The Effects of Explicit Spelling Lesson Programs on Performance Outcomes of Upper Primary Students

by

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DEDICATION

I dedicate this thesis to my husband Patrick,
and to my parents Olive and Ronald Black
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STATEMENT OF AUTHENTICATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

August 2007
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<td>AAv</td>
<td>Above Average</td>
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<tr>
<td>ASK-KIDS</td>
<td>ASK</td>
</tr>
<tr>
<td>Av</td>
<td>Average</td>
</tr>
<tr>
<td>B</td>
<td>Borderline cognitive ability</td>
</tr>
<tr>
<td>BAv</td>
<td>Below Average</td>
</tr>
<tr>
<td>B/Co</td>
<td>Borderline and Cut-off students grouped together</td>
</tr>
<tr>
<td>BOS</td>
<td>Board of Studies</td>
</tr>
<tr>
<td>CAI</td>
<td>Computer Assisted Instruction</td>
</tr>
<tr>
<td>ChrA</td>
<td>Chronological age</td>
</tr>
<tr>
<td>Co</td>
<td>At or below Cut-off level of cognitive ability</td>
</tr>
<tr>
<td>cwpm</td>
<td>Correct words per minute</td>
</tr>
<tr>
<td>DET</td>
<td>Department of Education and Training</td>
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<tr>
<td>Inv</td>
<td>Intervention (group or classes)</td>
</tr>
<tr>
<td>KLA</td>
<td>Key Learning Area</td>
</tr>
<tr>
<td>MI</td>
<td>Multiple Intelligences (Gardner)</td>
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<tr>
<td>NCA</td>
<td>Normal cognitive ability</td>
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<td>NEGD</td>
<td>Non-Equivalent Groups Design</td>
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<tr>
<td>NInv</td>
<td>Non-Intervention (group or classes)</td>
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<td>NNWL</td>
<td>Neural Network for Written Language model</td>
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<tr>
<td>NSW</td>
<td>New South Wales</td>
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<tr>
<td>ORF</td>
<td>Oral reading fluency</td>
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<td>PR</td>
<td>Percentile Ranking</td>
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<td>PrSA</td>
<td>Predicted spelling age</td>
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<tr>
<td>QSRLS</td>
<td>Queensland School Reform Longitudinal Study</td>
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<td>QT</td>
<td>Quality Teaching model</td>
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<tr>
<td>SA</td>
<td>Spelling age</td>
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<tr>
<td>SLD</td>
<td>Social Learning Theory</td>
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<td>SS/5</td>
<td>Study Students – Year 5 students only</td>
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<td>StSc</td>
<td>Standard score (spelling instrument)</td>
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<tr>
<td>SYSTEMS</td>
<td>SYS</td>
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<tr>
<td>TLS</td>
<td>Team Learning System</td>
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<tr>
<td>TWS</td>
<td>Test of Written Spelling</td>
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<td>ZPD</td>
<td>Zone of Proximal Development</td>
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ABSTRACT

The study is concerned with improving the spelling performance of below average spellers in an upper primary mainstream classroom setting. The main target group is children who do not qualify for learning support resources yet have difficulty thriving in the literacy area of spelling. It was expected that lessons designed to expand students’ knowledge about words and the English language system would generate a greater student facility with learning spellings.

A quasi-experimental methodological approach was taken which also has features of a controlled trials study. Four spelling intervention lesson programs were designed and each has a different pedagogic emphasis:

1) Metacognitive and multisensory learning strategies
2) Teacher-Best-Practice
3) Teacher designed inquiry-based group work
4) Learning with a computer-based Team Learning System.

The study design is both practical and pragmatic in that only resources already available to the schools were utilised; lesson formats and teaching practices can be easily replicated; and the spelling programs are compatible with NSW curriculum directives.

The intervention lesson program took place for one hour per week over a two-term period and involved four schools situated in the outer areas of Sydney, Australia. Students and teachers in nine upper primary classrooms took part in the study, five of which were intervention classes and four were non-intervention classes. The classroom teachers were an important factor in the program presentation and lessons with an explicit focus on words were conducted from a constructivist perspective.

Results indicate that when spelling becomes an instructional focus, substantial progress in performance levels can be made in both intervention and non-intervention classrooms. Discussion of the findings examines how pedagogic factors influenced learning outcomes for
all ability groups in the literacy area of spelling. Particular attention is given to the progress in spelling age made by below average performers, as determined on pre-testing, and students with lower than normal cognitive ability. It is considered that the more interactive approach to teaching spelling, plus a high level of congruence with the Quality Teaching model (NSW DET, 2003) elements of Engagement, High-order Thinking, and Substantive Communication, assisted these target groups of students in the intervention classes.

The principal conclusion that can be drawn from the findings of the study is that minimal modifications to teaching practices can bring about improvement in students’ spelling performance levels. It illustrates the capacity of children to advance their learning outcomes when lessons are designed and delivered in a manner that encourages engagement and interactive support. Such a conclusion directs the responsibility for students’ learning outcomes to their classroom teachers. The study identifies that there are implications for the providers of in-service and pre-service professional development of teachers situated in upper primary mainstream classrooms, and the pedagogic aspirations of the primary school community.
Chapter 1

Introduction to Area of Study

1.1 INTRODUCTION

Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttaer inwaht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is tahtthe frist and lsat ltteer be at the rghit pclae. … Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, butthe wrod as a wlohe (Krashen, 2002).

It is a long journey from first gaining the concept that squiggles on a page are a medium for communication to having sufficient mastery over the written language to deliberately design misspellings for a purpose. The simplicity of Krashen’s (2002) example belies the complexity of the cognitive processing required to comprehend the message, and the sophistication of the knowledge-base that wrote it. Each process engages cognitive networks that incorporate learnings about the English language: how it works, how to use it, and the words that support it. Cognitive associations are built up over years of practice and experience, and much time is invested in a drive for accuracy of reception and expression. In the literate society of today, non-deliberate incorrect spellings reflect poorly on the writer just as inaccurate pronunciations disadvantage the speaker.

This study is about spelling. The specific problem area that it is designed to address is that there are students in upper primary classrooms who do not spell at an age appropriate level of performance. Its focus is to explore ways to assist poor spellers in upper primary
mainstream classrooms to improve their spelling performance through the implementation of intervention spelling lesson programs. Students at this stage of their school careers who perform below their age appropriate levels have very little time to enhance their spelling performance before they meet the written language challenges of the secondary school environment. The lesson program designs adopt a pragmatic stance which juxtaposes the language knowledge needs of upper primary children with teachers’ pedagogic priorities that are constrained by curriculum imperatives and pressures on time.

The intervention lesson programs took place during the middle two terms of 2003 and 2004 when debate on perceived or actual poor ‘literacy standards’ was, and still is, a recurring theme in the media. In accordance with the increasingly widespread neoliberal approach of the past twenty-five years to economic management in the Western world, the NSW government (1999) had implemented a program of increased public accountability and reporting for school-based procedures and policies. According to Earl (2005) “accountability and data are at the heart of contemporary reform efforts worldwide. Accountability has become the watchword of education …” (p. 6) for both school administrations and teaching personnel, and underpins a more economic rationalist approach to the educational environment. Both National and State governments, aware of social and political pressures for reform, had supported initiatives to improve learning outcomes for students by establishing national benchmarks, providing more funding for support personnel, and by implementing the Quality Teaching (QT) pedagogic model (Department of Education and Training [DET], 2003) in New South Wales (NSW) schools. The vocal “back to basics” cry frequently focused on reading and writing standards but it was often the area of poor spelling that was singled out to illustrate what was commonly identified as a literacy problem.

The importance of this study lies in working with the belief that the performance of low achievers in spelling improves when they experience lessons that are explicit and challenging, yet supportive of their word learning difficulties. According to Edwards-Groves (2003) the main features of explicit teaching in literacy are that: a) students are informed of a lesson’s purposes and processes; b) student thinking is engaged with the primary topic; c) lessons focus specifically on learning; and d) meaning is attached to learning in literacy. Indeed, these factors, together with collaborative learning opportunities with peers and teachers, and lesson topics selected on an ‘important-to-know’ basis, constitute the support provided.
Intervention lessons were experienced by mainstream Year 5 and Year 6 students. Although the lesson parameters were designed prior to public dissemination of QT model documents (NSW DET, 2003a), descriptions and discussions of classroom environments are related to the QT dimensions of Intellectual Quality, a Quality Learning Environment, and Significance, as they aptly convey the approach taken.

The students demonstrated a range of spelling performance abilities. Differences between pre- and post-test data from the formal spelling test, “Test of Written Spelling (4th Edition)” (Larsen, Hammill, & Moats, 1999), (usually hereafter referred to as TWS) indicate one of two alternative scenarios:

1) If differences are not statistically significant then poor spelling performance levels are more resistant to improvement by an expanded program of teaching strategies than anticipated; or

2) If differences are statistically significant it indicates that very few modifications to teachers’ usual practices bring about improvement in students’ spelling performance standards.

1.2 BACKGROUND TO THE STUDY

The word ‘spell’ is an interesting word. Apart from meaning writing the letters of a word in the correct order, it has several other meanings which include magical charm or turn at work (Coulson, 1968). In the literacy context it derives from an Old French word ‘espeler’ which means to read out (Ayto, 1990). It is also a very emotive word and, depending on the learning experiences of the speller, evokes emotions that range anywhere from pride to shame. The attention given to learning spellings has not waned as many classroom hours are spent on spelling activities over the primary school years and it is often the main topic for primary school homework. Parents commonly use spelling performance as their gauge for how well their child is achieving in writing as it is the precision of the technical aspects of writing, including grammar and punctuation, which can catch their eye rather than the quality of the concepts expressed in the content of the product. There is something reassuring about the certainty of ‘rightness’ and ‘wrongness’, a quality spelling shares with mathematical-tables and working with numbers.

It is perhaps the indisputability of spelling mistakes that can give rise to negative feelings as the evidence is there in black and white. Errors cannot be denied even to oneself and a student knows when, despite their best efforts, they perform less well than their peers. Peters
(1985) identifies what she calls six good reasons for spelling correctly and her list was compiled over twenty years ago:

1) communication and consideration for others
2) courtesy
3) habit-formation of precision
4) contribution to a student’s self-concept
5) “because spelling has become ‘petrified’ it has to be learned” (p. 5)
6) freedom to write creatively when spelling is automatic and accurate.

The fourth reason named by Peters, relating to a student’s ‘self-concept’, is achieved through the child’s “knowledge that he can communicate adequately and acceptably in writing” (1985, p. 4) as well as the “status symbol” of demonstrating to others an “easy competence” with the skill of spelling. No doubt all children would like this opportunity. However, consideration of Peters’ other reasons for good spelling leads to the conclusion that they also relate to what she has called a person’s self-concept.

Self-concept is defined by Hamachek (1987, as cited in Eggen & Kauchak, 1994) as students’ “awareness of themselves as persons … (and) … includes the total of people’s perceptions about their physical, social, and academic competence” (p. 116). “Communication and consideration for others” (Peters’ Item 1), as well as “courtesy” (Item 2), are concerned with correctly conveying a message with the most ease for the reader, and failure to do so is deemed to reflect poorly on the social responsibility of the writer. Peters (1985) considers that “precision” (Item 3) is “one of the main virtues educated people have to acquire” (p. 3) and good spelling skills demonstrate a “habit of care”. The implication that can be drawn about a poor speller from Peters’ comments is that they failed in their education. The onus appears to be on the student. The same adverse judgment can be made if a person fails to adequately learn a “petrified” language system. The only one of Peters’ reasons that has affective distance from the struggling speller, and is less their faulty learning and rather their loss, is Item 6) “freedom to write creatively when spelling is automatic and accurate”. By this she means that reluctant spellers often avoid more complex unfamiliar words and thereby restrict their creative expression.

Public attitudes have modified since Peters’ list was compiled in 1985, although they represented the prevailing opinions when many of today’s parents and teachers were students in schools. Criticism is now less harshly directed at the poor spellers as there is greater awareness of physiological conditions that affect the ease with which some students learn to
read and spell. Additionally, some of the most reluctant and challenged adult writers use the email system in the course of their employment and exposure of poor spelling competence in educated people has weakened any previously perceived direct association of spelling ability with education and intelligence. Blame in the mass media for poor standards is currently more often directed at the educational system rather than the individual, and teachers are often professed to be at fault. Fault and blame are not useful paths to explore, any more than that of “student responsibility”, as mooted by Peters (1985). The orientation of this study is to consider pedagogic factors in the mainstream classroom experience that have a positive influence on students’ progress in spelling performance, so that learning opportunities are optimised irrespective of students’ present achievement levels.

The Year 5 and Year 6 male and female students who participated in the study were mainly between ten and twelve years of age and had experienced a number of years of spelling instruction. The focus of early instruction differs from that of later years. Authors such as Ehri (1989) and Henderson (1981) stress the interrelationship between learning to spell, read and write in the early stages of written language development, when a sight-word vocabulary is being established physiologically within the brain structures (Pugh et al., 2001). By the time students are in upper primary classes, Gentry (2004) argues that the main role of spelling lessons is to add further correct entries to sight-word storage for use in reading and writing activities. This unintentionally implies a very simplistic view of teaching spelling and evokes images of lessons dominated by word-list learning and weekly testing.

Students in Years 5 and 6 can be considered to be in the transition phase between a ‘supported reading and writing stage’ and an increasingly unsupported ‘independent reader and writer’ level expected in secondary schooling. Literacy benchmark standards (Curriculum Corporation, 1998) for Year 5 indicate that frequently used words “with less common spelling patterns - there, because [and] always” (p. 35) should be accurately spelt and that students’ errors in spelling more complex words should indicate their awareness of phonetic, visual and phonemic patterns. The implication is that the mistakes students make signify a direction for future instruction, a notion developed by researchers from the University of Virginia well over thirty years ago (Henderson & Templeton, 1986) into a program of word-study. Benchmark standards for reading, writing and spelling at Year 5 are summarised by stating that students should be able to read, write and spell texts that are straightforward and with frequently used textual features.
Nicholson (2000) cites researchers such as Ehri (1987) and Frith (1980) who contend that the relationships between reading, writing and spelling processes are not straightforward. Competence in reading does not necessarily signal ability in the spelling or writing spheres. For example, Ehri reports that the correlation between reading and spelling abilities ranges from .66 to .90, and Frith considers that about 12% of children are good readers yet poor spellers. There appears to be a mismatch in these students between what is visually recognised and what is laid down in memory for expressive recall or, alternatively, that errors arise in written expression through faulty recall of correct memory entries. Whatever the underlying causes, the quality of any written output is compromised by deficient spelling performance. Whilst a poor speller might competently convey a message, as illustrated by the opening quote (Krashen, 2002), comprehension relies heavily upon the skill of the reader. More restricting for the speller, a number of authors (Frank, 1995; Henderson, 1981; and Peters, 1985) suggest that lack of spelling competence influences decisions about the choice and range of words a writer is willing to commit to public exposure and thereby constricts the richness of the writer’s expression.

Ehri (1998) considers that spelling is one aspect of the knowledge required for sight-word acquisition and that a sight vocabulary is essential for fluency in the processes of reading and writing. This introduces the concept of efficiency during reading and writing activities and that ‘a correct and accurate spelling’ capability (Gentry, 2004) supports a notion of automaticity. It allows cognitive processing to be more directed to constructing meaning from a message rather than to overly attending to its technical aspects. Thus, spelling is integral to the cognitive processes that lay down the memory of words, and manifest in fast and efficient utilisation of the written language system.

1.3 CONTEXT OF NSW

Acknowledgement of the alliance of spelling with the language arts areas of reading and writing is apparent in curriculum documents produced by the NSW Department of Education and Training, and the Board of Studies [BOS] NSW. By association, the curriculum area labelled Spelling comes under the same umbrella as Reading and Writing in terms of Government policies and directions. The results of the 1996 “National School English Literacy Survey” (Commonwealth of Australia, 1997) indicate that about one third of Year 5 students did not meet the minimum standards in reading (29%) and writing (33%). National benchmarks for reading, writing and spelling were developed and approved in 1998.
(Curriculum Corporation) which “articulate nationally agreed minimum acceptable standards for literacy at years 3 and 5” (p.1). These were later extended to include Year 7. Irrespective of the exact percentages, the findings of the survey indicate there is a sizeable number of students in NSW schools who underachieve in a significant curriculum area that is critical for their ongoing educational development.

Since 1999 data on the percentage of Years 3, 5, and 7 students who achieve benchmark standards in reading, writing, and numeracy have been published in “The National Report on Schooling – Australia” (Ministerial Council on Education, Employment, Training and Youth Affairs [MCEETYA], 2004). It was found that 88.7% of Year 5 students reached benchmark standards in reading and 94.2% in writing in 2004. The NSW percentages are higher than the national figures with reading at 90.9% and writing at 95.9%. Conversely, this indicates that 9.1% of NSW Year 5 students failed to reach benchmark standards in reading and 4.1% in writing. Based on the 2002 “Report on Class Size Audit” (NSW DET) of 1,714 schools and approximately 59,000 Year 5 students in NSW, these percentages represent about 5,400 students who were below benchmarks in reading and 2,400 in writing. If results are comparable it appears that performance standards are improving. Nevertheless, it is sobering to contemplate that in addition to the students who are below minimal standards, there are yet others who only reach the benchmark level of achievement. For these children reading and/or writing can be an arduous process and such students may find it difficult to thrive educationally in less supported environments than the primary school classroom.

Teachers in secondary schools tend to be specialists in specific curriculum areas in contrast to the primary teachers’ more generalised training. Consequently, there is an expectation that students should achieve adequate levels of competence in basic literacy and numeracy skills in their primary years in preparation for secondary schooling. Yet the demands on a primary teacher are high. In addition to completing curriculum schedules they must meet the needs of a diverse student population. A non-selected mainstream public school classroom includes children with different cognitive abilities, emotional needs, and behavioural challenges. Almost certainly in metropolitan schools there will be students from a range of socio-economic, cultural and ethnic backgrounds, some of whom have the added problem of a non-English home language. Additionally, there might be children with a physical disability that compromises their ability to fully engage in the educational process, such as vision or hearing problems. Whilst there can be up to thirty students in NSW public school Year 5 classrooms
Informal programs are in place in many schools to assist children to develop literacy skills such as community volunteers. However, more specialised programs and teachers are often only available to students who demonstrate a significant lack of progress or have special needs. Children from non English speaking home backgrounds are an example. Whilst NSW school administrations can prioritise their spending, they nevertheless have to operate within budgetary constraints – and extra teaching personnel are a costly resource. Usually, any students who do not meet the criteria for accessing support resources yet struggle to achieve in the mainstream class environment are wholly dependent on their classroom teacher for their school-based learning opportunities.

In a literate society such as Australia and other Western countries, an important educational focus is development of the language arts. The NSW State literacy and numeracy plan 2001-2003 (NSW DET, 2001) states a commitment to improving student achievement and that "strategic policy development will provide teachers with systematic support for teaching reading, spelling, writing and talking and listening in all subjects"(p.5). There is acknowledgment that a supportive language environment is vital, and key objectives for the support of literacy include professional development, targeted whole-school approaches to teaching literacy, student assessment to monitor support needs, partnership arrangements with parents, and exploring "the relationship between literacy and new technologies to enhance literacy teaching"(p.5). Thus spelling is firmly posited in the language arts stable by the NSW DET, and spelling performance issues are subject to development in the wider dimensions of the language learning environment. Yet spelling has an important role in written language development and expression, and it is therefore pertinent to establish the boundaries of spelling and how the process supports learning in the functional spheres of reading and writing.

Curriculum materials, available to all public school primary teachers, include the English K-6 Syllabus (BOS NSW, 1998b) and English K-6 Modules (BOS NSW, 1998a). The Syllabus provides the following definition of literacy, which it quotes from the 1991 Department of Employment, Education and Training [DEET] publication, Australia’s Language and Literacy Policy: “Literacy is the ability to read and use written information and to write appropriately in a range of contexts. It is used to develop knowledge and understanding, to achieve personal
growth and to function effectively in our society” (p. 5). The Key Learning Area (KLA) of English is pivotal to all other KLAs and as such the quality of learning in the language arts influences learning in all aspects of school life. Teachers use the English Syllabus to structure their programs and it provides a framework for assessment purposes. Outcomes and content are organised into three strands, namely Talking and Listening; Reading; and Writing. Each strand has four stages, Early Stage 1; Stage 1; Stage 2; and Stage 3 that “describe the sequence of learning experiences through which students will progress” (BOS NSW, 1998b, p. 5). Early Stage 1 relates to students in Kindergarten (aged about five years); Stage 1 to those in Year 1 and Year 2; Stage 2 to Year 3 and Year 4; and Stage 3 to Year 5 and Year 6 students (aged approximately eleven years). The “Scope and Sequence of Phonological and Graphological Skills” section outlines the opportunities that students should be provided with in Visual Processing; Sound Awareness; Letter-Sound Relationships; Spelling and Handwriting for each stage. Spelling appears to relate only to writing activities whilst Letter-Sound Relationships relate to reading. The separation is confusing as “build word families using words with known rimes (for example, using knowledge of ‘day’ to spell ‘bay’ and ‘ray’)” (p. 80) is an item in the Reading section.

The English K-6 Syllabus “Overview of language and language learning” (BOS NSW, 1998b, p. 7) labels the subject Spelling, as a component in “Contributing skills and strategies” of the Writing section and it is listed with Processes; Grammar; and Handwriting. The “Contributing skills and strategies” of the Reading section include: contextual and semantic; grammatical; phonological; and graphological. Graphological is defined in the Glossary as “Visual information about words and texts in print, eg punctuation, letter sequences” (p. 95) so it appears that the Syllabus considers letter sequence activities are “graphological” in the receptive areas of Listening and Reading, and “spelling” in the expressive functions of Writing and Speaking. The impression gained from the Syllabus is that spelling is solely considered by the BOS NSW as a substrand of Writing, and Bouffler (1984) suggests that such positioning presents spelling as a monolithic skill rather than a language process.

The view that spelling is a substrand of writing in the English K-6 Syllabus (BOS NSW, 1998b) perhaps underrates its role in literacy development, particularly in the early stages, although it is acknowledged in the Syllabus that “learning to spell is closely linked to learning to read and write. Learning about spelling reinforces knowledge about common letter sequences and about spelling–sound relationships” (p. 77). A plausible conjecture is that the desire to engage in communication
through reading or writing drives the learning to spell process which leads to the development of a sight vocabulary in lexical memory. This in turn supports the learning to read and write processes by providing an expanding store of sight-words with which to communicate. Reading and writing activities further develop lexical memory by driving and consolidating that expansion. Henderson (1981) calls this a pedagogic dilemma: “To know how to spell, one must know many words, but to know many words, one must know how to spell” (p. 69). Such a model of interdependence between reading, writing and spelling raises the role of spelling from that of a support function to one that is an important link in the literacy learning process, particularly in the early stages of written language development.

The Syllabus and the curriculum support document, English K-6 Modules (BOS NSW, 1998a) set out what students should learn in Reading, Writing and Spelling (sections in the documents) for each stage of written literacy development in the primary school years, although the distinction between what should be addressed in Reading and in Spelling is not always clear. An important focus in Reading and Writing at the Kindergarten level (Early Stage 1) is to convey the concept that print communicates meaning and that there are conventions for written language and text construction (BOS NSW, 1998a). Activities that could be considered more associated with Spelling come under the banner of Reading, for example it is stated that students engage in phonological awareness and letter-sound relationship activities and learn that “spoken words are made up of sounds that are represented in written words by letters” (p.24). Again, there is overlap between reading and spelling activities for Stage 1 students as the Reading section specifies that students learn to manipulate letters within words to make other words; “identify blends, syllables and onsets” (p. 101); as well as to add suffixes.

By Stage 2 (Year 3 and Year 4 students) there is clearer separation between the activities related to reading and writing and those identified as spelling in the English K-6 Modules (BOS NSW, 1998a). The focus in Reading and Writing is on texts whilst the Spelling focus is at the word knowledge level. Children apply this knowledge to reading and writing, for example by identifying word roots and affixes. In Spelling students learn spelling strategies, mnemonics, base words and grammatical information. Students in Stage 3 (Year 5 and Year 6) continue to develop their understanding of texts in Reading and Writing, as well as their editing skills. The scope of Spelling has broadened as multistrategy approaches “draw upon wide graphological, phonological, grammatical and semantic knowledge” (p. 285). It is acknowledged in the English Syllabus (BOS NSW, 1998b) that by this stage students should be able to accurately spell words
commonly used in the classroom and “to use a wide range of strategies for spelling unknown words” (p.83). It is open to conjecture whether a more precise presentation of the role of spelling in the K-6 Syllabus and a greater differentiation between developmental reading and spelling would promote its vital contribution to the process of language learning.

A broader view of the role of spelling than the English K-6 Syllabus (BOS NSW, 1998b) presents will be taken in this study as it has significance beyond writing activities and influences how learning processes are conceptualised. Spelling is both a process and a skill. It is a process during conscious cognitive processing operations and a skill when the accuracy of the products of learning activities is demonstrated. More accurately, the latter condition demonstrates a ‘word-learning’ skill as a range of learnings contribute to precision in the graphic representation of a word, additional to the correct letters written in the correct order. These include the word’s pronunciation (Castiglioni-Spalten & Ehri, 2003) and its meaning, for example.

In the early stages of becoming literate, spelling is an integral component of the learning-to-read and learning-to-write processes as it is involved when conscious thought is given to the construction of a word such as when establishing or modifying sight vocabulary entries. This developmental level is termed “Phase 1: Learning to Spell” by Gentry (2004). Speculatively, it is not until a student, for the purpose of communication, can recognise a whole word in reading or represent one in writing, however imperfectly, that the child can be said to be reading or writing. The interface between spelling and the processes of reading and writing is, therefore, at the level of a word. And a word is the smallest unit of meaningful communication in both reading and writing.

Whether a person is spelling, or reading or writing depends on their intention. If the interest is in the components or construction of a word and its meaning in isolation, the process is spelling. Again, a more accurate terminology is word-learning as the process involves more than learning the order of component letters. Students are learning spellings when they try to remember the order of letters in a word, and spelling when they reproduce this learning in a spelling test. The meanings of the words are not necessarily attached to the spelling-learning, a situation bewailed by many classroom teachers. However, when meanings and contexts are learnt in conjunction with spellings, word-learning is taking place. [Although ‘word-learning’ more aptly describes the process of spelling as it is taught and perceived in a classroom setting, ‘spelling’ or learning ‘spellings’ will mainly be used in the context of word-learning in this
Writing or reading occurs when the purpose of an activity is to convey or receive meaning from text. The efficiency of the reading or writing process is, however, influenced by the quality of ‘spelling skill’ as a word that is incorrectly spelt or is the incorrect homophone impedes the fluency of communication. The introductory quote by Krashen (2002) demonstrates that whilst reading speed might be slowed by the spelling anomalies, the process of communication is intact. Bouffler (1984) considers that spelling is a language process integral to writing. It functions as the transactional part of the writing process such that “the graphic symbols thus created in transaction with the context of situation constitute a linguistic sign system” (p.42). Once the spelling rules of Krashen’s quote are transacted and comprehended, reading fluency improves. This demonstrates that spelling skill, utilising the new rules, has improved and this assists the speed of reading processing.

Fluency in reading and writing is achieved when students have a sufficient sight-word vocabulary and knowledge of the written language system to give no conscious thought to the features of individual words, and can attend to the function of reading or writing, that of communication. They are using the products of previous word-based learning to engage in the processes of acquiring new information from texts (reading) or expressing their own cognitive products in new textual outputs (writing). Their ability to recognise and accurately reproduce letter components of words stored in sight-word memory demonstrates their skill in spelling. Gentry (2004) considers that students at this stage are in “Phase 2: Correct and automatic spelling” and that the role of spelling lessons is to build on and consolidate their sight-word vocabulary.

It is the effectiveness of pedagogic practices that has an influence on the spelling performance development of students as they progress through primary schooling. Concerns about literacy development, including spelling, are expressed in governmental policy documents that are directed towards teaching reform. In 1999 the “National Goals for Schooling in the Twenty-first Century” (MCEETYA) set out the objective that “2. In terms of the curriculum, students should have … 2.2 attained the skills of numeracy and English literacy; such that, every student should be numerate, able to read, write, spell and communicate at an appropriate level” (p.3). One measure implemented to further this goal was additional funding for teaching support personnel. More particularly, the practices of classroom teachers became the subject of a study,
the “Queensland School Reform Longitudinal Study” [QSRLS] (2001), based on the notion of “Productive Pedagogies” developed by Lingard and Ladwig (NSW DET, 2003a) which, in turn, is built upon the “Authentic Pedagogy” model of Newmann, Marks and Gamoran (1996). “Productive Pedagogies Characteristics” (Appendix A) were compiled from the results of the longitudinal study in Queensland which identify the differing attitudes, skills and beliefs of high- and low-scoring teachers about their role as educators. The findings contributed to the Quality Teaching (QT) model (NSW DET, 2003a) currently being implemented in a number of NSW public schools.

One aim of the QT model is to enhance student learning through improved pedagogy and literacy is an educational area targeted for reform. Indeed, a need to improve literacy and numeracy standards was an initial impetus to design and implement the QT model in NSW. As many learning and assessment tasks employ text-based skills and English is integral to all curriculum areas, it follows that the benefits to students of improved performance levels in reading and writing are experienced in the outcomes of all other KLAs. It is acknowledged in the “Discussion Paper” on “Quality Teaching in NSW Public schools” (NSW DET, 2003a) that “of all the things that schools can control, it is the quality of pedagogy that most directly and most powerfully affects the quality of learning outcomes that students demonstrate” (p.4). The paper further states that “the nature and quality of pedagogy is their [teachers’] core business” (p.4). The latter in particular appears to be an obvious statement and implicit in any understanding of the role of a teacher. Expressed so explicitly in an official communication, it brings pedagogic issues to the forefront of any lesson planning priorities and these are therefore integral to the present study.

1.4 RESEARCH DESIGN

The research design is a “quasi-experimental” study (Mertens, 1998) (with some features of a “controlled trials study” (Lesaffre & Verbeke, 2005)) involving Years 5 and 6 male and female students in nine mainstream classrooms from four public schools located in outer urban areas of Sydney, Australia. Five classes experienced intervention spelling lesson programs and four classes continued with their usual spelling lesson formats. The endpoint is the progress made in spelling performance over the intervention period of five months. Quantitative data are derived from formal and informal instruments that tested pre- and post-test spelling performance; oral reading fluency; attitudes to reading, spelling, and writing; reading comprehension; and students supplied an informal writing piece. Additionally, students were asked to complete a Multiple Intelligences (MI) inventory; and to rate their perceptions of
progress in reading, spelling, and writing, at the end of the intervention period. The majority of Year 5 students also experienced cognitive ability screening at the beginning of the study. Qualitative data comprises one teacher’s lesson journal (Appendix D) (all intervention teachers were supplied with a journal and all but one were unable to find the time); my lesson journals (Appendix G) and lists of lesson topics (Appendix H); students’ comments about the lessons and their progress (Appendix F); three teachers’ remarks about their students’ performances and progress (Appendix E); and teachers’ responses to questions about their teaching philosophy and practices in the area of literacy (Appendix C).

The implementation of the QT model in a small number of NSW schools that had received grants for action learning projects was underway but did not involve the schools participating in this study. Advantage is taken of the QT literature (NSW DET, 2003b) as a framework for discussion of the classroom environments of the five intervention classes. They are described in terms of the three “Dimensions” of the QT model, namely: 1) Intellectual Quality; 2) Quality Learning Environment; and 3) Significance (Appendix B, p. 299), and encompass providing students with optimal opportunities for meaningful learning in an environment that supports their learning. The “Elements” that contribute to the attributes of each dimension have been selected on the basis of research that links them to improved student learning outcomes within the context of the dimension they describe. It is noted when the intervention lessons complied with descriptions of the elements although it was not possible to fully address all elements in this research study situation. As an example, time was too limited to develop students’ literary texts for the element of Narrative in the dimension of Significance. All elements of Intellectual Quality were supported, particularly High-order Thinking and Substantive Communication. Together with the elements of Engagement and Social Support of the Quality Learning Environment dimension, they are foundation elements of the intervention lesson designs. [The first letters of the QT labels for dimensions and elements are capitalised hereafter to assist identification].

The element that was most easily complied with in the dimension of Significance is Inclusivity, although Background Knowledge and Cultural Knowledge were drawn upon whenever possible. The element of Explicit Quality Criteria could only be applied at the micro level in the multiple-topics format of a number of the intervention lessons, rather than when it is applied at the macro level to students’ projects. Although a study that involves an outside researcher and a whole class situation cannot easily accommodate individual students’ learning
needs, nevertheless the principles embodied in the QT model were upheld during the intervention lessons to the extent that circumstances allowed.

The data collection arrangements and design of interventions have their origins in pragmatism with a view to minimal disruption of normal classroom proceedings. An additional consideration was that no more time than teachers would normally allot to dedicated spelling activities during a normal school week should be involved during the intervention period. Intervention lessons of one hour per week were planned, based on the consensus opinion gathered from informal discussions with teachers that this time period was usually managed (plus time for students to copy down their weekly word-lists, and complete the weekly spelling test) although normally two, to two and a half hours per week was programmed. Spelling activities usually occur in small time-packets over the school week, but by necessity the intervention lessons occurred in weekly one-hour blocks. The intervention period extended over the middle two terms of a four term year and the time interval between pre- and post-tests was approximately five months. The minimalist nature of these arrangements is an important aspect of the study’s design, not only in regard to reproducibility by other researchers, but because it increases its generalisability to the body of classroom teachers.

The problem that “there are students in upper primary classrooms who do not spell at an age appropriate level of performance” has been identified in Section 1.1 and the purpose of this study is to improve the spelling performance of students who perform at a below average level on pre-test to a greater extent than that predicted by the intervention period, as measured by the standardised spelling test administered. Of particular interest are students who are considered of lower cognitive ability according to the screening test used, designed by Ouvrier, Hendy, Bornholt, and Black (1999). There are three main benefits to this achievement. Firstly, it is expected that the children who progress more than the predicted level for the five-month period will gain in confidence about their ability with spelling words. Secondly, it demonstrates to the teaching fraternity that a learning environment compatible with the dimensions of the NSW QT model (NSW DET, 2003a) improves the educational outcomes in spelling of all ability groups within a mainstream classroom. The third benefit derives from the second. More time is then available to individually address the problem areas of lower achieving students as a greater proportion of the class become competent spellers and require less error-correcting attention.
Any intervention study in a primary classroom focused on spelling brings with it, by its very nature, some aspect of difference from normal classroom practices. Often research studies involve a strategy to assist learning, for example J. M. Smith’s (1996) dissertation on metacognitive strategies used in conjunction with word study; Kernaghan and Woloshyn’s (1995) interventions to expand Year 1 students’ spelling strategies that included one involving metacognition; and a study on supplementary spelling, reading and writing instruction given to poorly performing Year 2 students (Graham, Harris, & Fink-Chorzempa, 2002). A feature common to intervention studies other than this one, is that they involve dedicating a period of time specifically to the spelling intervention, in excess of the time the classroom teacher would normally allocate. Thus, not only is specific instruction given more time than usual, but also that time is explicitly focused. It follows, therefore, that outcomes from an intervention study usually cannot be directly related to normal classroom events. A particular feature of the present study design is that it involves no more time than normal lesson programming allows and no more knowledge or skills than those readily available to classroom teachers. The purpose of empirical studies is either to rectify a deficit condition or to demonstrate the superiority of a new situation over established practice. Ideally, once positive findings are reported and the efficacy of the study confirmed, future practices will incorporate the new knowledge. If, however, the intervention strategy demands more teaching time, more preparation, more teacher knowledge, more training, or is a radical departure from a teacher’s normal practice, there will be reluctance on the part of teachers to assimilate any new procedure into normal classroom practices. These considerations influenced the approach to the study’s design and underpinned its practical and pragmatic direction.

It is said by some teachers that a poor speller will always be a poor speller. Perhaps it is truer to say that a poor speller might always be a poor speller unless spelling is taught in a different way. The behaviourist approach to teaching spelling (Henderson, 1981) was the dominant practice in classrooms for many years and centred on students learning words by rote from graded lists and readers. Today, vocabulary building involves a wider range of activities including work with dictionaries, thesauruses, and sentence construction. The teachers in the study prepared their weekly lists of words based on themes students were studying, etymological knowledge, spelling rules, high frequency words, and common errors in spelling that the students make in their writing. The main strategy for learning spellings that the students encountered for the study had been taught (in preparation for the weekly Friday test in most classrooms) is one of a number of variations on the Look-Cover-Write-Check theme.
(Horn, 1919, as cited in Peters, 1985). Whilst the majority of students in primary classrooms attains various levels of success there is a minority who consistently underachieves. If a number of students perform poorly on a regular basis it is an indication that some modification to usual teaching strategies might benefit those who are failing to learn.

Yet according to Cuban (1986) teachers are often reluctant to change how they usually teach either because the familiar way is easier or they need proof of the merit of alternative practices. Two characteristics of “Low-scoring teachers” in the Productive Pedagogies list of the QSRLS (2001) (Appendix A) are: a) “assumed that some students would learn, others would not – it was up to the student”; and b) “aimed instruction at the ‘middle level’ of the class” (p.1). Teachers who subscribe to these two characteristics are almost guaranteed to have students in their classrooms who fail to thrive educationally. One benefit of the current implementation process of the QT model (NSW DET, 2003a) in NSW public schools using action learning methodology is that it provides a stimulus for talking and thinking about pedagogy with fellow teachers such that ideas and attitudes can be constructively challenged. Edward-Groves (2003) argues that change can be accomplished in schools if teachers have time for focused sharing and reflection without the feelings of stress and frustration. Her thesis (1998) demonstrates that improved literacy outcomes can be achieved in middle primary classrooms when “conversation analysis” techniques are the focus of a professional development program. The word change, however, implies that teachers’ current practices are not sufficiently effective and it is perhaps more useful to think in terms of teachers expanding their practices to be more inclusive of students who do not thrive in the learning environment they usually provide.

This research study demonstrates practical value by addressing one of the concerns of the 1996 National School English Literacy Survey (Commonwealth of Australia, 1997) that of the need to improve literacy standards in the nation’s schools. The latest report on benchmark standards (Turtle, 2007) indicates that one in ten Year 7 students do not meet the standard for literacy and this study’s spelling interventions in Year 5 were therefore timely. Words are the foundation of reading and writing activities and knowledge of correct spellings of words promotes more confidence in using words in writing and facilitates recognition of words in reading. Thus, spelling is a component of the language arts that supports literacy outcomes.
Pragmatic dimensions of value encompass a design that uses the resources available to teachers in upper primary mainstream classrooms. All teachers have access to formal spelling tests; at least one hour per week timetabled for dedicated spelling instruction; and the optional use of projectors or computer technology. A “Team Learning System” (TLS) (Findlay, 2003), available in one school, was used for one intervention design and illustrates the value of adapting an existing resource for a novel purpose. No special pre-study preparation was required for this study, in contrast to the metacognitive-based research of J. M. Smith (1996) which necessitated training teachers in metacognitive learning techniques. Edward-Groves’ (1998) professional development study was also demanding of teachers’ commitment and time, particularly as it involved a collaborative-analytic intervention that extended over three to four weeks on a daily basis, as well as a pre-intervention study and follow-up discussions.

In contrast, the intervention lesson programs for the present study made minimal demands on teachers’ time and organisational resources. Teachers in three of the five intervention classes had no responsibility for lesson planning, and lessons were presented in a team-teaching arrangement in four of the five classrooms. The programs demonstrate a range of the QT model elements (NSW DET, 2003b). In the event of any teacher seeking to emulate features of the intervention lessons, QT documents are freely available to all NSW public school teachers. As no further resources are necessary for a learning environment that is more inclusive of students’ diverse needs, other than teachers’ commitment to enhancing their students’ educational experiences, there is therefore no barrier to the transferability of any positive outcomes of this study.

The significance of this study can be summarised by stating that effective teachers who provide quality learning environments can achieve appropriate, if not remarkable, student learning outcomes in spelling using no more time or resources than are usually available in a mainstream classroom. Teachers can be resistant to change (Cuban, 1986; Edwards-Groves, 1998) unless there is evidence that any change is not only beneficial to students’ learning but also minimally disruptive to current practices. Any effect of the latter is obviated by the concept of enrichment rather than change, as well as the support measures in place in many schools associated with the implementation of the Quality Teaching model currently underway in NSW.
1.5 ORGANISATION OF THESIS

The Review of the Literature in Chapter 2 focuses on aspects of spelling and pedagogy. Developmental aspects of learning to spell are explored together with resources to support classroom practices. Although spelling is positioned in curriculum documents as a substrand of one of the four principal language arts, that of writing, its influence on learning outcomes in literacy and teaching practice decisions belies its relatively minor status. The development of written literacy unfolds as issues related to spelling are investigated. They range from early literacy acquisition to reading and writing competence, including a model of the neurophysiological changes that take place as learning in written language develops. Pedagogic issues include approaches to literacy that determine instructional priorities. Of particular importance are socio-cultural perspectives that relate to student diversity and opportunities in learning. Resources that support spelling instruction are outlined and linked to programming decisions. These are influenced by the work of learning theorists and the direction taken is to support a constructivist stance inherent in the NSW QT model. Four focus questions are developed from the literature that facilitate exploration of the research problem identified earlier in this chapter.

Methodological and statistical analysis procedures used in the study are presented in Chapter 3. Rationales for the subject selection, measurement instruments utilised, and the study design, are described. Quantitative and qualitative data were collected and analysis procedures are outlined. The section on procedures provides an overview of events that occurred during the intervention period and explains departures from the study’s original plan. Chapter 4 provides the statistical measures and results of analyses of quantitative data. The qualitative data collected are referred to when applicable. The chapter is organised to present findings to answer each focus question that derive from the literature in turn, followed by a consolidating summary. An important feature of this study is a comparison of the learning environments of four intervention classes with information garnered through my direct experience. Very little was directly observed by me in the four non-intervention classes and one of the five intervention classrooms, and the data utilised are mainly from test results and teachers’ reports. Progress made in spelling performance over the five months intervention period is the principle focus for analysis.

A concern during the Discussion of the research findings in Chapter 5 is to identify associations between classroom practices and student learning outcomes that have been
influenced positively by the interventions. Issues that arose from investigation of the focus questions are discussed in relation to cognitive learning theories and the theoretical bases for the QT model's (NSW DET, 2003a) pedagogic perspectives. Finally, in Chapter 6, a summary of the study is presented and conclusions are drawn from evaluation of the results. Additionally, limitations of the study design and outcomes are identified. Recommendations are made for future research as the climate for exploration of expanded pedagogic opportunities is currently developing under the banner of the NSW QT program's implementation.

1.6 CONCLUDING REMARKS

It is a tribute to the teachers involved in this research and their principals that such a study even took place as, although minimal for an intervention study, there were organisational demands and interruptions to scheduled classroom programs. The intervention lessons involved using teaching practices that differed in various aspects from the teachers’ usual methods of lesson delivery and their accommodation of the program illustrates a willingness to extend their pedagogic paradigm. The fact that the study was taking place had a stimulating influence on the students as well as the teachers as it meant a departure from usual practices. In view of the heightened interest in spelling performance generated by the study situation it was expected that there would be a positive effect on spelling outcomes. It is the responsibility of this study to demonstrate positive learning outcomes for students that can be attributed directly to the interventions rather than to a more general “greater-focus-on-spelling” classroom experience.
Chapter 2

Review of the Literature

2.1 INTRODUCTION

The relationship of spelling to the reading and writing processes is explored together with its role in the development of literacy. A number of authors including Bear and Templeton (1998), Ehri (1989), Gentry (2004), and Henderson and Templeton (1986), strongly suggest that spelling should be specifically taught in conjunction with reading and writing, and that explicit teaching approaches be adopted, particularly for grapho-phonetic correspondence. The skills-based phonics orientation differs from the process-based whole-language perspective of literacy development and influences pedagogic priorities. Irrespective of their early learning experience in literacy, however, a proportion of students in upper primary school mainstream classrooms will underachieve in spelling performance if assessed using a normative spelling test instrument. In the “averagely-performing” classroom, about 50% of students should perform in the average standard score range, 25% above average and 25% below average (Larsen et al., 1999). This translates to an average of six or seven children who fall into the below average group in each mainstream classroom and, as such, they have a spelling age at least two years behind their chronological age.

In recent years, the NSW government has addressed the issue of improving standards in literacy and has targeted professional development at the classroom teacher level through the implementation of the QT model (NSW DET, 2003a). Participation in action learning projects is voluntary in a bid to nurture reform rather than to compel it through compulsory policy driven measures. Edwards-Groves (2003) conducted a study based on a program of
professional development called “collaborative focused reflection” in which teachers were supported in changing their classroom practice in teaching literacy to include critical self-analysis of instructional talk. Transcripts of their lessons enabled teachers “to focus on the significant relationship between effective pedagogy, classroom interaction and explicit teaching” (p. 2).

