predictable failure of education systems has a range of consequences for the practice and process of schooling. (p.64)

It is this aspect of contemporary public education that needs acknowledgement. In short, the system of schooling itself, imbued with its unique and often alienating structures and actions, cannot but lead to a level of system sanctioned under-achievement for some students. It is designed for this purpose.

Reproductive Processes of Education

The analysis and examination of individual student learning outcomes is not replete without recognition given to the relationship that exists between the educational system and the “structure of class relations” (Bourdieu and Passeron, 1990, p.177) prevalent in a given society. Classroom action in its varied manifestations is situated within structures that are not easily mapped for empirical evaluation. The evaluation of an educational system that includes a description and examination of pedagogical work and action, with the intended view to empirically determine the work of schooling is bound up in the practical reality of everyday existence. The intended education policy-making strategy aimed at perpetuated public school improvement continues to emphasize a metricated evaluation system of performance.

A more finely tuned approach to school management will be put in place to assess school performance against a balanced set of measures and to implement a broader range of strategies for school improvement. This approach covers the three major outcome areas of student learning, student wellbeing, and pathways and transitions. ‘Value-added’ measures will be included as these are developed. (Blueprint, 2008, p. 26)

The absence of a mediated category of explanation for low or poor academic achievement amongst particular social classes, ignores the social scientific character of theoretical and practical knowledge. This absence also reifies pedagogic action by totalizing objectivist inquiry and de-contextualizing the work of schooling.

The effort to catalogue the external functions of the educational system, that is, the objective relations between this system and the other sub-systems, for example the economic system or value system, remains fictitious whenever the relations thereby established are not brought into relationships with the structure of the relations prevailing at a given moment between the social classes. (Bourdieu and Passeron, 1990, p.178)

A theoretical framework that offers a scheme of analysis that sociologically and politically contextualises individual student learning outcomes is warranted, locating all of the aspects of schooling practice within a social totality that is defined and characterised by its own set of regulating structures. To do otherwise is to fall for a statistical and comparative fallacy, only serving to focus on collated information-data-deprived of situational significance.

The work of Bourdieu (1974, 1990) highlights the reproductive nature of contemporary schooling practices. The specific reproductive tendency of pedagogic action and contemporary schooling practice is established and displayed in the social relations depicted in a “sociology of education” (Bourdieu, 1974, p.71). A science of the relations inherent in the cultural and social nature of schooling practice that acts to explain individual student academic achievement, must grapple with the reproductive processes at work in the education system that produces and contributes to the learning outcomes attained. The power and symbolic relationships that occurs between different socio-economic and cultural classes indicated by the variation in distributed “cultural capital” (Bourdieu, 1974, p.71), is the designated measurement that is reflected in testing.

Indeed, it would seem that the action of the school, whose effect is unequal (if only from the point of view of duration) among children from different social classes, and whose success varies considerably among those upon whom it has an effect, tends to reinforce and to consecrate by its sanctions the initial inequalities. (Bourdieu, 1974, p.79)

Moreover, the work of schooling practice and pedagogic action, particularly in a subject discipline such as mathematics changes as one ascends the levels of schooling. The hierarchical nature of the curriculum including school mathematics requires cognitive change. Students have to:

migrate from play to work, from physical materials to symbolic, from group-based learning to private study, and from implicit meaning to formal purpose. (Teese and Polesel, 2003, p.102)

There are also subject selection consequences as a result. Teese and Polesel (2003) point out that “working class and lower-middle class students are twice as likely as upper-middle class students to take no mathematics at all” (p.104) as they move through the school system. Indeed, the VAG Report (2009) points out that mathematics as a core subject discipline

within the broader school system curriculum is losing its appeal amongst a substantial number of the public school student population.

The overall decline in numeracy masked improving trends for the two advanced maths studies. The overall decline occurred alongside an overall decline in enrolments in VCE maths studies since 2003, which was primarily in the two advanced maths studies. The combination of decreasing enrolments in advanced maths and improving trends for these studies indicates that, increasingly, only the more able students are taking these studies. (p. 37)

This presents its own set of particular problems. Entry into most higher education (University) courses in Victoria, including those considered the more prestigious, require subject specific pre-requisites usually stipulating the study of an advanced school mathematics subject. This could have academic consequences for public education students from lower SES backgrounds, particularly if that specific cohort of students actively resists the study of advanced level school mathematics. Its effects include pathway restrictions, limiting choice of possible future careers and higher education course options.