The QT model (NSW DET, 2003a) encourages the process of critical self-analysis in a supportive environment that promotes collegiality. The school project team focuses on a curriculum area and an aspect of pedagogy that has been identified by them as a “problem”. The process of targeting specific elements within the QT dimensions develops a greater awareness of the relationship between students’ learning needs and teachers’ instructional priorities. The element of Explicit Quality Criteria is identified in the dimension of Quality Learning Environment and refers to explicit statements about the quality of work required and the criteria that will be used for assessment. No element relates specifically to making instruction explicit but it is implicit in the element of Deep Knowledge, part of the dimension of Intellectual Quality, as level (5) states that “the task requires [students’] sustained focus on key concepts and ideas and requires clear articulation of the relationships between and among concepts” (NSW DET, 2003b, p. 14). This would be difficult for students to achieve without clear and explicit instruction.

Teachers who participated in the research study of Edwards-Groves (1998) attribute an explicit lesson focus to “increasing students’ access to be taught in English” (p. 358). Moreover, it is argued that implicit approaches to teaching can exclude or silence students from backgrounds and abilities different from the dominant group (Freebody, Ludwig, & Gunn, 1995) and that effective teaching, viz explicit teaching, “assists students to make the appropriate connections” (Edwards-Groves, 2003, p. 7). This reference to diversity in a student population supports the notion that “the impact of socio-cultural factors is accounted for in theories that view reading as a social and cultural practice. Therefore, literacy pedagogy needs to cater for socio-cultural difference” (Anstey & Bull, 1996, as cited in Edward-Groves, 1998, p. 31).

Theories of literacy development are not extensively explored in this section of the thesis but are referred to when they provide support for an aspect of spelling under discussion. The dual concerns of improving literacy standards and pedagogy are juxtaposed in this review of the literature, and spelling as a language art is explored in relation to teaching practices. An understanding of the learning processes involved during language development, including spelling, provides a scaffold for perspectives of lesson programming and pedagogic parameters.
2.2 A FOCUS ON SPELLING

In the early stages of learning to spell the boundaries between learning to read and spell are somewhat blurred, as they are between learning to write and spell. They become more defined as children develop into “readers”, “writers” and “spellers”. Importantly, “before children know what a word is they cannot segment it or remember it. When they know what words are they can do both” (Henderson, 1981, p. 117). I propose that spelling can be described as the foundation of phonologically based reading and writing processes. Letters, appropriately chosen or recognised for the sounds they represent, form a word and written words are essential components of writing and reading activities.

O’Brien (2000) investigated the difference in reading strategies between good readers/good spellers and good readers/poor spellers and proposes that good readers/ good spellers read as “spellers”, whilst good readers/poor spellers have reading strategies that “may not allow full attention to the spellings being presented in the text” (p. 236). This suggests that the definition of to spell could be expanded to include the process during reading when the construction of an unfamiliar word is mentally noted and learnt, or when the unfamiliar word is decoded, or deciphered, in an attempt to find meaning. I also propose that an example of when good spelling skills in reading are manifest is on the occasions that readers are not confused by homophones encountered in texts for instance. An important aspect of standard spelling in relation to the reading process is that it facilitates consistency (Smith, 1982, as cited in Bouffler, 1984) so that the reader can predict meaning and maintain fluency. I also suggest that spelling skill is demonstrated during fluent and accurate writing and that the process of spelling in writing is involved when words are consciously constructed by their phonemic components.

It is considered by Gentry (2004) that there are two distinctive developmental phases of spelling (Phase I & II) and that the teaching focus for each is different. Phase I, Learning to Spell is mainly concerned with “learning how to represent words with alphabetic letters” (p. 16) and is usually achieved by the end of Year 1, after about two years of schooling. He considers that it is intimately associated with the processes of learning to read and learning to write. Phase II refers to being a speller and is called “Correct and Automatic Spelling”. According to Gentry the main spelling purpose from Year 2 onwards (Phase II) is to develop and consolidate the brain’s word-storage area, the lexicon, by expanding the number of sight-words understood and spelt correctly. Bouffler (1984) makes no such distinction between ‘learning to spell” and ‘spelling”
and states “although there may be qualitative differences between children’s products and those of an efficient writer, such products are achieved by the same language process in each case” (p. 50). It is feasible that Bouffler and Gentry apply ‘learning to spell’ to different phases and for the purpose of this study the following explanation of terms (Table 1) has been constructed to promote clarity:

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Description</th>
<th>Authors and Spelling Phases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning the concept of spelling</td>
<td>Is when a child acquires some understanding of the spelling process which leads to the development of learning to read and write.</td>
<td>Gentry’s Phase I: “Learning to Spell”</td>
</tr>
<tr>
<td>2</td>
<td>Learning about spelling</td>
<td>Is concerned with acquiring Spelling Knowledge comprising the components of phonological; visual; morphemic; and etymological knowledge (ongoing topics of classroom spelling lessons).</td>
<td>(NSW DET, 1998)</td>
</tr>
<tr>
<td>3</td>
<td>Spelling as a process</td>
<td>Employs the cognitive processes of Rumelhart and Norman’s (1978) ‘accretion’, ‘structuring’ and ‘tuning’ to add entries to a sight vocabulary stored in lexical memory and to correct mistakes in previous entries. It occurs when working with words during spelling lessons, and the encoding and decoding processing of words during writing and reading activities.</td>
<td>Gentry’s Phase II: “Correct &amp; Automatic Spelling”; Bouffler’s “Learning to spell” and “Spelling”: “Spelling as a functional process”</td>
</tr>
<tr>
<td>4</td>
<td>Spelling as a skill</td>
<td>Involves recalling words from sight vocabulary and demonstrating the accuracy of sight-word learning during the processes of fluent reading, writing, spelling games and spelling assessment.</td>
<td>Gentry’s Phase II: “Correct and Automatic Spelling”; Bouffler’s “Spelling as a functional process”</td>
</tr>
</tbody>
</table>

Bouffler (1984) appears to assert that the conscious learning of new lexical entries and the modifying of imperfect products in lexical storage employs the same processes as the automatic recall of correctly spelt sight-words. Such a view does not distinguish between the processes involved in the function of learning spellings and the means to express spellings that
have been learnt. Gentry’s (2004) Correct and Automatic Spelling (Phase II) has jumped from Phase I: Learning to Spell (by which he means learning the concept of spelling), without making distinct provision for word-learning processes which result in additions to a sight-word vocabulary. Students in upper primary classes, the main focus of this study, are both learning new spellings and demonstrating learnt spellings in their reading and writing activities. For consistency in further discussion the former condition is hereafter called “Learning Spellings” (and also includes rectifying errors in previous learning) and the latter is referred to as “Automatic Spelling”. When students engage in consciously encoding or decoding words (when writing or reading), or reproducing learnt words in isolation as in a spelling test, they are considered to be “Spelling”.

The word storage area, conceptualised as a “lexicon”, is the component of the neurophysiologic language system that links spellings to reading and writing. In the field of linguistics, a lexicon is further defined by *lexemes* which are generative devices to produce more words, such as by adding affixes to root words according to language rules. Thus a lexicon in this context is more than a collection of words (which is *vocabulary*) as it has organisational and generative functions. According to Gathercole (1990, as cited in Bourne, 2002) the role of vocabulary knowledge is that of a *pacemaker* of phonological memory performance which influences how easily lexical sequences are retained. This is particularly important in Learning Spellings when the lexical system becomes increasingly sophisticated as students augment their orthographic and word-specific knowledge.

Rumelhart’s and Norman’s model of cognitive function (1978) provides a general model for human learning that can be applied to word-learning in spelling and which illustrates the memory processing function. Three modes are described namely, a) *accretion*, when new knowledge is added to existing memory, such as learning grapho-phonics correspondence; and b) *structuring*, which involves forming new conceptual structures. Syllabication or learning whole words are examples. And c) *tuning*, which can be applied to using new knowledge or skills, for example improving accuracy and speed during repeated recall of newly learnt sight-words. Once a child has acquired the concept of spelling he is able to employ the modes of accretion, structuring and tuning to initiate the reading and writing processes by developing a store of available words. The concept of Rumelhart’s and Norman’s modes has pedagogic implications as it demonstrates the role of assisting students to attach new learning to old learning, making teaching of new learning explicit, and providing opportunities to consolidate new learning.
Speculatively, the mode of accretion even comes into play when students are in the very early stages of Learning to Spell (Gentry, 2004) when a link is made between oral language and written language.

Gentry’s (2004) Phase I: Learning to Spell (Item 1 in Table 1) marks the beginning of the development of the lexicon for written language although lexical memory for oral language is well established. Developmental spelling stages in this phase are identified by Gentry and called, 1) Precommunicative spelling; 2) Semiphonetic spelling; 3) Phonetic spelling; and 4) Transitional spelling. Gentry remarks that these stages correspond to Ehri’s (2005) phases of word learning namely Pre-Alphabetic; Partial Alphabetic; Full Alphabetic; and Consolidated Alphabetic word reading. According to Gentry, during Kindergarten children emerge from the precommunicative spelling stage in which there is no letter-sound correspondence to the semiphonetic stage when there is partial correspondence. Ehri (1989) has found that as students gain experience they attach more letters to sounds, and the choice of letters might be based on the names of letters, “for example, Y (named “wie”) used to spell wife as YUF” (p. 358). Ehri adds that children “may know very few correct spellings” … and that … “memory for correct spellings may be unstable during this stage” (p. 358). It is early in the development of lexical memory for written words.

Early school instruction in literacy is considered by Gentry (2004) to be mainly concerned with teaching the letters of the alphabet. Students also learn to recognise letters within words and write their names. As phonemic awareness develops students learn about the spelling system which includes phoneme-grapheme correspondence and segmenting “pronunciations into phonemes” (Ehri, 1989, p. 357). Acquiring lexical knowledge involves learning that letters represent phonemes in words and that letters are specifically placed in each word. At the phonetic stage, usually during the first half of Year 1 (aged about 6 years), students are able to match one letter for each sound and can spell correctly some high-frequency word families (Gentry). According to Ehri one important development is that vowels are spelt. Children also try to attach a letter to every sound in a pronunciation such that they write more letters at times than conventional spelling demands. A further development at this stage is that it is probable that students find remembering the spellings of whole words easier than during the earlier stage and Ehri surmises that “this is because knowledge of the spelling system provides schemata that enable spellers to make phonetic sense of individual spellings and hence remember them” (p. 358). Additionally, because there are relatively few, they can also remember exceptions to the usual
rules. It is suggested, “children may need to learn how the orthographic system works phonetically before they become able to remember the correct spellings of many English words” (p. 358). Ehri also stresses the importance of the role of pronunciations of phonemes in word learning, as their association with the letters a child sees assists the process of making connections in memory.

By the end of Year 1, after about two years of schooling, students should at least know how to write and spell correctly some one-syllable words with short-vowel patterns and also some with long-vowel patterns. Most students are at the transitional stage and “spell with letter combinations based on phonics principles, much as you and I do, but they often use the wrong pattern for the word or syllable being spelled” (Gentry, 2004, p. 15). At this stage students have learnt the English alphabetic principle which maps “the detached graphic word to its spoken counterpart” (Gentry, p. 16) and know how spelling ‘works’. They are in the last stage of Phase I, Learning to Spell (Item 1, Table 1), and about to develop into Phase II Spellers who increasingly spell accurately and automatically. Their repertoire of automatic correctly spelt words numbers at least fifty (Table 1, Item 4) and invented spelling follows basic phonics rules (Table 1, Item 2). It is difficult to make distinctions between the processes of learning to read, write and spell in the early stages, particularly as they share the common foundation of words and the language system.

According to D. R. Bear and Templeton (1998) “development in spelling reflects a growth in sophistication of knowledge about letters and sounds, letter patterns and syllable patterns, and how meaning is directly represented through spelling” (p. 224). Ehri (2005) and Gentry (2004) stress the importance of phonological knowledge as a precursor to an efficient lexical system. It would appear that early teaching in spelling is focused on developing a link between sounds in speech and graphic representations of those sounds in students’ awareness such that a word can be constructed. As constructed words are remembered and recalled in early reading and writing activities a lexicon of sight-words is established. Teaching refines the grapho-phonic correspondence and children become more able to make distinctions between similarities. Reading and word teaching activities expose the students to correct spellings, and sight-word entries in lexical storage are recalled and demonstrated in writing. Templeton & Pikulski, (1999) also stress that a sight-word vocabulary plays an important role in reading comprehension and reading fluency.

The processes of Learning Spellings, Spelling, and Automatic Spelling have been described in an above paragraph and this nomenclature facilitates the review of upper primary students’ spelling activities beyond Gentry’s (2004) Phase I: Learning to Spell. Automatic
Spelling is consolidated when students have developed a usable sight vocabulary and can recall words from lexical storage with no conscious effort. It is estimated to take 200 milliseconds or less for a word to be recognised (Aitchison, 2003) when it is accessed from the brain’s lexicon and automaticity is a concept that underlies the pedagogic aspirations for spelling, reading and writing. It is defined as “the ability to effortlessly complete everyday tasks with low interference of other simultaneous activities and without conscious thought to step-by-step process” (Encyclopedia of Educational Technology, n.y.). During fluent reading and writing, cognitive processes can engage in higher order activities without the interference of consciously considering how a word is spelt when it is retrieved from lexical memory. Automaticity is developed by completing a series of steps and then repeating the process until the action can be performed quickly and with little interference. The mechanism can be explained by synaptic plasticity inherent in Hebbian Theory which states that “the processing of new information makes heavy use of working memory … [and the] … development of automaticity of skills generally reduces the load of the working memory by 90%” (Schneider, 2003, as cited in Encyclopedia of Educational Technology, n.y., n.p.). This indicates that considerably less mental effort is required once learning has taken place than during the learning process.

Authors such as Gentry (2004) suggest that the main purpose of spelling instruction beyond the early stages is for students to increase their knowledge of the written language system and augment the number of words in lexical storage. Teaching for automatic retrieval has important implications for classroom practices in the area of spelling as the desired outcome is more than a simple response to a stimulus as occurs when a reflex loop is in place, such as a knee jerk in response to a patella hammer. Spelling skill is a higher level of learning and involves cortical brain structures where cognitive processes take place. An essential feature of automaticity in spelling and word recognition is that neural changes take place in the lexical memory in response to the learning. This area is then activated in response to seeing a printed word or preparing to write a stored word, and the whole array of learning about the word is automatically available for retrieval.

Shaywitz (2003) states that the spelling of a word is stored and retrieved together with the other features of the word such as meaning and pronunciation. In view of this it can be surmised that students sabotage their learning when they just try to remember the order of letters in words from a list for the ubiquitous Friday spelling test without attaching meaning and context to the words. Without the support of other learnings about the word, the memory
of its constituent letter arrangements fades and fails to bring about the neural changes in the
cortical lexicon that will make the word available for long-term automatic retrieval. If lessons
that involve words are called ‘word-learning’ rather than ‘spelling’ lessons, it is open to
speculation whether teaching practices and students’ learning behaviour would expand their
parameters to automatically include the broader spectrum of learnings necessary to develop a
comprehensive vocabulary.

Written words are usually retrieved from the lexicon for the purpose of communication
(Stauffer, 1970) in reading and writing. Retrieval for spelling purposes is mainly confined to
classroom word study activities or recreational games such as crossword puzzles. Templeton
(1991) emphasises that “the encoding of words in writing and the decoding of words in reading are not totally
separate processes … [and that] … a common source of word knowledge underlies these processes” (p. 186).
He considers that reading is the main source of word knowledge and that it is developed by
writing, although it is also acknowledged that “the study of words out of context also plays a crucial role
in this development” (p. 187). The classroom descriptor of spelling applied to learning words
sufficiently well for long-term storage does not do justice to the depth and breadth of learning
required to support this process. Indeed, it might well trivialise the process to the point of: “I
don’t need to know what a word means; I just have to know how to spell it [until the Friday test]” (a direct
quote from a Year 4 student). Teachers have long lamented the paucity of transfer of learning
from the spelling weekly list to actual use in writing assignments and Bloodgood (1991)
suggests that extending the parameters of spelling instruction to encompass word studies
achieves beneficial outcomes for reading and writing, as well as for spelling.

Word study lessons take an integrative approach to the language arts and incorporate
spelling, grammar and vocabulary. According to Bloodgood and Pacifica (2004) students
benefit “from expanded vocabularies and effective strategies to make sense of how written language works” (p.
252). Unfortunately the extent and dimension of improvement is not described in their article.
Nevertheless, the study indicates that an improved knowledge about words and the language
system influences performance across the written language arts. D. R. Bear and Templeton
(1998) describe the stages of word study development based on the “Virginia Studies” work
begun by Henderson at the University of Virginia thirty or more years ago. Henderson’s basic
tenet is that learning to spell is a developmental process. A child’s knowledge of English
orthography begins from a foundation of associating letters with sounds and meaning, and
progresses through to knowing all the morphemic elements that constitute a word’s identity.
Interestingly, this is an invariant progression irrespective of any learning difficulty, culture, first language or social status. Information about individual students’ developmental level on this continuum can be gleaned from the errors they make in writing and assists in planning instructional programs. One level on the spelling knowledge continuum is the Letter Name stage, when children recognise that one letter represents one sound. Year 2 to Year 4 students are usually “within word pattern” spellers as they misspell one-syllable and long-vowel words as well as homophones. “Syllable juncture” spellers have difficulty with “doubling letters before adding suffixes” rules and typically include Year 3 to Year 6 students who are at the intermediate stage in reading and writing.

From Year 5 onwards and into adulthood spelling errors denote lack of “derivational constancy” which is experienced by spellers who, according to Bloodgood and Pacifica (2004), have difficulty with words derived from other language roots, mainly Greek and Latin. A different emphasis is placed on the term by Templeton who states that derivational constancy “reflects the fact that words that are derived from a common base word or word root usually keep the spelling of that base or root constant” (1979, as cited in D. R. Bear & Templeton, 1998, p. 228). At this stage students are mature readers and writers who appreciate that they “should focus on spelling meaning rather than spelling sound” (p. 228) particularly as words with a common root can sound very different, as in sign and signature. Templeton (1991) calls this the “spelling-meaning” principle which explains that the “visual preservation of meaning across related words” (p. 195) would be lost if words were spelt how they sound.

D. R. Bear and Templeton (1998) observe that as students’ spelling develops and becomes more sophisticated they also augment their knowledge about the language system. “This knowledge corresponds to the three layers of information that spelling represents – alphabetic, pattern, and meaning” (p. 224), and they refer to the previous work of Henderson and Templeton (1986) and Ehri (1993). Letters and sounds are matched in left-to-right sequence in ‘alphabetic’; ‘pattern’ is a more advanced concept as it accounts for deviations from the left-to-right pattern as when using the silent ‘e’; and ‘meaning’ encompasses the “spelling-meaning” principle of Templeton (1991). The importance of lessons specifically focused on words and spelling is that they cover aspects of the language system that children are unlikely to discover independently.

Henderson (1981) and his colleagues (D. R. Bear & Templeton, 1998) strongly urge that teaching students about words should not be confined to spelling and spelling rules but
expanded to the richer area of word study. As well as spelling it integrates “phonics and vocabulary”, although the dimensions of each area are not made clear. As students advance in language development they gain a greater understanding of words and the language system through word-categorisation activities. They are encouraged to “look for patterns” in the words they encounter and “examining word origins and the processes of word creation provides a powerful knowledge base for learning spelling and vocabulary as well as for facilitating more effective reading and writing” (Templeton, 1991, p. 195). The authors also emphasise that the mistakes students make tell more about their level of spelling development than their correct spelling.

A comparative study for spelling performance between a word-study group and one experiencing a traditional spelling instruction regime has not been located in the literature although two studies, Joseph and Orlins (2005) and Dangel (1989, as cited in Joseph & Orlins, 2005) report improvement in performance before and after word sorts interventions. It cannot be ruled out that other types of interventions might also have produced improvement. Nevertheless, the principle of designing classroom activities to go beyond spelling rules and sight-word lists, to expanding students’ knowledge about words and the language system and to encouraging children to actively make connections between words, is intuitively persuasive.

The appeal of integrating spelling into the broader domain of word study stems from advances in medical technology which have made it possible to more fully investigate the structure and function of the brain. Functional magnetic resonance imaging (fMRI), positron emission tomography scanning (PET scan) and magnetoencephalography (MEG) studies indicate that there are specific brain areas associated with language processing. Pugh et al. (2001) compared the neurological function of reading disabled people (RD) and non-impaired readers (NI) in an attempt to find differences that could clarify reasons for the RD group’s difficulties. They found differences in the degree and pattern of activation of three main brain centres associated with language processing. The conclusion is drawn that those in the RD group appear to have difficulties at the level of the development of phonological awareness, defined as “the metalinguistic understanding that spoken words can be decomposed into phonological primitives, which in turn can be represented by alphabetic characters” (Liberman et al., 1974, as cited in Pugh et al., p. 241). Paucity of development in this area also results in reduced activation of the region associated with sight-word storage, the so-called lexicon.
The findings of Pugh et al. (2001) also suggest that there is “functional connectivity” (p. 244) between distinct brain regions which interact during language processing tasks. The physiological process can perhaps be explained by Hebbian learning (D. Smith, 2004) which results from the formation of neural connections, made possible by a mechanism for synaptic plasticity. It is based on the principle that the more often a neural pathway is stimulated, the more enduring the connection and the quicker the response becomes automatic. This process is involved in the acquisition of a sight vocabulary. The formation of connections between cognitive centres has pedagogic implications as they can be modified by classroom learning experiences. Indeed, establishing neural connections between language centres is in progress during literacy development and results in the establishment of the written language processing system.

The researchers Pugh et al. (2001) postulate that there are three main cerebral regions involved in the process of reading and their functions are: a) “fine-grained articulatory recoding (ie output phonology)”; b) “rule-based analysis function – integration of orthographic, phonological, lexical-semantic dimensions”; and c) “linguistically structured memory-based word identification system (word-form area)” (p. 242). It is suggested that region c), located in the left occipito-temporal area of the brain, is activated by skilled readers during fluent word recognition activities. Thus the function of this area is for the storage of lexical knowledge and is namely, the lexicon. Shaywitz (2003) asserts that the reader can form “an exact neural model of a specific word” (p. 79) and that its meaning, how it sounds and spelling are all stored in this neural centre. According to Gentry, when this area is activated words are identified instantaneously and automatically, that is, with no conscious processing. It might be truer to say that the neural centre for the lexicon is one part of the system that forms the exact neural model, rather than that a word in its entirety is stored in the word-form area. Thus, when this area is stimulated the whole system associated with word recognition is also activated and all learnings about a particular word are recalled.

The concept of an interconnected system is further supported by Bourne (2002) who describes the “Connection Forming Process” (CFP) as “the mechanism that fixes word knowledge in memory by a process of forming connections between orthographic and phonetic information so that the symbol-sound correspondences in words are fully analysed to achieve reading and spelling knowledge” (p. 40). This is built upon the work of researchers such as Ehri and Wilce (1985) who consider that when spellings are linked to pronunciations, the correct spelling of words is more easily achieved. It can be speculated that the greater the accuracy of the perceived grapho-phonetic information
about a word available in memory the less likelihood there is of output error. Conversely, if the grapho-phonetic features of the word in memory are inaccurate, the word will be misspelt. This suggestion is upheld in a study by Holmes and Davis (2002) who found that words a reader misspelt in writing had greater facility during reading when they were presented in the misspelt form than when they were correctly spelt. The implication is that the version of a word’s spelling laid down in the learning process persists in reading and writing outcomes unless amended by new learning.

“Dual-route” and “connectionist” theories arise from the concept of neurophysiological connections that “generate models to perform computations that are thought to represent the cognitive and neurological processes of human behaviour” (Bourne, 2002, p. 57). Connectionist theory suggests that activation is widespread over the brain in response to stimuli. Bourne favours a dual route cascaded (DRC) model for written language which is “grounded in localised and specialised regions of the brain that form modules or inner lexicons and cascaded activation spreads between these modules” (p. 83). Coltheart et al. (2001) support a DRC model “for handling visual word recognition plus a phonological lexicon and a nonlexical … route to handle reading aloud” (p. 251). A “Dual-Route Connectionist” model of spelling is described by Houghton and Zorzi (2003) who postulate that two routes in particular are utilised in parallel during lexical retrieval. One route implements grapho-phonemic correspondence whilst the other is a mediated lexical pathway sensitive to the frequency a particular word is retrieved so that frequently accessed words are retrieved more rapidly. These models suggest a complexity in the system that underpin a greater efficiency during fluent reading and writing activities.

A conceptual model, the “Neural Network for Written Language” (NNWL), of the cognitive processes involved in written language acquisition and utility has emerged, based on the work of Houghton and Zorzi (2003), Pugh et al. (2001), and Shaywitz and Shaywitz (2004). It has been formulated by me to facilitate linking theoretical perspectives on learning to practical classroom applications. The mechanism for emerging written literacy is summarised as follows:

Three neural centres are primarily involved in written language learning and expression which for brevity are called “articulatory” (anterior region of the brain), “phonetic” (temporo-parietal region), and “lexical” (occipito-temporal region). These labels also refer to the phases when activation of the different centres predominates. Early literacy development initially mainly stimulates the region
associated with articulatory encoding. As learning takes place in phonemic awareness the function of the second area becomes more prominent and develops into the neural centre for grapho-phonetic and semantic functions. The third centre, the lexicon, gradually develops neural representations of written words, expanding on the features of words stored in the articulatory and phonetic centres, and maintaining interconnections between them.

There is no intention to suggest by the simplicity of this model that neural centres are established for the purpose of written language expression. Rather, it is proposed by Pugh et al. (2001) that existing oral language centres accommodate to written language processing and that the language system develops as a realisation of an “innate language potential” first mooted by Chomsky (1957). All three centres are involved in the reading process (Pugh et al.) although the predominance changes with development until the lexicon is the most active centre. Sight-words are learnt by making connections between the three centres (Learning Spellings) but once learned they are recalled more speedily for fluent reading and writing activities (Automatic Spelling) using a mediated pathway described by Houghton and Zorzi (2003).

Gentry (2004) stresses that the priority of Phase II spellers is to learn sight-words and Ehri (2005) outlines a rationale for this emphasis:

*If readers know words by sight and can recognize them automatically as they read text, then word reading operates unconsciously. In contrast, each of the other ways of reading words requires conscious attention. If readers attempt to decode words, to analogize, or to predict words, their attention is shifted from the text to the word itself to identify it, and this disrupts comprehension, at least momentarily. It is clear that being able to read words automatically from memory is the most efficient, unobtrusive way to read words in text. Hence, building a sight vocabulary is essential for achieving text-reading skill* (p. 170).

Sight-words are also essential for fluent writing (Templeton & Pikulski, 1999). To summarise, a sight vocabulary stored in the lexical system comprises memories and links associated with the orthographic and semantic features of words that can be recalled automatically and instantly during fluent reading and writing activities. According to Ehri (2005) graphemes and phonemes bond spellings to pronunciations and meanings in memory and students learn this either implicitly or through explicit instruction.

The NNWL model lends itself to the concept of new learning interconnecting with neural representations of old learning. “Research using neural network models confirms that memories can be
stored by small but coherent modifications of synapses that may be widely distributed among many neurons” (M. Bear, 1996, p. 13453). Simplistically stated, an initial stimulus evokes a response in one pathway but after synaptic connections to other pathways, the same stimulus repeated produces a response simultaneously in the other neural connections and pathways. An illustration of the process from lexical entry learning is that a child can learn the words *sign* and *signature* as two unrelated learnings but after associations are made *sign* will be recognised as part of *signature* and the whole array of learning about one will be available to the array of the other. According to Ehri and Soffer (1999) these connections facilitate reading unfamiliar words as well as familiar, as illustrated by a cognitive mechanism called “analogizing” which is employed during sight-word learning (Goswami, 1986, as cited in Ehri, 2005). “This involves using words we already know to read new words—for example, using the known word bottle to read throttle” (p. 168).

The development of spelling is placed by the NNWL model in a pivotal position during the development of reading and writing. Spelling processes play an increasingly smaller part in reading and writing activities as the lexicon acquires a larger store of sight-word connections and students develop their orthographic knowledge. During fluent reading and writing activities the process of Spelling is superfluous and needs only to be employed when unfamiliar or misspelt words are encountered. At this stage of learning Automatic Spelling is the dominant process that also demonstrates spelling skill. As students progress through the primary years their sight vocabulary grows and their knowledge of the language system matures. The process of learning new sight-words (Learning Spellings) becomes more efficient as there is a larger body of stored knowledge into which to connect new learning. Instead of needing to learn each letter of a word, spelling can be learnt as larger chunks such as syllables, word roots and affixes, or whole words found in compound words (Ehri, 2005).

Gentry (2004) asserts that studying words explicitly is the most effective method of increasing the ability to spell correctly and automatically and his view is supported by Peters (1985). The priority given to teaching spelling and associated word knowledge in classroom lesson programs depends on the philosophy, interest and disposition of individual teachers and the educational targets of a school. The purpose of proposing the NNWL model is to provide a conceptual framework for Learning Spellings, Spelling and Automatic Spelling based on neurophysiological research studies. In so doing it will facilitate relating spelling processes to pedagogic considerations. These are the subject of the following section.
2.3 A FOCUS ON PEDAGOGY

Pedagogy mainly concerns classroom events when what is taught is conditioned by how it is taught. The broader perspectives of teaching in the area of literacy are examined and then related to more specific requirements when programming for spelling. The spelling intervention designs for this study were developed from the perspective of exploring what upper primary students should know, what students thought they needed to know, and examining teaching strategies that could students in their learning.

2.3.1 APPROACHES TO LITERACY TEACHING

It is probable that the most contentious issue today in respect to literacy teaching is still the so-called whole-word/phonics debate. With the whole-word approach to learning to read, students acquire a sight vocabulary by learning words as whole units and do not break words down to their component letters, syllables or morphemes in the first instance. According to Mayer (2003) the whole-word approach has now been incorporated into the whole-language philosophy of written language acquisition which takes the view that literacy should be taught from within the context of meaning. The child’s school-based written literacy education therefore begins at the text level and the mechanics of language, including grapho-phonemic correspondence, are taught as texts are experienced and when they have relevance to students’ literacy developmental needs.

Phonics-based literacy education, on the other hand, begins literally at the sound level. Sounds are represented by letters and the sounds of letters within words blend together such that the word can be pronounced. Reading skills develop as students learn to recognise words and can utilise their lexical store of correctly spelt sight-words. This is a bottom-up approach to literacy acquisition as opposed to the whole-word top-down approach. According to Henderson (1981) these two approaches to learning to read emerged in a formal sense in the 1870s and there has been ongoing debate about the merits and otherwise of each system since. Edwards-Groves (1998) considers that “these discussions have drawn on conflicting theoretical paradigms and have focused on skills-based versus meaning-based approaches” (p. 13). Debate has widened in more recent times to include a “critical socio-cultural dimension to literacy practices” (p. 13) and there is recognition that the skills and knowledge that students are required to display are influenced by social and educational perspectives.
Literacy pedagogy is described within three generic categories derived by Edwards-Groves (1998) from the cited work of Christie et al. (1991), Freebody et al. (1993), and Gilbert (1989) namely: a) skills; b) growth and heritage; and c) critical-cultural approaches. “Skills” approaches are concerned with procedures of encoding during writing and decoding during reading. The significance of “growth and heritage” approaches is that they consider that reading and writing offer “access to valued literacy heritage of a culture” (p. 13) as people individually develop in literacy. How reading and writing are used in everyday experiences is the main tenet of “critical-cultural” approaches and these vary according to sites and cultures. Freebody and Luke (1990, as cited in Edward-Groves) incorporate skills, meanings, and critical-culture dimensions into one integrated approach to the pedagogy of literature and call it the “Four Literacies Approach”. In this, literacy is considered to be socially constructed and learning is described in terms of reader’s roles during text processing which include: a) “code breaker”, which refers to understanding the English graphics system; b) “text participant”, relating to comprehension and understanding genres; c) “text user”, which means understanding the context and purpose of the text as a social and cultural event; and d) “text analyst and critic” that requires an awareness of the values, interests and stance taken by both the writer and reader.

Edward-Groves (1998) notes from the work of Anstey (1996) and Heap (1991) that none of these approaches to literacy practices fully caters for the diversity of students in a classroom. Anstey in particular argues that educators need to understand the social organisations within their classrooms and take account of interactional features between students and their teacher. The classroom experience will be different for all students and catering for this is an integral component of lesson planning. It is the contention of Harman and Edelsky (1989) that becoming literate is both empowering and alienating for subordinate groups, and opportunities to succeed are influenced by factors such as ethnicity and gender. This is particularly pertinent with whole-language literacy instruction. Concern for students from low socio-economic and minority ethnic groups led Stahl and Miller (1989) to argue that skills-based explicit instruction afforded such children greater opportunities for learning than whole-language approaches if the texts used are more typically found in white middle-class homes. Comber and Barnett (2003) identify factors that have a positive effect on the literacy learning of children from low socio-economic communities, examples of which include: explicit teaching, a meaningful curriculum, interaction and communication, and teacher knowledge. They also stipulate that “teachers need to recognise and respond to the different nature of literacy-learning tasks for children who speak
Primary mainstream classrooms in Australia have a diverse student population and can include children from different ethnic, cultural, or socio-economic backgrounds who bring with them differing language experience histories, as well as individual attitudes and aptitudes to written language learning (BOS NSW, 1998a). Diversity exists not only in demographic terms but also in regard to performance levels. It is increasingly more usual since 1981 marked a change in policy, for children who come under the category label of “exceptional child” to be a member of a mainstream classroom community and many classes have at least one such student. “The term ‘exceptional child’ includes those with special problems related to physical disabilities, sensory impairments, emotional disturbances, learning disabilities, and mental retardation” (Shenberger, 1996, n.p.) and “is one that is different in some way from the ‘normal’ or ‘average’ child”. Government funding provides these children with necessary additional support personnel and resources and, depending on the circumstances, individualised programs are designed to facilitate integration into the whole class program.

Children from non-English speaking backgrounds can find written language learning challenging, especially if they are recent arrivals to this country, and their initial needs are recognised in governmental funding policies. The English K-6 Modules (BOS NSW, 1998a) also identifies Aboriginal children and students from low socio-economic home backgrounds as being potentially at risk of underachieving in literacy. Teachers are urged to accommodate their needs in programming and teaching strategies. A further dimension of student diversity is the range of cognitive abilities in a non-streamed class of about twenty-eight students. The upper IQ level on the Stanford-Binet test for mild intellectual impairment classification by the NSW DET is 75 and the lower level of giftedness (mildly) is 115, although the majority of students fall into the 90 - 110 IQ range. The practice typified by the statement “I teach for the middle and the others have to do the best they can” (direct quote from a Year 5 practicum teacher, 1995) has the potential to jeopardise the educational outcomes for those outside the middle range, particularly at the low end of the IQ scale. This is not to say that literacy acquisition or spelling performance levels are directly related to IQ level, rather that such teaching practices might not provide students outside the middle range with adequate opportunities for learning.

There are neurophysiologically based conditions that make it difficult for some people to learn to read. Students with such problems (Oakland, Black, Stanford, Nussbaum, & Balise,
have difficulty with the process of word recognition which impedes their ability to read, spell and write. It is speculated that their difficulties derive from a deficit in phonological coding processes (Pugh et al., 2001) which interferes with the ability to produce accurately spelt words for storage in lexical memory. The incidence of language learning disorders in children is in the range of 10-15% (SPEDLD, 1987-2005). Although “problems with phonological analysis, and with the use of grapho-phonetic information, are not the only causes of spelling difficulty” (Westwood, 2005, p. 24) they are the most prevalent. Moats (1995) identifies some poor spellers who “seem unable to conjure up a word image from their visual-orthographic memory, so they remain overly dependent on sound and spelling ‘by ear’” (p. 25). In view of the long-term consequences of continued failure to achieve in literacy it can be argued that a diagnostic scan such as an fMRI would be justified if more focused teaching fails to evince improvement in spelling performance. Identification, assessment and intervention programs for adverse neurophysiological conditions are critical, particularly in the early years of schooling as remedial measures can reduce or eliminate long-term detrimental effects.

A study of people with brain lesions in different language-related sites (Hillis et al., 2002) indicates that “spelling is a complex process, consisting of a number of relatively discrete cognitive processes that take place in a network of different brain regions” and that MRI scanning “can be used to identify regions of the brain that are essential for specific components of the spelling process” (p. 437). This lends support to the work of Pugh et al. (2001) and it is emphasised that spelling intervention measures can establish neural pathways, through the process of synaptic plasticity, that compensate for deficits in normal spelling network routes.

In addition to students for whom difficulty in learning to spell or delayed performance levels have an identifiable cause, there are children who appear to just simply underachieve such that they do not reach an average level of performance. Although Ehri, Gentry, Henderson and his Virginia studies colleagues, NSW curriculum materials, and others, contribute to the understanding of how children acquire spelling skills and how they can be assisted in this acquisition, it is less clear why some students fail to achieve at spelling as well as their fellow students in the same educational environment. How spelling errors are dealt with might well account for some differences in students’ performance. When Arra and Aaron (2001) drew a group of students’ attention to the psycholinguistic aspects of their incorrect spellings, their performance significantly improved in comparison to a group who were only shown the correct version of their misspelt words. Peters (1985) refers to a study by Spache
(1940) who found that “poor spellers … have frequently been observed to have small memory span for visually presented material” and Peters suggests that “limitations in the visual field affected the magnitude of the visual span and might account for the tendency to perceive small units” (p. 52). This is not a view that is expressed in more recent literature for spelling difficulties. However, it does raise the notion that physically mediated behaviour from sub-clinical or unobserved causes could possibly affect learning outcomes.

According to Nicholson (2000) “poor readers often have difficulty in thinking metacognitively about words” (p. 101) that is, looking for patterns, and as a consequence do not engage the most useful strategies for identifying words or for generalising letter/sound relationships. J. M. Smith (1996) taught cognitive and metacognitive strategies to students and their teachers in four classrooms and found that the majority of students made significant gains in their spelling performance with the exception of the average reader/average speller group. She speculates that their lack of progress was influenced by the students’ attitudes to spelling and school. Many students in her study “continued to perceive learning to spell as learning a list of words rather than learning to apply different strategies appropriately” (p. 283) and Bransford & Vye (1989) stress that preconceptions and misconceptions need to be addressed before there can be progress. Regrettably, Henderson (1981) observes that poor student performance can sometimes be attributed to “bad or ill informed instruction” (p. 95) whilst Ehri (1998) expresses that view in a more positive manner by emphasising the importance of informed teaching.

Nonetheless, students do differ in their interest in learning to spell and preparedness to engage in the learning process. According to Henderson (1981) some underachieving students “do not examine words with much care” (p. 95) and this disinterest might be mediated by the experience of a teaching approach more compatible with the students’ preferred learning styles. It is clear that the concept of student diversity has many facets and that a range of factors influence student performance. Differences in spelling performance have far-reaching effects as noted by Nicholson (2000) who contrasts the spelling behaviour of good and poor spellers:

Good spellers seem aware of the value of accurate spelling and get into the habit of checking their work. They write more, they use more words, and they practice and cross-check more spellings. In contrast, the poor speller writes less and thus gets less practice in checking spellings. In their writing, they also tended to write only the words they knew how to spell, and so did not extend their spelling knowledge (p. 224).

This situation can be exemplified as a “cumulative advantage phenomenon” mooted by Stanovich
(1986, p. 381) and characterised as the “Matthew Effect” when describing student differences in reading development. It is taken from a parable found in the New Testament and can be simplistically interpreted as “the rich get richer and the poor get poorer”. In this context it means that the gap in performance levels between poor and good spellers widens as they advance through their school years.

Peters (1985) is optimistic when she states that “though spelling is ‘caught’ by some, there are some very strong reasons why it should be caught by all in the cause of communication, courtesy and habits of care” (p. 23). It is perhaps unrealistic to expect one teacher to be all things to all students in a class such that every student achieves at the highest level of their potential. Nonetheless, the target of ensuring that each student progresses in spelling per school Year to a level that reflects one year’s authentic schooling for each child should be the least that is achieved.

In 1983 Gardner (1993) launched his “Theory of Multiple Intelligences” (MI) that identifies seven different kinds of intelligence namely: linguistic, logico-mathematical, visual-spatial, bodily-kinaesthetic, musical, interpersonal, and intrapersonal. The list has since been expanded to include naturalist intelligence and further possibilities are spiritual, existential, and even perhaps moral intelligence. The significance of the MI theory is that it has brought to the forefront of educators’ attention the notion that learners’ innate aptitudes influence their response to classroom experiences and highlighted the need to provide more inclusive teaching strategies to take account of students’ preferred “intelligence”. A program that is based on the MI theory is described by Bryan (2003) and incorporates spelling and handwriting activities.

Students in upper primary classrooms have already experienced five or six years of written literacy learning and whether it has been taught with the whole-word, phonics or an integrated approach is not the issue for this study per se. The primary concern is their spelling performance, as measured by a normative data spelling instrument, at the time of this study when the strategies students use for improving their vocabulary of accurately spelt words are well established. Not only can a spelling performance instrument provide an indication of students’ spelling age in relation to their chronological age but it can also indicate whether the results of members of minority groups identified in the classrooms differ significantly from the dominant student cohort. These considerations are the subjects of focus questions and incorporated in the design of this study. In addition to students’ gender, groups that can be investigated include students from non-English speaking backgrounds; those with lower than
normal cognitive ability; students with different preferred Intelligence (MI); and the group of students who underachieve for no reason that is apparent.

### 2.3.2 PROGRAMMING FOR SPELLING

In Years 5 and 6 mainstream classrooms, routines for teaching the technical aspects of written language such as correct spelling, punctuation and grammar are well established and subject to the literacy teaching approach of the individual classroom teachers. Included in their repertoires are strategies that target specific aspects of the language arts. Those that are most efficient for learning the written language at the level of a word differ from strategies that are effective for working with texts. In particular, teachers provide opportunities for students to practice the rudimentary memory strategy of rehearsal when learning spellings as the required outcome is accurate recall. “Rehearsal” is defined by Eggen and Kauchak (1994) as “the process of repeating information over and over, without altering its form, either out loud or mentally” (p. 326). This is usually only required at the text level when learning a poem or a part in a play. But the purpose of learning words in spelling lessons is intended to lend support to literacy development and to be demonstrated in reading and writing outcomes. As such, spellings are not meant to be learnt in isolation but to be integrated into students’ literacy experiences. It is hereby argued that students benefit from spelling lessons that not only develop their memory strategies but also assist them in establishing links between words and texts for more secure long-term memory storage. In particular, this involves associating knowledge about a word’s orthographic features and its meaning with the textual context in which it is used.

Until the 1960s word-lists underpinned spelling instruction in most schools and they still have a prominent place in many classrooms today. Early lists took little account of the vocabulary needs of children and were compiled from inappropriate sources such as adult reading material (Peters, 1985). There was a high reliance on rote learning exercises for learning sight-words which involved trying to memorise the superficial features of the words by repetition to the point of automaticity, without necessarily having any understanding of the meanings or relationships to other words. Presumably students developed their own word learning techniques as they progressed into secondary school and beyond, as rote is an arduous and inadequate process for learning the 70,000 or so words a literate adult will know. Gradually lists were refined and compiled according to the frequency the words were found or needed in children’s writing and an example is the “Alphabetical Spelling List” (Arvidson, 1968). Today, word-lists continue to be used as a source of words for a weekly test, even the “Essential
Spelling List” (Schonell) published in 1932. Freyburg (1964) compared the spelling performances of a group after two years of using the Alphabetical Spelling List to another group which continued with teacher selected words from the Essential Spelling List and found no difference in their results. It is possible, though, that the teachers of the “Schonell” group selected words that they thought useful to their students’ writing, thereby minimising the difference between the groups.

A number of formal programs have been available since the McGuffey Readers of 1866 (Henderson, 1981) to assist teachers in their reading programs and, by extension, their spelling regimes. The theoretical model of behaviourism was a prominent influence in the 1950s–1960s and underpins the design of basal readers such as the “Dick and Jane” series. Students progress through the readers after mastery of the words presented at each level. The main criticisms levelled at formal readers is the artificiality of the language and the banality of the stories which results from the gradual introduction of new words and the repetitious use of the old. Unless children are specifically instructed to attend to the spellings of the words these might well be lost by lack of focused attention and therefore not transferred correctly to writing. Peters (1985) refers to a study by Nisbet (1941) and states that “children are likely to learn how to spell (catch) only about 4 per cent of the words read” (p. 26).

The “Spalding Method” (Spalding, 2003) is a program for “Teaching speech, spelling, writing, and reading” (Title page). It bases the development of reading and spelling skills on the coordination of subskills. First-order subskills refer to letter-sound correspondence; second-order to the lawful grouping of letter-phoneme units; and third-order subskills to thinking and learning. Word-lists (“Extended Ayres Words”) are compiled on the basis of frequency of use. An important part of the learning process is for students to write and it is claimed that, after a grounding in phonics, they start to read without further explicit instruction. Multisensory teaching techniques are used: “Students see, hear, say and write using all channels to the brain, the stronger channels reinforcing the weaker” (p. 6). The program is best suited to a whole school approach to literacy instruction because it is a structured program building on the learning of previous years. A comparative study of student performance levels with other reading/spelling/writing schemes was not found in the literature.

A number of commercially produced spelling programs are available in book form or for use on computers. In the latter mode they are usually in a games format. Some spelling
programs take a one-size-fits-all approach whereas others are designed to cater for individual needs. Gentry (2004) has produced spelling books and states that spelling programs should be designed to efficiently support teaching spelling for about fifteen minutes a day within the daily literacy learning block of about two hours. According to Gentry, an important requirement is a developmentally appropriate word-list and he suggests that ideally there should be a range of exercises which link learning in spelling to reading and writing. Gentry promotes a program that includes activities such as word-sorting as they employ conceptual, auditory, visual, kinaesthetic and tactile modes which “helps the child commit words to automatic recognition” (p. 47). Commercial programs are usually expensive and it is difficult to establish their success rate compared to informal teacher designed programs.

Following a prescriptive program for teaching spelling has appeal as its very existence gives it a measure of authenticity, particularly to a non-confident teacher. Yet whatever program is used there will be some children who do well and some who will not, as is the case with less formal classroom practices. Perhaps any method should be rated by how many children fail to reach at least a normative average level of performance rather than by those who achieve this level. Afterall, it is probable that a sizeable number of successful students would do well enough no matter what program is used.

What is important is that students are given the opportunity to learn what they need to know as it is most unlikely that they will acquire the knowledge or skills without assistance and explicit explanation. The English K-6 Syllabus (BOS NSW, 1998b) sets out the “Outcomes” children are expected to achieve at each literacy developmental Stage. Some schools utilise a formal literacy program whilst others require teachers to establish their own independently. Whatever program is in place, spelling instruction is an essential feature as it is through learning spellings that a sight vocabulary is established which is essential for fluent reading and writing processes.

According to the NSW curriculum document “Focus on Literacy: Spelling” (NSW DET, 1998a):

It is the responsibility of schools to address the needs of the diverse learners in their school. Teachers are responsible for selecting and sequencing effective teaching strategies that build on what students can do and explicitly teach spelling knowledge and skills to ensure that all students use correct spelling (p. 27)
The document is part of the “NSW State Literacy Strategy” and in relation to spelling directs that appropriate programs should be put in place to assist students who experience difficulties and that they should be continuously monitored. Gentry (2004) warns against a one-size-fits-all approach to spelling program designs, and Henderson (1981) and his Virginia Model colleagues stress the need to link instruction to the level of students’ understanding of spelling concepts. According to the Virginia Model, children’s stage of spelling development can be ascertained from the errors they make in spelling during writing activities, and more formal tests for diagnostic and remedial spelling assessments are also available for teachers interested in targeting problem areas.

Usually students have only their classroom teacher or reading group teacher to meet their educational needs unless students’ lower literacy performance levels warrant the support of STLDs or allied personnel. How well their needs are accommodated is subject to the interest, commitment, experience and energy of their teachers. And there is little doubt that a more individualised or small group approach to programming is time consuming to design and more complicated to implement. Invernizzi and Hayes (2004) report on their attempts to teach spelling according to Virginia Model’s “developmental level groupings” and note that organisational difficulties are the main problem, even with willing participants.

It is understandable from the time-management perspective that in many classrooms individual spelling instruction comprises oral or written correction of errors, opportunistic reiteration of spelling rules or mnemonics, and sometimes it extends to personal spelling dictionaries or word collections. Weekly spelling lists that involve the whole class are still commonly used in primary school classrooms. In some cases this is more because they are convenient for homework assignments than a belief in their educational value. Additionally, spelling lists fulfil parental expectations as they remember their own school experiences and spelling is one area in which parents can provide homework assistance. An apparent counter-intuitive philosophy operates when poorer spellers are expected to learn easier words and fewer words on the weekly list than more proficient spellers. When poorer spellers score well they are “rewarded” by having to learn more words in the ensuing weeks. The stated rationale (Year 4 practicum teacher, 1997) is that poorer spellers should not be over-extended and discouraged by low marks. However, students admit to a reluctance to progress to a higher group to avoid the prospect of more work. The Matthew Effect appears to be well supported by both teacher and student behaviour.
Perhaps the real flaw in setting students the task of rehearsing word-lists that they fail to effectively transfer to long-term memory is that the practice continues despite a lack of success. If it does not work for some students at the beginning of a school year, despite their best efforts, it is unlikely to work at the end unless they have acquired useful strategies for the task in the interim period. Interestingly, Nicholson (2000) states that “it appears that below-average spellers can benefit from the more traditional technique of teaching words in lists, as well as from invented spelling” and he concludes that “above-average spellers may be able to teach themselves to spell. Yet struggling spellers may need a combination of both new and traditional ways” (p. 234). Possibly Nicholson is referring to students before they become disheartened by lack of success. One key factor appears to be that a range of strategies should be employed when teaching spellings to poorer performers to ensure that each finds a method that works for them. Additionally, Brown and Morris (2005) stress that students should be provided with “appropriately-leveled instruction paced to their learning rate” (p. 182), particularly in the early years.

In NSW public primary schools spelling program decisions are usually made by the classroom teachers and there might or might not be a whole school spelling policy in place. Informal conversations with teachers (2003-2006) elicited the following picture of how spelling programs are generally designed and implemented in NSW primary classrooms:

There are teachers who have a special interest in literacy and a love of words. They work to interest their students in language studies and endeavour to provide a range of interesting and challenging literacy experiences. These incorporate working specifically with words and spelling is just one part of their program. A larger number of teachers would like their students to succeed in literacy and spelling but are not always sure how to teach spelling such that it supports literacy development. They tend to focus on literacy programming and rely on their own experiences as students to teach spelling. This centres largely on weekly spelling lists, spelling rules and spelling games. Commercially available spelling booklets are often consulted for ideas about lesson content, and it is rare for more academic theoretical perspectives to be investigated. There is a tendency to believe that some students will always be poor spellers and an acceptance that there is little that can be done to improve their performance. This is not because the teachers cannot be bothered but because they feel that they have little hope of success or that they do not know how to do things differently. The annual whole school spelling test results are consulted in order to place students in class spelling ability groups rather
than for diagnostic or remedial purposes.

Teachers do have NSW DET curriculum resources available to support their teaching of spelling but it is unclear how widely they are consulted for lesson planning purposes. Nevertheless, they are central to assessment and reporting responsibilities and, because they are freely available to all public school teachers, will form the basis of the review of this topic. Additionally, it is probable that public school policies have shaped the spelling paradigm of the majority of teachers, both as students themselves and as professional educators. A further observation is that the majority of people who choose to become teachers are those for whom the spelling teaching practices of their schooldays worked. Children who experience difficulties in literacy acquisition are less likely to work as an adult in an area in which their written language skills are subject to public scrutiny.

The NSW DET documents include “Focus on Literacy: Spelling” (NSW DET, 1998a) and “Teaching Spelling K-6” (NSW DET, 1998b), as well as the “English K-6 Syllabus” document (BOS NSW, 1998b) and “English K-6 Modules” (BOS NSW, 1998a). The English K-6 Syllabus positions spelling as a contributing skill to writing and articulates Learning to Spell and Learning about Spelling outcomes as substrands of Writing for each stage of literacy development. Opportunities in spelling in support of writing that should be provided to students are outlined in English K-6 Modules, and Teaching Spelling K-6 describes a model of spelling that it considers a pathway of development. “The pathway indicates the broad sequence of development that teachers can expect to see as students develop competence as spellers” (p. 9). It claims to present a systematic approach to the teaching of spelling that has three dimensions which include a) teacher understanding of the knowledge and skills students require; b) systematic monitoring so that appropriate skills are taught; and c) “the instruction should not be left to chance” (p. 18). Importantly, the document provides guidance, lesson topics and ideas for teaching “Spelling Knowledge”.

The Focus on Literacy: Spelling document (NSW DET, 1998a) constitutes the basis for the instruction about spelling that the NSW Curriculum Directorate considers essential for students in their progress to become proficient spellers. It urges teachers to ensure that students:

Have a balanced repertoire on which to draw as they approach the spelling of both known and unknown words. Typically, proficient spellers have not only developed a range of spelling knowledge
on which to draw, but are also able to integrate the spelling strategies they use (p. 14).

According to the document, teachers need to know how the spelling system works; how to teach Spelling Knowledge; and how to plan spelling programs using the major teaching strategies (modelled, guided and independent spelling). Additionally, it provides further references to spelling development, the relationship of spelling to reading and writing, catering for the diverse needs of students, and how to monitor and assess spelling development.

According to the Focus on Literacy: Spelling document “Spelling Knowledge” is the key concept in understanding the spelling process and central to planning and instruction decisions. Four different forms of Spelling Knowledge that students should know and understand are described: 1) phonological; 2) visual; 3) morphemic; and 4) etymological knowledge (NSW DET, 1998a). (The following list reflects my interpretations and perceptions. Statements taken directly from the Focus on Literacy: Spelling document are italicised):

1) **Phonological knowledge** (NSW DET, 1998a) refers to the relationship between sounds and letters which is also called grapho-phonetic correspondence. It extends to phonemic awareness when words are segmented into sound chunks or phonemes, and graphemes which are the letters that form a phoneme. According to the NNWL model and brainscan imaging studies (Pugh et al., 2001; Shaywitz & Shaywitz, 2004) this knowledge is a prerequisite for lexical sight-word entries. It is also the focus of the main area of disagreement between whole-word proponents and phonics-based advocates for written language acquisition in terms of how and when it should be taught.

2) **Visual knowledge** (NSW DET, 1998a) is employed when letters and words are recognised and recalled, as well as common letter groupings such as affixes. Speculatively, it is a foundation component of lexical memory located in the visual cortex of the brain that enables us to recognise words in order to read fluently and decide when words look right in writing. This knowledge in particular is exercised during proofreading and editing activities. Lesson planning using a MI (Gardner, 1993) approach may assist children with poorer visual-spatial skills to succeed in learning by stimulating another modality. Conversely, activities that encourage visual memory development promote the formation of relevant neural pathways referred to as functional connectivity by Pugh et al. (2001). Visual knowledge plays a part in the recognition of words when they are presented in a less familiar form, for example when a different handwriting style or computer font is used, the initial letter or
whole word is capitalised, or a word is written with another writer’s spelling errors.

3) **Morphemic knowledge:** Focus on Literacy: Spelling (NSW DET, 1998a) states that “Morphemic knowledge focuses on the meaning of words and how they change when they take on different grammatical forms” (p. 13). It is derived from the word morpheme which represents the smallest unit of meaning in a word such as an affix or a component of a compound word. It can also be a whole word if the word cannot be reduced into smaller meaningful units as in ‘man’. Knowledge about morphemes assists in the processes of encoding and decoding words to arrive at the meaning of a whole word or to obtain the correct spelling of a word. Spelling rules are generated by morphemic knowledge, and possibly the learning of pronunciations is dependent on this knowledge by making an association between the sound of a morpheme and its meaning.

It is conjectured that morphemic knowledge is the pivotal factor in learning spellings as a word has no purpose unless it is associated with its meaning. And its meaning is derived from how it is spoken, how it looks, its constituent parts, and ultimately how it is used. “How it is used” is when the word is no longer in the domain of Spelling and has crossed the line into the realm of Reading or Writing for the function of communication.

4) **Etymological knowledge**, the fourth Knowledge: “focuses on the origins and meaning of non-phonetic words” (NSW DET, 1998a, p. 13). In general terms, etymology is the study of the histories and origins of words and it is unclear why this source states that etymological knowledge refers only to non-phonetic words. The value of etymological knowledge is that word meanings can often be deduced from knowledge of the meanings of parts of the word such as, “homo-” (same) plus “–phone” (sound). Knowledge of the spelling idiosyncrasies of words originating from other language systems assists in the learning process of unfamiliar words for example, ‘ph’ for the /f/ sound in “phone” can be generalised to the /f/ sound in “phylum”. The English language has been influenced by association with many other cultures and language groups throughout its development and it is still evolving. The most interfused contributions up to the present day in modern written English originate from Latin and the ancient Greek languages, particularly in the fields of law, science and medicine. Perhaps the greatest influence on spelling in the future will be American English.

Another important aspect of etymological knowledge is that it assists in developing awareness of derivational constancy (Henderson, 1981). A student who knows the spelling and
meaning of a root word can combine this knowledge with morphemic knowledge to decipher an unfamiliar derivation even though there may be no similar features in the pronunciations. Associating the unfamiliar derivation with the familiar root word and morphemic features facilitates speedy entry to lexical memory for future sight-word recall.

Summarising remarks in the section on the four forms of Spelling Knowledge in the Focus on Literacy: Spelling (NSW DET, 1998a) include:

*When they have access to this knowledge, students will be better able to spell unfamiliar words accurately for a variety of social and academic purposes. Knowing about what words mean and: how words sound, how words look, how words change form, and where words come from forms the basis of the strategies which writers use when working out how to spell words (p. 13).*

This knowledge is also used in reading strategies. Ehri (2000) maintains that “based on theory and evidence, reading words and spelling words are like two sides of a coin in that they both rely on the same knowledge sources in memory” (p. 33). These are described by Kelman & Apel (2004) as “orthographic knowledge, phonological awareness, morphological knowledge, mental graphemic representations” (p. 58). I contend that the positioning of spelling as a contributing skill of writing in curriculum materials (BOS NSW, 1998b) overlooks its importance to the reading process and underrates its influence on written language acquisition. The following amendments are made to the above statement to illustrate how reading can be included and spelling can be viewed as more than a support skill of writing:

*When they have access to this knowledge, WRITERS will be better able to spell unfamiliar words accurately for a variety of social and academic purposes AND READERS WILL BE BETTER ABLE TO DECIPHER UNFAMILIAR WORDS. Knowing about what words mean and: how words sound, how words look, how words change form, and where words come from forms the basis of the strategies which writers use when working out how to spell words BY ENCODING, AND READERS USE WHEN WORKING OUT THE MEANING OF WORDS BY DECODING.*

A distinction between presenting spelling as a substrand (Contributing skills and strategies) of writing, as in the English K-6 Syllabus (BOS NSW, 1998b) or spelling as a process used in both reading and writing needs to be made. This is because pedagogic decisions arise from classroom teachers’ concepts of the purpose of spelling lessons in a language arts program and these are formed or influenced by curriculum directives. The Focus on Literacy: Spelling document (NSW DET, 1998a) considers spelling to be more than a skill.
It states that “spelling is functional. That is, it is a system for making meaning. Spelling is also social, its purpose being to enable readers to construct meaning. Correct or standard spelling assists the reader” (p. 8). If looked at in isolation the statement appears to refer to the reading process rather than writing. However, it follows on from:

Learning to write well involves learning to spell. Writing creates the need for spelling. The purposes of spelling are the purposes of language itself, that is:

- to make meaning, and
- to share meaning in a way that is clearly understood by readers (p. 7).

This assigns spelling a function greater than that of the skill of writing words correctly, as in “making or sharing meaning” it is an important, if not the most critical, process in the function of written communication. As such, it cannot be confined as an expressive function of writing alone, as in the English K-6 Syllabus (BOS NSW, 1998b), but must be recognised for its receptive function in reading in terms of extracting meaning from written communication.

Based on viewing spelling as a process, I suggest that the purpose of spelling lessons is “to teach students to spell in order to convey meaning in their writing and to assist readers to derive meaning from the writing of others”, which indicates that teaching morphemic knowledge is of greater importance than the Focus on Literacy: Spelling (NSW DET, 1998a) conveys.

It is possible to question the veracity of the model of spelling presented in NSW curriculum materials in regard to the understatement of its relationship to reading. Nevertheless, the Focus on Literacy: Spelling document (NSW DET, 1998a) is a platform for programming based on the knowledges students need. Additionally, the responsibilities of teachers are outlined and directed towards explicit teaching of Spelling Knowledge using the strategies of modelled, guided and independent spelling. How to use Spelling Knowledge is demonstrated by the teacher; guided spelling involves focusing on the specific needs of small groups; and “the teacher constructs purposeful written language contexts in which students can apply, practise and integrate the knowledge which they have gained, particularly during modelled and guided spelling sessions” (p. 21) for independent spelling activities.

A major component of teaching spelling is by using word-lists and teachers are cautioned that:

Teaching spelling should not consist merely of presenting students with lists of words without the explicit teaching of spelling knowledge. As they become proficient spellers, students learn how to
It is suggested in Focus on Literacy: Spelling (NSW DET, 1998a) that the four forms of Spelling Knowledge can also be taught through a) using dictionaries, spell checkers, and word processing; b) mnemonics and visual memory techniques for example, Look-Say-Cover-Write-Check; c) strategies such as “analogising”; and d) by developing proofreading and editing skills.

Teaching practices in primary school classrooms are as varied as the number of teachers. Yet being aware of the pressures teachers are under to fulfil all aspects of their responsibilities in terms of the curriculum and taking into account diverse student needs and demands, it makes it possible to speculate which aspects of Focus on Literacy: Spelling (NSW DET, 1998a) are least likely to be implemented as fully as is ideal. The second of the three dimensions of systematic instruction, “it requires the teacher to monitor systematically the need for certain skills to be taught” (p. 18) would necessitate regular formal or informal testing, together with analysis of each students’ spelling performance. Alternatively, spelling errors from samples of each child’s writing could be looked at in detail. Results from these analyses would indicate gaps in students’ knowledge which could be rectified at an individual or small group level. The teaching strategy most suited for this situation is guided teaching. Time constraints are one barrier to diagnostic analyses, individualised programming and small group instruction. Nevertheless, a number of individual teachers and researchers do seek solutions to the problem of some students’ lack of progress within the limitations of teacher time, expertise and resources.

2.3.3 SPELLING INTERVENTIONS

The two main foci for spelling interventions found in the literature are spelling knowledge and teaching strategies. Understandably, a prominent target group are students with learning difficulties (LD). Mushinski and Stormont-Spurgin’s (1995) review for LD students grouped the interventions into four types: a) instructional techniques which included analogising, modeling, and test correction; b) Computer Assisted Instruction (CAI) for drill and practice, individual instruction, and performance summaries; c) study techniques for individuals, peer pairs, and groups with directed study techniques and self-monitoring; and d) multisensory/modality training, for example “write and say”. In summary, “nearly all ‘systematic’ instructional techniques can be employed to improve the spelling of students with LD” whose difficulties “may be related to underlying difficulties with language, memory, phonological awareness, visual and motor processes, and/or inefficient study strategies” (p. 509). It appears that providing students with specific
Phonological awareness studies are prominent in the literature, particularly for the earlier stages of literacy development and those that involve students with reading difficulties (RD). Berninger (2000), using computer simulation as well as an instructional study, reached the conclusion that “children with phonological impairment need explicit modeling of orthographic–phonological connections” (p. 263). Students with poor phonological skills are more likely to use orthographic skills (Lennox & Siegel, 1996) and “average spellers used a phonological approach more frequently than a visual approach, while the reverse pattern was true for poor spellers” (p. 60). Bourne (2002) was interested in looking at methods of presentation and found that intensive Direct Instruction (DI) benefits the development of reading in normal Year 2 students and that contiguous graphemic and phonological presentation is superior to separate presentation. Castiglione-Spalten and Ehri (2003) have identified a preceding facilitating condition for the activation of grapho-phonemic connections, that of awareness of articulatory gestures which assists the identification and memorising of written words. An important finding in relation to phonological awareness (Bradley, 1988) is that “less skilled [8 year old] readers seemed to use a phonological strategy to spell words, and a visual strategy to read the same words” (p. 4). Students who were taught to connect the two strategies, phonological and visual orthographic, in early reading activities made greater gains in reading and spelling performances two years later than a control group and one that was not taught to connect the strategies. The effect of phonological instruction endures beyond the early years as Savage et al. (2005) found that “in regression analyses, phonological processing measures predicted word reading and comprehension, and both phonological processing and RAN [Rapid Automatized Naming] predicted spelling” (p. 12). The subjects of their investigation were poor, average and good readers and spellers in Years 3 and 5.

Research studies indicate that Year 4 and above students tend to have a wider Spelling Knowledge focus than the predominantly phonological focus of lower primary years, although O’Sullivan (2000) considers that “many different kinds of knowledge influenced development in spelling, even at the early stages: children needed to integrate different kinds of knowledge, phonetic, visual, structural and semantic, in order to develop effectively as spellers” (p. 10). The reading performance of students with reading difficulties (RD) (Years 4-6) improved after instruction in “the morphological structure of common words” (Carlisle, 2003, p. 311) whilst one Year 5 student with spelling and reading impairment experienced a multiple linguistic approach (Kelman & Apel, 2004) which included
orthographic knowledge, phonological awareness, morphological knowledge, mental graphemic representations (visual-orthographic images). More specifically, Moats (2000, as cited in Carlisle, 2003) emphasises the importance of morphemic instruction as “knowledge of word meaning, rapid word recognition, and spelling ability greatly depend on knowledge of word structure at the level of morphemes” (p. 312). This view reiterates that of Mangieri and Baldwin (1979) who state that students tend to misspell words that they cannot match with an appropriate meaning. A group of Years 4 and 5 students (n=33) identified as dyslexic received training in morphological awareness and Arnbak and Elbro (2000) found that there was a positive effect on spelling performance, especially that of compound and derived words. The authors suggest that “awareness of morpheme units in words enabled dyslexic students to segment complex words into linguistic units they knew how to spell. The results in spelling might also be an indication of the ease of the load on verbal working memory” (p. 247). Deacon and Bryant (2005) also designed an intervention to develop morphemic awareness during which students had to make decisions about appropriate morphemes in writing. The results show that related improvements are seen in reading and spelling performances.

Morphemic knowledge plays an important role in the development of sight vocabulary and according to Nagy, Berninger, and Abbott (2006), a correlation is found by a number of researchers including Carlisle and Fleming (2003); Singson et al. (2000); and Vaughan and Vermeulen (2003). Nagy, Berninger, and Abbot comment that:

With each grade children encounter an increasing number of morphologically complex words. The majority of these have meanings that can be inferred from the meanings of their component parts (Nagy & Anderson, 1984), and so recognizing the morphological structure of words should aid children in interpreting and learning them (p. 134).

However, the authors question whether the contribution of morphological awareness to reading ability is independent of phonological ability or highly dependent on it but conclude that “reading words for meaning, reading text for understanding, spelling, and accuracy and rate of decoding morphologically complex words (which are common in the upper elementary and middle-school grades) cannot be explained solely on the basis of phonological skills” (p. 145).

Research studies concerned with relationships between students’ age and performance are advanced by the “Overlapping Waves” theory (Kwong & Varnhagen, 2005). This refers to the different spelling strategy repertoires children have over time. Rather than changing in stages, children increasingly use a recently learnt strategy and decrease their reliance on those
that they learnt before. An important gradual change is from “effortful backup strategies to fast retrieval of spelling from memory” (p. 149). Treiman and Bourassa (2000) concur with the view that spelling development should be depicted more as the “predominant use of a particular process or strategy at different points of time” (p. 1) rather than a stage theory as favoured by Ehri (1986, as cited in Treiman & Bourassa). A further change that occurs as students get older is reported by Spencer (1999) who has found that although the phoneticity of a word is important in the early years, from seven years upwards the relationship of this factor to frequency of use is such that “even bizarre representations are learned if they are frequently encountered” (p. 291). Unfortunately, at the other end of the age spectrum, learnt words are gradually “unlearnt” and errors increase (MacKay & Abrams, 1998). The “Transmission Deficit” model suggests that the decline in orthographic knowledge retrieval is linked in the aged to a decline in spoken word retrieval. This perhaps illustrates the close association between oral and written language structures in the lexical system (Chomsky, 1957). Interestingly, the errors that students correct (Figueredo & Varnhagen, 2004) can indicate their spelling knowledge as they might well detect phonological errors but fail to identify orthographic and morphological errors. Detection of the latter depends on spelling skill and the authors surmise “that good spellers may have a larger memory for word-specific spellings” (p. 337) than average spellers. Memory retrieval is more frequently used for error detection than a visual or a phonological strategy and indicates that the correct spelling has been memorised. This study supports the notion that the quality of the product from fluent reading and writing reflects the quality of the spelling in lexical storage, a situation that is epitomised by the saying associated with computer data entry, “garbage in / garbage out”.

Research studies found in the literature indicate that teaching which targets spelling almost always produces improvement in students’ performance although the depth or breadth of advancement cannot necessarily be anticipated. Positive results are to be expected as many project proposals are subject to the rigor of research panel review prior to implementation and the studies are designed in reference to previous research findings. Ethically, the foci of the spelling interventions are within the boundaries of what a child is developmentally capable of learning and, in public schooling, confined by curriculum directives. Common features of many of the studies reviewed are that a) spelling performance improvement is the specific target of the intervention or, b) the instruction strategies employed deviate from the normal classroom practices.
It is difficult to separate the effects of “explicit purpose” and “novelty” present in many intervention designs on student performance and teacher behaviour, from the contribution of the instructional intent. Additionally, there is the so-called “Hawthorne Effect” which can have a beneficial affect on performance merely by the fact that a study is taking place. It refers to a research project (1927-1932) during which workers responded positively to an intervention, regardless of its nature, because they enjoyed the interest shown in them and their work conditions. The researchers reported a difficulty in allowing for this effect whilst relating “manipulated physical conditions to the worker’s efficiency” (Clark, 1999). A spelling intervention study on Year 2 students countered a “contact” effect by providing their control group with an alternative intervention in mathematics, although such precautions are often absent (Graham et al., 2002).

The elements of explicit purpose, novelty and the Hawthorne Effect have one feature in common and that is that they gain students’ attention, at least initially. Any effect on teachers’ and students’ behaviour or performance produced by an instructional intervention is moderated by the influence of increased attention caused by the study situation rather than the lesson focus. Notwithstanding this, it is speculated that the raised attention level contributes to a heightened response to the instructional focus which leads to increased opportunities for learning. The positive climate for learning through greater attention can be considered conversely. Opportunities for learning are enhanced when factors that interfere with attention are reduced. The former scenario suggests that attention is raised above the normal level whilst the latter implies that the normal level of attention is not diluted by students focusing in a non productive area. Whichever condition is present, the purpose in an educational environment is the same, and that is to promote learning. And attention assists the neurophysiological processes of learning by enhancing the efficiency of the neural connection system so that more enduring cognitive changes can take place.

The process of written language learning can be illustrated by expanding the NNWL model described earlier in this review. The three main neural centres of language processing, articulatory, phonological and lexical, are interconnected by a system of nerve processes. The nerve processes are axons and dendrites which project from a neural cell body and determine the direction of the signal. Network system connections are made at axon/dendrite junctions, called “synapses”, where neural transmitter chemicals are released to facilitate the passage of stimuli. The stimulus of new information activates the neural system, and learning occurs.
through the mechanism of “synaptic plasticity” if new connections endure. Active cognitive attention enhances the efficiency of the system as there is opportunity for a greater number of stimulations of the pathways so that enduring interconnections are made. New learning is supported by old learning through interconnecting network systems. “Interference”, such as through reduced attention, interferes with the process as synaptic activity fails to reach a level critical for durable “connectivity”.

One goal of teaching spelling is to facilitate the students’ processes of making enduring connections and establishing engrams. An engram is defined as “a physical alteration thought to occur in living neural tissue in response to stimuli, posited as an explanation for memory” (The American Heritage Stedman’s medical dictionary, 2002, n.p.). A further definition suggests that it is “a patterned response which has been stabilised at the level of unconscious competence” (Wikipedia, n.y., n.p.). These definitions can be used to describe a sight-word and all the associated learnings that are retrieved during automatic spelling associated with fluent reading and writing processes. Enduring connections can be made through the process of rehearsal, as defined in an earlier section. Rehearsal is the basis of rote learning and neural connections are made through Hebbian learning which relates to repeatedly stimulating a neural pathway to speed the forming of connections for an automatic response. Not all learning is the result of repeat stimulations. The properties of the different neurotransmitters contribute to the effectiveness of synaptic connections and these are influenced by such factors as emotion, mood or intent. This allows for a less mechanistic model of learning such as “encoding”. It is a cognitive process which Eggen & Kauchak (1994), based on Seigler’s (1991) work, define as “the process of forming mental representations based on the critical features of the learning task” (p. 327). For the process to be efficient the task needs to be meaningful in order to facilitate making links to former knowledge.

Students do not passively receive or copy input from teachers, but instead actively mediate it by trying to make sense of it and to relate it to what they already know (or think they know) about the topic. Thus, students develop new knowledge through the process of active construction (Brophy, 1992). The need to engage students’ attention and promote active cognitive processing is an important consideration, particularly when teaching low achievers, and leads to the concept of “best practice” in the classroom environment. This is shaped by the prevailing educational theory of the time, the teaching culture of the school, and the knowledge, experience, and personal philosophy about student learning of the individual teachers. It is underpinned by learning theories of which there have been four basic emphases
over the past twenty-five years (McInerney, 2005). These are “behavioural psychology”, “social cognitive theory”, “humanism” and “cognitive psychology”. Skinner is considered “The Father of Behaviourism” because of his influence on attitudes to learning in the 1950s and 1960s, although it was first introduced by John Watson in 1913 from the University of South Florida. The idea that “contiguity” between stimulus and response determines the likelihood of learning is central to behaviourist theories. It is a mechanistic view of learning “in which individuals were seen more as bundles of operants shaped by reinforcement than active and perceiving processors of information” (McInerney, p. 588). Traditional teaching methods reflect a behaviourist philosophy when knowledge is transmitted to students through demonstration, reinforcement, and controlled and sequenced practice. Such mastery practices are the basis of basal readers and many CAI programs. Spelling has been, and still is in many classrooms, taught with traditional teaching methods and although many children succeed with this mode of presentation, others do not. Possibly this method impedes those children who do not succeed well in forming adequate mental representations unassisted (Seigler, 1991, as cited in Eggen & Kauchak).

Bandura is most closely identified with Social Cognitive Theory (McCormack Brown, n.d.) or Social Learning Theory (SLT). It is derived from behaviourism but incorporates the influence of environment and currently includes elements of cognitive approaches. Eggen and Kauchak (1994) also include personal factors when the theory is applied to motivation as “learners will be motivated to work on a task to the extent that a) they expect to succeed on the task and b) the degree to which they value achievement of the task” (p. 434). The principle teaching strategy is modelling or “vicarious learning” which is one of the three strategies suggested in Focus on Literacy: Spelling (NSW DET, 1998a) for demonstrating Spelling Knowledge. The three basic tenets of SLT are a) “Response consequences … influence the likelihood that a person will perform a particular behavior again in a given situation”; b) “humans can learn by observing others, in addition to learning by participating in an act personally” (vicarious learning); and c) “individuals are most likely to model behavior observed by others they identify with” (McCormack Brown, n.p.). Speculatively, SLT highlights the influence of the teacher/student relationship on student learning.

The third emphasis suggested by McInerney (2005) is “humanism” which is the philosophy behind student-centred learning environments. It “emphasizes an individual’s overall well-being and describes needs as anything lacking for this well being” (Eggen & Kauchak, 1994, p. 439). Human interests and needs are central tenets. Maslow is considered the father of the humanistic movement and suggests that “people have a drive for self-realization, self-fulfilment, or self-
actualization” (p. 439). Gage and Berliner (1991, as cited in Huitt, 2001) outline some basic principles of the humanist approach in education: “a) Students will learn best what they want and need to know … b) Knowing how to learn is more important than acquiring a lot of knowledge … c) Self-evaluation is the only meaningful evaluation of a student’s work … d) Feelings are as important as facts … e) Students learn best in a non-threatening environment” (n.p.). Implications for classroom practices include ensuring that every child is safe in the environment so that they are confident to cognitively engage in the learning process. Both humanistic psychology and SLT tap into students’ motivation to learn and participate.

The NNWL model has been devised from a cognitive psychology perspective. The impetus came from the need to relate the brain imaging work of Pugh et al. (2001) and Shaywitz and Shaywitz (2004) to an understanding of spelling processes, as revealed by the literature. The concept of neural networks is particularly relevant to the schema theories of Gagne and Ausubel (McInerney, 2005) and neural connections take place through the processes of rehearsal and encoding. The names of Piaget and Vygotsky are almost synonymous with cognitive learning theories which, according to Eggen and Kauchak (1994), “are explanations for learning that focus on the internal mental processes people use in their effort to make sense of the world” (p. 305). The term Cognitive Psychology was coined by Neisser (1967) as a point of view that the mind has a certain conceptual structure and he defines cognition as “all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used” (p. 2).

The influence of Piaget’s work on the stages of cognitive development is seen today in the design of developmentally appropriate curricula (McInerney, 2005) and Vygotsky’s concept of a “zone of proximal development” (ZPD), “each person’s range of potential for learning” (p. 593), underpins teaching strategies such as “scaffolding and mediated learning, reciprocal teaching, distributed teaching, collaborative learning, and learning communities” (p. 593). These two theorists believed that learners construct their own meanings, Piaget at a personal level and Vygotsky within social environments (McInerney). A socio-cultural perspective on learning in literacy is well placed in relation to the work of Vygotsky as a classroom environment that encourages collaborative learning provides student mediated scaffolding for the minority or struggling groups within the class.

The term constructivism refers to “a view of learning that says learners use their experiences to actively construct understanding that makes sense to them, rather than acquiring understanding by having it presented in
an already organized form” (Eggen & Kauchak, 1994, p. 54). There are several approaches to constructivism and Olsen (1999) identifies two main branches, one that is built on philosophical theories of learning and the other that is built on psychological theories. The latter addresses constructivism as a theory of human learning. The most prominent categories are “social-contextual” and “radical constructivism”. Jones and Brader-Araje (2002) identify further divisions as “within educational contexts there are philosophical meanings of constructivism, as well as personal constructivism as described by Piaget (1967), social constructivism outlined by Vygotsky (1978), radical constructivism advocated by von Glasersfeld (1995), constructivist epistemologies, and educational constructivism (Mathews, 1998)” (p. 2). A notion that they all have in common is that learners construct meaning. By this it is meant that they focus on knowing as a process rather than knowledge as a product, as in behaviourist thinking. Constructivist practices are usually presented as being very distant from the transmission view of teaching that delivers knowledge (stimulus) to students in discrete graded packages. Yet even in this latter form, I suggest that students still have to perform some conversion of the stimulus (new knowledge) into cerebral representations of that knowledge, as without processing the stimuli have no greater function than electrical signals in a reflex arc. Conceivably, the important differences lie in the efficiency of the learning mode for various learners, and the stimulus and incentive to engage in higher order thinking, which is more elaborate cognitive processing. For students who understand a concept early in a transmission mode of presentation, much of the learning time might well be underutilised unless supplemented with more challenging extension work.

“Social constructivism and educational constructivism (including theories of learning and pedagogy) have had the greatest impact on instruction and curriculum design because they seem to be the most conducive to integration into current educational approaches” (Jones & Brader-Araje, 2002, p. 2). Educational constructivism is not defined by Jones and Brader-Araje but social constructivism refers to Vygotsky’s work where constructs are first developed at an interpersonal level and then at an intrapersonal level. This is the converse of the personal constructivism of Piaget where intrapersonal constructs are formed before interpersonal. Richardson (2003) differs from Jones and Brader-Araje and considers that constructivist pedagogy is mainly concerned with what she terms “psychological” constructivism which is clearly analogous to “personal” constructivism. Richardson attests that there is a converging of social and psychological constructivism and that the main difference is that of focus. In social constructivism the construct of formal knowledge is “determined by such things as politics, ideologies, values, the exertion of power and the preservation of status, religious beliefs, and economic self-interest” (Phillips, 2000, as cited in Richardson,
The focus of psychological constructivism is the individual mind and the ways in which meaning is created. The social element of psychological constructivism is a more recent inclusion and relates to how shared meaning is created within a group situation, such as a classroom (Richardson). It is emphasised that individual constructs are initially developed and then each contribution is negotiated within the group (intrapersonal to interpersonal).

The translation of constructivist theory into constructivist pedagogy was seen in the late 1980s (Richardson, 2003) in the language arts area when the term “facilitating” learning rather than teaching appeared in the literature. Since then there have been studies conducted in the different curriculum areas, particularly mathematics and science, which often focus on explicating differences between constructivist and transmission approaches to teaching. Richardson lists characteristics of constructivist pedagogy derived from the literature, herewith summarised or directly quoted (p. 1626):

- Student-centred approaches giving attention to the individual and respect for students’ background
- Facilitation of group dialogue for the purpose of creating a shared understanding of the topic
- Planned or unplanned introduction of topic into conversation through direct instruction, exploration of texts or other resources and means
- Provision of opportunities for students to determine, challenge, change or add to existing beliefs and understandings through engagement in tasks that are structured for this purpose
- Development of students’ metawareness of their own understandings and learning processes.

Richardson (2003) emphasises that these elements are not specific practices but are approaches to teaching. Effective teaching approaches and teacher characteristics that relate specifically to spelling and the language arts are identified by O’Sullivan (2000, p. 11). The most crucial is “teachers’ enthusiasm and excitement about language and words.” … “Such teachers actively involved children in thinking about spelling, discussed issues in relation to spelling and actively demonstrated approaches to learning spelling.” … “Spelling was taught through a combination of: working within all aspects of the writing process” and interventions which “reflected their teaching strategies and their understanding both of children’s development and of how to support further progress.” Strategies were taught at early stages of development in conjunction with acquiring a vocabulary and as children progressed in
spelling “the syntactic and semantic features of words needed to be given an increasingly significant role.” Individual needs were linked to “group and whole class spelling activities” and children’s spelling products “gave them insights into the spelling process” and each child’s progress. Lastly, “effective teachers collected a wide range of spelling resources, appropriate to the age and experiences of children they worked with, which they helped children to use.” Concluding remarks note that “children at the early stages of writing and spelling and older children with spelling difficulties benefited from being helped to use not only phonetic strategies but also to recognise the visual, structural and semantic aspects of the spelling system” and “with older children in particular, helping them to become more reflective and analytical about their own spelling played a key role in their development” (p. 12). Constructivist elements are evident in the teaching approaches described by O’Sullivan which are reflected in the language used, for example ‘actively involved’; ‘discussed’; ‘support’; ‘individual needs linked’; ‘reflective’ and ‘helped children to use’.

O’Sullivan (2000) emphasises teachers’ enthusiasm for language and words which not only serves for positive role modeling but also implies a rich knowledge base. The observation is made by Moats (2000, as cited in Carlisle, 2003) that:

Especially since the demise of Latin in the high-school curriculum, it has been uncommon for instructional materials in word recognition, vocabulary, and spelling to systematically explicate the structural components of words and morphological relationships among words. … Familiarity with morphology is essential for teachers who give instruction in advanced word recognition, vocabulary, and spelling from third grade on (p. 312).

The subject of teachers’ knowledge of metalinguistics was investigated by Fielding-Barnsley and Purdie (2005) who report that although the attitude to language teaching might be positive, many teachers’ knowledge base is not strong. Results from a ten question paper showed that Special Education trained teachers performed best (73% average) and the scores of the poorer performing groups (54% – 62%) did not vary “according to years of experience, or specialist LOTE, ESL or Reading Recovery training” (p. 77). No teacher scored 100%. The International Reading Association (2003) suggests that “oral language, phonemic awareness, phonics, word identification; fluency, vocabulary, and comprehension; assessing all aspects of literacy learning; and organizing and managing literacy instruction across grade levels” (p. 10) must be included in teacher preparation programs.
According to the literature, having a comprehensive knowledge of the English language is just one part of what teachers should know in regard to spelling instruction. But what teachers know in one subject area is a small part of what they need to fully equip them in their professional capacities. In addition to familiarity with the curriculum, pedagogic issues include aspects of student diversity, developmental stages of literacy and numeracy acquisition, as well as KLA assessment procedures and requirements. Learning theories that underpin teaching practices are further areas that contribute to a teacher’s body of knowledge and influence classroom decisions about how they teach spelling. Yet, in spite of their teachers’ best efforts, some children fail to achieve. Rather than speculating on the causes of these students’ lack of success, this study focuses on positive outcomes in student learning that can be achieved by constructing a learning environment that is commensurate with aspects of the NSW model of pedagogy called Quality Teaching (NSW DET, 2003a). Although an intervention program by its nature is outside normal classroom practices, nevertheless the lessons can be designed and presented which come within QT model parameters. (Although the planning and much of the implementation of the intervention program was accomplished before the public dissemination of QT literature, it was been incorporated into this literature review and in the whole thesis document as it clearly states and represents the pedagogic objectives of this research study).

In the QT model (NSW DET, 2003a) “the term pedagogy recognises that how one teaches is inseparable from what one teaches, from what and how one assesses and from how one learns” (p. 4). The model is developed from the concept of productive pedagogies that was the basis of the Queensland School Reform Longitudinal Study which, under the directorship of Lingard and Ladwig, produced the final report in 2001. The QSRLS also spawned the “New Basics” program (State of Queensland, 2004), implemented in Queensland schools since 2000, in order to “shift towards the sustained higher-order thinking needed for future success” (p. 3) which was a response to the finding that “teachers had rated intellectual demand as their lowest priority and assessment tasks were usually low in cognitive demand, not connected to the world, and not challenging intellectually” (p. 3). Productive pedagogies, in turn, are derived from a constructivist model of “authentic pedagogy” (Newmann et al., 1995) that has the dimension of “active learning” at its heart. It encompasses the notion that students construct meaning from a base of what they already know rather than just out of what they are told (Newmann et al., 1996). Another critical element of authentic pedagogy is the concern for high standards of intellectual quality, as adopted by productive pedagogies, but above all student achievements should represent “accomplishments that are significant, worthwhile and meaningful” (Newmann et al., 1995, p. 1).
Newmann and colleagues (1995) identify three criteria for their conception of authentic academic achievement: a) “construction of knowledge”, rather than “merely reproducing knowledge or meaning created by others” (p. 3); b) “disciplined inquiry” which is demonstrated by the use of specialised vocabulary in expressing ideas, nuances and details pertinent to the area of study; and c) “value beyond school”, which involves more than just documenting a student’s competence as a learner within the school. Authentic pedagogy also stresses the value of higher order thinking opportunities in the learning environment and constructivist assumptions are expressed thus:

Learning takes place as students progress, interpret and negotiate the meaning of new information. This is heavily influenced by the student’s prior knowledge, and by the values, expectations, rewards and sanctions that shape the learning environment. Students’ assimilation of new information depends heavily on whether that information helps them explain, or meaningfully extend, their past experience. Even an apparently simple task, such as the spelling of a word, involves this complex process (p. 3).

This statement suggests that the NNWL model’s conception of learning, particularly in spelling, needs to involve a more complex system with a deeper level of thinking to bring about the assimilation of new knowledge with old. Nevertheless, together with authentic assessment, the model does provide support for the notion that effective learning in spelling requires a richer intellectual challenge than some teachers provide. One of the findings that emerged from the government commissioned QSRLS is that “it is teachers who are the most significant variable in effective school reform” (Lingard & Mills, 2003, p. 3) and the authors suggest that teacher professional practices, comprising pedagogies and assessment practices linked to student outcomes, are central to any reform measure. Teachers’ classroom practices are a factor that influences student learning outcomes and one that can be examined in this study.

The QSRLS project differed from the authentic pedagogy project of Newmann et al. (1996) in that it separated but aligned pedagogies and assessment rather than incorporating the two together. QSRLS also included social outcomes as well as academic, because there was a concern that students should not be disadvantaged by their backgrounds. Authentic pedagogy standards were expanded into the four dimensions of productive pedagogies, a) “intellectual quality”; b) “connectedness”; c) “social support”; and d) “engagement and valuing of difference”. On a five point scale the ranked mean scores of the four dimensions are as follows: 1st) social support = 3.03; 2nd) intellectual quality = 2.27; 3rd) connectedness = 2.07;
and $4^{th}$ engagement with difference $= 1.94$. The research suggests that “such support [social support] is a necessary, but not sufficient requirement for enhancing student outcomes, both social and academic, and for achieving more equality of educational achievement” (Lingard & Mills, p. 8). One explanation proffered for the lack of intellectual quality is that the coverage of the substantial amount of curriculum content can become more pressing than the setting up of higher order thinking opportunities. Nevertheless, according to Lingard and Mills there is a good correlation between the presence of productive pedagogies, productive assessment and student outcomes, and importantly, “teacher effect upon student outcomes is much greater than whole school effect” (p. 120).

In an effort to identify how the practices of effective teachers can be disseminated throughout a whole school community the QSRLS also investigated professional development characteristics of good schools. “Teacher collaboration”, a “professional community” rather than just “collegiality”, “leadership that led learning”, and “interschool and other institutions collaboration”, are important features (Lingard & Mills, 2003). Implementation of the QT model in NSW public schools (NSW DET, 2003) draws heavily on the need to involve the whole school teaching community in a discussion about the model in a manner that is constructive and co-operative. It is through the development of a school project that the teaching community can pool its expertise and expand its professional development horizons.

The QT model (NSW DET, 2003a) has been referred to in earlier sections and its components, which comprise a number of elements within the three dimensions of Intellectual Quality; Quality Learning Environment; and Significance, are itemised in Appendix B, page 299 of this document. The elements that support a Quality Learning Environment, those of Explicit Quality Criteria; High Expectations; Student Direction; Social Support; Engagement; and Self-regulation, relate not only to creating learning opportunities within the classroom but also to encouraging students to support each other and their own learning. Significance, the third dimension, “lies in the connections between and among the student as an individual and social being, the nature of the work at hand, and the contexts in which such work matters” (NSW DET, 2003a, p. 14). It is described by the elements of Background Knowledge; Cultural Knowledge; Knowledge Integration; Connectedness; Narrative; and Inclusivity which not only support children from a range of backgrounds but also cater for diverse learning aptitudes.