Despite modern discourses and theoretical debates emphasizing the ideologies of equal opportunity and meritocracy, the dominant classes exert significant influence upon educational direction ensuring that educational systems “reproduce the legitimate culture as it stands and produce agents capable of manipulating it legitimately” (Bourdieu and Passeron, 1990, pp.59-60). Bourdieu’s work highlights the overwhelming influence of the dominant social group in society that “controls the economic, social, and political resources which are embodied in schools” (Mills and Gale, 2007, p.435). Accordingly, Campbell (2005) maintains that a “substantial impact of neo-liberal inspired government policy in Australia appears to be the promotion of class division through schooling” (p.12). The situated connections of individuals, groups, and institutions embedded within a broad matrix of structured political and economic relations, the significance of which is successful and consequently effective manipulation of existent capital can only maintain and exacerbate disadvantage. The relevance and impact of social conditioning upon educational success reflects and maintains the “pre-existing order, that is, the gap between pupils endowed with unequal amounts of cultural capital” (Bourdieu, 1998, p.20), and is particularly relevant and evident in levels of attainment in numeracy. Consequently, a science of a logic of pedagogic and schooling practice expressed in terms that seeks to advance what is considered to work in the classroom and which dominates contemporary educational thinking about classroom instruction may not necessarily lead to intended outcomes. The particular scope or range of functionality inherent in what is termed effective pedagogic action and pedagogic practice expressed through the work of schooling, maintains the importance and role of the classroom teacher practitioner in making a difference to individual student learning outcomes. “Of the many factors that impact student achievement, the most potent relate to teachers and their practice” (Sanders, 2000). The case of numeracy is of particular relevance.

Improvements in numeracy outcomes were largely achieved as a consequence of a concerted focus on recognised ‘best practice’ in the teaching and learning of mathematics. However, while ‘good’ mathematics teaching is necessary to numeracy improvement, it is not sufficient. Consideration also needs to be given to how learning is organ-

ised and supported in the middle years of schooling and how what is expected of schools and students in terms of numeracy-related learning outcomes is represented. (Siemon, Virgona and Corneille, 2001, p.7)

The inter-connected and associative contextual information that, on first inspection is concealed or seemingly unobtrusive yet remains central to and impinges upon individual teaching practice and furthermore, acts on the outcome(s) attained, is a key feature of the objective evaluation of the work of schooling. However, movement beyond “ritual alternatives of separation and participation’ (Bourdieu, 1990, p.104) which is common to ideologically framed research inquiry, considers pedagogic action in terms of a system of functions. It would appear though that ‘best practice’ teaching is not enough. To develop a “theory of the logic of practice as practical participation in a game, *illusio*” (Bourdieu, 1990, p.104) is to advance, through objectivist descriptions of practical classroom actions such as pedagogic and teaching instruction, an illusory and false, or at the very least, incomplete illustration of the relations between different social groups that comprise the public education system. Subsequently, learning outcomes such as those obtained on state wide or national numeracy tests and compiled by government agencies may actually be reporting on social differences rather than specific cases of learning deficiencies experienced in and or caused by the teaching of numeracy.

Conclusion

In this paper I have argued that socio-economic status (SES) has a bearing upon individual student achievement. Students from low SES backgrounds still experience significant educational disadvantage in terms of learning outcomes. The recent VAG Report (2009) studying literacy and numeracy achievement in Victoria’s public schools for the period (1997-2008) appears to support this claim. This rather surprising and somewhat unexpected finding has occurred despite substantial government efforts. The “DEECD expected improvements in literacy and numeracy achievements resulting from its actions since 2003” (VAGR, 2009, p.2) and that gains in achievement levels “would start to emerge by 2008” (VAGR, 2009, p.2). This has not been the case. The paper considers the specific case of numeracy achievement in the stated period, and finds from the evidence provided by the report that numeracy achievement for students from lower SES backgrounds is significantly below their higher achieving SES counterparts.

The paper has approached the problem of SES and public school under-achievement from a theoretical perspective that is informed by critical theory. Numeracy in public schools for the period (1997-2008) has been examined as a specific case for study. The argument mounted rests upon a theoretical framework that utilizes an interpretative method of inquiry in matters of educational interest.

Economic and political change brought about by neo-liberal approaches to educational practice is discussed. The consequences for education are many and varied. Neo-liberalism in education has resulted in a shift of educational emphasis. The established holistic view of education as a public good that brought individual benefit, expressed as a whole-person benefit in the best traditions of a liberal educational outlook, has been superseded. The contemporary educational emphasis insists on continuous and active immersion in life-long learning. This offers the individual preparation in a form of hyper-competitiveness for post-

Fordist engagement and readiness in a world that is increasingly unstable regarding continuous and gainful employment. Unfortunately, those most in need of this form of skill preparation remain educationally disadvantaged despite efforts seeking educational change.

The problematical nature of statewide testing including the idea of curriculum reform in school mathematics is briefly discussed. It is suggested that test results obtained through state-wide testing may not necessarily indicate educational deficiencies. The evaluation of student individual achievement and by implication teaching practice holds teachers and schools accountable. Yet, the complex nature of teaching practice is difficult to measure, if at all, when student learning is based on a single unit or criterion of measurement. Moreover, one-off system wide testing may not be a useful tool for the measurement and evaluation of skills considered important for a future world that requires highly adaptable and flexible thinkers and workers.

The paper ends with a discussion centred on the reproductive processes of contemporary schooling. These reproductive processes inherent and on display in the education system are well known. Contemporary public-education policy-making continues to emphasize school-system improvement through alterations to classroom instruction. Control is enacted through an intervention process, aimed primarily at the individual classroom teacher practitioner. An intrusive evaluation system assists in its delivery that in effect, may offer misguided and distorted depictions of learning outcomes re-asserting reproductive processes of school-system inadequacy and failure for the already disadvantaged.

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