The dimension of Intellectual Quality includes the elements of Deep Knowledge; Deep Understanding; Problematic Knowledge; High-order Thinking; Metalanguage; and Substantive
Communication. It draws heavily on the conceptual framework known as “Bloom’s Taxonomy”, developed by a team of academics in about 1956 to assist planning of education objectives. The original version describes levels of thinking skills in terms of nouns: Knowledge; Comprehension; Application; Analysis; Synthesis; and Evaluation. In the 1990’s the taxonomy was revised and stated with verbs: Remembering; Understanding; Applying; Analysing; Evaluating; and Creating. It is a hierarchical structure, each level building on those below, and its value in the classroom is that lessons can be designed to mindfully engage students in higher order thinking experiences, thereby delving more deeply into the subject of study. Compared to a traditional transmission style of lesson presentation the QT model places heavy planning demands on teachers, at least in the early stages of implementation.

The QSRLS (2001) rated teachers as “high”, “average” or “low” in relation to their sense of responsibility, expressed efficacy in improving student learning outcomes, conceptions of their role as a teacher, and their understanding of the curriculum. Characteristics of high-scoring teachers are identified and are summarised as follows: They “viewed all learners as capable of improving” and “were more prepared to ‘subvert the curriculum’ to create spaces for learning activities that they valued”. As facilitators they “set up environments where students could explore” and “focused on the development of skills and concepts, more than transmission of content”. Additionally, such teachers “engaged in professional conversations with colleagues about their teaching” and “were willing to talk about their failings and about the changes they had made to their teaching” (QSRLS, n.p.). Further characteristics that facilitate the learning process are identified by Newmann and colleagues (1996) and they refer to teachers needing to use students’ prior knowledge in their lessons as students’ assimilation of new knowledge will depend on how well they can extend their own experience. Additionally, it is felt important that students communicate their learning and that there are high expectations for student performance. Although the merits of high-scoring teachers’ characteristics can be recognised it has to be acknowledged that many teachers fall short of the ideal and have little support within their school community to effect change, even should they want to. It is appreciated that for some teachers, changing how they have conducted their professional lives for a number of years would be challenging, especially as an acknowledgement of need to change can be interpreted as invalidation of their past decisions and practices.

The topmost items on the lists of characteristics of the high- and low- scoring teacher groups in the QSRLS (2001) (Appendix A) are as follows: The “low-scoring” teachers
expressed the belief that students were responsible for their own learning” and “held that factors totally outside the teacher’s control largely ‘determine’ student outcomes”; whilst the “high-scoring” teachers “acknowledged that they could not force students to learn” and “considered themselves responsible for providing opportunities for student learning” (QSRLS, n.p.). The low-scoring teachers took no responsibility for the willingness of their students to participate in the learning process and the high-scoring teachers recognised that curriculum learning is an active process that students elect to engage in – or not. Student decisions about whether or not they will participate in educational activities, and the level of their engagement, is influenced by their motivation.

In the NNWL model motivation increases attention and decreases interference. Two broad categories of motivation are defined by Eggen and Kauchak (1994): “External motivation refers to motivation that comes from outside the learner” for example, high test scores; and “intrinsic motivation is a response to needs that exist within the learner, such as curiosity, the need to know” (p. 428). According to Ryan and Deci (2000) who developed the Self-Determination Theory (SDT) “the quality of experience and performance can be very different when one is behaving for intrinsic versus extrinsic reasons” (p. 55). Their theory relates to intrinsic motivation as a response to the psychological needs for ‘competence’, ‘autonomy’ and ‘relatedness’. These innate needs encourage development and, importantly, “the inclinations to take interest in novelty, to actively assimilate, and to creatively apply our skills is not limited to childhood, but is a significant feature of human nature that affects performance, persistence, and well-being across life’s epochs” (Ryan & LaGuardia, in press, as cited in Ryan & Deci, p. 56). Yet there is also acknowledgement of the value in promoting more active and volitional forms of extrinsic motivation as “an essential strategy for successful teaching” (p. 56) when students engage in classroom activities “with an attitude of willingness that reflects an inner acceptance of the value or utility of a task” (p. 56).

The SDT provides a link between teachers and QT (NSW DET, 2003a) and the motivation of students, as the three dimensions of QT namely, Intellectual Quality, a Quality Learning Environment, and Significance promote student behaviours that are volitional and at a high level of intellectual engagement. Intellectual Quality “requires students to engage in higher-order thinking and to communicate substantively about what they are learning” (p. 9). This occurs in a Quality Learning Environment that is focused on learning, has high expectations of student performance and “develops positive relationships between teachers and students and among students” (p. 9). Additionally, learning is ‘significant’ for students as meaningful connections are made to prior learning, personal aptitudes and social experiences. An unmotivated student will not participate
in the learning and communication processes at a level consistent with developing and assimilating deep understanding. Conversely and in relation to spelling, a motivated student in a QT environment will have opportunities to develop highly structured neural links in their cognitive language systems, a love of words and the use of language in reading and writing, a developmentally appropriate repertoire of spelling knowledge and strategies, metacognitive and metamemory strategies for learning words and about words, and an ever expanding sight vocabulary to be expressively used for meaningful communication.

A further number of studies have specifically influenced the direction and design of the present research. Although reading and writing outcomes are not subject to particular attention, the work of O’Brien (2000) nevertheless has current relevance. He argues that the reading and writing behaviours of poor spellers differ from those of good spellers and to some extent attributes this to early experiences of attitudes to spelling. With this in mind talk in O’Brien’s intervention classrooms between students and teachers encouraged a link to be made by students between spelling and the processes of reading and writing. Additionally, O’Brien’s study raised the awareness that poor spellers use less sophisticated strategies in their reading more often, such as phoneme/grapheme matching, than good spellers who are more conversant with morphemic and semantic elements of a text. This work helped to make clear that deficits in understanding and knowledge about words impede upper primary children’s literacy performance. Interventions to test the effectiveness of teaching strategies were not part of O’Brien’s multiple case study approach but in the present study, changes in reading and writing performances contribute to the data collected for comparative analysis with spelling performance.

A study more aligned to the present research, that of teaching spelling, was carried out by J. M. Smith (1996). It is more costly in terms of time as it extended over seven months as opposed to the five months of the present study and Smith’s intervention design incorporates cognitive and metacognitive training. The similarity of Smith’s study to the present one is that upper primary students experienced interventions to improve their spelling performance levels, as measured by formal standardised spelling tests. Groups that made significant gains are good readers/good spellers; good readers/poor spellers; and poor readers/poor spellers. The study was least beneficial to average readers/average spellers and Smith surmises that students’ attitudes contributed to their outcomes. This finding directed attention in planning the present research to providing a test for pre- and post- intervention attitudes to reading, spelling and
writing and to including a means for students to indicate their perception of progress made. Differences between the two studies are mainly that a) the principal experimental component of Smith’s study was to train teachers in metacognitive techniques which were then applied in the classroom, as opposed to direct intervention in classroom practices; and b) that, in contrast to differing interventions, Smith’s interventions differed only as necessary for the content to meet the needs of the different age levels and individual classroom circumstances. This included accommodating the number of classroom helpers and the special needs of any student. A further difference, c) is that Smith was a staff member of the schools where her study took place and was able to plan for two and one half hours of spelling instruction per class per week, with one half hour for planning with each classroom teacher. A more pragmatic view of instruction time was taken with the present study as the organisational complexity of Smith’s work reduces its generalisability.

J. M. Smith’s (1996) approach to interventions emphasises the need for an understanding of the cognitive processes involved in learning spelling. Research on the neurophysiological bases of literacy learning (Pugh et al., 2001) influenced the conceptualisation of the NNWL model (this author) as a means to relate changes in brain physiology to an understanding of the instructional and environmental support needed when learning spellings and using spellings. Speculations about cognitive processes are further expanded by concepts of interconnectedness and relationships (Ehri & Wilce, 1985) and connectionist theories (Bourne, 2002).

Instructional support centres on student/teacher interactions. The importance of these exchanges are highlighted in Edward-Groves’ (1998) study on teaching literacy in primary schools. Although the author sought to change teachers’ behaviour in the light of a heightened awareness of their teaching practices, it nevertheless has value to the present study as it identifies the positive effects of explicit and systematic instruction. Effective literacy pedagogy incorporates clearly articulated goals and purposes of the learning event, as well as ensuring that the goals remain explicitly in focus throughout.

Students’ awareness of the significance of a learning event is mediated by the skills of their teachers. The present study is advantaged by the findings from the QSRLS (2001), particularly the identification of high-scoring teacher characteristics (Appendix A). The NSW QT model (NSW DET, 2003a) evolved from the productive pedagogies (Lingard & Mills,
2003) and authentic pedagogies (Newmann et al., 1996) models underpinning the Queensland work. In this research study these models provide the framework for the interpretation of classroom events in relation to teacher behaviour and the learning environment. Consistent with the QT model, the theoretical basis of this research is constructivist (Richardson, 2003) which underpins the approach taken to intervention design. This research is timely in that findings can be related to aspects of the QT model which is currently being implemented in a number of NSW schools. The schools involved in the study were not actively familiar with the QT model at the time which limits any demonstrations of the elements of pedagogy described in the model. Nevertheless, factors can be identified in the intervention classrooms that demonstrate aspects of Quality Teaching.

2.4 SUMMARY OF THE LITERATURE

Federal and State governments have long been concerned about improving academic standards in public schools, particularly in the areas of literacy and numeracy. One route taken by Queensland and NSW is to implement school reform programs that focus on raising intellectual challenge to a higher priority in classrooms, whilst maintaining supportive learning environments. In NSW the QT model is being implemented and results of student outcomes from completed studies are yet to be published. State funding has been provided to support more students in literacy (NSW DET, 2001) and teaching spelling is targeted in the publication titled “Focus on Literacy: Spelling” (NSW DET, 1998a).

Spelling development is seen, not so much in terms of stages, but more by the preferred strategies that students are able to use. In the very early phase of written language acquisition, spelling is intimately linked to learning to read and learning to write. Reading and writing are for the purpose of communication whilst the main function of spelling lessons is to teach students strategies for learning a sight vocabulary of correctly spelt words. ‘Word-learning’ is a more apt description of this activity as it involves learning more about a word than just its spelling. The English K-6 Syllabus (BOS NSW, 1998b) outlines spelling outcomes for different stages of literacy development and positions spelling primarily in the writing domain which underrates its importance to reading. The Neural Network for Written Language (NNWL) model is developed to link findings from neurophysiological scanning procedures to a concept of how spelling is learnt. I also suggest that Learning Spellings is a more apt description of the spelling process when learning unfamiliar words, that Spelling occurs when cognition is consciously engaged in encoding or decoding words, and the term Automatic Spelling...
demonstrates spelling skill during lexical retrieval for reading or writing purposes. The errors students make in spelling and that they can correct, indicate their developmental level (Henderson & Templeton, 1986).

Classroom practices for teaching spelling usually include spelling lists to be learnt for homework, a spelling rule or strategy as a weekly focus, and a Friday spelling test. Although tests are scored they are not necessarily used to identify and rectify individual problem areas when there is a teacher perception that poor spellers are unlikely to make significant improvement in performance. Possibly also, some teachers might not know how to assist low achieving students specifically. In some classes, students keep note of their own errors which can dictate the focus of a whole-class mini-lesson. Programming in spelling is usually at a whole class or graded group level and it is unlikely that individual learning style preferences will be accommodated. Curriculum materials are a useful resource, particularly Focus on Literacy: Spelling (NSW DET, 1998a) which outlines Spelling Knowledge and the subcategories of phonological, visual, morphemic, and etymological knowledges. They are often the focus of research studies on spelling development. Common threads that are frequently identified in research studies involving classroom practices are an explicit focus on topics and the novelty of presentations.

The major learning theories are outlined and cognitive psychology perspectives lead to a constructivist model of learning. This is the basis of the QT model which also promotes the integration of Bloom’s taxonomy of thinking skills. High- and low-scoring teacher attributes are identified in the QSRILS (2001) and the Self Determination theory of Ryan and Deci (2000) provides a framework for conceptualising student motivation. This review of the literature illustrates that spelling cannot be isolated from the complex web of interacting processes of cognition associated with language development and production, and that teaching spelling holds an understated pivotal position in any language arts program.

2.5 RESEARCH QUESTIONS

Four focus questions are derived from the initial problem, “there are students in upper primary classrooms who do not spell at an age appropriate level of performance” that was outlined in Chapter 1 and they have been developed during this review of the literature. Students who underachieve in spelling are the main concern and the literature suggests that an explicit, more student-centred pedagogy that facilitates students’ learning is more inclusive of
the non-dominant groups that are part of the diversity of students found in any mainstream classroom. This includes students of lower than normal cognitive ability. It is expected that the programs of intervention lessons will positively influence spelling performance for all ability levels, and that features of individual classroom situations will be identified to account for improved spelling performance outcomes.

The focus questions are:

#1  
Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?

#2  
Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?

#3  
Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?

#4  
Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?

Recognition of the constraints of time and resources experienced by classroom teachers is inherent in the research design as it is intended that a lesson presentation that focuses explicitly on spelling and word knowledge for one hour per week is the primary departure from the practices of many classrooms. Only resources that are normally available to the teachers in the schools involved in the study are utilised. The one-hour block replaces smaller timeslots of dedicated spelling activities that are usually spread over five days.

It is a study that is intended to relate to a primary school mainstream classroom situation, yet takes into account the “steering towards change” that is resulting from the implementation of the QT model (NSW DET, 2003a). The new direction dictated by the QT model signals a more constructivist approach to teaching, whilst exercising an explicit lesson delivery. Students aged ten years who are in the Below Average or lower ranges of spelling performance using the TWS instrument (Larsen et al., 1999) are at least two years behind their chronological age in
terms of spelling performance age. They represent statistically about 25% of ten year olds (normative data of the test instrument). Upper primary students with poor performance levels are at risk of failing educationally in their secondary school careers and improved performance in the intervention period will possibly stimulate students’ motivation (Eggen & Kauchak, 1994) to further that improvement.

Intervention lesson designs (Jones & Brader-Araje, 2002) will accommodate the educational needs (NSW DET, 1998a) of the diverse range of students found in upper primary classes (Anstey & Bull, 1996, as cited in Edward-Groves, 1998) and classroom teachers will receive no special training. It is speculated that no more than explicit teaching (Edwards-Groves) and a more interesting, challenging and interactive lesson design that maintains students’ attention (Eggen & Kauchak, 1994), are sufficient to produce positive learning outcomes. Students’ attention will also be focused for more of the lesson time on the instruction topic when they are assisted in understanding its connection to previous learning and relevance to their language development (Edwards-Groves; NSW DET, 2003a). Working more interactively with their peers assists poorer performers in meeting learning challenges more readily than when they struggle on their own (Vygotsky, 1978, as cited in McInerney, 2005). A minimalist intervention study has been designed that seeks to demonstrate that very few changes to classroom practices are required to produce significantly improved student outcomes in spelling performance. It is speculated that improved spelling performance will also generate more positive attitudes to reading and spelling (Bransford & Vye, 1989) and a beneficial flow-on effect to oral reading fluency (Smith, 1982, as cited in Bouffler, 1984).
Chapter 3

METHODOLOGY

3.1 INTRODUCTION

Some children learn to spell without apparent effort, whilst others do not become functional spellers over a whole lifetime. The principal area of interest of this study is to identify factors in the classroom environment that contribute to improved spelling performance outcomes for poor spelling achievers so that they can gain confidence in their ability to learn in this language arts area. The rationale is that identification of such factors will lead to the provision of greater educational support for the strugglers so that all may succeed.

This is a quasi-experimental study of a non-randomised control group pre-test/post-test design, as students were not randomly assigned to groups (Fraenkel & Wallen, 1996; Burns, 1997) but it also has elements of a controlled trials design (Lesaffre & Verbeke, 2005). There are two parallel groups of classes that were assembled from nine upper primary classes in four schools. One group of five classes, the intervention group (Inv), experienced spelling lesson interventions. The parallel group of four classes, the non-intervention group (NInv), continued with their usual lesson programs. The intervention group of classes is subject to different factorial designs for each of the five classes and is therefore a “differentiated group”. The endpoint is the progress made in spelling performance over Term 2 and Term 3, a period of approximately five months. Spelling performance level on pre-test is the base-line and individual students’ scores as well as mean average class scores are utilised for analyses. The study is controlled, as per the controlled trials component, only in so far as one of the parallel group of classes (intervention) accommodated intervention lesson programs and the other
In view of the intervention program that is central to this empirical study, and my need to minimise the impact on usual classroom practices, a qualitative methodology that involves participant observations was not adopted. I considered a mixed quantitative and qualitative case study methodology unsuitable as the principal approach to data analysis because my main interest is on outcomes rather than processes. Although a “program logic model” (Yin, 2003) was considered, it became clear during the process of seeking participants in the study that it would not be logistically possible to investigate outcomes of a chain of events (for example, periodic testing of spelling performance in response to intervention events) leading to an ultimate outcome (an increased number of students spelling at age-appropriate levels) under the arrangements in place in the schools. An action-research design would have been possible with the teachers who showed enthusiasm for participating in the study but I feared that the less motivated teachers would find the process onerous.

A quasi-experimental design was more suitable for the conditions under which the study was conducted as it was less disruptive to normal classroom routines and required only as much involvement in lesson planning and accommodation as the teachers volunteered. Additionally, I was an active influence on the process of the lesson in four of the five intervention classes. Although students’ progress was not tracked over time with the present design, the difference between their pre-test and post-test spelling performance scores nevertheless indicates when progress has been made. This is not to suggest that students would necessarily improve at a steady monthly rate. However, an intervention period over two terms is sufficiently long for changes in spelling age performance to take place, if only because of a maturation effect over half of the school year. Testing of spelling was carried out in students’ classrooms under conditions with which they were very familiar and a practice that they had experienced (usually) on a regular weekly basis throughout their previous primary school years. Although it is not possible to say with certainty that no student was adversely affected by the experience, it can be stated that the students were made aware that their participation was on a voluntary basis and all appeared to be comfortable with the process.

The intervention and non-intervention teachers were treated differently. Non-intervention teachers were requested to continue with their normal spelling lesson programs and no constraints were placed upon them, except to allow their students to complete the
necessary tests for the study. The teachers also answered a list of questions related to their teaching philosophy and practices. It would not have been possible to police classroom events in all the classes over the number of weeks for two terms, or to expect full documentation on their spelling activities by the non-intervention teachers. Therefore, the decision was taken that a more casual and general “continue as usual” approach might lessen the teachers’ natural tendency to focus on spelling to a greater extent than their usual practices in response to the nature of the study. It was expected that, although the full amount of time programmed for spelling activities might be utilised during the study, pressure on time from other curriculum areas would make it difficult to extend the time-tabled time too much further. The outcome is that the non-intervention classes probably experienced dedicated spelling instruction for two to two and a half hours per week (Q6; Appendix C). Although this amount of time is usually time-tabled by the majority of upper primary teachers, an informal survey suggests that about one hour per week is usually managed. It is therefore very probable that non-intervention students received about one hour per week more spelling instruction than would be the case if the study was not taking place. This is not only during the intervention period but also during the term before the commencement of the study.

Intervention teachers, on the other hand, were requested to confine their dedicated spelling instruction time to the intervention lessons of one hour per week, a length of time commensurate with usual practices although not normally in one block of time. They were each provided with a journal and requested to document the duration and nature of activities involved with spelling during each week. Only one teacher (Teacher 2) complied, a situation that is regrettable but understandable in view of time pressures. It was expected that opportunistic and remedial instruction events would take place in response to students’ reading and writing activities but that little new ground would be broken in relation to spelling except during the intervention time. With the exception of Class 2 (Teacher 2), all classes continued to be given a weekly spelling list for homework by their teachers and to experience weekly spelling tests. Comments from the teachers suggest that classroom time spent on these activities amounted to less than one hour per week, in addition to the intervention lesson. The teachers preferred to continue with word-lists and tests as they were part of their assessment regimes and suitable for homework. The non-intervention teachers followed the same policy.

To summarise, it was not possible to control classroom events in relation to teaching spelling outside of the intervention lessons themselves. There is a high probability that non-
intervention students experienced spelling activities for more than two hours per week whilst for intervention students they occupied less than two hours per week. This places the onus on the intervention students to demonstrate at least equal spelling performance progress over the intervention period. Further details of the intervention and non-intervention classes and the intervention lesson programs are provided in later sections of this chapter.

3.2 FURTHER INTRODUCTORY FEATURES OF STUDY

Students were pre- and post-tested for spelling performance using a formal normative test. Further testing included cognitive ability screening, oral reading fluency, attitudes and self-concepts, and a MI inventory. A reading comprehension test and an informal writing task were also administered. Qualitative data include students’ self-assessment of progress and teachers’ responses to questions about their teaching philosophy and practices.

The design of the study has evolved as it became necessary to translate the ideal of the planned study into reality. The main difficulty was in finding teachers who were willing to accommodate intrusion into their classroom environments and the interruption of their own spelling lesson regimes over the duration of two terms. Their reluctance was understandable. The resulting intervention design is an amalgamation of my conceptual notions of warranted departures from current practices, supported by the literature, and the experiential contributions and enthusiasms of participating teachers.

The intervention period of two school terms (five months) was designed to achieve a balance between allowing sufficient time for the intervention program to be effective statistically (if only a trend), and avoiding prolonged disruption to the teachers’ normal programs. The research design addresses the four focus questions that were introduced in Chapter 2 above, as follows:

1. **Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?**

The instrument used is the Test of Written Spelling (4th edition) (TWS) (Larsen et al., 1999) which allows for standard score (StSc) grouping of results, and performance levels measured in terms of spelling age (SA).

2. **Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?**
Students can be categorised as of “Normal Cognitive Ability” (NCA); “Borderline cognitive ability” (B); and “at or below a Cut-off level for normal cognitive ability” (Co) using SYSTEMS (Ouvrier et al., 1999), a cognitive screening test for primary school-age children. Focus question #2 is founded on this screening instrument.

#3 Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?

Features of individual intervention classroom situations are related to elements of the QT model (NSW DET, 2003a) when applicable.

#4 Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?

Further parameters examined are: oral reading fluency (ORF) (School District, 1997); self-concepts and attitudes (ASK-KIDS) (Bornholt, 2000); and an informal self-assessment of progress. It was planned to also include reading comprehension (TORCH) (Mossenson et al., 1987); and an informal writing task but the standard of compliance was unsatisfactory. Only a group of Year 5 students who had written parental consent, the so-called Study Students (SS/5), were individually tested with the SYSTEMS, ORF, and ASK-KIDS instruments, as well as the informal self-assessment of progress.

3.3 THEORETICAL CONSIDERATIONS

A philosophical orientation to constructivist pedagogy underpins the design and implementation of the intervention program, in contrast to the more behaviourist approach (McInerney, 2005) of traditional spelling programs. The notions of authentic pedagogy (Newmann et al., 1995) leading to productive pedagogies (QSRLS, 2001) and hence the NSW QT model (NSW DET, 2003a) are founded on a constructivist approach to learning and teaching. Congruency of lesson programs with elements of the QT model is an informal measure utilised in this study. Richardson’s (2003) summary of constructivist pedagogic characteristics is inherent in the design of the lesson programs experienced by intervention classes. The list from the Review of the Literature (Chapter 2) is restated as follows (Richardson, p. 1626):

- Student-centred approaches giving attention to the individual and respect for students’ background
- Facilitation of group dialogue for the purpose of creating a shared understanding of the topic
• Planned or unplanned introduction of topic into conversation through direct instruction, exploration of texts or other resources and means
• Provision of opportunities for students to determine, challenge, change or add to existing beliefs and understandings through engagement in tasks that are structured for this purpose
• Development of students’ metawareness of their own understandings and learning processes.

The endpoint of this research is changes to student performance after the experience of the intervention lesson programs. It is not the intention of the study to investigate or measure any changes to the teachers’ approaches to their teaching practices. Therefore, further theoretical considerations in relation to teachers are not explored.

3.4 METHODOLOGICAL APPROACH

Sampling procedures utilised for selecting the subjects taking part in the study are described, followed by an outline of the measurements used to collect data. The section on procedures includes a rationale for the study design and a description of the procedures followed in implementing the intervention program.

3.4.1 SUBJECTS

The subjects of the study are Year 5 and Year 6 students (n=237) and their teachers (n=11) in nine mainstream classrooms located in four public primary schools (A, B, C, and D). Primary schools in Australia correspond to elementary schools in the American system and public schools are under the control of state governments, in this case, NSW. They comprise six primary Year levels and the age of students is mainly from five years to twelve years.

The schools in the study are in the outer environs of Sydney, NSW and located in areas above the mean (1000) of the average range (800-1200) on the Socio-Economic Index for Area (SEIFA01) which is a measure of the Index of Relative Socio-Economic Advantage/Disadvantage (Australian Bureau of Statistics, 2001):

A higher score … indicates that an area has attributes such as a relatively high proportion of people with high incomes or a skilled workforce. It also means an area has a low proportion of people with low incomes and relatively few unskilled people in the workforce. Conversely, a low score on the index indicates that an area has a higher proportion of individuals with low incomes,
more employees in unskilled occupations, etc.; and a low proportion of people with high incomes or 
in skilled occupations (Details, p. 5).

Schools A (SEIFA = 1004) and D (SEIFA = 1064) are surrounded by older-style housing and 
Schools B (SEIFA = 1054) and C (SEIFA = 1152) are recently built in new housing 
developments. The immediate environs of School B suggest that it is located in one of the 
higher income parts of the area included in the SEIFA (1054), whilst the suburb for School C 
has experienced in recent years a high level of redevelopment. The suburbs in which Schools A 
and D are situated have been long established. It had been my intention to recruit schools in 
areas with SEIFA 1000 but this was not possible.

3.4.1.1 SAMPLING PROCEDURE AND DESCRIPTION

The sample is as random as it was possible to achieve in the circumstances. In the first 
year of the study a number of principals, randomly selected, in a school District of Sydney were 
contacted in writing and only four were interested in further communication. Teachers in two 
of these acceded to their principals’ request to consider participation in the study. One non-
intervention teacher (Class 6) in School A moved to School C the following year and agreed to 
conduct an intervention lesson program for his new class (Class 3). With the principal’s 
permission and at Teacher 3a/6’s request, Teachers 8 and 9 in School C agreed to participate as 
non-intervention classes. School D was not randomly selected but was asked to participate for 
the sole reason that there was a Team Learning System (TLS) (Findlay, 2003) installed in a 
dedicated room.

The hierarchy of rationales for sampling events are as follows:

1) **Urban areas of Sydney**: require educational facilities for a large number of 
students living in the environs of a multicultural city.

2) **Public schools**: are more homogenous and representative of a greater number of 
students within the city suburbs than private schools.

3) **Primary schools**: are preparing students for the more independent learning 
environment of secondary schooling.

4) **Upper primary**: students have had grounding in learning spellings and the spelling 
rules. Also their spelling performance levels have had time to consolidate into 
informal bands of ability. Moreover, their experiences of spelling lessons generally 
follow a similar pattern of presentation over a number of previous years.

5) **Schools A, B, C, D**: had school principals and administrations willing to support
the study (n=4).

6) **Classes 1 - 9** are the classes with teachers willing to participate in the study, either through their own interest or, more passively, because they assented to their school principals’ request.

7) **Students within the classes**: were not randomly assigned to classes but remained as intact groups of male and female students. All Year 5 and Year 6 students (n=237) were included initially (Table 2, next page). Data from students who did not complete both the pre- and the post-test spelling performance tests (n=30) were excluded (Table 5, p. 85) as the primary interest was to establish difference in performance between the two testing episodes. The total number of students with pre- and post-test spelling performance results is n=207 (Table 6, p. 85).

8) **Intervention group (Inv)**: are classes (n=5) which have Year 5 students and teachers who agreed to work with me to implement an intervention. Four of the five classes also have Year 6 students. (Total students in intervention group: n=130).

9) **Non-intervention group (NInv)**: are classes (n=4) with Year 5 students whose teachers agreed to continue with their normal practices and allow me to follow the same student testing regime as with the intervention group. One of the classes is a Year 4/5 composite class (data from Year 4 students are not included in the study) and the remaining three classes are Years 5/6 composites. (Total students in non-intervention group: n=107).

10) **Study Student group (SS/5)** is a group that comprises intervention and non-intervention Year 5 students whose parents provided written permission for me to administer tests to their child individually, in addition to the tests that were given to the whole class (Table 2). The Study Student group (n=114) is a subset of the total number (n=237) of students in the study.

Table 2 shows the number of students in each Year at the start of the study, the size of the intervention and non-intervention groups, and the number of students in the Study Student (SS/5) group.
Table 2
Students in Intervention / Non-Intervention Groups
at Start of Study

<table>
<thead>
<tr>
<th></th>
<th>Inv</th>
<th>NInv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 5 students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/NInv group</td>
<td>83</td>
<td>66</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>64%</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Year 6 students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/NInv group</td>
<td>47</td>
<td>41</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>36%</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Total no. students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Total</td>
<td>130</td>
<td>107</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>55%</td>
<td>45%</td>
<td>100%</td>
</tr>
<tr>
<td>Study Students (SS/5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Yr 5 only)</td>
<td>75</td>
<td>39</td>
<td>114</td>
</tr>
<tr>
<td>% of SS/5 Total</td>
<td>66%</td>
<td>34%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Of the total number (n=237) of Year 5 and Year 6 students in the nine classes that participated in the study, over half (55%) are in the intervention group. In addition to there being only four non-intervention classes (compared to five classes in the intervention group), one non-intervention class was a 4/5 composite and, as Year 4 students are excluded from the study, these factors contributed to the lower percentage of students in the non-intervention group. Nonetheless, there is an approximate six to four ratio (6:4) of Year 5 students to Year 6 in both the intervention and non-intervention groups.

Parental permission was obtained for approximately three quarters (n=114; 76.5%) of the total Year 5 students to experience individual testing. Of these, about two thirds (75 of 114=65.7%) are in the intervention group. According to the classroom teachers, the main reasons that parents did not give permission were because they feared that the testing might cause stress or that their child would be adversely labelled, the latter in view of the cognitive ability screening test. A larger number of parents for the non-intervention group (n=27) than the intervention group (n=8) failed to give permission for individual testing. In addition to the two reasons already identified, it is speculated that the non-intervention parents (and possibly teachers) had less interest in the study, or they perceived that there would be no benefit to their child.
The gender of students in each group is shown in Table 3.

### Table 3
**Gender Distribution of Students at Start of Study**

<table>
<thead>
<tr>
<th>All Students</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv</td>
<td>69</td>
<td>61</td>
<td>130</td>
</tr>
<tr>
<td>NInv</td>
<td>46</td>
<td>61</td>
<td>107</td>
</tr>
<tr>
<td><strong>Total (n=)</strong></td>
<td><strong>115</strong></td>
<td><strong>122</strong></td>
<td><strong>237</strong></td>
</tr>
<tr>
<td><strong>%</strong></td>
<td><strong>48%</strong></td>
<td><strong>52%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Whilst the male:female ratio for the intervention group is fairly similar, the percentage of non-intervention males is only forty-three (n=46; 43%) and lower than the percentage of females (n=61; 57%). All classes were of mixed gender so presumably the prevalence of females in the non-intervention group is related to school enrolment patterns.

Table 4 (next page) shows the gender, home language, and cognitive ability statistics for the Study Students group (SS/5), comprising Year 5 students only (n=114). The ratio of male:female intervention students is fairly equal (7:8), however the ratio for the non-intervention SS/5 group is only 1:2. As shown in the table, there is minimal difference between the intervention and non-intervention groups in regard to the three to one (3:1) ratio of students who speak only English or have a home language other than English (LOTE). The percentages of students with normal cognitive ability (NCA) are also very similar in the intervention (69%) and non-intervention (72%) groups; conversely students with borderline or below cutoff (B/Co) levels of ability on screening are therefore similar.
Table 4
Gender; Home Language; and Cognitive Ability Groupings
of SS/5 Group at Start of Study

<table>
<thead>
<tr>
<th></th>
<th>Inv</th>
<th>Ninv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>35</td>
<td>13</td>
<td>48</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>47%</td>
<td>33%</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>40</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>53%</td>
<td>67%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>English only</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>57</td>
<td>30</td>
<td>87</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>76%</td>
<td>77%</td>
<td>76%</td>
</tr>
<tr>
<td><strong>LOTE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>18</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>24%</td>
<td>23%</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Normal Cognitive Ability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>52</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>69%</td>
<td>72%</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Borderline/Cutoff</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>23</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>31%</td>
<td>28%</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total no. students</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Total</td>
<td>75</td>
<td>39</td>
<td>114</td>
</tr>
</tbody>
</table>

The four schools are located in areas with Socio-Economic Index for Area scores which are above the mean (1000), and range from 1004 for School A to 1152 for School C. Equivalence between the intervention and non-intervention groups is demonstrated by their ratios of Year 5 students to Year 6 students (6:4) in each group; a home language of English only versus a language other than English (3:1) in each group; and by their similarity of about 70% of students in the normal cognitive ability range, and approximately 30% below this level of ability in each group. The gender distributions are less equivalent as, whilst the male:female ratio in the intervention group is about equal, there is a higher percentage of female (57%) than male (43%) students in the non-intervention group, a consequence of the enrolment patterns in the classes involved.

The data of thirty students (n=30: 12.7% of initial total, n=237) are excluded from analyses, as shown in Table 5, and include seven students in the SS/5 group (intervention n=6; non-intervention n=1).
Table 5

Students in Intervention / Non-Intervention Groups

Lost to Study

<table>
<thead>
<tr>
<th></th>
<th>Inv</th>
<th>NInv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 5 students</td>
<td>-6</td>
<td>-7</td>
<td>-13</td>
</tr>
<tr>
<td>Year 6 students</td>
<td>-6</td>
<td>-11</td>
<td>-17</td>
</tr>
<tr>
<td>Total no. students</td>
<td>-12</td>
<td>-18</td>
<td>-30</td>
</tr>
<tr>
<td>%</td>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Students (SS/5) (Yr 5 only)</th>
<th>Inv</th>
<th>NInv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>86%</td>
<td>14%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Four of the SS/5 group moved to other schools within the intervention period and the remaining three students excluded from this group were on family holidays during the post-testing period. The largest category of student that was absent for testing is Year 6 students in the non-intervention group. The sole criterion for excluding students’ data from analyses is because they were not present for both the pre- and the post- spelling test.

Table 6 shows the statistics of students included in the study, which are hereafter referred to in any further discussion.

Table 6

Students in Intervention / Non-Intervention Groups

Included in Study

<table>
<thead>
<tr>
<th></th>
<th>Inv</th>
<th>NInv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 5 students</td>
<td>77</td>
<td>59</td>
<td>136</td>
</tr>
<tr>
<td>Year 6 students</td>
<td>41</td>
<td>30</td>
<td>71</td>
</tr>
<tr>
<td>Total no. students</td>
<td>118</td>
<td>89</td>
<td>207</td>
</tr>
<tr>
<td>percentage</td>
<td>57%</td>
<td>43%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Students (SS/5) (Yr 5 only)</th>
<th>Inv</th>
<th>NInv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>64%</td>
<td>36%</td>
<td>100%</td>
</tr>
</tbody>
</table>
The intervention and non-intervention groups are parallel groups insofar as they comprise mainstream upper primary students who live in the outer areas of Sydney in areas with a SEIFA score above the mean level of 1000. They are equivalent in terms of school Year ratio, home language pattern, and cognitive ability levels. The base-line for each group is their mean spelling age on pre-test. These are different for each group and the reasons for the difference are discussed in later sections of this work. The endpoint of the study is the progress made in mean spelling age by the students in each group. As progress is the difference in spelling age between pre- and post-tests, the dissimilar pre-test mean spelling ages (the base-lines) do not compromise the endpoint. The five intervention class interventions are of different factorial designs, consistent with the controlled trials component of the methodology, and are described later in this chapter.

3.4.1.2 EXTERNAL VALIDITY

Attempts were made to improve external validity by using the proximal similarity model (Trochim, 2004) as follows:

- The difficulty with finding teachers willing to participate resulted in implementing the interventions in Schools C and D one year later (2004) than in Schools A and B (2003). Completing the interventions at the same time in the same year for all schools would have increased similarity but, counter to that, the one year’s difference in time improves the generalisability. The intervention period for all classes extended from the beginning of Term 2 to the end of Term 3, a duration of approximately five months.

- The design parameters of the study were extended by necessity to include the spelling performance levels of Year 6 students as it was not possible to establish the ideal study situation of a sufficient number of straight non-streamed Year 5 classes. Table 7 shows the student Year profile of each class available for the study. A total of nine classes participated, five of which are intervention classes (Inv) and four non-intervention classes (NInv). Intervention classes comprise one straight Year 5 class and four composite Years 5/6. Three non-intervention classes are also Years 5/6 and the fourth a Years 4/5. Only data from the Year 5 students in the latter Years 4/5 class are used in the study.
### Table 7

**Year Levels of Classes**

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year levels</td>
<td>5</td>
<td>5/6</td>
<td>5/6</td>
<td>5/6</td>
<td>5/6</td>
<td>4/5</td>
<td>5/6</td>
<td>5/6</td>
<td>5/6</td>
</tr>
</tbody>
</table>

- The five intervention classes (the experimental group) experienced interventions and the research procedures for each class were as closely matched as possible, although at least one factor differed in the characteristics of each class intervention. There were four different teaching programs and one intervention teaching program was experienced by two classes (Classes 4 and 5). The factor that differed between Classes 4 and 5 was the different teaching style of the classroom teachers.
- A further four classes, the non-intervention group (the control group), did not experience an intervention but were tested with the same range of pre- and post-tests as the intervention classes.
- The range of both formal and informal test instruments ensures that results of the study have confirmability.

Every effort was made to decrease any threat to external validity by ensuring that the subjects and the locations of schools were as similar as possible, and that the intervention periods were consistent for all classes, albeit with a time shift of one year for two intervention classes (and two non-intervention classes). In this quasi-experimental/controlled trials hybrid study the main difference in the treatment for the parallel intervention and non-intervention groups is that the intervention group of classes experienced an intervention lesson program. The main difference between each intervention class is that they were of different factorial designs.
3.4.1.3 FURTHER DETAILS OF SAMPLE

The gender distribution of the sample is shown in Table 8.

<table>
<thead>
<tr>
<th>All Students</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv</td>
<td>65</td>
<td>53</td>
<td>118</td>
</tr>
<tr>
<td>Ninv</td>
<td>38</td>
<td>51</td>
<td>89</td>
</tr>
<tr>
<td>Total (n=)</td>
<td>103</td>
<td>104</td>
<td>207</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SS/5 only</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv</td>
<td>33</td>
<td>36</td>
<td>69</td>
</tr>
<tr>
<td>Ninv</td>
<td>13</td>
<td>25</td>
<td>38</td>
</tr>
<tr>
<td>Total (n=)</td>
<td>46</td>
<td>61</td>
<td>107</td>
</tr>
</tbody>
</table>

There is only one less male student than female in the Total student group compared to the ratio of 46:61 in the Study Student group when participating in the individual testing regime required written parental consent.

The home language (Table 9) is known only for the Study Student group (SS/5) and the languages other than English spoken at home (LOTE students) include: Cambodian, Chinese, Creole, Fijian, Indian, Korean, Lebanese, Pakistani, Yugoslavian, Maori, Persian, Greek, Polish, Philippi, and Italian. All students spoke English adequately but compromised understanding of nuances was observed during individual testing in five students.

<table>
<thead>
<tr>
<th></th>
<th>English only</th>
<th>LOTE</th>
<th>DK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv</td>
<td>51</td>
<td>18</td>
<td>49</td>
<td>118</td>
</tr>
<tr>
<td>Ninv</td>
<td>29</td>
<td>9</td>
<td>51</td>
<td>89</td>
</tr>
<tr>
<td>Total (n=)</td>
<td>80</td>
<td>27</td>
<td>100</td>
<td>207</td>
</tr>
</tbody>
</table>
The DK group (Don’t Know) in Table 9 comprises all students who are not SS/5 students and includes all Year 6 students and the twenty-nine Year 5 students who did not participate in the individual testing regime.

The range of teachers’ ages is wide and herewith (Table 10) my estimations: (Teacher 3a/6 is so-called because he was the teacher for Class 6 during 2003 and Class 3 for the first part of the intervention period in 2004).

### Table 10

**Gender and Approximate Age of Teachers**

<table>
<thead>
<tr>
<th>Class</th>
<th>Teacher n=11</th>
<th>Approx. Age</th>
<th>Gender</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Mid-twenties</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Mid-forties</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3a/6</td>
<td>Mid-forties</td>
<td>M</td>
<td>First half of intervention</td>
</tr>
<tr>
<td>3</td>
<td>3b</td>
<td>Early twenties</td>
<td>M</td>
<td>Second half of intervention</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>About 60 years old</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Mid-fifties</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3a/6</td>
<td>As per 3a/6</td>
<td>M</td>
<td>Class 6 2003: Class 3 2004</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Late twenties</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8a &amp; 8b</td>
<td>Late thirties x 2</td>
<td>F x 2</td>
<td>Two job-share teachers</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>Late forties</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

The range of teachers’ ages is from about twenty-two years of age, having qualified in teaching the previous year, to about sixty years with plans to retire the following term. There are two male and nine female teachers involved in the study.

Four schools took part in the research and it was unavoidable that the non-intervention classes were in the same schools as intervention classes, as shown in Table 11.
School A:

Classes 1 (an intervention class), 6 and 7 (non-intervention classes) include all the Year 5 students in School A. Class 1, a Year 5 class, comprises the middle (with some exceptions) academic performers informally assessed at the end of the previous year. Class 6 is a composite Year 4/5 class and has mainly but not exclusively the lower academic Year 5 performers. The Year 5 students in Class 7, a Year 5/6 class, are most of the higher academic performers in the school.

School B:

Only one teacher in School B volunteered to take part in the study. Class 2 (Inv) is a composite Years 5/6 class comprising students with a range of academic abilities.

School C:

Classes 3 (Inv), 8 (NInv) and 9 (NInv) are parallel composite Years 5/6 classes and have n=18, n=19 and n=17 Year 5 students respectively. Students were assigned to each class in a manner designed to achieve a similar range of academic achievement levels, as determined by school personnel at the end of the previous year.

School D:

Classes 4 and 5 are 5/6 composite intervention classes. Students were randomly assigned to each class at the beginning of the school year from three academic performance levels. The classes have a similar balance of performance levels, although Teacher 5 volunteered to have the students with more challenging behaviours. (The highest achieving students of the age group in School D are in a

---

Table 11

Location of Classes

<table>
<thead>
<tr>
<th>School</th>
<th>Class</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>Class 1</td>
<td>Inv</td>
</tr>
<tr>
<td></td>
<td>Class 6</td>
<td>NInv</td>
</tr>
<tr>
<td></td>
<td>Class 7</td>
<td>NInv</td>
</tr>
<tr>
<td>School B</td>
<td>Class 2</td>
<td>Inv</td>
</tr>
<tr>
<td>School C</td>
<td>Class 3</td>
<td>Inv</td>
</tr>
<tr>
<td></td>
<td>Class 8</td>
<td>NInv</td>
</tr>
<tr>
<td></td>
<td>Class 9</td>
<td>NInv</td>
</tr>
<tr>
<td>School D</td>
<td>Class 4</td>
<td>Inv</td>
</tr>
<tr>
<td></td>
<td>Class 5</td>
<td>Inv</td>
</tr>
</tbody>
</table>
separate Gifted and Talented class that did not take part in this study).

Although the schools and classes were less homogenous than planned, they nevertheless are representative of public school urban populations in the outer areas of a large multicultural city. Students were in the upper primary years and a range of different ethnic, cognitive ability, and socio-economic groups are represented across the total sample.

### 3.4.2 Measurement Section

All formal measures used in the study are available to schools and the test that is central to this study is the Test of Written Spelling (4th Edition) (TWS) (Larsen et al., 1999). Cognitive ability screening was carried out using SYSTEMS (Ouvrier et al., 1999), and the measure for self-concepts and attitudes is ASK-KIDS (Bornholt, 2000). TORCH, a test for reading comprehension (Mossenson et al., 1987) was given to students on a whole-class basis but the administration proved to be unsatisfactory because of poor student supervision and the results are not used for this study. Students also completed a Multiple Intelligences inventory (McGrath & Noble, 1995). Informal measures related to students include: a) a writing task; and b) students’ perceptions of their progress using a simple 1-to-5 rating variable. The writing task was also disregarded as again, the students were poorly supervised during the administration. The dimensions of the QT model (NSW DET, 2003a) assisted informal analysis of classroom environments (Appendix B).

A mixed-method approach was taken and both quantitative and qualitative data were collected. Additionally, quantitative data such as the number of correct words per minute (cwpm) in the ORF test are organised qualitatively into performance level groupings; and qualitative data obtained during ASK-KIDS testing are assigned numerical values and averaged (Trochim, 2004). Further qualitative data comprises teachers’ philosophies and practices (Appendix C); a teacher’s journal (Appendix D); teachers’ assessment of students’ progress (Appendix E); students’ comments on their progress (Appendix F); and my classroom journals of Classes 1, 3, 4 and 5 (Appendix G). All students experienced pre- and post-test spelling performance testing using the TWS instrument. Only the Study Student group were tested with SYSTEMS, ORF, ASK-KIDS, and asked to rate their perceptions of progress.
3.4.2.1 TEST OF WRITTEN SPELLING – 4 (TWS)

The spelling test most commonly used in public schools in the geographical area of the study is the South Australian Spelling Test (SAST) (Westwood, 1993). The most important reason for selecting the TWS (Larsen et al., 1999) rather than the SAST is that the TWS has two matched spelling words lists, Form A and Form B. (This feature is now available with the more recent version of SAST). The parallel-forms reliability for the TWS is high across content sampling (.94 and .93), time sampling (.95 and .96) and scorer differences (.99 and .99). It was felt important at the time of the intervention program to use different word-lists for pre- and post-tests as the interval between testing was only five months and using two lists avoided any influence of familiarity with the testing words. The possibility of such a familiarity was a further factor in deciding to avoid using the SAST as all students had experienced previous testing with that instrument as part of their school-based testing program. One negative feature of the TWS is that the normative data were obtained from American students rather than Australian. However, as the purpose of testing for this study is to measure differences in performance levels during a specific time period, rather than to make judgments about performance against the norm-reference group per se, I considered that the advantages of using the two matched word lists outweighed the disadvantage of the non-Australian reference group. Of the total one hundred words used in the two word-lists, only the word visualize (visualise) has an acceptable alternative spelling. A further benefit of using two matched lists is that the errors students made in completing the pre-test could be noted to assist lesson planning decisions during the intervention period without prejudicing the results of their post-testing.

The TWS (Larsen et al., 1999) is a norm-referenced spelling test for students in Years 1–12 and the authors state that the test has been found to be statistically reliable, with reliability coefficients of above .90. The “degree of homogeneity among items within the test” (p. 27), content sampling, was tested and the average coefficient alpha for Form A is .94 and for Form B it is .93. When both forms were tested during one session using a procedure for estimating error described by Anastasi and Urbina (1997, as cited in Larsen et al.), the means and standard deviations at every age interval were found to be similar, with all but one coefficient showing a relationship of more than .90. The authors of TWS confidently state “that the forms of the test are indeed equivalent” (p. 29), and they further assert that the test-retest reliability is acceptable at, for example, .97 for Sixth Grade students. Inter-scorer differences were also tested and the results for the three sources of potential tests error are summarised in Table 12 (reproduced from Larsen et al., p. 31).
TWS is administered using a dictated word format. It took about twenty minutes to administer one spelling list of fifty words to each class as each word was pronounced, a sentence provided using the word in context, and the word repeated. (When administered to an individual rather than a whole-class, testing continues until a ceiling of correct words is obtained and then testing stops. This is decided by a sequence of five incorrectly spelt words).

The test data are available as standard scores (StSc), percentile ranking (PR), spelling ages (SA), and grade equivalents. The TWS standard score (StSc) categories include Very Poor (2.34%), Poor (6.87%), Below Average (16.12%), Average (49.51%), Above Average (16.12%), Superior (6.87%), and Very Superior (2.34%). However, in order to reduce problems with analysis of categories with small numbers of students, the categories are consolidated into three groups namely “Below Average” (BAv) (including Very Poor, Poor and Below Average=25.33%), “Average” (Av) (49.51%), and “Above Average” (AAv) (including Above Average, Superior and Very Superior=25.33%). The Average category includes students with a standard score of between 90 and 110; Below Average students have a standard score of less than 90, and Above Average students a score of 111 or more. [The first letters of the labels Below Average, Average, and Above Average are hereafter capitalised when they refer to the TWS standard score groups described above].

Larsen and others (1999) caution against using spelling age data because of strong arguments against, which have been expressed by experts in measurement. The grounds are that spelling age data “are frequently misunderstood, have limited value statistically, require a good deal of subjective interpolation to calculate, and often give an unrealistic picture of a youngster’s true abilities” (p. 15). Additionally they have been subjected to “interpolation, extrapolation, and smoothing” (p.24). Percentile ranking has the disadvantage that “the differences between the successive percentile ranks from
1 to 99 do not represent equal amounts of information measured” (p. 15). This is also a problem with standard scores. When Below Average and Average students’ data collected for this study are analysed using spelling age, percentile rank, and standard scores, the comparisons that can be made between groups are very similar. The decision to predominantly use spelling age data in analyses and discussion is because it is the most suitable measure for exploring relationships with a student profile-based variable, that of chronological age. The standard score categories of Below Average, Average, and Above Average are employed to group students into performance levels; whilst spelling performance progress over the intervention period is measured by changes in spelling age.

The limitation of spelling age scores is that a number of students reached the upper limit of normative data, that of 210 months (17 years and 6 months). Consequently, when scores of students at the upper limit are included, average mean scores are an unknown value lower than the true value and therefore only conservative approximations. There is also a problem in deciding whether any student who performs above 210 months spelling age on pre-test (SA1) has made progress over the intervention period, when post-tested (SA2). To address this limitation, any progress is determined by the number of correctly spelt words recorded on their pre- and post-test spelling sheets (raw scores). Students are deemed to have made progress if they spell at least one more word correctly on the post-test sheet than on pre-test. (The TWS score figures indicate that at the students’ chronological age each additional word is equivalent to spelling performance progress of three months; yet at the upper end of the spelling age range each additional correct word represents one year’s progress). Theoretically, on post-testing the mean spelling age (SA2) should be the mean pre-test spelling age (SA1) plus five, representing the five months of the intervention period. This is termed the Predicted Spelling Age (PrSA) and indicates that learning in spelling has progressed at the expected rate in the interval of time between pre-testing and post-testing.

Table 13 shows the number of students in each class and at each Year level who were present for both TWS tests (n=207).
<table>
<thead>
<tr>
<th>Class</th>
<th>Class Group</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inv</td>
<td>22</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>Inv</td>
<td>13</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Inv</td>
<td>18</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>Inv</td>
<td>12</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>Inv</td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Total Inv</td>
<td></td>
<td>77</td>
<td>41</td>
<td>118</td>
</tr>
<tr>
<td>6</td>
<td>NInv</td>
<td>14</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>NInv</td>
<td>9</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>NInv</td>
<td>19</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>NInv</td>
<td>17</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>Total NInv</td>
<td></td>
<td>59</td>
<td>30</td>
<td>89</td>
</tr>
<tr>
<td>Total Inv and NInv</td>
<td></td>
<td>136</td>
<td>71</td>
<td>207</td>
</tr>
</tbody>
</table>

There are almost twice as many Year 5 students as Year 6 students who completed both TWS word-lists, Form A (pre-test) and Form B (post-test). A further thirty students completed only either the pre-test or the post-test for TWS and their data are excluded from statistical analysis.

### 3.4.2.2 SYSTEMS

Only Year 5 students in the Study Student group were tested with the “School-Years Screening Test for Evaluation of Mental Status” (SYSTEMS) (Ouvrier et al., 1999). This instrument has an advantage over other formal cognitive testing in that training in psychology is not necessary for its administration and interpretation so that it is a useful tool for teaching personnel. It was designed to show whether further, more in-depth, cognitive testing by an educational psychologist is indicated for children aged between 5 and 12 years.

The validity of the measure is in terms of sensitivity and specificity. “Sensitivity is the proportion of children who are correctly identified by the test as in need of further assessment. Specificity is the proportion of cases who are accurately excluded by the test” (Ouvrier et al., 1999, p. 8). According to the
instrument designers, the test has internal consistency across age groups with a Cronbach alpha coefficient of .92. Inter-rater reliability was tested by two researchers administering the test to the same children in a counter balanced order within one day of each other and the scores were highly correlated (.94). The test-retest reliability (.94) examination involved retesting three groups of students over different time periods of two weeks, four weeks, and twelve weeks.

SYSTEMS was administered at the beginning of the intervention period to the Study Student group (n=114) during a one-on-one testing session. Three categories of students are identified: “at or below Cut-off” (Co); “Borderline” (B); and “Normal Cognitive Ability” (NCA). As SYSTEMS scores are “reliable over time” (Ouvrier et al.) the principal designer of the test personally considered it unnecessary to post-test the students. Also, as cognitive ability can be considered an innate attribute and not subject to influence from the interventions, no post-tests were carried out.

The purpose of using SYSTEMS as part of the test battery is to facilitate answering Focus Question #2: Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year? It is hoped that the findings will clarify whether spelling interventions can assist students who might be limited in spelling performance by their cognitive ability. If students who are below the normal cognitive ability range on pre-test improve in spelling performance by more than the predicted level, it indicates that lessons in a mainstream classroom can be designed to assist these students.

3.4.2.3 ORAL READING FLUENCY (ORF)

The oral reading fluency (ORF) of only the Study Student group was tested in support of Focus Question #4: Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing? The instrument used was designed by the Learning Difficulties Support team of a School District (1997) and implemented on an annual basis in many of the District’s primary schools. It is a “curriculum-based measurement that is standardised but not normalised” (verbatim from one co-author of the test).

Testing oral reading fluency involves timing students for one minute as they read three different reading passages (one minute each) and counting the number of correct words per passage read in the time. The median score (not mean score) for the number of correct words
(cwpm) is noted. The percentage of correct words per minute is also calculated. The reading passages are graded for each Year level and students in the study had not previously encountered the Year 5 passages used in the study. The same reading passages were used for pre- and post-testing. A co-author of the test suggested that an increase of twenty correct words per minute (20 cwpm), in the age group of the Year 5 Study Students (SS/5), represents about one year’s progress in reading fluency.

The indication of progress described above barely suffices for this study and a more rigorous scoring system using normative data would have been preferable. A best-guess suggests that an increase of ten correct words per minute (10 cwpm) represents about six months progress in ORF for this age group, and using the Year 5 reading passages. It is not possible to assess with confidence the ORF level of students who read fewer than the cwpm for the Year 4 level as a different set of reading passages are required for the lower performance rates. This limitation of the scoring system was not appreciated by me until after pre-testing had been completed. As the main purpose of testing the ORF is to note any difference in performance over the five months intervention period, rather than to obtain an instruction level of performance, the decision was made to continue to use this instrument for post-testing as previously planned.

3.4.2.4 ATTITUDES TO READING, SPELLING, AND WRITING

“Aspects of Self Knowledge about Activities” inventory (ASK-KIDS) (Bornholt, 2000) provides a profile of self-knowledge students have in relation to various activities. It was completed only by the Year 5 Study Student group (n=107) during the individual testing sessions (pre-test and post-test) and took about five minutes to administer. Although the inventory covers a range of activities and other categorisations for assessing self-concepts, only three components are included in the data analysed, namely attitudes to Reading, Spelling, and Writing.

Students were asked to rate their attitudes to spelling, reading and writing activities on a five-point rating scale. “ASK-KIDS about Activities uses items-in-common between two sources of self-concepts: the activities … and salient aspects of competence” (Bornholt, 2000, p. 21). The latter were “current and future performance”; “natural talent”; “effort needed”; and “task difficulty”. The ideal student responses “are a profile that reflects the child’s motivation to choose the next challenging task, to persist and complete activities” (p. 6). Test-retest correlation co-efficients are available for reading,
as shown in Table 14, and “range from -1.0 to +1.0, where * indicates that the correlation is significantly different from zero (p<.05)” (p. 7).

<table>
<thead>
<tr>
<th>Follow-up Interval</th>
<th>Good at Natural Talent</th>
<th>Effort Needed</th>
<th>Task Difficulty</th>
<th>Good at Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>One week</td>
<td>.79*</td>
<td>.71*</td>
<td>.52*</td>
<td>.68*</td>
</tr>
<tr>
<td>Three months</td>
<td>.22</td>
<td>.52*</td>
<td>.37*</td>
<td>.29*</td>
</tr>
<tr>
<td>One year</td>
<td>.26*</td>
<td>.24*</td>
<td>.43*</td>
<td>.25*</td>
</tr>
</tbody>
</table>

The purpose for using ASK-KIDS in this study was to explore whether improvement in achievement leads to positive changes in attitudes in relation to the activities of reading, spelling, and writing.

### 3.4.2.5 TORCH

Reading comprehension was tested using “Tests of Reading Comprehension” (TORCH) (Mossenson et al., 1987). These untimed reading tests for students in Years 3–10 were used to assess students’ ability to obtain meaning from the texts they read. Group-referenced scores are provided as percentile rank scores and stanine scores. “The exercises in the TORCH tests are constructed around questions. A context is given to cue readers into the sorts of answers they should give” (p. 1). Using the Kuder-Richardson Reliability Coefficient (KR20), the authors state that:

One can be … about 68 per cent certain that the student’s true raw score is between a lower limit set one SEM [Standard Error of Measurement] below the obtained score and an upper limit set one SEM above the obtained score. One can be about 95 per cent certain that the true score lies between a lower limit two SEMs below the obtained score and an upper limit two SEMs above the obtained score (p. 22).

As it is “widely accepted that the best indicator of the content validity of a general subject area achievement test such as the TORCH tests is obtained by a detailed and thorough examination of the content [and is] largely a subjective process” (p. 22), no satisfactory statistical test has been used to establish content validity. The decision to use TORCH was made after consultation with an STLD who considered this instrument the most suitable for the age group of interest to the study.
By using TORCH it was thought possible to determine two groups of students: a) those with poor spelling skills and poor reading comprehension scores; and b) those with poor spelling skills and good reading comprehension scores. It was hoped that pre- and post-tests would help to provide further insight into any relationship between spelling performance and reading comprehension skills.

Unfortunately, the students’ data were too unreliable to utilise and the findings for this test are excluded from the study. Responsibility for administering TORCH (Mossenson et al., 1987) and an informal writing task as whole-class activities had been given to classroom teachers as I was reluctant to further impose on classroom arrangements. However, supervision of the tests was insufficient in several classes and it was impossible to have confidence in students’ responses. Additionally, as there were numerous instances of incomplete answer sheets, it is probable that insufficient time was allowed for the slower students to complete the test.

3.4.2.6 WRITING TASK

An informal pre- and post-test writing task was given to all students as a whole class activity. As with the reading comprehension test (TORCH), the administration of the writing test was too unreliably supervised and the findings are not used in this study. Students were required to complete a twenty minute free writing activity, with an initial five-minute thinking period. The pre-test title was “My happiest …” and the post-test title “My favourite …”. The intent was to find whether the pre- and post-test writing content differed in the range of words used, the length of the passage, the complexity of ideas, the difficulty of words used, and the technical aspects of writing which included spelling, punctuation and grammar.

3.4.2.7 ADDITIONAL DATA

Additional data on students were collected as follows:

1) A Multiple Intelligences inventory (McGrath & Noble, 1995) was completed as a whole-class activity and sufficiently well completed by a number of students (n=82) for the results to be included in the study. In instances when there is more than one Intelligence in first place, I selected the one (only for SS/5 students) that is most supported by students’ responses to the ASK-KIDS inventory (“Best-guess” decisions). The information from the MI inventory contributes to gaining a profile of students’ aptitudes.
2) At the end of the intervention period, SS/5 students indicated their perceptions of their progress in reading, spelling, and writing over the five months as a 1-5 rating variable. They also answered questions about their progress and the spelling lessons, as outlined in Appendix F.

3) Three teachers informally assessed their students’ progress over the intervention period, as found in Appendix E.

Table 15 provides a profile of the number of students in each class who completed the study measures. SYSTEMS, Progress rating, Progress assessment, and MI inventory are presented only once. TWS, ASK-KIDS (attitudes), ORF, Write, and TORCH required pre- and post-tests.

<table>
<thead>
<tr>
<th>Year/group</th>
<th>TWS</th>
<th>SYS</th>
<th>ASK</th>
<th>ORF</th>
<th>Progress</th>
<th>5 Qs</th>
<th>MI</th>
<th>Write</th>
<th>TOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>22</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Class 2</td>
<td>26</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Class 3</td>
<td>27</td>
<td>18</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>13</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Class 4</td>
<td>21</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>3</td>
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<td>7</td>
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<tr>
<td>Class 5</td>
<td>22</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>9</td>
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<td>Class 6</td>
<td>14</td>
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<td>12</td>
<td>12</td>
<td>12</td>
<td>6</td>
<td>10</td>
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<tr>
<td>Class 7</td>
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<tr>
<td>Class 8</td>
<td>24</td>
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<td>8</td>
<td>8</td>
<td>8</td>
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<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Class 9</td>
<td>27</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>2</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Total (n=)</td>
<td>207</td>
<td>107</td>
<td>102</td>
<td>102</td>
<td>102</td>
<td>102</td>
<td>82</td>
<td>72</td>
<td>87</td>
</tr>
</tbody>
</table>

To summarise, SYSTEMS, ASK-KIDS, ORF, Progress Rating, and Progress Assessment (five-point scale) were completed by SS/5 students only during one-to-one testing sessions. I presented TWS tests to whole-class groups. MI, Write and TORCH were completed by Year 5 (and some Year 6) students in their classrooms. Write and TORCH data were subsequently discarded for this study as the standard of completion was unsatisfactory.
3.4.2.8 QUALITY TEACHING (QT) MODEL

The NSW QT model (NSW DET, 2003b) provides a framework on which to build descriptions of the learning environments and facilitates discussion of students’ experiences in each classroom. Table 16 (and Appendix B, p. 299) provides a summary of each of the three dimensions of the model, namely Intellectual Quality, Quality Learning Environment and Significance, and lists the elements that constitute each dimension (NSW DET, 2003a, p. 9). High-order Thinking and Substantive Communication, in particular, are elements that can be related to the learning process and therefore of major interest to this study.

<table>
<thead>
<tr>
<th>INTELLECTUAL QUALITY</th>
<th>QUALITY LEARNING ENVIRONMENT</th>
<th>SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td>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</td>
<td>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.</td>
</tr>
<tr>
<td>Deep knowledge</td>
<td>Explicit quality criteria</td>
<td>Background knowledge</td>
</tr>
<tr>
<td>Deep understanding</td>
<td>High expectations</td>
<td>Cultural knowledge</td>
</tr>
<tr>
<td>Problematic knowledge</td>
<td>Student direction</td>
<td>Knowledge integration</td>
</tr>
<tr>
<td>High-order thinking</td>
<td>Social Support</td>
<td>Connectedness</td>
</tr>
<tr>
<td>Metalanguage</td>
<td>Engagement</td>
<td>Narrative</td>
</tr>
<tr>
<td>Substantive communication</td>
<td>Self regulation</td>
<td>Inclusivity</td>
</tr>
</tbody>
</table>

3.4.2.9 VARIABLES

The independent variable for this research study is the spelling intervention programs. The principal dependent variable is progress in spelling performance, and other dependent variables from test instruments include, oral reading fluency, students’ attitudes to reading, spelling, and writing and their perceptions of progress over the intervention period. Variables that concern attributes of students include their age, gender, home language, and school Year level, cognitive ability screening level, and preferred Intelligence (MI).
STATISTICAL ANALYSES

Data are analysed using Microsoft® Excel 2002 and SPSS 12.0.1 for Windows computer applications. An alpha level of .05 (p=5%) was used for statistical tests and represents the probability of error in rejecting a given null hypothesis. The statistical tests employed for correlations of metric variables are the Pearson Correlation Coefficients and Levene’s Test for Equality of Variances. The T-statistic is used for One-Sample and Paired-Samples testing. Categorical data are analysed using the Chi-Square statistic which calculates the Pearson Chi-square and also Fisher’s exact test when any cells have an expected frequency of less than five (5). The Goodman-Kruskal tau index assists in determining how two variables are associated.

NNWL

The Neural Network for Written Language (NNWL) model was formulated by me during the compilation of the review of the literature to provide a conceptual bridge between an understanding of the cognitive processes involved in the development of literacy and classroom factors that influence those processes. It is used to provide a framework on which to base any speculation of the effects of students’ classroom experiences on their learning outcomes.

PROCEDURES SECTION

The design of the study is described and threats to internal validity identified. Different factorial designs for the intervention programs evolved during discussions with participating classroom teachers and school administrations and are influenced in two classrooms (Class 2 and Class 3) by the specific interests of the teachers involved. Procedures that were followed during the course of the intervention program are outlined.

DESIGN

The methodological approach taken is a quasi-experimental design with non-equivalent groups, rather than an experimental design, as assignment to the groups was not random (Trochim, 2004). The two groups, an intervention group and a non-intervention group, were pre- and post-tested using formal and informal test instruments, and only the intervention group experienced intervention lesson programs. This Non-Equivalent Groups Design (NEGD) can be depicted in notational form as:
The classes in both the intervention and non-intervention groups were kept as intact student communities, consistent with a NEGD. There are also features of a controlled trials study (Lesaffre & Verbeke, 2005) but without random assignment to the parallel groups. The trials of the study involve the varying factorial designs of each of the five intervention classes that make up the intervention group, which are described in more detail later in this chapter. As stated in a previous section, the main difference between the control group (non-intervention) and the differentiated or experimental group (Inv) is that the intervention group of classes experienced spelling program interventions over a two-term period. No mechanisms were put in place to direct or control the teaching behaviours and practices of the non-intervention teachers beyond requesting that they continue with their normal practices. Although it is acknowledged that the study has features of a controlled trials study, as random assignment to groups is an important factor in controlled trials methodology, this study will hereafter be referred to only as a “quasi-experimental” study.

The intervention group of classes are a Differentiated Group as each intervention varied in some respect from the others by at least one identifiable factor. The main thrust of the study design is that each of the intervention classes experienced five months of a spelling intervention under pedagogic conditions that differed from the students’ usual classroom experiences with their present teacher during Term 1, and probably also with teachers from previous years. It is not possible to talk in comparative terms about the intervention group’s lessons and non-intervention group’s lessons as only general comments about non-intervention teachers’ practices are available in Appendix C.

3.4.3.1.1 INTERNAL VALIDITY

As the main purpose of the study was to improve the spelling performance of intervention students beyond the level predicted by the duration of the intervention period, it is important to establish the basis of any improvement. If any event is identified as being primarily responsible for positive outcomes, then the findings of the study could be replicated. Threats to internal validity were a major consideration in the study design and the steps taken...
to reduce the threats are presented as follows (Fraenkel & Wallen, 1996; Mertens, 1998; Trochim, 2004):

1) Schools and classes were as similar as practically possible under the circumstance of the difficulty in finding willing participants and the “location” threat is minimal.

2) A comparison group (non-intervention group) was established to remove “single-group” threats. Available classes were assigned to either the intervention group or the non-intervention group on logistical grounds and with the desire to meet the primary need, that of implementing interventions that differed from each other by one identified feature. There was no prior knowledge of the proportion of students in each class who are low achievers, or the class gender ratios and ethnic mixes and this reduces any “differential selection” threat. Indeed, a “statistical regression” threat is minimal as the intervention and non-intervention groups are equivalent in the proportions of Year 5 and Year 6 students, home language profiles, and cognitive ability screening groups; and a little less equivalent in their ratios of male and female students. A further comment can be made about the cognitive ability of the two groups. In the intervention group, two classes have a mixed-ability body of students and two classes from School D comprise students who were not deemed to be the really high academic achievers in their school (as judged by their teachers for class assignment purposes at the beginning of the school year). The high achievers in School D were in a separate class and did not take part in the study. In the non-intervention group there are two classes from the same school (School A), one of which comprises mainly low achievers and the other mainly high achievers, plus two classes of children from School C which have a wide ability range. Possibly the non-intervention group has a marginally higher overall academic ability level than the intervention group as the top third academic achievers in School D were not part of the study. However, the pre-test cognitive ability screening test results indicate that 72% of the non-intervention SS/5 group have normal cognitive ability compared to 69% of intervention group students, a difference of only 3% which further supports the similarity between the two groups. No known event (“history” threat) outside the intervention program was experienced by any class to threaten validity. All children were equally influenced by the “maturation” effect of five months of spelling instruction. There is no reason to suspect that students in the two groups had differential rates of normal growth (Trochim, 2004) as the mean average
chronological age on pre-test was 130.5 months for the intervention group and 130.7 months for the non-intervention group, and there is no “selection-maturation interaction” threat. The same instruments were used on both groups of students for pre- and post-testing so there is no “instrumentation” threat. Spelling performance levels of all children in the classes were established both before and after the intervention period, using different matched word-lists to avoid a “testing” threat. “Selection-mortality” is not a threat as data from all students are used except from those who moved to different schools within the intervention period or were absent for a testing session through illness or some other random reason.

3) The main threats to this study could be described as “social interaction” threats. “Experimental treatment diffusion” between Teacher 1 (an Inv teacher) and Teacher 7 (a NInv teacher) is only a possibility, and most unlikely between any of the other teachers. A “compensatory rivalry” threat (Mertens, 1998) by the control group of teachers is however suspected because, although the mean average chronological ages of the two groups are very similar (0.2 months difference), their pre-test spelling age (SA1) results are not. The mean average intervention group pre-test spelling age is 136 months and the non-intervention groups is 140.8 months, a difference of 4.8 months. Additionally, there are differences in the pre-test spelling ages of three parallel classes in the same school, namely Classes 3, 8, and 9. Class 3 is an intervention class and Classes 8 and 9 are non-intervention classes. Their mean chronological ages on pre-test were 130.9 months, 128.1 months, and 129.7 months respectively. Table 17 shows their mean pre-test spelling age (SA1) results and the differences between the SA1s and their mean pre-test chronological ages (ChrA1).

<table>
<thead>
<tr>
<th>Class</th>
<th>3</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Inv</td>
<td>NInv</td>
<td>NInv</td>
</tr>
<tr>
<td>SA1 (maths)</td>
<td>136.1</td>
<td>140.9</td>
<td>146.1</td>
</tr>
<tr>
<td>SA1 - ChrA1</td>
<td>5.2</td>
<td>12.8</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Table 17
Mean Pre-test Spelling Ages and Differences from Mean Pre-test Chronological Ages (Classes 3, 8, & 9)
The differences between the mean average pre-test spelling ages and mean chronological ages of each class should be very similar, and it is of concern that the differences of the non-intervention classes are substantially greater than that of the intervention class. As all teachers at the beginning of Term 1 were aware of the impending study scheduled to start in Term 2, the most plausible explanation is that the non-intervention teachers were prompted by professional concern to ensure that their students were as well grounded in spelling as possible before the start of the intervention period. This compensatory rivalry effect, also known as the John Henry effect, continued to operate throughout the course of the study period and also probably affected Class 7, a non-intervention class from School A. It is possible that the effect on the non-intervention teachers’ behaviour might have been less if the intervention and non-intervention classes had been in different schools from each other but this was not possible to organise. Additionally, it is probable that the Hawthorne effect (Clark, 1999) operated on both the intervention and non-intervention groups to some extent.

Individual classroom spelling programs could be considered a threat to internal validity under other circumstances. The assumption is made that the teaching practices and lesson programs of the non-intervention teachers are representative of those found in other schools in similar environments. As such it was expected that their students would make at least the appropriate progress in spelling performance over the intervention period. Although the mean spelling progress of the whole class might be in advance of that predicted because of the compensatory rivalry effect, it does not necessarily follow that all types of learners within the classes will progress to the same extent. Students who are high achievers demonstrate that they respond well to the teaching strategies they experience. Whilst there can be many reasons for the poor performance of low achievers, one might be that teaching practices to which they are exposed do not optimally support their learning style. It therefore follows that the teaching in non-intervention classes overall might favour a different spelling ability group profile than the intervention class teaching, which is a desirable outcome for the study.

As each intervention classroom situation differed by at least one identified and deliberate feature, in accordance with the factorial designs of the intervention program, these will be discussed in relation to the data from each class in Chapter 4 below. However, the different
lesson programs of the intervention classes also had core similarities such as a) classroom teachers (or Relief teachers) participated in each lesson, although the degree of their participation varied according to the intervention; b) lessons were conducted as a one-hour block per week (with the exception of Class 2 as Teacher 2 preferred two half-hour blocks); c) words and language remained the explicit focus throughout; d) lesson plans for each week included “favourite” activities and also novel features; e) discussion and exchange of ideas were encouraged; and f) lessons were cognitively challenging. It is expected that findings common to all intervention classes will emerge that differ from those presented by the non-intervention group of classes.

3.4.3.2 PROCEDURES

The study commenced at the beginning of Term 2 and continued until the end of Term 3 during 2003 and 2004, periods of approximately five months. Nine classes with Year 5 students were involved in the study, five intervention and four non-intervention classes. During 2003, a Year 3 class and Year 3 students from a 2/3 class were also tested but the plan to involve Year 3 students during 2004 was abandoned because of lack of time. The major focus of this research work is to ascertain the effect of five intervention programs on the spelling performance levels of Year 5 and Year 6 students (Inv), and to compare changes in their performance levels with those of a comparison group (NInv). Descriptions of the five intervention programs are in the following sections.

Backgrounds to the decisions made about the study design in the light of available options have already been described and are elaborated as follows:

1) The time allocated for intervention lessons (Inv classes) of one hour per week over two terms was considered a realistic allocation of time to dedicate exclusively to spelling and language study. Although a one hour block for spelling was contrived (rather than teaching spelling as a series of mini-lessons adding up to about one hour per week) it nevertheless meets the minimum requisite time allocation that was normal practice for the intervention teachers and others who were canvassed in staffrooms. Teachers 1, 3b, 4 and 5 continued to provide students with weekly word-lists followed by the Friday test as there was parental expectation for spelling homework and it was deemed necessary by teachers for their assessment programs.
No instructions were given to non-intervention teachers in regard to the duration of lessons as I did not intend to interfere with their usual classroom arrangements. It was hoped that an attitude of casual non-interference would result in the non-intervention teachers continuing their normal practices in regard to their spelling programs, as requested, rather than being unduly focused on the spelling area of the language arts. To that end, non-intervention teachers were not asked to keep a journal of their spelling activities. It is an omission that is regretted as there is the possibility that at least one teacher might have provided more detailed information about their practices. However, the suspicion is that it is most probable that at least three of the four non-intervention teachers did make special efforts to improve their students’ spelling performance, in parallel with the intervention program, and in so doing demonstrated a compensatory rivalry threat to internal validity.

It is not suggested that any non-intervention teachers had a deliberate intention to work harder to improve the spelling performance of their own students in competition with the intervention classes (the John Henry effect); it is more an unconscious response as the study continually focused their attention on spelling. The possibility arises that the mere fact of a study that focused on spelling performance brought about greater teacher attention to spelling, which in turn, led to improved performance levels in their students. The Hawthorne effect (Clark, 1999) does not appear to fully explain this situation as it was not the teachers who were experiencing more attention. Rather, they were just more mindful and rigorous in a particular lesson area. For the purpose of this work this will be called a “study effect” which also has aspects of non-deliberate compensatory rivalry.

The following paragraphs outline the procedures involving the intervention classes. Intervention programs for each class were designed either by me (for Classes 1, 4 and 5) or the classroom teachers (for Classes 2 and 3). The unique feature of each intervention situation was determined during discussions with the individual intervention teachers, and the particular interest that they wished to explore contributed significantly to the design of their class lesson program. Only resources already available to the teachers were used and in three of the five classes, pen and paper were all that were required. School D had a dedicated room set up for a computer controlled Team Learning System (TLS), and the program for Classes 4 and 5 centred on that available technology, marketed as Zing (Findlay, 2003). The Zing-based lesson
program can also be adapted for use with an overhead projector or a PowerPoint presentation.

Involvement of the intervention teachers was uneven. Two teachers (Teacher 2 and Teacher 3a) wished to design their own program and to be in control of lessons. In support of this I had some initial informal exchange of ideas and resources with each teacher. The lesson preparation arrangement continued with Teacher 3b of Class 3 when Teacher 3a/6 took leave from the school after the first half of the intervention period. It was a less productive period of work than the previous term as Teacher 3b was absent on a number of occasions and also had yet to acquire a sound knowledge-base for the idiosyncrasies of the English language system. The remaining three teachers (Teachers 1, 4, and 5) preferred me to design the lesson programs and they rarely voiced a preference for content. These six teachers are to be commended for allowing such disruption to their normal lesson programming.

All intervention teachers were provided with a journal in which to note any spelling-related instruction additional to the interventions and to record reflections on the spelling program. Teacher 2 reported on her intervention lessons regularly and noted her reflections (Appendix D). Journals were not utilised by the teachers of the other classes. Nevertheless, my notes on Class 3’s lessons are located in Appendix G, together with journal entries for lessons with Classes 1, 4 and 5.

My role in each situation was decided after discussion with the teachers and their preferences were met in all cases. Classes 4 and 5 had a parallel student profile and experienced the same lessons, Class 4 before morning recess and Class 5 after recess. Table 18 outlines the features of each intervention class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Year</th>
<th>Lessons Designed by</th>
<th>Researcher’s Role</th>
<th>Main Pedagogic Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>researcher</td>
<td>team teacher</td>
<td>Metacognitive and multisensory strategies</td>
</tr>
<tr>
<td>2</td>
<td>5/6</td>
<td>teacher</td>
<td>absent</td>
<td>Teaching for transference of spelling to reading &amp; writing</td>
</tr>
<tr>
<td>3</td>
<td>5/6</td>
<td>teacher</td>
<td>assistant</td>
<td>Group work and innovative lesson design</td>
</tr>
<tr>
<td>4</td>
<td>5/6</td>
<td>researcher</td>
<td>team teacher</td>
<td>Team Learning System (TLS)</td>
</tr>
<tr>
<td>5</td>
<td>5/6</td>
<td>researcher</td>
<td>team teacher</td>
<td>TLS – repeat of Class 4 program</td>
</tr>
</tbody>
</table>
There were four composite Years 5/6 classes (Classes 2, 3, 4, & 5) and one Year 5 class (Class 1). I was present in four classes for the lessons (Classes 1, 3, 4, & 5); team teaching in three (Classes 1, 4, & 5) and assisting in one (Class 3).

My aims were to ensure that, in addition to explicit instruction about words which was common to all intervention classes, there was a unique feature of each intervention that related to spelling lesson focus and/or pedagogy. Briefly, these are shown in Table 19:

<table>
<thead>
<tr>
<th>Class</th>
<th>Intervention feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metacognitive and multisensory learning strategies</td>
</tr>
<tr>
<td>2</td>
<td>Teacher-Best-Practice</td>
</tr>
<tr>
<td>3</td>
<td>Teacher designed inquiry-based group work</td>
</tr>
<tr>
<td>4</td>
<td>Learning with a computer based Team Learning System (TLS)</td>
</tr>
<tr>
<td>5</td>
<td>Identical to 4) but a different classroom teacher</td>
</tr>
</tbody>
</table>

The main features of the Class 1 lesson program were a) discussion of metacognitive strategies, b) demonstration of multisensory techniques, and c) the experience of inquiry-based learning activities. Teacher 2 of Class 2 focused on teaching spelling explicitly and transferring new learning to reading and writing. Class 3 experienced inquiry-based learning (with a creative and innovative classroom teacher in the first half of the intervention period). Both Class 4 and Class 5 worked with a computer-based TLS and experienced the same lesson program, Class 5 following Class 4. The latter was a novel use of the technology and it was possible to exploit the interactive properties to advantage.

Features of the interventions are herewith outlined and each is elaborated upon in Chapter 4. As low achievers were of particular interest, lessons frequently focused on consolidating prior learning of spelling rules and vocabulary but presented from a new perspective. They also incorporated elements of Edwards-Groves’ (2003) explicit teaching strategies and no divergent topics were entertained. A further consideration was to ensure that students were given opportunities to exercise the higher order thinking skills of ‘analysing’, ‘evaluating’, and ‘creating’ (Pohl, 2000).
It was explicitly conveyed to students that the purpose of the intervention program was to assist in their learning about words so that they could develop their understanding, knowledge and love of language (metalanguage) through the expression of their new learning. Further, it was also discussed that learning as much as possible about a word was more enduring and more useful to them than simply knowing the order of a word’s letters (metamemory). Students were prompted to test their own strategies for learning and to incorporate new understandings of learning processes into their cognitive processing repertoires (metacognition).

Lessons took the form of small-group investigations, such as “exploring the letter ε”. Whole-class facilitated discussions on spelling strategies and attitudes to spelling tasks (Bornholt, 2002) took place, and students had opportunities to identify their learning needs. I felt that it was important for students to be encouraged to take their own initiative in learning new words and asked Teacher 1 to support this endeavour. Bright coloured paper and envelope folders were distributed to each student. I suggested that they make their own word collections and add at least one new word per day, with the proviso that they find out its meaning. They were given carte blanche in terms of ordering and organisation, as well as the writing implement and writing style. They were also encouraged to decorate their folders as they chose. The purpose was to promote some ownership of their word-learning activities through pleasurable experiences in documenting and sharing their discoveries.

Students were introduced to approaches such as the “Las Vegas Rules of Spelling” (Phenix & Scott-Dunne, 1991) which focuses on teaching rules that always apply, never apply; and apply most of the time. Multisensory learning techniques (Carreker, 1999) were demonstrated and practiced, and there was an emphasis on using mnemonics and making distinctions between differing word-features. Students were encouraged to share their own strategies, insights and learning cues. Some “accelerated learning” techniques (Rose, 1985) were adapted for the age group and the situation, such as using humour to make learning memorable. “Mapping” (Buzan, 1991) was used to brainstorm synonyms, for example making a collection of words that relate to the concept of looking good. Flowcharts were constructed to track morphemes such as perimeter – periscope – microscope – telescope – telephone. Aspects of the language system were explored during proofreading activities and long words were demystified by
examining the component morphemes. Meanings of morphemes and affixes were central to several activities and related to contexts when appropriate. Combined with the Las Vegas approach it was possible to investigate the choice of ‘-ible’ or ‘-able’, for instance. Exploration of etymologies and meanings contributed to understanding the bases of a number of homophones and making distinctions between them.

3.4.3.2.2 CLASS 2

Teacher 2 conducted a Teacher-Best-Practice intervention and made all decisions about teaching procedures and lesson content. She usually integrated spelling instruction into reading and writing activities across the KLAs, rather than planning for a set timeslot but in deference to the needs of this study she set aside two half-hour periods per week for dedicated spelling instruction. Her own comments about her lessons are listed as follows:

- Students learnt to spell in a way that was useful to them and not just a list I created
- When I teach I make the connections between everything explicit so that students can see the links and realise that they already know it in different way
- I use a lot of questions in my teaching to enable students to construct knowledge rather than receive information, and plan strategic questions to ensure they are learning what they are ready to learn and to keep the lesson on track
- My lessons are always structured the same way: Explicit teaching for about 1/4 of the lesson time, guided and independent activities for about 1/2 of the time, and reflection for about 1/4 of the time
- I certainly used investigations where students had to find similarly spelt words and work out rules for themselves
- Group activities – interaction. Students definitely engaged in substantive communication about spelling (and all of their learning). Students were scaffolded using strategic questioning.

The Class 2 lesson journal (Appendix D) indicates that examples of lesson topics are: a) investigating words with the long ‘a’ sound; b) strategies for learning theme words; c) investigating ‘wh’ words; and d) correcting misspelt words and discussing how to remember correct spellings.

3.4.3.2.3 CLASS 3

Teacher 3a/6 created a range of investigations over the weeks of Term 2 (the first half of the intervention period). Students were organised into five ability groups which remained
constant during Term 1. The purpose of each activity was always well explained and instructions noted on the chalk-board. The formats of lessons varied: each group might have the same activity, rotate through five different stations, or be assigned a specific activity with a view to sharing results for the last part of the lesson. Students transcribed the results of their investigations to large sheets of paper cut into “cloud” shapes. These were when displayed on the upper parts of their classroom walls and referred to on occasion during subsequent lessons. Teacher 3a/6’s idea was to expand students’ literacy by investigating words, spelling rules, and word families. Working on the clouds consolidated learning and assisted recall when referred to during writing activities. Lesson topics were wide ranging and a number were in common with other classes such as, investigating homophones, a multisensory approach to learning spellings, discovering the theme associated with particular word-lists, and conducting word searches to meet particular criteria.

Teacher 3b was a novice teacher who attempted to accommodate the purpose of the study. His lessons mainly consisted of writing lists of words on the chalk-board and asking students to copy them into their books and to add others with a similar theme.

3.4.3.2.4 CLASSES 4 and 5

Classes 4 and 5 experienced the same lessons, Class 4 before recess and Class 5 after recess. I designed the lessons and operated the Zing system. After I introduced each topic the teachers’ role was to expand the learning experience as they were familiar with their students’ educational needs. Lessons were arranged as a series of mini-lessons, for example students explored silent letters in words, investigated different spellings of the sound /shun/, and justified why they considered a word to be correctly spelt when it was presented with misspelt versions.

The team learning system (TLS) used for the intervention for Classes 4 and 5 is marketed as Zing (Findlay, 2003). It is described as an interactive knowledge creation system that allows groups of students to be scaffolded in their learning of particular processes, skills or concepts. The Zing platform was used to develop a series of spelling improvement teaching/learning strategies, designed to parallel those used in the paper-and-pencil approach for Class 1 when suitable and also to exploit the novel presentation. The TLS approach enabled students to engage in collaborative on-line exchanges, supported by just-in-time scaffolds. Many learning experiences were framed in a game format as it was expected that fun, novelty, and interactive
communication would enhance the learning process. Students’ awareness of the purpose of the intervention program was built upon, and a partnership developed between students and teachers to support the learning experience.

The intervention lesson programs were designed for upper primary children in mainstream classrooms. However, no individual student’s remedial requirements were specifically catered for beyond student grouping and partnership arrangements. This was a disadvantage of the intervention arrangement (with the exception of Class 2, Teacher-Best-Practice) as in normal circumstances classroom teachers would be more able to accommodate every student’s instructional needs.

The assumption was made that students in Years 5 and 6 are well advanced in Gentry’s (2004) Phase 2 Correct and Automatic Spelling, and already have a grounding in spelling strategies and language knowledge. According to Gentry, their main requirement is therefore for learning more sight-words. A different emphasis was adopted during the interventions as they focused on learning more about words, and strategies for learning that can be utilised for word-learning. The Focus on Literacy: Spelling (NSW DET, 1998a) and other curriculum documents were consulted to ensure that intervention lesson content was pitched at the appropriate instructional level. Upper primary students should have “phonological transcoding abilities” (Caravolas, Hulme, & Snowling, 2001) enabling the formation of “orthographic representations”. These authors state that although students are exposed to increasingly complex and specific orthographic patterns as they advance through their school careers, they learn spellings through both spelling instruction and independent experiences during reading and writing activities. The intervention lessons were not concerned with reading and writing per se but, for example, in directing spelling instruction to applications expressed in reading and writing such as contexts, derivational constancy, and etymological knowledge.

Students engaged in the learning process during the intervention lessons, and interacted purposefully with the presenters and each other. The intervention lessons demonstrated some aspects of the QT model (particularly in terms of providing a quality learning environment and opportunities for interaction, promoting higher-order thinking, and exploring opportunities to demonstrate the significance of any learning. No more resources were used than were already available to the schools and this demonstrates that the study has transferability. It is acknowledged that teachers are the prime resource of any school, and they do have access to
further resources that support their professional development which include texts, specialist personnel, and conferencing opportunities. Although a Team Learning System was used with two intervention classes and is available in only a small number of primary schools, it is feasible to adapt the lessons to utilize other readily available technology, such as computer applications or an overhead projector. The perspective that I, the researcher, brought to classroom practices is that interesting, challenging, interactive, and enjoyable experiences in word-learning promotes an interest in language and in utilising the new learning in reading and writing activities.

It is expected statistically that 25% of students (normative data) will perform at the Below Average level in spelling on pre-test which, with the instrument used in this study (Larsen et al., 1999), will indicate a delay in spelling performance of at least two years. If no progress beyond the predicted five months is made by lower performing intervention group students, it indicates that improved spelling performance is difficult to achieve in a mainstream primary classroom. In the event that significant progress is made, however, it is proposed that positive effects on spelling performance can arise from expanding the learning opportunities that occur in normal classroom environments. This would therefore demonstrate that the study has credibility.

This quasi-experimental study can be summarised as one that seeks to illustrate how student learning outcomes in spelling are influenced by the practices of teachers and the learning opportunities provided. The design of the study was constrained by practical and pragmatic considerations, particularly in regard to the understandably limited number of teachers who were willing to participate and tolerate intrusion into their classroom regimes. The emphasis of the study is pedagogy in the language arts area of spelling performance. Explicit teaching practices (Edwards-Groves, 2003) are employed and students have opportunities to demonstrate cognitive engagement consistent with the higher levels of Bloom’s taxonomy of thinking skills, such as analysis, synthesis and evaluation. It is recognised that it is not only the content of a lesson that is important but also the activities that support the learning. A constructivist pedagogy (Richardson, 2003) underlies the intervention lessons and there is support for the belief that group dialogues create opportunities for shared understanding which lead to quality learning. It is proposed that such situations assist the lower performing students in their learning to a greater extent than more usual classroom practices in the environment of a mixed ability mainstream classroom.
3.5 ETHICAL CONSIDERATIONS

The following measures have been taken in this thesis to protect the anonymity of the people and places referred to in this study:

- The location of the four public primary schools involved is described by general terms such as “the outer environs of Sydney, NSW” or “the outer suburbs of Sydney”.
- Each of the schools is arbitrarily identified by one alphabetic letter A, B, C or D.
- Each of the nine classes is identified by a numeral (Class 1 to Class 9), the intervention classes in the range 1 to 5, and the non-intervention classes in the range 6 to 9. The numeral assigned to each class in each of the two groups is for identification purposes only and has no other significance.
- Teachers are identified by the numeral assigned to their class (Teacher 1 to Teacher 9). A teacher’s gender is identified if I consider it relevant to the text.
- Each student is referred to by a numeral (1 to 237) and their gender is disclosed if I consider that this feature contributes to the discussion.

Care has been taken in reporting this research not to misrepresent or falsify evidence, data, findings or conclusions, and all significant data are represented without omission. Ethics approval for this study was granted by the University of Western Sydney Human Research Ethics Committee: Registration Number HEC 02/094 (Appendix J).
Chapter 4

ANALYSES AND RESULTS

4.1 INTRODUCTION

The study was undertaken in response to a concern for students who underperform in spelling in upper primary mainstream classrooms. Children who are of particular concern are those who struggle with spelling yet do not qualify for specialist remedial literacy teaching assistance. Poor spellers can be reluctant to write (Westwood, 2005) and their reading comprehension and fluency also can be impaired (Graham et al., 2002), thereby compounding poor performance levels in the written language arts as they are encountered across the Key Learning Areas. Although the performance levels of good spellers were not the primary focus of the study, nevertheless a classroom environment that leads to improved accomplishment enhances the educational experience for all students.

The four main emphases of the intervention program are: a) that the lesson focus was firmly maintained throughout; b) the relevance of new learning to literacy developments was made clear; c) lessons were cognitively challenging; and d) that activities were included that promoted student interactions. According to Edwards-Groves (2003) explicit teaching is “about the talk of classroom lessons” and the intervention lessons focused throughout on spelling and knowledge about words. Upper primary students were the target of the study because those who perform poorly need assistance and opportunities to improve before they face the demands of secondary schooling. The lesson duration of one hour per week was determined after consultation with teachers as the usual length of time per week they dedicated to teaching spelling. It does not include the time spent on weekly tests or opportunistic
integration of spelling knowledge during reading and writing activities. The resources used were restricted to those already available to the teachers. Intervention lessons for Classes 1, 2, and 3 were conducted in their classrooms using only chalk-board, paper and pen resources. Lessons for Classes 4 and 5 utilised a room in the school specifically set up for the school’s own Team Learning System. My contribution to the lessons varied with each intervention and was negotiated with each teacher, as described in Chapter 3 above.

Focus questions derived from the research question include:

#1 **Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?**

#2 **Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?**

#3 **Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?**

#4 **Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?**

The primary formal test instrument used in the study is the Test of Written Spelling (4th Edition) (TWS) (Larsen et al., 1999) and only students who completed both the pre-test word list and the post-test word list are included in the study (n=207). Analyses of data from the intervention program and the results of analyses are organised to provide answers to each Focus Question in turn, followed by a consolidating summary.

### 4.2 ANALYSIS AND PRESENTATION OF RESULTS

Although lessons of one hour duration were planned they were usually less than one hour (forty-five to fifty-five minutes) as other demands encroached on the lesson time. These included administrative matters, school fitness programs, and student movement delays. Although unwelcome, such incursions into instruction time brought the intervention program closer to the authentic, everyday experience of any mainstream classroom.

School terms are usually of ten or eleven weeks duration and it was planned that lessons would take place during eighteen weeks over the two terms of Term 2 and Term 3, allowing
two weeks for beginning or end of term busy periods, plus the loss of a further week. It was anticipated that no fewer than sixteen lessons per class would be achieved, taking into account unforeseen class commitments. Table 20 shows the actual number of intervention lessons experienced by each class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Term 2</th>
<th>Term 3</th>
<th>Total no. lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>34</td>
<td>n=70</td>
</tr>
<tr>
<td>Average</td>
<td>7.2</td>
<td>6.8</td>
<td>14</td>
</tr>
</tbody>
</table>

It was not expected that the average number of lessons would be as low as fourteen. The class number of lessons ranged from eleven to seventeen and Class 2 (Teacher-Best-Practice) achieved the greatest number. Lessons were cancelled, always by a teacher, for such reasons as school camps, sports carnivals, State examinations or school plays. Alternative time slots were found when possible, although teacher organisation (and possibly commitment) also played a part, as evidenced by the greatest number managed by Teacher 2. Only four lessons took place in Class 3 during the second part of the intervention period as Teacher 3b was frequently unwell and intervention lessons were not pre-planned by him for the casual teacher to implement.

This situation has made it impossible to make inter-class comparisons in relation to the levels of mean progress in spelling performance based on students’ duration of exposure to spelling instruction during the intervention lesson program, with the exception of Classes 4 and 5 which had parallel experiences. Even though the spelling instruction time varies between interventions, the fact remains that the intervention classes experienced lessons that differed from their usual experiences. Whilst the low average (14) number of intervention lessons and the shorter average duration of each lesson (45–55 minutes instead of one hour) challenge the
opportunities for the intervention program to be instructionally effective, nevertheless the findings from the study are presented in relation to the four focus questions. These explore different dimensions of the factors that contribute to student performance levels and comparisons can be made between the results of intervention and non-intervention students’ performances.

4.2.1 INTRODUCTION TO FOCUS QUESTIONS

Findings from the four Focus Questions are presented in sequence. For the first focus question, #1: ‘*Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?*’ students are assigned by their pre-test spelling standard score (StSc1) to one of three standard score categories. These are a) Below Average (BAv) which includes Very Poor, Poor and Below Average groupings found in the TWS instrument manual (Larsen et al., 1999); b) Average (Av); and c) Above Average (AAv). The Above Average group includes Above Average, Superior and Very Superior performance levels. Thus the seven TWS standard score categories are consolidated to three for the purpose of these analyses as student numbers in some categories are very small. Importantly, a student in the Below Average category is at least two years behind their chronological age in spelling performance. Students’ progress is assessed by improvement in spelling age over the intervention period of five months and is measured in months. Informally, the total numbers of correct words of fifty test words for each student are noted. This assists in estimating the level of progress, if any, of the students who score at the upper limit of the spelling age scale (17 years and 6 months, or 210 months).

Focus question #2: ‘*Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?*’ utilises SYSTEMS (Ouvrier et al., 1999), a test designed for cognitive ability screening. It was administered at the beginning of the intervention period to the Year 5 Study Student group (SS/5) (n=107) and identifies three categories of students: a) below Cut-off (Co); b) Borderline (B); and c) Normal Cognitive Ability (NCA). The Borderline and Cut-off groups are consolidated and depicted as “B/Co”. Any relationship between progress in spelling age and cognitive ability categories is explored. Other factors such as gender, home language, dominant “intelligence” obtained by completing a MI inventory (McGrath & Noble, 1995), and the school Year of the students are analysed for any relationship with spelling
Focus question #3: ‘Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?’ explores individual classroom features. My knowledge of the classroom practices of the teachers involved in the study is very limited as less than one hour per week was spent co-teaching with the teachers of Classes 1, 3, 4, and 5 during the two-term intervention period. Further contact and observations were made with all teachers (Classes 1 – 9) in the classroom settings for short periods when student testing was carried out. Attempts are made in observations about each intervention class to identify features of the classroom environments that can be related to elements of the QT model (Appendix B). Additionally, each teacher provided written answers to a set of questions about their teaching philosophy and practices (Appendix C). Both standard score and spelling age measures (TWS) are utilised in this section.

In addition to spelling performance, further data are available from: a) ASK-KIDS (Bornholt, 2000) for any relationship between spelling performance levels and attitudes to reading, spelling, and writing (SS/5 group); b) an informal scale of students’ perceptions of their progress (SS/5 group); c) oral reading fluency (ORF) (SS/5 group); d) reading comprehension; and e) a pre- and post-test writing task. These data were collected to answer Focus Question #4: ‘Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?’ but unfortunately, results from reading comprehension and writing tasks cannot be included. Nevertheless, findings from the remaining additional tests are explored in relation to spelling performance.

Both quantitative and qualitative data from the group of students who were at the Below Average level of spelling performance on pre-test are compiled into table format and found in Appendix I. Class 2 Teacher’s lesson journal is located in Appendix D. I kept lesson journals for Classes 1, 3, 4, and 5 (Appendix G). The Study Student group responded to open-ended questions about their progress and the lessons they experienced (Appendix F). Additionally, Teachers 1, 4, and 5 provided comments on their students’ progress (Appendix E). Data from these sources are referred to in discussion.
4.2.1.1 FOCUS QUESTION #1 RESULTS

#1: *Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?*

Table 21 shows the percentage of students per class in each standard score (StSc) category (Below Average = BAv; Average = Av; and Above Average = AAv) on pre-test and post-test.

<table>
<thead>
<tr>
<th>Class</th>
<th>BAv %</th>
<th>Av %</th>
<th>AAv %</th>
<th>BAv %</th>
<th>Av %</th>
<th>AAv %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13.6</td>
<td>63.6</td>
<td>22.7</td>
<td>4.5</td>
<td>68.2</td>
<td>27.3</td>
</tr>
<tr>
<td>2</td>
<td>23.1</td>
<td>57.7</td>
<td>19.2</td>
<td>19.2</td>
<td>53.8</td>
<td>26.9</td>
</tr>
<tr>
<td>3</td>
<td>18.5</td>
<td>66.7</td>
<td>14.8</td>
<td>11.1</td>
<td>66.7</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>38.1</td>
<td>42.9</td>
<td>19</td>
<td>14.3</td>
<td>66.7</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>9.1</td>
<td>81.8</td>
<td>9.1</td>
<td>4.5</td>
<td>68.2</td>
<td>27.3</td>
</tr>
<tr>
<td>6</td>
<td>35.7</td>
<td>57.1</td>
<td>7.1</td>
<td>28.6</td>
<td>64.3</td>
<td>7.1</td>
</tr>
<tr>
<td>7</td>
<td>4.2</td>
<td>75</td>
<td>20.8</td>
<td>4.2</td>
<td>70.8</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>29.2</td>
<td>50</td>
<td>20.8</td>
<td>25</td>
<td>37.5</td>
<td>37.5</td>
</tr>
<tr>
<td>9</td>
<td>14.8</td>
<td>55.6</td>
<td>29.6</td>
<td>18.2</td>
<td>44.4</td>
<td>37</td>
</tr>
</tbody>
</table>

On pre-test Class 2 and Class 8 most closely represent the normative data distribution of BAv=25.3%; Av=49.5%; and AAv=25.3%, whilst on post-test only Class 2 retains some resemblance of the normal distribution. Figure 1 (next page) illustrates the percentage differences of the total students in the Below Average, Average and Above Average groups on pre- and post-testing.
The figure indicates that spelling performance levels on pre-test are more concentrated in the Average range (61.4%) than statistically predicted by the TWS normative group data although the Below Average (19.8%) and Above Average (18.8%) groups are fairly evenly distributed. Interestingly, on post-testing there is little change in the Average percentage (59.4%) but the Below Average percentage has decreased from 19.8% to 14.0% and the post-test percentage of Above Average has increased from 18.8% to 26.6%.

Figure 2 shows that although the percentages of Below Average performers in the intervention and non-intervention student groups are similar on pre-test, they differ on post-test. A greater percentage of pre-test intervention Below Average performers than non-intervention moved into the Average category on post-test (differences in pre- and post-test
Below Average percentages: Inv=9.3%; NInv=1.1%). Additionally, there is approximately the same percentage change in the Above Average category for intervention (7.7%) as non-intervention (7.9%) students.

Although the standard score categories have provided an indication of the spelling performance changes of intervention and non-intervention students over the intervention period this categorisation lacks the precision for any significant change to be established. Examination of numerical data, as measured by spelling age (SA) in months yields further analysis of the study's findings.

One limitation of spelling age scores is that a number of students reached the upper limit of normative data, that of 210 months (17 years and 6 months). At this level of performance each additional correct word from the raw data represents about twelve months progress in spelling age. The decision was taken that students who performed above the upper spelling age level of 210 months are deemed to have a spelling age of 18 years or 216 months, irrespective of how much their raw scores indicate that they should be higher. Consequently, average mean scores that can be calculated are an unknown value lower than the true value, when scores of students at the upper limit are included. Mean average scores of spelling age are therefore only approximations. An inconsistency arises in the results when students are categorised by whether or not they made progress. The students who achieved a spelling age of 216 months on pre-test and on post-test are categorised as not having made progress if their raw scores remain the same, and as having progressed if they spell more words correctly on post-test than on pre-test. As students who perform at the upper level of spelling age are not the main interest in this study, no further steps have been taken to accommodate this problem.

The Standard Error of Measurement for the TWS instrument (Larsen et al., 1999) for students aged eleven years is three standard score points. The approximate spelling age of eleven year old students with a standard score of 100 (mid-point) is therefore:

\[ \text{Spelling age} = 11 \text{ years } +/- 6 \text{ months}. \]

It was not feasible to repeat spelling performance testing in order to gain more confidence in the efficacy of students’ spelling age scores and the assumption is made that discrepancies are cancelled out when a number of students are involved. However the limitation of this measure
is acknowledged.

It is considered that progress in spelling performance has been achieved if students’ post-test spelling age (SA2) exceeds the pre-test score (SA1) by more than six months. Although the duration of the intervention period is five months and the predicted spelling age (PrSA) is therefore SA1 plus five months, a margin of one month is added. Analyses in the following sections frequently use a cut-off value of progress as follows:

1) “No-Progress” group: < 2 months above PrSA (that is, SA1+ 6 months or less).
2) “Progressed” group: =/> 2 months above PrSA, and includes all students with scores of the pre-test value plus seven months or more (SA1 =/> 7 months).

When analyses involves only two groups of progress, the No-Progress group includes all students with scores below, up to and including six months above their pre-test scores; and the Progressed group are the rest of the students.

Any further sub-groupings derived from these two main progress groups are defined as necessary. The decision to consider that scores two months or more than the predicted spelling age (SA1 =/> 7 months) are progress in spelling performance is based on the premise that students are much more likely to score too low than too high and that a larger margin is not necessary. The assumption is made that spelling errors occur more often than inspirational correct guesses.

Students’ whose spelling age scores regressed on post-test in relation to their pre-test scores (n=38) are included in the No-Progress group (Inv n=18; NInv n= 20). The pre-test standard score categories of students’ with a post-test score more than six months below their pre-test spelling age scores (n=17) are shown in Table 22 (next page). No intervention Below Average students’ scores regressed more than six months compared to n=2 non-intervention students’ scores, and there were fewer intervention Average students (n=2) whose scores regressed to this level compared to the non-intervention group students (n=4). However, twice as many intervention Above Average students as non-intervention regressed more than 6 months (ratio = 6:3).
Table 22
Pre-test Standard Score Categories of Students with Negative Spelling Progress Scores.
Pre- and Post-Test Spelling Age Differences of > - 6 months

<table>
<thead>
<tr>
<th>Pre-test StSc Category</th>
<th>Inv</th>
<th>Ninv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAv</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Av</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>AAb below upper SA limit</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>AAb at upper SA limit</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total students</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
</tbody>
</table>

The mean post- and pre-test spelling age differences for the three pre-test standard score categories are for the total students in the study (n=207) are as follows:

- Below Average = 12.2 months
- Average = 19.5 months
- Above Average = 4.8 months.

The result for the Above Average group is distorted by the normative data ceiling of 210 months spelling age, and such a limitation must influence the integrity of the statistical processing results. Nevertheless, progress of both the Below Average and Average groups over the intervention period is a positive finding.

The pre-test differences between students’ mean spelling age and their mean chronological age are:

- Below Average = -31.2 months
- Average = +2.1 months
- Above Average = +65.8 months.

The Below Average students’ mean spelling age is almost three years behind their mean chronological age on pre-test, the Average group are approximately at age, and the Above Average students are on average at least more than five years ahead of their age in spelling performance.

Relationships between students’ pre-test standard score categories (BAv, Av, and AAv) and progress in spelling age are explored, as stated in the following hypothesis:

\[ H_1 = \text{There is a relationship between students’ pre-test standard score category and progress in spelling age.} \]
Differences between pre- and post-test spelling age (SA2-SA1) scores are grouped into six groups:

1) minus > 6 months
2) -6 to +6 month’s progress (upper limit is PrSA + 1)
3) 7-11 months
4) 12-23 months
5) 24-35 months
6) >36 months progress

Table 23 (next page) displays the data for the pre-test standard score Below Average, Average, and Above Average categories, and spelling age progress on post-test (SA2-SA1) crosstabulation. Any progress made by students who had reached the upper limit (210 months) of spelling age on pre-test and remained at that performance level on post-test, is determined by the number (if any) of extra correct words on the post-test raw score. One extra correct word is counted in the “7-11 months progress” category. More than one extra word is deemed to be between “12 and 23 months” progress.

The hypothesis is accepted for the intervention group (n=118, v=19.566, p=0.009, 1-sided), at p <1% level on Fisher’s exact test and there is a significant relationship between progress in spelling age and students’ pre-test standard score category. However, the hypothesis is rejected for the non-intervention group of classes (n=89, v=12.863, p=0.090, 1-sided) and no significant relationship is found. The Goodman and Kruskal tau statistic indicates that intervention spelling age progress (n=118, v=0.28, p=0.082) is dependent on students’ pre-test standard score category (n=118, v=0.100, p=0.010) but this relationship is not found for the non-intervention group of students (SA progress: n=89, v=0.034, p=0.136; StSc category: n=89, v=0.071, p=0.249). The pre-test standard score therefore influences the spelling age progress for the intervention group significantly more strongly than for the non-intervention group.

These are positive findings as it can be inferred from Table 23 that the intervention lessons benefited the intervention Below Average students more than the non-intervention lessons assisted the non-intervention Below Average students. Although differences in the pattern of results between the intervention and non-intervention groups are not marked in Table 23, a greater percentage of intervention students (33.1%) made two years or more
progress, compared to 23.6% of non-intervention students; and 25% (n=6) of the intervention Below Average students (n=24) made this greater progress, which is not achieved by any non-intervention Below Average students.

Table 23

<table>
<thead>
<tr>
<th>Spelling Age Difference Groups * Pre-test Standard Score Categories *</th>
<th>Intervention/Non-Intervention Groups Crosstabulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv/Ninv Classes SA Minus &gt;6 mths Count AAv Av BAv</td>
<td>Total StSc 1 Categories</td>
</tr>
<tr>
<td>Inv classes Progress Groups</td>
<td>% of Total % of Total % of Total</td>
</tr>
<tr>
<td>-6 to +6 mths Count</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>1.1% 1.7%</td>
</tr>
<tr>
<td>7-11 months Count</td>
<td>2</td>
</tr>
<tr>
<td>12-23 months Count</td>
<td>9</td>
</tr>
<tr>
<td>% of Total</td>
<td>6.7% 20.2% 3.4%</td>
</tr>
<tr>
<td>24-35 months Count</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>2.2% 4.5%</td>
</tr>
<tr>
<td>&gt;/=36 months Count</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>2.2% 4.5%</td>
</tr>
<tr>
<td>Total Count</td>
<td>24</td>
</tr>
<tr>
<td>% of Total</td>
<td>2.2% 4.5%</td>
</tr>
</tbody>
</table>

128
The mean spelling ages of the Below Average, Average, and Above Average categories in each intervention or non-intervention group were tested using Levene’s Test for Equality of Variances and the results for “Equal variance assumed” are: Below Average p=0.019; Average p=0.0392; and Above Average p=0.388, (1-tailed) which indicates a significant difference in the means of the Below Average group.

These findings lead to the following hypothesis:

\[ H_1 = \text{There is a relationship between progress in spelling age and intervention/non-intervention grouping when data are analysed per standard score category (BAv, Av, AAv).} \]

The hypothesis is rejected for all pre-test standard score groups and no significant relationships at p <5% are found on Fisher’s exact test analysis between progress in spelling age and intervention/non-intervention class groupings: (Below Average: n=41, v=6.415, p=0.124, 1-sided; Average: n=127, v=5.095, p=0.206, 1-sided; and Above Average (n=39, v=2.827, p=0.405, 1-sided).

The above hypothesis is also rejected at p <5% when spelling age progress is consolidated into No-Progress and Progressed groups, rather than six groups as shown in Table 23 (previous page): (Below Average: n=41, p=0.200, 1-sided; Average: n=127, p=0.292, 1-sided; and Above Average (n=39, p=0.424, 1-sided).

Focus Question #1, asks *Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?* and can be answered as follows:

- **Below Average Group**: There is a total of forty-one (n=41) Below Average students (19.8% of total students in study), of whom twenty-four (n=24) are intervention students, and seventeen (n=17) are non-intervention students. The Below Average group comprises:
  - Year 5 n=24 (Inv n=13; NInv n=11)
  - Year 6 n=17 (Inv n=11; NInv n=6)
  - Male n=21 (Inv n=15; NInv n=6)
  - Female n=20 (Inv n=9; NInv n=11)
Cognitive ability screening was only carried out on the Year 5 Study Student group, and of the fifteen SS/5 students in the Below Average category on pre-test, ten students are of below normal cognitive ability. Only one student in this group has a non-English home language.

A higher percentage of intervention Below Average students (70.8%) progressed seven months or more in spelling age compared to non-intervention Below Average students (52.9%). The intervention Below Average students who progressed represent 14.4% of the total intervention students; and the non-intervention Below Average students who progressed represent 10.1% of the total non-intervention students. Additionally, 25% (n=6) of intervention Below Average students made at least two years progress (three of these students progressed more than 36 months) and this level of achievement was not made by any non-intervention Below Average students. Students in the Below Average category have a spelling age two years behind their chronological age on pre-test. Four intervention students progressed such that their post-test spelling ages are only six months behind their chronological ages or better (three of these are 6, 7, and 9 months ahead of their chronological ages). No non-intervention Below Average student achieved this. (Only three of 24 intervention Below Average students (12.5%) have a post-test spelling age less than their pre-test spelling age, compared to seven of 17 non-intervention Below Average students (41.2%).)

Overall, the mean Below Average progress in spelling age is about one year: the intervention group’s mean progress is 15.8 months (10.8 months above predicted progress) and that of the non-intervention group is 7.2 months (2.2 months above predicted spelling age). It is concluded that the explicit word-focused lessons benefited the intervention Below Average
students more than the non-intervention lessons assisted the non-intervention Below Average students.

- **Average Group:** Nearly 65% of Average intervention students (64.9%) made seven months or more progress compared to 58.5% of non-intervention Average students, and the percentages of achieving students of the total intervention and non-intervention groups are also fairly similar at 40.7% intervention and 34.8% non-intervention students. This group’s overall mean progress of 19.5 months spelling age is well in advance of the predicted progress. The mean values for the two groups are: intervention group = 20 months and non-intervention group = 18.8 months progress. These are 15 months and 13.8 months above their respective predicted spelling ages and lead to the conclusion that explicit word-focused lessons did improve the spelling performance of the Average group of students but not substantially more than the non-intervention lessons progressed the non-intervention students.

- **Above Average Group:** The intervention students performed less well than the non-intervention students in this group on post-test. A higher percentage of non-intervention Above Average performers (63.3% of NInv AAv) improved by seven months or more compared to 55% of Above Average intervention students. The achieving non-intervention Above Average students represent 13.5% of the total non-intervention group and the achieving intervention Above Average students represent 9.3% of the total intervention group. The Above Average group’s mean average is distorted by the normative data upper limit. If students who have reached or are within five months of the upper limit spelling age on pre-test are excluded from the calculation, intervention Above Average students’ (n=11) mean progress is 14.2 months and that of the non-intervention Above Average students (n=8) is 25.5 months. It is concluded that explicit word-focused lessons did improve the spelling performance of the intervention Above Average students by 9.2 months more than the predicted spelling age but this progress is substantially less than that achieved by the lessons the non-intervention students experienced (20.5 months above predicted spelling age).
These findings are illustrated in Figure 3 which represents the percentage of students in each standard score category per intervention or non-intervention group (Inv n=118; NInv n=89) who did progress over the intervention period and those that did not.

![Figure 3](image)

**Figure 3:** Percentage of intervention and non-intervention students in standard score groups and progress groups.

The findings indicate that greater percentages of Below Average and Average intervention students progressed than corresponding non-intervention students, whilst a greater percentage of Above Average non-intervention students progressed than intervention students. There is a similarity in the pattern of percentages for intervention and non-intervention students who did not progress during this period, although the percentages of the non-intervention groups are higher for the Below Average and Average standard score categories. It appears from these findings that intervention Below Average and Average students derived the most benefit from the intervention lesson programs over the intervention period, as measured by spelling age improvement, and that the intervention Above Average students fared less well than their non-intervention counterparts.

4.2.1.2 **FOCUS QUESTION #2 RESULTS**

#2: Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?

Factors of diversity in student populations in public primary school non-selective classrooms include not only ethnicity, cultural backgrounds and gender, but also academic achievement levels. Additionally, there is a range of cognitive abilities in the student body.
4.2.1.2.1 COGNITIVE ABILITY

Formal instruments have been designed for testing various aspects of cognitive function and require the expertise of professional psychologists for useful interpretation of results. Such a service is beyond the resources of this study. However, a cognitive screening test was employed to provide an indication of whether or not a student could be considered within the range of “normal cognitive ability” or is below that level. The “School-Years Screening Test for the Evaluation of Mental Status” (SYSTEMS) instrument (Ouvrier et al., 1999) was included in the Year 5 Study Students (SS/5; n=107) battery of pre-tests. “A score below the age-appropriate cut-off score suggests cognitive impairment or cognitive deterioration, which means the child needs a more detailed cognitive assessment” (p. 5). The test is designed as an indicator of cognitive functioning, which includes “cognitive manipulation as well as general information and skills” (p.5). Three levels are identified for this study: a) Normal Cognitive Ability (NCA); b) Borderline (B), which indicates that “clinical judgment is to be made as to whether the child is referred for further testing” (p. 12); and c) Cut-off (Co), when further cognitive testing is required. However, as the student count is small Borderline (B) and Cut-off (Co) groups are consolidated to one group identified at times as “B/Co”.

On pre-test the Borderline/Cut-off group’s mean average spelling age is one year behind their mean chronological age (-12.8 months); and on post-test the group’s mean spelling age is 2.6 months more than their mean post-test chronological age. The Normal Cognitive Ability group is more than one year ahead of their mean chronological age (13.8 months) on pre-test and over two years ahead (26.3 months) on post-test. (For the total number of students in the study (n=207), the mean pre-test spelling age is 7.5 months more than the mean chronological age, and the mean post-test spelling age is in advance of the post-test chronological age by 17.8 months).

The percentage of intervention and non-intervention students who are of normal cognitive ability is 71% and the remaining 29% of students are either of Borderline (B) or at Cut-off (Co) levels, combined into the B/Co group (Table 24).
Table 24

**Intervention/Non-Intervention Students and Cognitive Ability Groupings**

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>NCA</th>
<th>B/Co</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv group</td>
<td>Count</td>
<td>49</td>
<td>20</td>
</tr>
<tr>
<td>% of Total Inv</td>
<td>71%</td>
<td>29%</td>
<td>100%</td>
</tr>
<tr>
<td>NInv group</td>
<td>Count</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>% of Total NInv</td>
<td>71.1%</td>
<td>28.9%</td>
<td>100%</td>
</tr>
<tr>
<td>Total SS/5</td>
<td>76</td>
<td>31</td>
<td>107</td>
</tr>
</tbody>
</table>

Table 25 shows a crosstabulation of pre-test spelling standard score performance groups and the SYSTEMS cognitive ability grouping of normal cognitive ability and Borderline/Cut-off ability. Ten of the latter group of students (10 of n=31) performed at the Below Average level on pre-test.

**Table 25**

**Cognitive Ability Groups * Pre-test Standard Score Categories * Intervention/Non-Intervention Groups Crosstabulation**

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>Pre-Test</th>
<th>Cog. Ability Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>StSc</td>
<td>BAv</td>
<td>NCA</td>
</tr>
<tr>
<td>Inv classes</td>
<td>Count</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>5.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Av</td>
<td>Count</td>
<td>35</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>50.7%</td>
<td>20.3%</td>
</tr>
<tr>
<td>AAv</td>
<td>Count</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>14.5%</td>
<td>.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>49</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>71.0%</td>
<td>29.0%</td>
</tr>
<tr>
<td>NInv classes</td>
<td>Count</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>2.6%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Av</td>
<td>Count</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>47.4%</td>
<td>18.4%</td>
</tr>
<tr>
<td>AAv</td>
<td>Count</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>21.1%</td>
<td>.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>71.1%</td>
<td>28.9%</td>
</tr>
</tbody>
</table>

134
Only the Study Students group (SS/5) group (n=107) is analysed as they experienced individual testing, of which SYSTEMS was part. The following hypothesis is formulated:

\[ H_1 = \text{There is a relationship between cognitive ability grouping and pre-test standard score spelling performance levels (BAv, Av, AAv).} \]

The hypothesis is accepted. Fisher’s exact test indicates a significant relationship between cognitive ability grouping and pre-test standard score spelling performance categories for both the intervention (n=69, v=8.630, p=0.006, 1-sided) and non-intervention groups (n=38, v=8.649, p=0.004, 1-sided) at the p <1% level. Directional measures (Goodman and Kruskal tau) indicate that SYSTEMS is the independent variable: (Inv v=0.127, p=0.014 and non-intervention v=0.253, p=0.008) and pre-test standard score categories the dependent variable: (Inv v=0.041, p=0.060 and NInv v=0.079, p=0.054).

The pre-test distribution patterns of both the intervention and non-intervention group results are very similar and each shows an approximate ratio of 70:30 for the percentage of students of normal cognitive ability and those in the Borderline/Cut-off group. No intervention or non-intervention classes have Borderline/Cut-off students in the Above Average spelling performance category on pre-test and the majority of students in both cognitive ability groups are at the Average level of performance in spelling. There is a greater percentage of intervention students of normal cognitive ability at the Below Average level (5.8%) than in the non-intervention group (2.6%). Additionally, there is a smaller proportion of intervention students (14.5%) of normal cognitive ability at the Above Average spelling performance level than in the non-intervention group (21.1%). This indicates that a greater percentage of the intervention group of students of normal cognitive ability performed less well in spelling than their non-intervention counterparts on pre-test.

Cognitive ability screening was not repeated on post-test as the principle author of the test indicated that the test is reliable over time and that retesting was unnecessary. The hypothesis is adjusted for post-test spelling performance, as follows:

\[ H_1 = \text{There is a relationship between cognitive ability grouping and post-test standard score spelling performance levels (BAv, Av, AAv).} \]
Table 26 is a crosstabulation of pre-test cognitive ability groups and post-test spelling performance standard score categories.

<table>
<thead>
<tr>
<th>Inv/Ninv Groups</th>
<th>Post-Test</th>
<th>Cog. Ability Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NCA</td>
<td>B/Co</td>
<td></td>
</tr>
<tr>
<td>Inv</td>
<td>Count</td>
<td>% of Total 2.9%</td>
<td>7.2%</td>
</tr>
<tr>
<td>classes categories</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>% of Total 49.3%</td>
<td>69.6%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td>% of Total 18.8%</td>
<td>23.2%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>% of Total 71.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The results of Fisher’s exact test on post-test differ from the findings of the pre-test crosstabulation and the post-test hypothesis is rejected for the intervention group (n=69, v=2.980, p=0.114, 1-sided). In contrast, the hypothesis is accepted at p <5% for the non-intervention group (Fisher’s exact test results: n=38, v=6.677, p=0.012, 1-sided) which indicates that there is a relationship between cognitive ability grouping and post-test standard score spelling performance levels (BAv, Av, AAav). These results are a positive finding as they indicate that post-test spelling performance levels for the intervention group are not related to the cognitive ability grouping of the intervention students.
On pre-test the mean average spelling ages of the two groups, Normal Cognitive Ability and Borderline/Cut-off (SS/5 students, n=107), differ by about two years (23.2 months) and on post-test the difference at 20.4 months, has decreased by three months (the spelling age ceiling would have some effect on this difference). Table 27 shows the mean pre- and post-test spelling ages, in months, of the SS/5 students when they are split into intervention and non-intervention groups.

Table 27
Mean Pre- and Post-test Spelling Ages of Intervention and Non-Intervention Cognitive Ability Groups

<table>
<thead>
<tr>
<th>(months)</th>
<th>Mean Pre-test SA</th>
<th>Mean Post-test SA</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv B/Co</td>
<td>117.3</td>
<td>143.1</td>
<td>25.8</td>
</tr>
<tr>
<td>NInv B/Co</td>
<td>114.3</td>
<td>124.6</td>
<td>10.3</td>
</tr>
<tr>
<td>Difference</td>
<td>3.0</td>
<td>18.5</td>
<td>15.5</td>
</tr>
</tbody>
</table>

| Inv NCA | 134.6            | 153.4             | 18.8       |
| NInv NCA| 148.1            | 163.3             | 15.2       |
| Difference | -13.5   | -9.9             | 3.6        |

Table 27 shows that the difference between the mean pre-test spelling ages of the Borderline/Cut-off intervention (117.3 months) and non-intervention (114.3 months) groups is only three months but on post-test the difference has increased to 18.5 months. Their respective differences in pre- and post-test scores indicate that the intervention Borderline/Cut-off students progressed substantially more (25.8 months) than the non-intervention Borderline/Cut-off students (10.3 months) in five months. The non-intervention Normal Cognitive Ability students are over thirteen months (13.5 months) ahead of the intervention students in spelling age on pre-test but just less than ten months (9.9 months) ahead of this group on post-test. This suggests that the intervention Normal Cognitive Ability students have improved their situation compared to the non-intervention group over the intervention period but that the non-intervention Normal Cognitive Ability students maintain a more advanced mean spelling age score than the intervention group.
The differences between students’ mean spelling ages (SA) and chronological ages (ChrA) are shown in Table 28:

Table 28
Mean Pre- and Post-test Spelling Age/Chronological Age Differences of Cognitive Ability Groups

<table>
<thead>
<tr>
<th></th>
<th>Mean Pre-test SA/ChrA diff</th>
<th>Mean Post-test SA/ChrA diff</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv B/Co</td>
<td>-10.9</td>
<td>10.1</td>
<td>21.0</td>
</tr>
<tr>
<td>NInv B/Co</td>
<td>-16.4</td>
<td>-11</td>
<td>5.4</td>
</tr>
<tr>
<td>Difference</td>
<td>-5.5</td>
<td>21.1</td>
<td>26.4</td>
</tr>
<tr>
<td>Inv NCA</td>
<td>9.2</td>
<td>23</td>
<td>13.8</td>
</tr>
<tr>
<td>NInv NCA</td>
<td>22.2</td>
<td>32.4</td>
<td>10.2</td>
</tr>
<tr>
<td>Difference</td>
<td>13.0</td>
<td>9.4</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Table 28 makes it very clear that the intervention Borderline/Cut-off students progressed from being eleven months behind their chronological age on pre-test to being ten months ahead on post-test. The non-intervention Borderline/Cut-off students are almost one year behind their mean age on post-test and advanced on their chronological age by only 5.4 months (compared to the intervention level of 21 months). Although the intervention Normal Cognitive Ability group are almost two years ahead of their mean chronological age on post-test, the non-intervention Normal Cognitive Ability students are approaching being three years in advance of their age.

The findings for both Table 27 and Table 28 indicate that the intervention Borderline/Cut-off students made greater progress over the intervention period than the non-intervention Borderline/Cut-off students; and that the non-intervention Normal Cognitive Ability students were in advance of the corresponding intervention group on pre-test and, although the difference between them decreased, they retained their superior position.

Figures 4 and 5 illustrate the differences in findings between the pre-test and post-test*cognitive ability levels*intervention/non-intervention groups crosstabulations. Figure 4 shows the results for the Borderline/Cut-off (B/Co) group of students and Figure 5 shows the
results for students of normal cognitive ability (NCA):

![Bar chart showing B/Co Cognitive Ability results for intervention (Inv) and non-intervention (Ninv) students.](image)

**Figure 4:** Intervention and non-intervention students of borderline/cut-off cognitive ability and their pre- and post-test standard score categories.

![Bar chart showing Normal Cognitive Ability (NCA) results for intervention (Inv) and non-intervention (Ninv) students.](image)

**Figure 5:** Intervention and non-intervention students of normal cognitive ability and their pre- and post-test standard score categories.

The most impressive difference in post-test results of both intervention and non-intervention groups compared to their pre-test patterns is that there are Borderline/Cut-off students in the Above Average level of spelling performance on post-test (Inv n=6 students; NInv n=2 students). This finding is remarkable, not because of the number of Borderline/Cut-off students at the Above Average level but because there are any there at all.
In contrast to the pre-test results, there is now a greater percentage of Normal Cognitive Ability non-intervention students in the Below Average (BAv) performance group (pre-test=2.6%; post-test=13.2%). This direction of change is not found with the Normal Cognitive Ability intervention group (pre-test=5.5%; post-test=4.3%). Additionally, the total percentage (both B/Co and NCA) of Below Average performers has decreased in the intervention group on post-test (from 14.5% pre-test to 8.7% post-test) yet increased in the non-intervention group (from 13.2% pre-test to 21.1% post-test). Further, on post-test the percentage of total Above Average intervention students has increased from 14.5% to 29%, whilst non-intervention results show a smaller improvement (21.1% pre-test to 28.9% post-test).

To summarise, there has been an upwards movement to improved performance levels for Borderline/Cut-off students in both intervention and non-intervention groups, and Normal Cognitive Ability students in the intervention group. In contrast, the non-intervention Normal Cognitive Ability group shows a decline in performance in that the percentage of students in the Below Average category increases on post-test. The differences in the pre- and post-test Fisher’s exact test analyses indicate that an effect has taken place on spelling performance over the intervention period, such that any suggestion of a relationship between spelling performance and cognitive ability cannot be sustained on post-test for students in the intervention group, yet is maintained for the non-intervention students. This finding is compatible with the superior progress in spelling age made by the intervention Borderline/Cut-off students compared to the non-intervention Borderline/Cut-off students.

Analysis of pre- and post-test spelling age differences enables greater facility in determining more discrete changes in spelling performance than the analysis of standard score category shifts. Figure 6 (next page) illustrates the percentages of intervention and non-intervention students in the Progress groups: a) No-Progress (did not progress beyond their predicted spelling age (PrSA) plus one month); and b) Progressed (did progress two months or more beyond their PrSA) and who are either of Normal Cognitive Ability or Borderline/Cut-off cognitive ability:
Figure 6 shows that a greater percentage of intervention students made seven months or more progress than those in the non-intervention group and that the difference is more marked in the lower cognitive ability group of students. These findings indicate that the explicit spelling lessons over the intervention period benefited the intervention group’s Borderline/Cut-off (Inv B/Co) students to a greater extent than the non-intervention group’s lessons assisted the non-intervention Borderline/Cut-off students. This difference is also demonstrated in the mean progress made by the Below Average in each group. The intervention Below Average students progressed 25.8 months and the non-intervention Below Average students progressed 10.3 months, a difference of 15.5 months between the groups.

The following hypothesis is devised to explore any relationship between cognitive ability grouping and progress in spelling, using the Spelling Age variable (rather than Standard Score categories):

\[ H_1 = \text{There is a relationship between cognitive ability grouping and progress in spelling age (SA).} \]

Table 29 (next page) shows the findings of the crosstabulation of the intervention/non-intervention groups, cognitive ability groups, and Progress groups.
The hypothesis is rejected. There is no significant relationship between cognitive ability grouping and progress in spelling age. The results of Fisher's exact test for students of Normal Cognitive Ability are: \( n=76, \ p=0.356 \), one-sided. The results for the Borderline/Cut-off group, however, indicate that there is a relationship but that it is not significant at \( p < 0.05 \) level: \( n=31, \ p=0.060 \), one-sided. This is a positive finding for the Borderline/Cut-off group as there need be no greater barrier to progression in spelling than that experienced by the average student of normal cognitive ability. The mean progress in spelling age made by the Normal Cognitive Ability group is 17.5 months and for the Borderline/Cut-off group it is 20.3 months (Inv=25.8 months; NInv=10.4 months), indicating the more positive response to lessons over the intervention period by the Borderline/Cut-off students.

It is expected that all students should progress in spelling age performance at least five months over the intervention period and attain the predicted spelling age (PrSA) of the pre-test performance level plus five months. Figure 7 (next page) shows the percentages of Normal Cognitive Ability and Borderline/Cut-off students in the intervention and non-intervention groups.
groups who progressed less than one year above their predicted spelling age, at least one year above their predicted spelling age (that is at least seventeen months above their pre-test spelling age score) and also those who progressed at least two years above their predicted spelling age.

Figure 7: Spelling age progress in relation to predicted spelling age of intervention and non-intervention normal cognitive ability and borderline/cut-off groups.

Figure 7 indicates that substantial gains can be made by students with normal cognitive ability and, importantly, those with lower than normal cognitive abilities. The gains are more impressive when it is appreciated that they are over and above the five months progress predicted for the duration of the intervention period. Comparisons of the intervention and non-intervention groups show that greater percentages of intervention students of lower cognitive ability than the non-intervention Borderline/Cut-off students made more than one and two years progress. In both Normal Cognitive Ability and Borderline/Cut-off groups a greater percentage of the non-intervention students made less than twelve months progress above their predicted spelling ages.

The following hypothesis is explored using Fisher’s exact test:

\[ H_1 = \text{There is a relationship between cognitive ability grouping and progress in spelling age of at least one or two years beyond predicted spelling age (PrSA).} \]
The hypothesis is rejected for the Normal Cognitive Ability group and no relationship is found with progress (n=76, v=1.009, p=0.317, 1-sided). However, the hypothesis is accepted for the Borderline/Cut-off group of students and there is a significant relationship at p <0.1% level with a spelling age progress of one, or two or more years beyond that expected by the duration of the intervention lesson program (n=31, v=8.848, p=0.007, 1-sided).

These findings indicate that intervention lessons assisted about two thirds (13 of 20 students) of the intervention students of lower cognitive ability to achieve in spelling performance at least twelve months more than was expected over a five-month period. Only one Borderline/Cut-off student of eleven in the non-intervention group achieved this level of progress which suggests that the non-intervention teachers were more successful with normal cognitive ability students than with the lower cognitive ability group.

4.2.1.2.2 SCHOOL YEAR

The school Year of students is a further student-related factor to be explored. Seven classrooms are composite Years 5/6 classes; one is a Year 5 class; and the remaining class is a composite Year 4/5 (but only the Year 5 students were tested). It is arguable that there should be a difference in the pre-test performance levels and progress patterns of Year 5 and Year 6 students as Year 5 students have had one year less schooling than Year 6 students. Statistical data describing the two school Year groups are summarised in Table 30.

<table>
<thead>
<tr>
<th></th>
<th>Year 5</th>
<th>Year 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. students</td>
<td>136</td>
<td>71</td>
</tr>
<tr>
<td>No. Inv students</td>
<td>77</td>
<td>41</td>
</tr>
<tr>
<td>No. NInv students</td>
<td>59</td>
<td>30</td>
</tr>
<tr>
<td>No. male</td>
<td>62</td>
<td>41</td>
</tr>
<tr>
<td>No. female</td>
<td>74</td>
<td>30</td>
</tr>
<tr>
<td>Mean pre-test chron age</td>
<td>126.4 months</td>
<td>139.5 months</td>
</tr>
<tr>
<td>Mean pre-test SA</td>
<td>131.8 months</td>
<td>150.1 months</td>
</tr>
<tr>
<td>Chron age and pre-test SA difference</td>
<td>5.5 months</td>
<td>11.2 months</td>
</tr>
<tr>
<td>Mean SA progress</td>
<td>17.5 months</td>
<td>10.9 months</td>
</tr>
<tr>
<td>Chron age and post-test SA difference</td>
<td>18 months</td>
<td>17.2 months</td>
</tr>
</tbody>
</table>
There are almost twice as many Year 5 students (n=136) as Year 6 students (n=71). The mean pre-test spelling age of Year 5 students is 5.5 months above their mean chronological age, and that of Year 6 students is 11.2 months above their age. As expected, the mean pre-test spelling age of Year 5 students (131.8 months) is less than the mean pre-test spelling age of Year 6 students (150.1 months). Year 5 students made greater gains than Year 6 students in spelling age during the intervention period and their average progress over the intervention period is 17.5 months, whilst Year 6 students progressed 10.9 months.

Interestingly, both the Year 5 and the Year 6 students completed the intervention period almost the same number of months ahead in spelling age of their mean chronological ages (18 months and 17.2 months respectively). However, these statistics are distorted by the normative data spelling age upper limit as six Year 5 and thirteen Year 6 students were at the 17 years 6 months level for spelling age on pre-test.

Students are categorised by School Year rather than their chronological age as a separation of Year 5 students for the Study Student group is already in place. It assumes that no more than a few children will have repeated grades and that Year 6 students have had more schooling in spelling than the Year 5 students. However, a correlation analysis between students’ chronological ages and progress in spelling ages (Pearson) was performed and no correlation was found.

The following hypothesis is constructed to test any relationship between spelling age progress and school Year and results of analysis are found in Table 31 (next page):

\[ H_1 = \text{There is a relationship between school Year and progress in spelling age} \]

The hypothesis is accepted for the intervention group and there is a significant relationship at p <5% between School Year and progress in spelling age on Fisher’s exact test (n=118, p=0.024, 1-sided). No relationship is found with the non-intervention group (n=89, p=0.319, 1-sided). The greater success rate for the intervention Year 5 students could be explained by their response to lessons targeted to their needs, their greater involvement in the study, or their greater familiarity with me that was established during individual testing.
### Table 31

**Progress Groups * School Year *\**

**Intervention/Non-Intervention Groups Crosstabulation**

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>School Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 5</td>
<td>Year 6</td>
</tr>
<tr>
<td><strong>Inv group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress</td>
<td>Count</td>
<td>22</td>
</tr>
<tr>
<td>groups</td>
<td>% within School Year</td>
<td>28.6%</td>
</tr>
<tr>
<td>No-Progress</td>
<td>Count</td>
<td>55</td>
</tr>
<tr>
<td>% within School Year</td>
<td>71.4%</td>
<td>51.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count</td>
<td>77</td>
</tr>
<tr>
<td>% within School Year</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>NInv group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress</td>
<td>Count</td>
<td>23</td>
</tr>
<tr>
<td>groups</td>
<td>% within School Year</td>
<td>39%</td>
</tr>
<tr>
<td>No-Progress</td>
<td>Count</td>
<td>36</td>
</tr>
<tr>
<td>% within School Year</td>
<td>61%</td>
<td>53.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count</td>
<td>59</td>
</tr>
<tr>
<td>% within School Year</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The crosstabulation in Table 32 (next page) shows the pattern of spelling age progress for Years 5 and 6: The most notable feature of Table 32 is the higher percentages of Year 5 than Year 6 students in both the intervention and non-intervention groups in the “24-35 months” progress category in spelling age over the intervention period. This is possibly because more Year 6 students would be closer to the spelling age normative data upper limit. Interestingly, Class 2 (Teacher-Best-Practice) is the only 5/6 class in which more Year 6 (n=5) than Year 5 (n=3) students made two years or more progress. No significant relationships between spelling age progress and school Year are demonstrated on Fisher’s exact test for either the intervention group (n=118, v=6.941, p=0.106, 1-sided) or the non-intervention group (n=89, v=1.850, p=0.452, 1-sided).
### Table 32

Spelling Age Groups * School Year *

Intervention/Non-Intervention Groups Crosstabulation

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>School Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 5</td>
<td>Year 6</td>
</tr>
<tr>
<td>Inv group SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minus &gt;6mths</td>
<td>Count</td>
<td>3</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>3.9%</td>
<td>12.2%</td>
</tr>
<tr>
<td>-6 to +6 mths</td>
<td>Count</td>
<td>19</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>24.7%</td>
<td>36.6%</td>
</tr>
<tr>
<td>7-11 months</td>
<td>Count</td>
<td>3</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>3.9%</td>
<td>2.4%</td>
</tr>
<tr>
<td>12-23 months</td>
<td>Count</td>
<td>23</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>29.2%</td>
<td>24.4%</td>
</tr>
<tr>
<td>24-35 months</td>
<td>Count</td>
<td>15</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>19.5%</td>
<td>7.3%</td>
</tr>
<tr>
<td>=/&gt; 36 months</td>
<td>Count</td>
<td>14</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>18.2%</td>
<td>17.1%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>77</td>
</tr>
<tr>
<td>NInv group SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minus &gt;6mths</td>
<td>Count</td>
<td>6</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>10.2%</td>
<td>13.3%</td>
</tr>
<tr>
<td>-6 to +6 mths</td>
<td>Count</td>
<td>17</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>28.8%</td>
<td>33.3%</td>
</tr>
<tr>
<td>7-11 months</td>
<td>Count</td>
<td>5</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>8.5%</td>
<td>6.7%</td>
</tr>
<tr>
<td>12-23 months</td>
<td>Count</td>
<td>15</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>25.4%</td>
<td>30%</td>
</tr>
<tr>
<td>24-35 months</td>
<td>Count</td>
<td>6</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>10.2%</td>
<td>3.3%</td>
</tr>
<tr>
<td>=/&gt; 36 months</td>
<td>Count</td>
<td>10</td>
</tr>
<tr>
<td>% within School Yr</td>
<td>16.9%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>59</td>
</tr>
</tbody>
</table>

% within School Yr | 100.0% | 100.0% | 100.0% |

### 4.2.1.2.3 GENDER

There are the same number of male students (n=103) in the study as female students (n=104). The male : female ratio for the intervention group is 65 : 53 and for the non-intervention group it is 38 : 51. The hypothesis in relation to gender and spelling age progress is as follows:
H₁ = There is a relationship between student gender and progress in spelling age.

Table 33

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>Progress groups</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Count</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>% within Gender</td>
<td>male</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>female</td>
<td>30.2%</td>
</tr>
<tr>
<td></td>
<td>Progressed</td>
<td>Count</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>% within Gender</td>
<td>male</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>female</td>
<td>69.8%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>% within Gender</td>
<td>male</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>female</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 33 shows the distribution of male and female students in the two progress groups. The hypothesis that there is a relationship between gender and progress in spelling age is not accepted on Fisher’s exact test analysis. The results for the intervention group are: n=118, p=0.181, one-sided, and for the non-intervention group they are: n=89, p=0.449, one-sided. No greater involvement in the lessons by either gender was observed and a significant relationship with spelling progress was not expected. However, it is noted on Table 33 that the ratio between the intervention female students who did and did not progress is 30 : 70, whilst the ratio for intervention male, non-intervention male and non-intervention female students is approximately 40 : 60.

Nevertheless, a relationship is explored between gender and the standard score categories of Below Average, Average and Above Average. On pre-test, no relationship is demonstrated on Fisher’s exact test for either the intervention group (n=118, p=0.250, 1-sided) or the non-intervention group (n=89, p=0.399, 1-sided). Interestingly on post-test, whilst there is no relationship for the non-intervention group (p=0.186), there is a significant relationship for the
intervention classes at $p < 5\%$ level ($p=0.012$). The greatest differences between the pre- and post-tests involve the female intervention students. The Below Average female intervention students decreased from 7.6% to 3.4% on post-test, whilst the Above Average students increased from 9.3% to a post-test percentage of 16.1%. The corresponding percentages for the intervention male students are Below Average 12.7% pre-test to 9.3% post-test; and Above Average 7.6% pre-test to 8.5% post-test. It appears that the intervention lessons were of greatest benefit to the intervention female Below Average students who moved into the Average category on post-test ($n=5$) and the intervention female Average students who progressed to the Above Average category ($n=8$).

4.2.1.2.4 HOME LANGUAGE

The home language is known only for Year 5 Study Students (SS/5, $n=107$). There were no students with a home language other than English (LOTE) who had obvious difficulties with English during the lessons, although two intervention students had only been in Australia for a few months. However, during the screening test for cognitive ability it was noted that four students did not fully understand some nuances of the English language and did not know the meaning of “nod your head”, for instance, a written instruction that is part of the test.

Table 34 (next page) shows the crosstabulation of home language and spelling age progress, and the following hypothesis is explored:

$$H_1 = \text{There is a relationship between students’ home language and progress in spelling age}$$
No significant relationship is found in the intervention group of students between the home language of students and spelling age progress (n=69, p=0.527, 1-sided). However, there is a significant relationship between these parameters in the non-intervention group (n=38, p=0.050, 1-sided) at the p=5% level.

In both intervention and non-intervention groups approximately one third of students speak a language other than English (LOTE) at home. In the intervention and the non-intervention groups the great majority of LOTE students (Inv n=14/18; NInv n=8/9) made more than six months progress in spelling age. Possibly, motivation is a factor that influenced student outcomes. LOTE students need to become competent in the English language and intervention “English only” students had the stimulation of intervention lessons. On this basis it can be surmised that non-intervention “English only” students might exhibit the least commitment to making progress in spelling.
4.2.1.2.5  MULTIPLE INTELLIGENCES INVENTORY

A Multiple Intelligences (MI) inventory was completed adequately by about 40% (n=82) of the students in the study (Inv=56; NInv=26). The following hypothesis is explored:

\[ H_1 = \text{There is a relationship between students’ preferred “Intelligence” (MI) and progress in spelling age} \]

As the p-values for intervention (n=56, v=4.351, p=0.389, 1-sided) and non-intervention (n=26, v=6.925, p=0.154) groups are p >5%, it is concluded that no relationship between students’ preferred Intelligence and spelling progress is found. Only n=82 of n=207 inventories were completed. Two teachers did not give their class the inventory and others did not provide sufficient time for all students to complete them. It is concluded that the disappointing teacher response to exploring students’ preferred Intelligences does not permit any firm conclusions to be drawn about any possible relationships to aspects of students’ learning outcomes.

4.2.1.2.6  CONCLUDING COMMENTS TO FOCUS QUESTION #2

Focus Question #2, asks ‘Can student-related factors be identified that influence spelling performance outcomes, such as cognitive ability, gender, home language, preferred Intelligence (MI) or school Year?’ The data indicate that there is a relationship between spelling performance levels and cognitive ability grouping on pre-test but not on post-test for the intervention group. The pre-test relationship is weakened at post-test by the positive finding of greater progress in spelling performance by the intervention Borderline/Cut-off group than predicted. Additionally, it is shown that intervention lessons had a more positive effect on students’ spelling age performance than non-intervention group’s lessons and that the difference between the intervention and non-intervention students in response to lessons is greater in the Borderline/Cut-off group. Five intervention and two non-intervention Borderline/Cut-off students reached the Above Average standard score level in spelling performance on post-test. It is considered that the progress of students of Borderline/Cut-off cognitive ability as a result of the intervention lessons is a most positive finding.

A significant relationship between School Year and spelling progress was found for the intervention group but not the non-intervention group of students. Year 5 intervention students benefited the most positively from lessons during the two terms. Spelling progress
was found to be independent of gender. The majority of LOTE students progressed well in spelling and the group that appears to be the least committed to progress in spelling is the non-intervention “English only” group. No useful findings were gathered from the Multiple Intelligences inventory scores.

Focus Question #2 has addressed student-related factors in relation to progress in spelling and has highlighted the positive effect that the intervention lessons had on the spelling performance of the group of students with lower than normal cognitive ability. Focus Question #3 is concerned with identifying classroom-related factors that might impact on students’ spelling performance levels.

4.2.1.3 FOCUS QUESTION #3 RESULTS

This section examines the data related to individual classrooms and endeavours to answer Focus Question #3:

#3: Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?

Focus Question #3 is mainly concerned with classroom environments and pedagogic issues associated with each class. Attempts are made to identify aspects of each class’s experiences that can be related to spelling performance levels and changes in performance levels in response to spelling programs. Five classes (Inv) experienced a different intervention over the middle two terms of a school year (five months). Four non-intervention (NInv) classroom teachers were asked to continue with their normal spelling programs. This question is the one that demonstrates features of a controlled trials methodology, but without the random assignment of subjects to each group.

During the study planning it was expected that a clear difference in performance would arise between the intervention group of classes and the non-intervention group, and that the intervention lessons would bring about improved spelling outcomes for the intervention students. This expectation was based on the premise that explicit teaching of spelling, together with an interactive lesson design, would improve learning performance by directing and maintaining student attention on the learning task. This in turn would facilitate students
making more enduring learning connections. Additionally, it was expected that learning about words would develop in students a deeper interest in written English language which would enhance their drive for attaining greater competence in using language. Outcomes from the lesson planning and presentation decisions are herewith presented.

The variable of primary importance to this study is the difference between post- and pre-test spelling ages. The aspect of this variable that is of interest is whether factors can be identified that influence when a student does or does not make appropriate progress in spelling performance. As the duration of the intervention period was five months, progress in spelling performance beyond that predicted by the intervention period is deemed to have taken place if a student’s post-test spelling age score is seven or more months greater than their pre-test score or, alternatively stated, two or more months beyond their predicted spelling age (PrSA).

The data available include pre- and post- spelling test scores, teachers’ comments on their teaching philosophies and practices (Appendix C), students’ comments on their progress (Appendix F), one teacher’s lesson journal (Appendix D), my classroom journals (Appendix G), and a list of intervention lesson topics (Appendix H). Aspects of classroom environments are identified in relation to dimensions of the QT model (Appendix B). Features of teachers’ attitudes, comments and practices are related to the Productive Pedagogies Characteristics list (Appendix A) of high- and low-scoring teachers (QSRLS, 2001).

In this section, spelling performance levels are measured in months and represent “spelling age” (SA). The spelling age of students can be different from their chronological age (ChrA) and it is the group of students who have a spelling age at least two years less than their chronological age on pre-testing (Below Average standard score) that are of greatest interest to this study.

Ideally, only the mean post-test spelling age (SA2) of non-intervention classes is equal to their mean predicted spelling age (PrSA) (SA1 + 5 months). It is expected that the mean post-test spelling age of the intervention classes is greater than their mean predicted spelling ages, which would indicate that the intervention students experienced a more effective spelling program than the non-intervention students during the intervention period of five months.
Students in each class are placed according to their pre-test spelling performance score in one of the three simplified standard score (StSc) categories previously described in Focus Question #1 namely, Below Average (BAv), Average (Av), and Above Average (AAv). According to the normative data collected for the TWS test instrument (Larsen et al., 1999) Below Average represents approximately 25% of students, Average represents 50%, and Above Average 25%.

There are similarities in classroom characteristics and also differences. All classes are mainstream male/female public primary school communities in urban areas on the outskirts of Sydney, and all have Year 5 students. However, the class profiles are not consistent in the student age mix such that there is one Year 4/5 class; one straight Year 5 class; and seven Year 5/6 classes. The difficulty in finding a sufficient number of Year 5 teachers interested in participating in the study, as described in Chapter 3 above, necessitated the extension of the study’s design parameters to include the spelling performance levels of Year 6 students. No Year 6 student experienced the individual testing regime such as the cognitive ability screening test, which was confined to consenting Year 5 students (SS/5) as per the research study plan.

The intervention teachers were asked to incorporate the intervention lessons into their weekly spelling lesson plan and to use no more time on spelling activities than normally utilised. It was also requested that they keep a journal of their spelling-related activities additional to the intervention lessons. Only Teacher 2 completed a journal, which is found in Appendix D. The teachers of the four non-intervention classes (Classes 6-9) were asked to continue with their usual planned spelling program. They were not requested to keep journals in order to avoid undue teacher focus on their spelling lesson practices and to reduce the study effect and social interaction threat to internal validity. Unfortunately, all non-intervention classes (NInv) were in schools where intervention lessons were taking place so it was not possible to isolate the non-intervention teachers from the intervention participants. The reasons for this situation are recounted in Chapter 3, above. I had to trust that any staffroom discussion of the intervention lessons’ content was minimal. It is most unlikely that any such exchanges did take place, with the possible exception of Teachers 1 and 7. It is probable that the main effect of the close proximity of non-intervention classes to intervention classes is that my weekly visits to the schools were a constant reminder that a study was taking place.
All teachers were asked to answer a list of questions about their teaching philosophies and practices at the end of the study (Appendix C) and their responses are referred to on occasion in this chapter. The response of Teacher 4 is incomplete; Teacher 3a/6 had supplied answers when he was the teacher of Class 6; and the second time-share teacher of Class 8 did not provide answers. Teachers 1, 4 and 5 (Classes 1, 4 and 5 respectively) provided a short verbal progress profile of each student in their class at the end of the intervention period (Appendix E). All Study Students (SS/5) were asked to comment on their progress (Appendix F) at the end of the study period and the intervention Study Student group was asked additional questions relating to how useful they found the intervention lessons.

Each classroom situation is described in turn and factors that might have affected students’ performances are identified. Teacher characteristics are related to the Queensland School Reform Longitudinal Study (QSRLS, 2001) findings on Productive Pedagogies Characteristics (Appendix A) and, where applicable, observations of the learning environments are from the QT model (NSW DET, 2003a) perspective.

The mean average pre-test spelling age (SA1) for all students in the study (n=207, which includes n=14 students at the upper limit of spelling age) is at least 139.4 months (which is 8.8 months above their mean chronological age (ChrA)). The mean predicted spelling age (PrSA) is therefore the mean SA1 plus the five months intervention period which is at least 144.4 months. The mean post-test spelling age (SA2) is at least 156.9 months; therefore the minimum mean improvement over the five month intervention period is 17.5 months, which is 12.5 months more than that predicted.

Spelling age is used for the following analysis of individual class performance, despite the disadvantage of the normative data upper limit, as it is metric data and therefore more suitable for the comparison of mean average scores than the standard score and percentile ranking. Additionally, the standard score category most affected by the upper limit is the Above Average group which is of less importance to this study than the Below Average and Average categories.
An introductory overview of relationships between variables is described by the following hypotheses:

1) \( H_1 = \) There is a relationship between progress in spelling age and Class

2) \( H_1 = \) There is a relationship between progress in spelling age and Class split into intervention/non-intervention groups

3) \( H_1 = \) There is a relationship between progress in spelling age and standard score category on pre-test (BAv, Av, or AAv) within each class

The two-value variable of “Progress Groups” is used for determining progress in spelling performance in the crosstabulations for all three hypotheses being tested, and these are: a) No-Progress and b) Progressed (two months or more progress beyond the predicted spelling age). The crosstabulation of Progress groups and Class results is shown in Table 35 and indicates the number of students in each condition.

Table 35
Progress Groups * Class Crosstabulation

<table>
<thead>
<tr>
<th>Class</th>
<th>Progress Groups</th>
<th>Total no. students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Total no. students</td>
<td>89</td>
<td>118</td>
</tr>
</tbody>
</table>

156
The hypothesis is accepted and there is a significant relationship between spelling age progress and Class ($\chi^2(8)$, $v=18.466$, $p=0.009$, 1-sided) at $p <1\%$ level. It is noted that three of the nine classes have more students in the No-Progress group than in the Progressed group although Classes 3 and 4 have approximately equal numbers and can be considered more or less in balance. A correspondence analysis reveals how the Classes and Progress groups relate and their order is as follows: Classes 7, 1, 2, 5 and 8 (Progressed); Classes 4 and 3 (near midline); and Classes 9, and 6 (No-Progress).

The hypothesis is amended as follows to relate analysis of spelling age progress to Classes defined by their intervention/non-intervention grouping:

$$H_1 = \text{There is a relationship between progress in spelling age and Class split into intervention/non-intervention groups}$$

This hypothesis is accepted at $p <5\%$ for the intervention group ($\chi^2(4)$, $v=7.940$, $p=0.047$, 1-sided) and also for the non-intervention group at $p <1\%$ ($\chi^2(3)$, $v=9.700$, $p=0.010$, 1-sided). Class 7 shows a very different distribution of students in relation to the No-Progress and Progressed groups compared to the remaining three non-intervention classes (Classes 6, 8, and 9), as shown in Table 36, and more resembles an intervention class in this respect.

The crosstabulation between Progress groups and intervention/non-intervention group results (with no separation of data by Class) is shown in Table 36 and indicates the number of students in each condition:

<table>
<thead>
<tr>
<th>Progress Groups * Intervention/Non-Intervention Groups Crosstabulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Progress Groups</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Inv group</td>
</tr>
<tr>
<td>Ninv group</td>
</tr>
<tr>
<td><strong>Total no. students</strong></td>
</tr>
</tbody>
</table>

157
The hypothesis is rejected and there is no significant relationship between progress in spelling age and intervention/non-intervention group ($\chi^2(1), v=0.769, p=0.232, 1$-sided). Although the results indicate that a greater proportion of intervention students (n=76; 64.4%) than non-intervention students (n=52; 58.4%) made progress in spelling age the difference between the two intervention condition groupings is too small to be significant.

One-Sample tests on the intervention and non-intervention group spelling age results were performed to test them against students’ mean chronological ages. They indicate that the differences between the mean pre-test spelling ages and students’ mean chronological ages (ChrA) are significantly different for both the intervention ($t(117)=1.829, p=0.035, 1$-tailed) and the non-intervention ($t(88)=2.612, p =.006, 1$-tailed) groups. These differences are even more significant ($p <0.1\%$) when the mean post-test spelling age differences from mean post-test chronological age are calculated: intervention $t(117)=5.120, p=0.000$; and non-intervention $t(88)=4.285, p=0.000$. Additionally, the mean spelling age progress of both groups are significantly different from their mean predicted spelling ages of SA1+5 months: a) intervention group: $t(117)=5.305, p=0.000$; and b) non-intervention group: $t(88)=3.300, p=0.000, 1$-tailed. It is therefore shown that not only were the levels of progress made during the intervention period by the intervention and the non-intervention groups significantly greater than those predicted but that both groups were significantly ahead of their mean chronological ages on pre-test. Either students were particularly adept at learning spellings during Term 1 and maintained a greater rate of progress than that predicted by the time interval of the intervention period, or they experienced increased opportunities to improve their spelling development as a consequence of their teachers’ greater focus on spelling performance since Term 1 in response to the impending study.

The statistics of the last hypothesis in this group to be tested, “$H_1 = $ There is a relationship between progress in spelling age and standard score category on pre-test (BAv, Av, or AAv) in each class,” are presented in Table 37 for greater clarity:
Table 37
Progress Groups * Pre-test Standard Score Categories * Class Crosstabulation

<table>
<thead>
<tr>
<th>Class</th>
<th>n=</th>
<th>Value=</th>
<th>P= (1-sided)</th>
<th>Significant Relationship?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Fisher's exact test</td>
<td>22</td>
<td>1.745</td>
<td>0.209</td>
</tr>
<tr>
<td>Class 2</td>
<td>Fisher's exact test</td>
<td>26</td>
<td>1.964</td>
<td>0.187</td>
</tr>
<tr>
<td>Class 3</td>
<td>Fisher's exact test</td>
<td>27</td>
<td>1.387</td>
<td>0.250</td>
</tr>
<tr>
<td>Class 4</td>
<td>Fisher's exact test</td>
<td>21</td>
<td>6.467</td>
<td>0.020</td>
</tr>
<tr>
<td>Class 5</td>
<td>Fisher's exact test</td>
<td>22</td>
<td>.745</td>
<td>0.345</td>
</tr>
<tr>
<td>Class 6</td>
<td>Fisher's exact test</td>
<td>14</td>
<td>2.975</td>
<td>0.113</td>
</tr>
<tr>
<td>Class 7</td>
<td>Fisher's exact test</td>
<td>24</td>
<td>8.560</td>
<td>0.007</td>
</tr>
<tr>
<td>Class 8</td>
<td>Fisher's exact test</td>
<td>24</td>
<td>1.656</td>
<td>0.219</td>
</tr>
<tr>
<td>Class 9</td>
<td>Fisher's exact test</td>
<td>27</td>
<td>3.363</td>
<td>0.154</td>
</tr>
</tbody>
</table>

The hypothesis is accepted for Classes 4 and 7 and there is a significant relationship between spelling age progress and pre-test standard score categories at p <5% and p <1% levels respectively. The preference is that no significant relationship is found as it indicates that progress in spelling age is not directly influenced by the pre-test performance levels and allows for another factor, such as particular lesson program experiences to be related to progress. Class 4 has the highest percentage (38.1%) of Below Average students (n=8), and Class 7 the lowest percentage (4.2%) which represents one Below Average student. Intuitively, it can be appreciated that the positive and negative loading of Below Average students influences the overall spelling progress outcomes of each of these two Classes.

Chi-Square analyses indicate that there are significant relationships between spelling age improvement and Class, and also when the classes are analysed per intervention/non-intervention grouping, but not per intervention/non-intervention group when there is no Class grouping. This leads to the conclusion that conditions in each Class have some influence on students’ spelling performance outcomes. The following sections seek to identify features of each Class that might possibly contribute to the spelling age gains of the students. Spelling performance and changes over the intervention period are described. Additionally, comments made by students, teachers, and me are recorded when appropriate (refer to Appendices B-F). Aspects of teachers’ practices and stated philosophies are related to Productive Pedagogies Characteristics (Appendix A) (QSRLS, 2001) and it is noted when intervention classroom environments demonstrate dimensions and elements of the QT model (NSW DET, 2003a).
The pre-test standard score category and the progress group of each student in the nine classes are identified.

4.2.1.3.1 CLASS 1

Class 1 comprises twenty-two Year 5 students (12 male and 10 female) of whom eight speak a home language other than English (unknown (n=3) as they are not SS/5 students). Teacher 1 is in her mid twenties and states that her main concerns in the classroom are management and “getting through the curriculum” (Appendix C-1). Her teaching style is mainly exposition and Teacher 1 initially demonstrated discomfiture with a more constructivist approach taken by me. As the weeks passed, however, we developed a workable team-teaching approach and her comment on the effectiveness of the lessons, expressed mid-way through the intervention period, is as follows: “Students like the different tasks. Spelling folders have been good and I will continue with them. I will also use some of the strategies in future teaching. It has been worthwhile – and more interesting for students” (Appendix C). It is probable that Teacher 1 would not have sought inclusion in the study but she did assent to the principal’s request. The students always behaved well during the lessons and their interest and involvement grew as they became used to the different teaching approach. (My journal is found in (Appendix G).

In Figure 8 on the following page and the equivalent figures for the other eight classes, students are assigned to the pre-test standard score groups and the difference between students’ post-test scores and their pre-test scores (spelling age progress) are indicated in progress groups. The positions of students who performed at the upper limit of spelling age on pre-test and maintained that level of performance for post-test are determined by the difference in their pre- and post-test number of correct words. It is a best guess situation. One additional correctly spelt word assumes “7-11 months” progress and more than one additional correct word indicates “12-23 months” progress.

The hypotheses for the findings produced by Fisher’s exact test that the figures represent are as follows:

\[ H_0 = \text{There is no relationship between students’ pre-test standard score categories of Below Average, Average, and Above Average and the levels of progress students made in this Class.} \]

\[ H_1 = \text{There is a relationship between students’ pre-test standard score} \]
categories of Below Average, Average, and Above Average and the levels of progress students made in this Class.

![Figure 8: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 1).](image)

The null hypothesis is rejected and the alternative hypothesis accepted. There is a relationship at $p < 0.05$ level between pre-test standard score categories of Below Average, Average, and Above Average and the progress Class 1 students made in spelling performance ($n=22, v=13.901, p=0.027$, 1-sided).

It is not clear why the two good Year 5 students (AAv) performed so poorly on post-test. One is a girl from a non-English speaking background and the other a boy (home language unknown). The girl is usually a very steady, capable student and the result is surprising, although to put it in perspective she regressed from a percentile rank of 91% to 74%. The boy is one of only three in the class who is not a Study Student and the teacher suggested that his mother was apprehensive about the results of any tests. The progress of the Below Average students is a positive finding as they all achieved above their predicted spelling age (PrSA). Two are of normal cognitive ability and that of the third Below Average student is unknown. Eleven Average students achieved twelve months or more progress.
The mean pre-test spelling age of Class 1 is 134.3 months (9.4 months above mean ChrA) and the post-test spelling age is >151.6 months, indicating a mean progress of >17.3 months in five months. The Below Average student with the lowest pre-test standard score (StSc=84) progressed seven months more than the predicted spelling age. The remaining Below Average students progressed 13 months and 19 months more than their predicted spelling ages and thereby moved into the Average standard score category on post-test.

A total of seventeen students (77.3%) made two months or more progress than their predicted spelling ages. Fifty percent (n=11) of Class 1 students’ scores are 24 months or more above their pre-test scores. The greatest advance is at least 54 months as this Above Average student scored higher than the upper limit of 210 months. Her teacher comments that:

Quite good already. Mature. Is aware of what can do and can’t do. Attitude has changed – has got lazy. Don’t always get the best from her. Some mistakes are laziness – not bothering. Has made small improvements but not great. Could do better (Appendix E: Student 19).

The student, on the other hand, considers that she progressed “heaps” in spelling, and “a lot” in reading and writing (Appendix F: Student 19). She is one of the four students in her class who always knew the meanings of the words she wanted to spell, rather than the majority who “sometimes” did and Student 19 found the multisensory strategy for learning new words useful.

To summarise these results, 77.3% of students in this class made at least two months more progress over the five months than was predicted. All thought they had made “a lot” of progress in spelling with the exception of two students who, according to their own assessment, made “a bit” (Student 2: made 19 months progress beyond PrSA) and “a little bit” (Student 11: progressed 37 months). A “small improvement” is noted by the classroom teacher for Student 2, and Student 11’s language difficulties (LOTE) are acknowledged. An impression is gained from the comments made that, although it is usually recognised when a student has made progress, Teacher 1 and the student might both underestimate the extent of the improvement in performance as scored by a formal spelling test.

My aim in the lessons was to encourage students to become more interested in words, to lose their fear of long words, to learn different strategies for learning words, and to think metacognitively about their learning (Appendix G). Whole class expository instruction practices were used on occasion as well as inquiry-based small group activities. In particular, whole class discussions took place about learning strategies, memorising techniques, and
attitudes to learning and spelling. Interestingly, when asked whether they always learned the meanings of words about half of the students admitted by a show of hands to learning spellings for tests without necessarily knowing the meanings. When the question was repeated at the end of the intervention period (Appendix F) seven students indicated that their behaviour had changed and that they were more interested in knowing meanings since the lessons. Students were encouraged to be involved in discussions and, as noted by Teacher 1, the students appeared to find the lessons interesting.

A multisensory method for learning spelling was demonstrated and practised as an alternative strategy to Look-Cover-Write-Check. According to Moats and Farrell (1999) “multisensory” is defined as “any learning activity that includes the use of two or more sensory modalities simultaneously to take in or express information” (p. 1). I requested Teacher 1 to actively encourage students to learn their spellings with the demonstrated method to see whether there was improvement in the weekly spelling test results. She reported that it certainly helped some children, one of whom got 100% correct spellings for the first time.

Lessons were prepared by me (Teacher 1’s preference) and briefly discussed prior to each lesson. Teacher 1 conveyed the impression that she would prefer me to conduct each lesson but I ensured that there was a role for each to play. Initially, I left the control of the lesson presentation to Teacher 1 but my perception was that learning opportunities were not being developed and that the time was under-utilised. Teacher 1 paced lessons to the slowest performers and the quicker students became less engaged whilst they waited for the lesson to proceed. Students were very concerned about knowing and following correct procedures and took a little time to adjust to having more autonomy over how they carried out activities and during teacher/student exchanges. Over the course of the two terms Teacher 1 became more comfortable with the different teaching styles that were more appropriate for the lessons I designed.

Under the circumstances of this study it is only possible to relate some aspects of the classroom experiences to the QT model as I could not adequately know the individual students, their prior experiences and the quality of their work. Nevertheless, the dimensions and elements of QT are addressed as follows:
1) INTELLECTUAL QUALITY: Topics were explicitly taught and adhered to for Deep Knowledge. Connections to other learnings were made through discussion and questioning. Present learning was consolidated with discussion and practice to assist deep understanding. Investigative tasks were designed to encourage Higher-order Thinking and an example for addressing Problematic Knowledge was the breaking down into morphemes and the re-assembling of antidisestablishmentarianism which encompasses political and social influences on word development. It was discussed that when the root establish is written with a capitalised first letter (Establish) then it has a different meaning and significance, for instance. The whole lesson time focused on words and language use (metalanguage) and activities such as proofreading encouraged deeper discussion. There was always a high level of Substantive Communication.

2) QUALITY LEARNING ENVIRONMENT: Engagement in the lessons was of a high order and High Expectations were conveyed by such activities as discussing word and morphemic origins and definitions. Group work encouraged Social Support and Self-regulation. Time limits did not allow for Student Direction in terms of time or pace of lessons, and assessment criteria was not addressed.

3) SIGNIFICANCE: Students were encouraged to actively participate in activities and to share their contributions (Inclusivity). Students’ Background and Cultural Knowledges were invaluable during discussions of words and language. Although Knowledge Integration with other KLAs was limited during these lessons there were efforts to link the learnings of the spelling lessons into coherent parcels of knowledge. These language lessons encouraged inclusivity, especially as there was a range of cultural backgrounds in the student population. Students spontaneously related incidences when they had demonstrated new learning in their home environments (Connectedness) and expressed pleasure when they felt they had told their parents facts they hadn’t known. There was little opportunity to explore Narrative during the study.

There was a high level of support for the QT model in this intervention situation, particularly in the greater demand for higher order thinking, more student interactions, and greater student participation. A more explicit focus was maintained than Teacher 1’s stated practice: “Questioning is not superficial – I encourage higher order thinking. This means that we go off onto
tangents – I follow curiosities and interests of students. I use what they enjoy as a starting point” (Appendix C). Teacher 1 was committed to her students’ social welfare but expressed little comment about their longer term educational needs. It is probable that students found the intervention lessons more cognitively challenging and varied than their usual spelling lessons.

The intervention lessons, carried out in a more interactive fashion than customary class practice, were perhaps discomforting for Teacher 1 at first but a successful working liaison between us developed. Teacher 1 “saw herself as an explainer of information”; “complained of the lack of time to get through the curriculum”; and “appeared to have a strong focus on content, rather than on skills or concepts”, features that are identified as low-scoring teacher characteristics by the QSRLS model (Appendix A). Other responses to questions on teaching philosophy and practices completed at the end of the intervention period convey an impression that more group work was carried out than at the beginning of the intervention period although a transmission model of lesson presentation continued to be the preferred method. Teacher 1 still “held that factors totally outside the teacher’s control largely ‘determine’ student outcomes” (Appendix A), as illustrated by part of the answer to Question 7 “How do you feel about the reading/writing/spelling achievement levels of your class?” (Appendix C): “I feel some are not achieving as well as they should be due to a variety of factors such as self motivation, self-confidence, parent encouragement, home life and previous school experience” (Appendix C-1). Teacher 1 does not concede that the intervention experience has affected her teaching decisions although it has been a reminder to focus more on individual performance:

I’m not sure if my teaching philosophy and behaviour have changed, but I do know that during this study I was reminded of important things that I as the teacher need to be focused on and continually aware of. I need to give more time to individual assessment and conferencing (Appendix A, Question 10).

Although Teacher 1 does not fully comply with the QSRLS (2001) high-scoring teacher characteristic “were willing to talk about their failings and about changes they had made to their teaching” she nevertheless has been more reflective about her teaching. To summarise, the intervention program in Class 1 has achieved positive outcomes in terms of student spelling performance, students’ attitudes to spelling and words, and has been an opportunity for the teacher to experience different teaching approaches. It is hoped that at least some of the students will continue to benefit from learning more strategies and will maintain their stated increased interest in the written English language. Although Teacher 1 does not concede
any changes to her practices she became more relaxed with the team-teaching arrangement and the more interactive lesson format than was her customary practice.

### 4.2.1.3.2 CLASS 2

There are twenty-six (n=26) students in Class 2 and equal numbers of Year 5 and Year 6 students, as well as equal numbers of each gender. Two Year 5 students speak a home language other than English and the status of the Year 6 students is not known. Teacher 2 is in her mid forties and takes an enthusiastic and committed approach to teaching. She has no interest in the weekly spelling test format or for setting homework as she feels that they are not productive methods of learning. This teacher considers that it is important to look at children’s work to determine their level of understanding but that routine marking takes responsibility for the work away from the students. Her approach to lessons is to plan what is needed for the student with the least understanding. She starts with the most able students so that they can soon work independently, and then gradually works down towards the students that need the most assistance. Students soon learn that their work is never finished as there is always somewhere further for them to go. Teacher 2 considers that she teaches from a constructivist perspective and that interactions with students comprise mainly open questions. This teacher was the only one in her school to have the confidence and interest to take part in the study, despite a strong urging to other teachers from the school principal.

Teacher 2 expressed a preference to conduct a ‘Teacher Best Practice’ intervention as she “had plenty of ideas to put into practice”. The only assistance required from me was the provision of resources such as Benchmark standards, a spelling development guide, and a brief discussion of possible topics for lesson planning. I was not present during her lessons and only occasional courtesy contact was made. In response to the instruction to teach spelling and word knowledge explicitly for one hour per week, and to teach for transference to reading and writing, this teacher suggested that two half hour sessions per week would be more suitable for her program. Although she usually employed a more integrative approach to teaching spelling, in conjunction with reading and writing, she was willing to focus more specifically on spelling for the allotted time in support of the study.

The mean pre-test spelling age of Class 2 is higher than that of Class 1 namely, $>139.15$ months rather than 134.3 months, influenced by the presence of Year 6 students. Three of the Year 6 students are at the $>216$ months level on pre-test. However, the mean pre-test spelling
age is only almost five months (4.9 months) above the mean pre-test chronological age (ChrA) for this class which indicates that there are some students who perform poorly. The mean post-test spelling age is >156 months and the progression from the mean pre-test spelling age is >16.9 months in five months. Five students have a post-test spelling age of >216 months, two more than on pre-test, and one is a Year 5 student.

In Figure 9 students are assigned to their pre-test standard score groups and their progress groupings are indicated:

![Figure 9: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 2).](image)

The null hypothesis is accepted and there is no relationship between pre-test standard score categories of Below Average, Average, and Above Average and the progress Class 2 students made (n=26, v=5.119, p=0.458, 1-sided). This is possibly because the progress levels of Below Average and Average students are spread across the range. The progress of four Below Average students is a positive finding, particularly the student who advanced 45 months.

To summarise, twenty students (76.9%) made two months or more progress in five months and three students remained at the upper performance limit. This level of performance was achieved by two more students on post-test, one of whom was in the Average category on pre-test. Eight students (30.8%) progressed in spelling age two years more than their pre-test
spelling age and the greatest advance is 72 months (Year 6 student in the Average StSc group on pre-test). Eleven students (42.3%) are clustered in the “12-23 months” progress range. The greatest progress made by a Year 5 student is >54 months (reached upper limit). He is a male Caucasian who was in the Above Average group on pre-test. The Below Average student who made no progress is the lowest academic achieving student in the class who has difficulty in staying on task. Only one Above Average student acknowledged that they had made progress (Appendix F) and no student stated that they knew the meanings of the words they needed to spell. The impression gained from student responses is that they felt that they had made definite progress in reading but were not aware of their progress in spelling and writing.

Teacher 2’s lesson journal is found in Appendix D. The emphasis of her lessons was to teach spelling as “word-knowledge” so that new knowledge was transferred to reading and writing, rather than “Learning spellings” as an isolated skill. Initially, students were usually placed in either an Extension or a Foundation group when they explored various topics, such as words with the long /a/ sound. Teacher 2’s ongoing reflections were recorded after each lesson and her summary at the end of the first intervention term is as follows:

*I don’t think this way of teaching spelling is any more effective in achieving transference than lists and weekly tests. I think the children’s reading may have improved – especially the lower readers – as they now have more idea about how different digraphs may sound. I think a more integrated approach is needed* (Appendix D).

There was less emphasis on differentiated group-work during the second term of the intervention period and students generally worked on whole class topics, often in pairs or small groups. For example, students were instructed to explore the word *democracy* and pool findings. Additionally, students were explicitly taught how to transfer rules and generalisations formed in spelling to written work, although Teacher 2 regretfully comments that “if the focus is removed they will immediately revert to old attitudes, that it’s the teacher’s job to correct their spelling (and other) mistakes” (Appendix D). I speculate that developing a sense of responsibility in students for their own work needs to be addressed earlier in their school careers as attitudes can be well established by the time they are in Years 5 and 6.

Teacher 2 is familiar with dimensions of the QT model and the following appraisal of her classroom practices is quoted verbatim from her written report, with the exception of some heading descriptors:
1) INTELLECTUAL QUALITY:

- **Deep Knowledge** – Routine lessons are based around a central concept – one for each level of understanding eg adjectives and nouns etc changing to verbs.
- **Deep Understanding** – (Problem solving) – Students use of deep knowledge not demonstrated in these lessons.
- **Problematic Knowledge** – Students construct knowledge eg Wk9 T3 – changing a word.
- **Higher Order Thinking** – Students apply, evaluate and synthesise knowledge eg Wk9 T3.
- **Metalanguage** – Students use language and provide commentary on language use eg Wk8 T3 – students telling everything they could about words.
- **Substantive Communication** – Students engage in conversations about concepts eg Wk8 & 9 T3 – discuss the words in groups.

2) QUALITY LEARNING ENVIRONMENT:

- **Explicit Quality Criteria** – Not demonstrated.
- **Engagement** – Students were engaged in the activities but were not necessarily displaying evidence that they were engaged in the learning.
- **High Expectations** – All students are ready to learn something. Evident in all lessons.
- **Social Support** – Strong positive support and respect. Evident in all lessons.
- **Student Self-Regulation** – Students require minimal disciplining. Evident in all lessons.
- **Student Direction** – Students direct the manner and level of activities – Not evident – Teacher directed except for lessons Wk 8 and 9 T3 where students told how much they know about the words.

3) SIGNIFICANCE:

- **Background Knowledge** – Not evident except Wk 8 and 9 T3.
- **Cultural Knowledge** – Not evident except lessons Wk 8 and 9 T3.
- **Knowledge Integration** – Not evident except lessons Wk 8 and 9 T3.
- **Inclusivity** – Lessons include and value the participation of all students – Evident in all lessons.
- **Connectedness** – Not evident.
- **Narrative** – Not evident.
Teacher 2 gradually refined her lesson format as the intervention period progressed. Had the QT criteria been available to us when the intervention took place, there would have been more evidence of meeting the criteria in her lessons. Notwithstanding the absence of QT resources, Teacher 2's lessons reflect an earnest attempt to provide intellectual quality in her teaching and a quality learning environment for her students.

Several of the Productive Pedagogies Characteristics of high-scoring teachers (Appendix A) identified by the Queensland study (QSRLS, 2001) are met by Teacher 2 (Appendix C). In relation to students and her teaching she states that “every child can learn well. If a child is not learning in the way I am teaching, then I must change the way that I am teaching. Teachers make the difference” (Question 1). She has very high expectations of students and firmly believes that everyone can learn. Assignments are very often open-ended so that students can explore to the extent of their choosing and, if she feels that particular students are capable of more than they are producing, will encourage them to delve deeper and further by ensuring that they know that she values their work. Teacher 2 is constantly monitoring her own teaching and students’ learning products and ensures that the learning needs of all students are addressed. She expressed regret that it was difficult to find a work colleague who was willing to discuss the theoretical and practical issues of teaching and was a little saddened that none of her peers at School B was interested in exploring why she was often able to assist some of the more challenged students in their learning.

Students in Class 2 made similar gains to students in Class 1. Class 1 students benefited during the intervention period by teaching that was closer to the QT ideal than their teacher’s normal practice and also that lessons had a more explicit focus on spelling. The teacher of Class 2 already practiced a high level of productive pedagogy. Her teaching of spelling, though, became more explicit during the intervention and had the additional aim of encouraging the transference of new spelling knowledge to reading and writing. She acknowledges that the different approach to teaching spelling produced positive results and is particularly pleased with students’ progress in the literacy areas of reading and writing. Contrary to Teacher 1, Teacher 2 has incorporated her new learning into her teaching repertoire and comments that:

I more clearly now see spelling as totally integral to reading and writing. I have now really looked at the results (ie the students’ transference of spelling strategies to their reading and writing) and can see that the way I teach spelling has made a difference (Appendix C, Q10).
Teacher 2’s results and attitudes to her teaching are impressive and the intervention has been true to a ‘Teacher-Best-Practice’ design. This is a high-scoring (QSRLS, 2001) teacher who mindfully provides a QT environment for her students and who operates in the classroom from a constructivist perspective.

4.2.1.3.3 CLASS 3

The arrangements for Class 3 were not straightforward as the classroom teacher took leave after the first term of the intervention period and was replaced by a casual teacher for the second part of the intervention. Their teaching styles and years of experience were very different and I was concerned about the effect this might have on student progress. The first word-list (Form A) of the TWS instrument was therefore repeated by sixteen (n=16) Year 5 students almost three and a half months after the first presentation. (The second word-list, Form B the post-test, was completed by all the classroom students at the end of the study, consistent with the practice for the other classes). The purpose of repeat testing with Form A was to document any progress in spelling performance made during the first part of the intervention period. It is acknowledged that repeating the test using the same word list after such a short interval (3.5 months) reduces the statistical validity; however it does provide an indication of progress. The measurement of performance taken is the mean average number of words spelt correctly by sixteen Year 5 students, as shown in Figure 10.

![Figure 10: Mean number of words (of 50) spelt correctly (students n=16) on pre-testing, after 3.5 months, and on post-testing.](image)

Figure 10 indicates progress in spelling development over time, and offers some assurance that students’ spelling performance is consistent with continued spelling instruction. For this age group and average ability level, each additional correctly spelt word represents
three months progress.

Class 3 (n=27) is a composite 5/6 class (Year 5=18 students and Year 6=9 students). It is one of three parallel classes in the same school, and the remaining two classes took part in the study as non-intervention classes (Class 8 and Class 9). Cognitive ability screening was carried out only on Year 5 Study Students (SS/5). Of the forty Study Students in School C (Classes 3, 8, and 9) fourteen are in the Borderline/Cut-off group of cognitive ability. Half of these children (n=7) are in Class 3. There are thirteen female (n=13) and fourteen male (n=14) students in Class 3. The home language status of Year 6 students is unknown and two Year 5 students speak a language other than English at home.

Teacher 3a/6 is male, in his mid forties, and a passionate lover of words. He is also the teacher of Class 6, a non-intervention class studied the previous year and in a different school. The inclination of Teacher 3a/6 is to teach creatively and to develop an interest in words in his students by such devices as a weekly “mystery word”, word learning projects and games, and by encouraging discussion and exploration involving words. During the school Term 1, Teacher 3a/6 conducted what he considered to be a conventional English language learning program. For school Term 2, the beginning of the intervention period, a more creative approach was taken and a “language rich” environment developed. Students were encouraged to find word and language learning fun and interesting, such that the room was increasingly adorned with student-produced word collections. This intervention can be described as a teacher-designed creative lesson program with teaching assistance provided by me, under the teacher’s direction. (My classroom journal is found in Appendix G). Students worked in five ability groups and different activities were planned for each weekly lesson. The atmosphere during these lessons was one of interest and industry. It is regretted that the program could not continue in this fashion for a second term.

It was less than a year since Teacher 3b, a young man in his early twenties, had completed his teaching degree and a deep knowledge of language had yet to be developed. The weekly lesson program continued during the second half of the intervention period. The program was intermittent during the second term of the study as only four lessons occurred because of Teacher 3b’s health problems or other organisational factors. I worked with Teacher 3b in the same relationship as with Teacher 3a/6 which meant that lessons were dependent upon his planning. Understandably, the level of work was less closely aligned with
students’ abilities as he had minimal teaching experience and little knowledge of the students. At times the students appeared under-stimulated and under-employed. Interestingly, the word-work of the previous term was removed from the classroom walls. A number of students were, however, self-motivated and after they had completed the set work they would either read independently or play games with neighbours using a dictionary.

The mean pre-test spelling age of Class 3 is 136.1 months (5.2 months above mean ChrA) and the post-test spelling age is >151.3 months, indicating a mean progress of >15.2 months in five months. Figure 11 indicates the difference between students’ post-test spelling age scores and their pre-test spelling age scores, cross tabulated with students’ standard score categories.

Although the null hypothesis is accepted, there is a relationship between pre-test standard score categories of Below Average, Average, and Above Average and the progress Class 3 students made at just above the p=5% level (n=27, v=12.895, p=0.053, 1-sided). Possibly the cluster of mixed standard score categories in the lower three progress groupings weakened the relationship. The number of students in the lower ranges of post-test performance is disappointing but understandable in view of the change of teachers halfway through the intervention period.
The Above Average student in the “12-23 months” grouping had reached the upper spelling age limit and two others’ scores regressed by one and two years. One Average male student reached the upper limit and had progressed >82 months. Two other Average students who made substantial progress (each 64 months), one male and one female, are both from English speaking backgrounds. The Below Average student (male) who made 24 months progress is at the Cut-off level of cognitive ability and he moved into the Average standard score category on post-test. Only 48.1% of students (n=13) progressed at least seven months more than the pre-test spelling age, and of these eight students (29.6% of total in class) advanced two years or more in spelling performance. Comments made by the Study Students group (Year 5 students) were generally positive (Appendix F). They reported that they enjoyed learning about strategies and words, and two of the eighteen of these students in this class referred positively to the teaching of Teacher 3a/6.

The contrasting teaching styles, confidence and enthusiasm for language of the two teachers were very apparent and influenced the ambience and student behaviour in the classroom during the lessons (Appendix G). It is doubtful that Teacher 3b would have volunteered to be part of the study under other circumstances but nevertheless supported it as well as he could. His own lack of depth of knowledge about the English language and linguistics made the situation more challenging for him although we worked together well in a co-operative and respectful manner. It is difficult to discuss the teaching of Teacher 3b in terms of the QT model as I observed very few instances when QT dimensions were well demonstrated. In contrast, the following relates to the teaching environment created in the first part of the intervention period by Teacher 3a/6:

Students were explicitly made aware of the purpose of each lesson both verbally and in writing and, if appropriate, an initial discussion established connection to prior learning. The following describes the third lesson with this teacher and illustrates how dimensions of the QT model can be identified in his teaching practice:

1) INTELLECTUAL QUALITY: Students demonstrated Deep Knowledge and Deep Understanding when they had to decide which spelling rule or theme was being illustrated. It involved exercising Problematic Knowledge and High-order Thinking skills. They worked in a team for Substantive Communication and used Metalanguage when describing their findings.
2) QUALITY LEARNING ENVIRONMENT: The students were explicitly made aware of the quality (Explicit Quality Criteria) of work required before they wrote up their findings. This class was always fully engaged in the lessons presented and worked with interest and intent in a self-regulated fashion. High expectations were communicated and the environment conducive to positive social support. Student direction was not a strong feature of these spelling lessons as they were structured to the needs of the study.

3) SIGNIFICANCE: Lessons built on prior background knowledge and exploration of words provided opportunities to incorporate cultural knowledge and promote inclusivity. Knowledge integration, connectedness, and narrative were not strong features of these lessons.

There was a high level of congruence with the dimensions of the QT model and this teacher’s answers (Appendix C) to the set of questions presented to each teacher indicates a high probability that all aspects of the model are supported by his usual classroom practices. (The questions were answered one year prior to these lessons when Teacher 3a/6 was the teacher of Class 6).

Not surprisingly, Teacher 3a/6 demonstrates characteristics of high-scoring teachers (QSRLS, 2001) in the productive pedagogies list (Appendix A). A learning environment that encouraged students to take risks and value their work was created. Children’s learning needs were central to planning and a variety of teaching approaches were taken to cater for student diversity. Discussion with other teachers was not witnessed by this author but he was very willing to “engage in professional conversations” (high-scoring teacher characteristic) with me in relation to the study and gave the project enthusiastic support.

The weekly visits to this classroom were instructive and they demonstrated very clearly the power and influence of an impressive teacher. There was a decline in students’ behaviour as the second part of the intervention progressed, particularly that of the boys. The more able students were clearly not being given sufficiently challenging work. Students expressed disappointment when the intervention period ended as they had enjoyed the diversions from normal classroom routines.
**4.2.1.3.4 CLASS 4**

The lesson presentation platform for Class 4 and Class 5 was a computer controlled Team Learning System (TLS), marketed as Zing (Findlay, 2003). It was a resource of the school and set-up in a dedicated room where tables were arranged in a horseshoe pattern. Students worked with one keyboard between two or three students and their products were on public display on one large projection screen visible to all students. The system was run by a laptop computer and I pre-planned the lesson program. All products generated during the lesson were stored and it was possible to re-access each team’s work for assessment and evaluation purposes. The students of Classes 4 and 5 had some prior experience with the system, although limited, but the design of lessons for the intervention was a novel approach to spelling instruction and this particular instruction medium. Although only a limited number of schools had this resource, it was nevertheless available on the market and subject to schools’ budgetary choices.

This is an intervention that utilises computer technology and promotes working with others to produce a result. Students gain confidence in finding that others also make mistakes and exhibit pride when they themselves succeed. The different mini-lesson format and student team arrangement expanded the opportunities for success to be available to all and not just the most able few. In fact, students participated in setting the rules and expressed preferences for various activities and topics. Features of this intervention are not confined to a TLS but can be adapted to work successfully using other technology such as overhead projectors, PowerPoint presentations in the classroom, or Word documents in a school computer laboratory.

Class 4 and Class 5 experienced the same lesson per week as each other, first Class 4 and then after recess, Class 5. There were three Year 5/6 classes in the school and the top scoring students were in one class that did not take part in this study. The remaining students had been randomly assigned in terms of performance ability to Class 4 and 5 (Years 5 and 6) although the Class 5 teacher volunteered to have a greater share of the more disruptive students. Two Year 5 students in Class 4 are in the Borderline/Cut-off group of cognitive ability, compared to six students in Class 5. Apart from that bias in favour of Class 4, the only difference between the two classes is the classroom teacher. I designed the lessons (teachers’ preference) and operated the technology. Each teacher was encouraged to actively participate in the lessons in order to enrich the learning experience for students as the teachers were familiar with their students’ literacy needs and abilities.
The teacher of Class 4 was in her early sixties and retired from the school at the end of the school year the intervention took place. Teacher 4 was a reluctant participant in the study initially but admitted at the end of the intervention that it had been worthwhile. Although she states in her answers to the research questions (Appendix C) that her teaching philosophy encompasses child-centred learning, my observations when in her classroom and my experiences during the intervention lessons, suggest a greater comfort level with “chalk-and-talk” presentations.

There are twenty-one students in Class 4 (n=21) of whom fourteen are male and seven female. It is a composite 5/6 class with twelve Year 5 and nine Year 6 children. Two students speak a language other than English at home and six are English-only speakers. The status of the remaining thirteen children is not known as they are not in the Study Student group. The mean pre-test spelling age of Class 4 is 132.3 months (1.9 months above mean ChrA) and the post-test spelling age is >143.4 months, indicating a mean progress of >11.1 months in five months. Spelling performance levels in relation to the pre-test spelling age are shown in Figure 12.

![Figure 12](image)

*Figure 12: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 4).*

The null hypothesis is rejected and the alternative hypothesis accepted. There is a significant relationship at the p <1% level between pre-test standard score categories of Below
Average, Average, and Above Average and the progress students made in spelling age for Class 4 (n=21, v=15.932, p=0.008, 1-sided). A possible explanation for the significant relationship result is that ten of the twenty-one students (47.6%) are concentrated in the No-Progress category. Additionally, the “12-23 months” and the “24-35 months” progress groupings comprise only Below Average students. This progress of the Below Average students, plus the one male Below Average student (at the Cut-off level of cognitive ability) who progressed 45 months, is a positive finding. The three Above Average No-Progress students were at the upper spelling age limit on pre-test. The cognitive ability of three of the No-Progress Average students is known and they are all in the normal category. The greatest progression (63 months) was achieved by a Year 5 female student who moved from the Average standard score category on pre-test to the Above Average category on post-test.

The Below Average students report that they know more words and are more interested in learning about words – "a fun way to learn". The disconcerting result is the number of Average students who did not progress. Three are Year 6 students and three are Year 5 students. The latter are Study Students (SS/5), two males (nos. 58 and 60) and one female (no. 56), who believe that they can spell a lot better since the lessons. Their teacher considers no. 58 to be a “slow learner”, no. 60 to be “a bit vague”, and no. 56 to be “a silly girl – giggles” (Appendix E).

In summary, 52.4% of students (n=11) in this class made at least two months more progress over the five months than was predicted. Ten students (47.6%) made 24 months or more progress than their pre-test spelling age scores and two of these students were in the Below Average category on pre-test. The progress of the Below Average students is a positive result but that of six Average students who did not progress is disappointing. Student comments do not identify reasons for the lack of progress; indeed they indicate that the lessons were enjoyable and helpful to them. The students always worked well. My journal for this intervention is found in Appendix G and lesson topics are listed in Appendix H.

There is a high level of congruence with the QT model in the dimensions of Intellectual Quality and a Quality Learning Environment.

1) INTELLECTUAL QUALITY: Deep Knowledge and Deep Understanding were demonstrated on many occasions for example, the reason for the different spellings of license and licence. Problematic Knowledge and High-
order Thinking skills were employed during proof-reading exercises. Metalanguage and Substantive Communication occurred when students consulted with each other and when they discussed each other’s contributions on the screen.

2) QUALITY LEARNING ENVIRONMENT: Explicit Quality Criteria were made clear to the students before each activity and this was open to negotiation at times. Evidence of Engagement was constantly on display on the screen and a strong sense of Social Support developed. Students had High Expectations of themselves and their partners, particularly as their products were on public display. Students required minimal disciplining and worked hard at the activities (Self Regulation). There was evidence of Student Direction when they were consulted about the type and focus of activities for the lessons as they responded with positive and constructive suggestions.

3) SIGNIFICANCE: Background and Cultural Knowledge were evident during discussions about words and their origins, especially when this extended beyond Greek and Latin roots. Inclusivity was an important component of these lessons. Knowledge Integration and Connectedness were not evident and although there was some opportunity for Narrative it was not a prominent feature.

The QT model is well supported by the Zing TLS platform as it engenders social and interactive learning. The students most definitely appeared to learn from others efforts and gradually realised that it was alright to make mistakes as everyone else does also. They displayed a motivation to do well and public affirmation became a bonus. There was a sense that all participants, including the teacher and me, were a team (particularly during the Class 5 lessons).

It is difficult to identify Productive Pedagogies Characteristics in Teacher 4 under the circumstances of this intervention as I was the principal lesson presenter. (Teacher 4 declined to take control of the lessons). Occasional visits to the classroom of Class 4 indicated Teacher 4’s preference for transmission style of lesson presentation and the students were often completing blackline masters. She exhibited discomfiture with the level of student interaction generated during the intervention lessons and needed constant urging from me to expand on the lesson content to accommodate her students’ level of understanding. I was not sufficiently
familiar with the students to conduct the lesson without this assistance. Although Teacher 4 did not indicate that she would welcome any discussion about the intervention program, she did acknowledge that her initial reluctance to participate in the study was unwarranted.

Whilst the progress of Below Average spellers is very encouraging, that of the Average level students is not. If the results from Class 5 are similar it indicates that either the lesson content or format, or both, are not fulfilling students’ learning needs. If Class 5’s results are an improvement on Class 4’s then it indicates that the teachers’ contributions to the lessons influenced students’ learning outcomes.

4.2.1.3.5 CLASS 5

Lesson plans with Class 5 were a repeat of those presented to Class 4 and lessons followed the Class 4 session. The teacher for Class 5 was in her mid-fifties and very flexible in her approach to teaching. Her attitude to the study was one of interest and co-operation. Teacher 5 is knowledgeable about language and followed up issues raised in the intervention lessons when back in the classroom. Her students wanted to adapt some of the intervention activities to classroom conditions and they were given full support.

Of twenty-two children in the class (n=22) twelve are male and ten are female; seven are English only speakers and four LOTE (n=11 unknown status). This composite 5/6 class has twelve Year 5 students and ten Year 6 students. The mean pre-test spelling age of Class 5 is 138.6 months (6.3 months above mean ChrA) and the post-test spelling age is >159.3 months, indicating a mean progress of >20.7 months in five months. Spelling age progress groupings are shown in Figure 13:
The null hypothesis is accepted and there is no relationship between pre-test standard score categories of Below Average, Average, and Above Average and the progress Class 5 students made (n=22, v=6.973, p=0.416, 1-sided). There are only two Below Average (spelling performance) students on pre-test in Class 5 compared to eight in Class 4, even though the classes were ability-matched at the beginning of the school year and Class 5 has a greater number of Year 5 Borderline/Cut-off (cognitive ability) students. As the mean spelling age/chronological age difference on pre-test for Class 5 was 4.4 months ahead of that of Class 4, it could indicate that Teacher 5’s teaching in spelling was more effective than Class 4’s experience during Term 1, before the intervention program commenced.

The predominant group is Average students (n=18) who occur across the range of progress groupings. All seven students who did not progress are Year 6 students, with the exception of one Year 5 Above Average student who declined to be a Study Student (SS/5) and one Average Year 5 student (No. 74) who rarely attended the classes as he had remedial mathematics lessons during the spelling lesson time. Fifteen students (68.2%) in Class 5 made two months or more progress beyond the predicted gain. Seven students (31.8%) progressed at least 24 months.

Interestingly, four students who were in the Average group on pre-test spelling age made sufficient gains to reach the upper limit of the spelling age score on post-test. The greatest
improvement above the predicted spelling age is sixty-seven months, achieved by two female Year 5 Australian born students (Nos. 71 & 72). The most unexpected advancement in post-test spelling age (45 months more than pre-test) is the Below Average student (No. 69) in the “=/> 36 months” grouping. Students in this class were retested with the post-test list of words after a two week interval (to informally obtain reassurance about the test reliability) and this student’s progress was maintained. In his comments he did not consider that he had made much progress in spelling but did acknowledge progress in reading and writing. Student No. 69 found that learning about word meanings was of benefit and “liked lessons. Helped learning (some). Would like more” (Appendix F). His teacher’s remarks about him (Appendix E Student 69) are:

Well below average student. Mildly intellectually handicapped (IQ 65-70). Literacy skills: quite a good reader but poor comprehension. Can write recount but can’t understand structure of other genres. Lessons appealed to him. Better for him that pressure not on him. [Started to shake when found he had made so much progress in his spelling performance].

It is impossible to know whether the combination of the lesson emphasis on learning word meanings, explicit teaching, use of technology, and a co-operative learning environment was responsible for assisting this student to improve his performance rather than any single factor. Nevertheless, another positive result is that Student 69 has become increasingly more willing to participate in class discussions and to offer a contribution in other areas of learning.

Although the overall percentage of students (n=15) who progressed is 68.2%, this includes 83.3% (n=10) of all Year 5 students (n=12) in Class 5. As noted earlier, one of the remaining Year 5 students was seldom present in the lessons and the other declined to take further interest in the study. It is difficult to find a reason for the greater progress made by Year 5 students than their Year 6 colleagues. The possibility that the Year 5’s interest was heightened by their parents’ awareness of the study and interest in any results of progress is not supported by the results from the parallel intervention class (Class 4) as only 58.3% of Year 5 students in Class 4 made two months or more progress more than the predicted spelling age (52.4% for whole 5/6 class).

Although Classes 4 and 5 have matched student groups, it is possible that their responses to their different classroom environments, and the unique dynamics of the students’ groups, influenced their learning outcomes. The disappointing lack of success of Class 4 Average students is not mirrored in Class 5 and suggests that lesson design is not responsible for the Class 4 result. One factor was undoubtedly different in Class 4 compared to Class 5 and that
was the respective teachers' interactions with their students and their responses to the pedagogic opportunities afforded them by the intervention program of lessons.

The lessons and learning environment were discussed in the QT section of Class 4 as the students in each class were subject to the same program. This intervention demonstrates many dimensions of the QT model. Students’ comments (Appendix F) suggest strongly that they enjoyed working with the Zing TLS and the opportunity to work with others. Student No. 73 stated that she “thought I was the only bad speller – now know others make mistakes.” She comments further that she learnt “not to be shy - … learnt to bother to learn words. Learnt to really try.” Several of the students remark on their progress in reading and writing and indicate that learning more words and about words has assisted in this development.

There was a marked contrast in the ambience of the Zing room with the different teachers. Teacher 4 was stilted and uncomfortable (Appendix G), particularly at the beginning of the intervention period, and rarely used an opportunity to extend students’ learning. Her teaching strategy did not take advantage of the Zing technology for team learning; rather it was employed as one would use an overhead projector to support a transmission style of teaching. Teacher 5 of Class 5 on the other hand, adapted easily to the intervention format and range of activities. Whilst I outlined the mini-lesson, Teacher 5 would skilfully provide support and expand the learning opportunity. Children in both classes worked well and enjoyed the lessons. Yet it was clear that Class 5 children felt more able to take risks in such a public domain and also to negotiate more robustly with their partners to arrive at a final product. They worked with industry, interest and enthusiasm.

Teacher 5 engenders many of the characteristics of high-scoring teachers on the QSRLS Productive Pedagogies list (Appendix A). She certainly considers herself “responsible for providing opportunities for student learning”. Rather than labelling herself a facilitator of learning, her approach is better described as a “teacher who facilitates learning” as she blends traditional practices with more progressive styles when she considers them the more productive. Her students show her obvious respect yet are comfortable to state their point of view. The rules of the intervention lessons were negotiated between all parties and challenged as occasions arose. Teacher 5 has a sound knowledge and interest in the English language which deepened the integrity of the intervention lessons and expanded the learning opportunities.
All five intervention classes progressed more than five months in mean spelling age over the intervention period. Factors that might have influenced the progression of each class will be discussed in Chapter 5, in conjunction with the results from the spelling performance changes of the non-intervention classes.

NON-INTERVENTION CLASSES

It is expected that the mean spelling age progression of the non-intervention classes will be greater than the predicted level for five months schooling but less than the intervention group’s spelling development. This assumption is based on the premise that there is a study effect and social interaction threat to internal validity (Trochim, 2004). It is probable that non-intervention teachers took more interest in their spelling programs than is usually the case because of their participation in the spelling study. The classroom situations and teaching practices in relation to the QT model and Productive Pedagogies Characteristics of the non-intervention group are not discussed as I had insufficient contact with non-intervention teachers to make comments. However, their answers to the set of questions found in Appendix C will be referred to as necessary.

4.2.1.3.6 CLASS 6

The teacher of non-intervention Class 6, Teacher 3a/6, is also the teacher for the first part of the intervention period for Class 3 carried out the following year, in 2004. He is male and in his mid forties. Teacher 3a/6 has taken a keen interest in the study as he is interested in words and language and tries “to create a ‘literacy-rich’ environment” (Appendix C). He gives students spelling homework four nights per week and they have one and a half hours of structured spelling lessons per week. Some students also have individual and small group spelling tuition for about one hour per week. This teacher comments that the literacy level of his class is quite low and that “a significant number of children [seven of the Year 5 students] attend lessons with the STLD or have individual reading programs.” There are fourteen (n=14) Year 5 students in the 4/5 composite class population of whom twelve (n=12) are Study Students. Only data from Year 5 students are included in this study.

The mean pre-test spelling age of Class 6 is 116.1 months which is twelve months below their mean chronological age. This is the only class in the study to have a pre-test spelling age
less than their chronological age. Interestingly, the only Above Average (AAv) student, a girl of Australian background, made at least forty-two months progress in five months and reached the upper spelling age limit of seventeen years and six months. The mean post-test spelling age is >125.1 months and the mean progress is nine months spelling age in five calendar months which is four months more than the predicted spelling age. Spelling performance progress groupings are shown in Figure 14.

![Figure 14: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 6.)](image)

The alternative hypothesis is accepted. There is a significant relationship at p <5% between pre-test standard score categories of Below Average, Average, and Above Average and the progress Class 6 students made (n=14, v=10.166, p=0.026, 1-sided). The Above Average group is poorly represented in this student cohort. These results confirm Teacher 3a/6’s assertion that the performance levels in his class are low although four students progressed a year or more beyond the predicted five months and equalled their chronological age. One other student, the Above Average student, progressed even more. When the progress of the Above Average student is included the mean net progress is four months more than predicted and when this student is excluded from the calculation the mean net progress of the remaining 13 students is 1.4 months.

In summary, 42.9% of students (n=6) in this class made at least two months more progress over the five months than was predicted. Only one student (who progressed ten months) felt he had made “big progress” (Appendix F – Student 81) and the Above Average
student who reached the upper spelling age limit is the only student (7.1%) to progress more than two years in this class. She thought she had progressed “a little but not much” (Student 79), and the remaining students were unsure about any change in performance.

4.2.1.3.7 CLASS 7

Class 7 comprises nine Year 5 and fifteen Year 6 students (n=24). Teacher 7 is in her late twenties and gives the impression of interest and commitment to her students. She believes that spelling is important to reading and writing outcomes “however, [it is] not considered vital in achieving reading and writing activities” (Appendix C, Q4). Spelling lessons take place for half an hour per day and her spelling program (Q5) appears to have the long-established format of graded groups, word-lists, a weekly rule, a weekly test, plus games and spelling activities. The main word learning strategy taught is Look-Cover-Write-Check.

The mean pre-test spelling age of Class 7 is 149.3 months (13.3 months above mean chronological age) and the post-test spelling age is >172.9 months, indicating a mean progress of >23.6 months in five months. Spelling performance progress in relation to pre-test levels is shown in Figure 15:

![Figure 15: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 7).](image-url)
The null hypothesis is rejected and the alternative hypothesis accepted at \( p < 0.05 \) level. There is a relationship between pre-test standard score categories of Below Average, Average, and Above Average and the progress students made for Class 7 (\( n=24, v=14.312, p=0.048 \), 1-sided). Most of the higher academic achievers in School A are in this class.

Class 7 has the greatest progression in spelling age of all nine classes in the study. Twenty students (83.3\%) progressed two months or more beyond their predicted spelling age, and ten students (41.7\%) progressed at least 24 months. One Year 6 student who was at the upper spelling age limit on pre-test maintained that level on post-test. One of three students who reached the upper spelling age limit on post-test is a Year 5 female student who progressed 72 months in five months. The Below Average student progressed only three months in spelling age after five months in the class. Only four students in this class are Study Students, three of whom report that they have made progress in spelling (9, 27, and 39 months progress). The fourth (female) who admitted to making “maybe a little” progress (Appendix F, Student 90) gained 33 months in spelling age.

Teacher 7's teaching strategies achieved very good results with this class. Students had two and a half hours of spelling instruction per week and possibly this teacher’s predominantly Direct Instruction style suited the more advanced academic level of the students (but not the Below Average student). It is also possible that Teacher 7 was explicit and organised in her teaching of spelling as she comments about taking time and effort to create reading stations. Perhaps this attention extends also to spelling.

4.2.1.3.8 CLASS 8

Class 8 had one teacher for two days (Teacher 8a) and Teacher 8b for three days per week. Both are female teachers in their late thirties. Questions relating to teaching philosophy and strategies (Appendix C) are answered by Teacher 8a. One hour is spent on spelling instruction during her two days of working and it is unclear how much time is spent on spelling by Teacher 8b but there is a high probability that their spelling regimes are compatible. Students are assigned to ability groups and are taught spelling techniques and grammar. They are encouraged to transfer learning to writing across the Key Learning Areas. Teaching strategies are focused on child-centred learning and catering for differences.
The mean pre-test spelling age of Class 8 is 141.8 months (12.8 months above mean chronological age) and the post-test spelling age is >152.5 months, indicating a mean progress of >10.8 months in five months. The difference between students’ post-test spelling age scores and their pre-test spelling age scores are shown Figure 16:

![Graph showing student count for each pre-test standard score category and spelling age progress grouping (Class 8).]

**Figure 16:** Number of students in each pre-test standard score category and their spelling age progress grouping (Class 8).

The null hypothesis is accepted. There is no relationship between pre-test standard score categories of Below Average, Average, and Above Average and the progress students made for Class 8 (n=24, v=9.849, p=0.210, 1-sided). The achievement spread of the Average group is fairly even and four in this category (16.7% of students in Class 8) are the only students to progress two years or more. Four of the seven Below Average students made no progress beyond their predicted spelling ages. The greatest progression of a Below Average student is 15 months. Fourteen students (58.3%) progressed two or more months beyond their predicted spelling ages.

Comments made by the students (Appendix F) are generally very positive about their progress. In view of some other students’ more muted response to this question in other classes it is a possibility that there was a greater focus on spelling in Class 8 during recent times than had previously been the case.
4.2.1.3.9  CLASS 9

Teacher 9 is about forty years of age and has a very keen interest in literacy standards. She believes that “spelling is integral to reading/writing outcomes and provides/promotes skills of engagement” (Appendix C). Her dedicated spelling lessons are about thirty minutes per day (2½ hours per week). The most common strategy that students use for learning the spellings of words is Look-Cover-Write-Check.

The mean pre-test spelling age of Class 9 is 146.9 months (16.7 months above mean chronological age) and the post-test spelling age is >157.6 months, indicating a mean progress of >10.7 months in five months. Spelling performance progression levels are shown in Figure 17:

![Figure 17: Number of students in each pre-test standard score category and their spelling age progress grouping (Class 9).](image)

The null hypothesis is rejected and the alternative hypothesis accepted. There is a relationship at p <5% level between pre-test standard score categories of Below Average, Average, and Above Average and the progress students made for Class 9 (n=27, V=14.233, p=0.023, 1-sided). Whilst it is possible to appreciate that this pattern of the levels of progress by the different groups is unlikely to occur by chance, it is difficult to find a satisfactory explanation for these findings. The failure to progress by fifteen of the twenty-seven students could possibly be related to their high pre-test scores.
Three of the students at the upper spelling age limit on pre-test made no further progress in the number of words spelt correctly. Twelve students (44.4%) progressed two or more months beyond their predicted spelling age, and 22.2% (n=6) progressed 24 months or more. The greatest gains in spelling age on post-test were made by three Average students (75, 75 and 60 months). The latter student is pleased to be able to spell more “tricky” words (Appendix F, Student 104). Three Below Average students made progress of 12, 15 and 21 months.

Class 9 was the most advanced class in mean spelling age beyond their mean chronological age (+16.4 months) at the beginning of the study yet had the greatest number of students (n=15) who failed to make further progress during the intervention period. Comments on their progress (Appendix F) made by students range from “a bit” (Student 107) to “a lot – learn more words more quickly” (Student 112). Student 103 considered that she is “not good at spelling. Sort of made progress” and was seven months behind her chronological age on pre-test and eighteen months ahead on post-test, an improvement of twenty-five months in five months. It can be speculated that spelling performance improvement was a class focus during the first school term and, whilst twelve students did improve during Terms 2 and 3, other students had difficulty in showing further gains on their pre-test spelling ages during the intervention period.

In summarising the performance of the non-intervention group, it is shown that all four non-intervention classes also progressed more than five months in mean spelling age over the intervention period and that Class 7 made the greatest progress in spelling age of all classes in the study (23 months). Correlations and a paired samples t-test, as shown in Table 38 and Table 39 respectively, are utilised to determine whether the increase in mean spelling age from pre-test (SA1) to post-test (SA2) is significant for each class.
Table 38
Paired Samples Correlations for Each Class

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>22</td>
<td>.635</td>
<td>.001</td>
</tr>
<tr>
<td>Class 2</td>
<td>26</td>
<td>.882</td>
<td>.000</td>
</tr>
<tr>
<td>Class 3</td>
<td>27</td>
<td>.714</td>
<td>.000</td>
</tr>
<tr>
<td>Class 4</td>
<td>21</td>
<td>.761</td>
<td>.000</td>
</tr>
<tr>
<td>Class 5</td>
<td>22</td>
<td>.764</td>
<td>.000</td>
</tr>
<tr>
<td>Class 6</td>
<td>14</td>
<td>.917</td>
<td>.000</td>
</tr>
<tr>
<td>Class 7</td>
<td>24</td>
<td>.511</td>
<td>.011</td>
</tr>
<tr>
<td>Class 8</td>
<td>24</td>
<td>.832</td>
<td>.000</td>
</tr>
<tr>
<td>Class 9</td>
<td>27</td>
<td>.829</td>
<td>.000</td>
</tr>
</tbody>
</table>

The correlations for all classes are significant. Correlations are only of moderate strength for Classes 1 (Inv) and 7 (NInv) but are high for the remaining classes.

Table 39
Paired Samples T-Test for Each Class

<table>
<thead>
<tr>
<th>Class</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (1-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 4</td>
<td>SA1 &amp; SA2</td>
<td>-11.143</td>
<td>26.276</td>
<td>5.734</td>
</tr>
<tr>
<td>Class 5</td>
<td>SA1 &amp; SA2</td>
<td>-10.667</td>
<td>26.145</td>
<td>5.032</td>
</tr>
</tbody>
</table>

Nine class sample sizes range from 14 to 27 students making a total of 207 students. The mean post-test spelling ages (SA2) are significantly higher at for all nine classes, particularly for Classes 2, 5, and 7 which are at p <0.1% level.

Throughout this chapter, students have frequently been grouped according to their pre-test standard score categories of Below Average, Average, and Above Average. Students in the
Below Average category have a pre-test spelling age of two years or more below their chronological age. Perhaps another useful measure of how well students have responded to a spelling program is to note the difference in the number of students who have a spelling age no more than six months behind their chronological age. The number of intervention students that fit this description increased from n=71 (60.2%) to n=86 (72.9%); and the number of non-intervention students similarly categorised increased from n=53 (59.6%) to n=58 (65.2%). The percentage increase for the intervention group is 12.7% of intervention students (n=15) compared to 5.6% (n=5) of non-intervention group. The pre-test percentages for the two groups are very similar (Inv 60.2%; NInv 59.6%) yet on post-test there is a difference of 7.1%.

4.2.1.3.10 THE NO-PROGRESS GROUP

It is as important to identify factors that influenced students’ failure to progress in spelling over the intervention period as it is to understand features of the learning environment that led to successful outcomes. After all, such failure indicates that teaching has not been effective in this area for a number of students for half of the school year. Although it is difficult to think in terms of children regressing in their learning as that implies un-learning, it is perhaps possible to discuss regression in terms of their spelling performance scores. For brevity, this group of students (n=79) is called the “No-progress” group and is represented in Figure 18 as the number of students in each class who did not reach a post-test spelling age score of seven months or more above their pre-test spelling age score. As such, they did not make at least the five months (plus one month margin for error) progress predicted by the intervention period.

![Figure 18: Number of No-Progress students per class, categorised by their pre-test standard score levels.](image)
The total (n=79) represents 38.2% of students in the study comprising intervention (n=42) and non-intervention (n=37) students. These are 35.6% of the intervention group and 41.6% of the non-intervention group respectively. The greatest number of intervention No-Progress students are in Class 3 (n=14), the class that had the disruption of a change in teacher after one term. Class 9, a non-intervention class, has fifteen No-Progress students. This classroom also has the greatest difference in students’ pre-test mean spelling age in advance of their mean chronological age, which might indicate that some of these students had reached their peak spelling performance level in relation to their cognitive maturity during Term 1.

Figure 19 shows the students in each class in the two No-Progress groupings, 1) minus > 6 months regression in spelling age score and 2) -6 to +6 months. The zero point in this range represents the students’ pre-test spelling age score and “+6” months is equal to the predicted progress plus one month.

![Figure 19: Number of students per class in No-Progress groupings and in pre-test standard score categories.](image)

Of the students at the upper limit of the spelling age scale for pre-test and post-test, five did not increase their correctly spelt words on post-test and are therefore considered to have made zero progress. Above Average students are over-represented in the “minus > 6 months” grouping as, at their level of performance, one or two fewer correctly spelt words reduces the students’ spelling age quite substantially. As the most successful students are not the main concern of this study, the Above Average (AAv) performers (n=16) who have a spelling age at
least 4.5 years above their chronological age, are excluded from analysis in this section. The total of the remaining No-Progress Below Average students (n=15) and Average students (n=48) is sixty-three (n=63; 30.4% of students).

About half of the No-Progress students (n=34), excluding the Above Average group, failed to make adequate progress rather than that their scores regressed. Their spelling age differences are in the “-6 to +6” range and in Class 3 there are eight children in this category. It is of interest to note that five Class 8 students and nine Class 9 children have negative spelling age difference scores. Possibly they peaked on pre-test as the pre-test positive differences between mean spelling age and chronological ages for these two classes are 12.8 months for Class 8 and 16.4 months for Class 9. Perusal of the more at-risk individuals’ spelling age data indicates that no intervention student with a pre-test spelling age of more than six months below their chronological age has a post-test score more than six months less than their pre-test score. This is in contrast to the non-intervention group which has four such students in this situation. Whilst they might be aberrant scores for these students or errors of measurement, it suggests that more stringent ongoing monitoring of their performance will insure that their educational needs are recognised.

Only the Study Students (n=107) were screened for cognitive ability. Four intervention students in the No-Progress group have lower than normal cognitive ability and they are all in the “-6 to +6” grouping. There are five non-intervention Borderline/Cut-off students in the “-6 to +6” grouping and one student in the “minus >6 months” grouping. These students represent 3.4% of the intervention students and 6.7% of the non-intervention students. The cognitive status of the remaining No-Progress students is not known.

It is not possible to say with certainty why a number of students did not progress in spelling over the five months period. Speculative explanations are as follows:

1) Class 3 No-Progress students’ performances were adversely affected by the departure of a well respected, effective teacher
2) A number of Class 8 and Class 9 students reached the limits of their cognitive maturity and their performance plateauxed
3) Class 6 comprises a high proportion of low achieving students
4) Teaching styles or lesson formats were not compatible with non-achieving students’ learning styles
It cannot be ruled out that some students might have looked at another’s work during the tests although a careful watch was kept during testing. Nonetheless, the number of children who succeeded in copying, if any, would be small.

4.2.1.3.11 SUMMARY OF FOCUS QUESTION #3

Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?

Spelling age is the measurement of choice for determining progress in spelling over the intervention period of five months as it is a metric variable. Mean averages allow for comparisons between classes and spelling age can be directly related to students’ chronological age. Five different intervention conditions are described and the performance levels of the classes experiencing the interventions are compared to the spelling scores of four non-intervention classes. Classroom environments are related to dimensions of the QT model (NSW DET, 2003a) and aspects of teachers’ practices are linked to high- and low-scoring teachers’ Productive Pedagogies Characteristics (QSRLS, 2001).

Statistically significant relationships are found between the pre-test standard score categories (BAv, Av, and AAv) and the progress students made on post-test in Class 4 (p <1%), Class 7 (p <1%), Class 8 (p <5%), and Class 9 (p <0.1%). Class 4 students made the least mean progress of the intervention classes. Class 6, the only non-intervention class not to demonstrate a significant relationship, comprises the majority of the lowest ability Year 5 students in the study. It is a positive finding that no significant relationship is established for four of the five intervention classes, in contrast to one of the four non-intervention classes, as it implies that factor(s) affected the pattern of spelling performance outcomes, crosstabulated with pre-test categories of performance levels, such that the relationship differed on post-test. Students’ progression in spelling performance above the level predicted is further addressed in the following chapter, Chapter 5. How spelling performance outcomes are related to factors such as reading fluency improvement, attitudes and perceptions of progress are the subject of the next section.
4.2.1.4 FOCUS QUESTION #4 RESULTS

#4 Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?

It had been anticipated that tests of oral reading fluency, reading comprehension, and writing (to assess the accuracy and complexity of words and sentence structure) would contribute to an understanding of students’ development in these areas as they might or might not relate to progress in spelling performance. Unfortunately, data from the reading comprehension and writing tasks cannot be included in the study. Nevertheless, results from oral reading fluency (ORF) (School District, 1997); ASK-KIDS Self Concept Inventory (Aspects of Self Knowledge about Activities) (Bornholt, 2000); and an informal self-assessment of progress can be analysed, in association with the TWS performance instrument. With the exception of TWS these tests were given to the Study Student subgroup (n=107) on an individual basis.

4.2.1.4.1 ORAL READING FLUENCY

A paired samples t-test was performed for oral reading fluency (ORF) to test the following hypothesis:

\[ H_1 = \text{There is a relationship between pre- and post-test oral reading fluency results} \]

Pre- and post-test oral reading fluency results correlate at the .914 level indicating that the linear relationship is strong. There is an improvement in mean scores of 11.6 correct words per minute (cwpm) on post-test. The paired samples t-test \((t(101)=10.15, p <0.001)\) indicates that the difference between the mean pre- and post-test ORF scores is significant at the 0.1% level and that the hypothesis should be accepted.

Normative data is not available for this Curriculum Based Measurement standardised test. However, one member of the development team suggested that an improvement of 20 cwpm indicates about one year’s progress for this age group. On this basis, the average improvement in ORF for the study students was just over six months. As the intervention period was five months, student data are divided into two groups for the purpose of further analyses: a) students who made up to about six months progress (<10 cwpm), and b) students who increased their number of correct words per minute to a level that approximated to six month’s progress or more (=/>10 cwpm). This is consistent with the grouping arrangement.
for spelling age progress data: a) students who made no more than six months progress; and b) students who made seven months or more progress than their pre-test spelling age.

A crosstabulation (Table 40) is constructed for progress in oral reading fluency (ORF) and progress in spelling age (SA) to explore the following hypothesis:

$$H_1 = \text{There is a relationship between progress in ORF and progress in spelling age}$$

<table>
<thead>
<tr>
<th>Table 40</th>
<th>Oral Reading Fluency Progress Groups * Spelling Age Progress Groups * Intervention/Non-Intervention Groups Crosstabulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inv/NInv Groups</strong></td>
<td><strong>Progress Groups</strong></td>
</tr>
<tr>
<td><strong>ORF Progress</strong></td>
<td><strong>No-Progress</strong></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Inv groups</td>
<td>&lt;10 cwpm</td>
</tr>
<tr>
<td></td>
<td>progress</td>
</tr>
<tr>
<td>=/&gt;10 cwpm</td>
<td>Count</td>
</tr>
<tr>
<td>progress</td>
<td>% of Total</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
</tr>
<tr>
<td>Ninv group</td>
<td>&lt;10 cwpm</td>
</tr>
<tr>
<td></td>
<td>progress</td>
</tr>
<tr>
<td>=/&gt;10 cwpm</td>
<td>Count</td>
</tr>
<tr>
<td>progress</td>
<td>% of Total</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
</tr>
</tbody>
</table>

Fisher’s exact test for Table 40 indicates that there is no relationship between progress in oral reading fluency and progress in spelling age for both the intervention (n=65, p=0.254, 1-sided) and non-intervention (n=37, p=0.481, 1-sided) groups and the hypothesis is not accepted. Nevertheless, there are differences in the results for the intervention and non-intervention groups that indicate a positive effect of the interventions. A higher percentage of intervention students (58.5%) than non-intervention students (45.9%) progressed in ORF. Additionally, a higher percentage of intervention (41.5%) than non-intervention (27%) children made progress in both spelling performance and ORF. Overall, the percentage of the
intervention group (58.5%) who made at least approximately six months progress in oral reading fluency is greater than the percentage in the non-intervention group (45.9%). However, there is no statistically significant relationship between progress in ORF and the intervention/non-intervention groups.

It is not possible to be accurate with the level of improvement in oral reading fluency and using an advance of ten words per minute to indicate six month’s progress in reading fluency is a “best guess” situation. Speece and Ritchey (2005) consider that early word recognition and word reading fluency develop together and it was hoped that a relationship between progress in spelling and progress in reading fluency would be demonstrated in these older children. The least that these results indicate is that there has been some progress.

It can be speculated that the reading comprehension results using the TORCH instrument might have indicated a significant relationship with spelling age progress had they been more reliably collected, or that a formal specific word reading test might have been a more sensitive measure of change in reading ability.

4.2.1.4.2 ATTITUDES

Students answered five questions to obtain a score for the ASK-KIDS instrument (Bornholt, 2000) and three of twelve areas investigated are herewith presented namely, Reading, Spelling and Writing. (Data are also available for Number, Drawing, Motor, Appearance, Friends, People, Person, Belong, and Body but they are not used in this text). The questions are the same for the three areas and only the subject is changed. The questions using Reading are:

1) How good are you at reading activities?
2) How naturally talented are you at reading activities?
3) How much do you try at reading activities?
4) How difficult are reading activities?
5) Next year, at school, how good will you be at reading activities?

Two groups are identified based on differences between the pre- and post-test scores: a) students who developed a more negative attitude to reading, spelling and writing activities or stayed the same, over the intervention period (scores -3 to +0.4); and b) students who were
more positive in their attitudes to reading, spelling and writing (scores +0.6 to +3). The hypothesis for all three areas is:

\[ H_1 = \text{There is a relationship between progress in spelling age and changes in students’ attitudes to reading, spelling or writing over the intervention period} \]

Results of the Reading inventory are shown in Table 41.

**Table 41**

**ASK READ Groups * Spelling Age Progress Groups * Intervention/Non-Intervention Groups**

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>SA Progress Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Inv group</td>
<td>-3 to +0.4</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>15.4%</td>
</tr>
<tr>
<td>ASK READ</td>
<td>positive</td>
<td>+0.6 to +3</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>9.2%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>24.6%</td>
</tr>
</tbody>
</table>

| Ninv group      | -3 to +0.4 | Count | 12 | 18 | 30 |
|                 | % of Total | 32.4% | 48.6% | 81.1% |
| ASK READ        | positive   | +0.6 to +3 | Count | 2 | 5 | 7 |
|                 | % of Total | 5.4% | 13.5% | 18.9% |
|                 | Total      | Count | 14 | 23 | 37 |
|                 | % of Total | 37.8% | 62.2% | 100.0% |

The hypothesis is rejected using Fisher’s exact test and there is no significant relationship between spelling performance improvement and changes in attitudes to reading for both the intervention (n=65, p=0.533, 1-sided) and the non-intervention (n=37, p=0.459, 1-sided) groups. The most interesting finding in Table 41 is that the percentage of intervention students (35.4%) who developed a more positive attitude to reading is almost twice that of the corresponding non-intervention group (18.9%).
Table 42 shows the results of crosstabulation between changes to attitudes to spelling and spelling performance pre- and post-test differences.

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>SA Progress Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Inv group</td>
<td>-3 to +0.4</td>
<td>Count: 14</td>
</tr>
<tr>
<td>ASK SPELL</td>
<td>% of Total: 21.5%</td>
<td>49.2%</td>
</tr>
<tr>
<td>positive</td>
<td>+0.6 to +3</td>
<td>Count: 2</td>
</tr>
<tr>
<td>% of Total</td>
<td>3.1%</td>
<td>26.2%</td>
</tr>
<tr>
<td>Total</td>
<td>Count: 16</td>
<td>49</td>
</tr>
<tr>
<td>% of Total</td>
<td>24.6%</td>
<td>75.4%</td>
</tr>
<tr>
<td>Ninv group</td>
<td>-3 to +0.4</td>
<td>Count: 9</td>
</tr>
<tr>
<td>ASK SPELL</td>
<td>% of Total: 24.3%</td>
<td>45.9%</td>
</tr>
<tr>
<td>positive</td>
<td>+0.6 to +3</td>
<td>Count: 5</td>
</tr>
<tr>
<td>% of Total</td>
<td>13.5%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Total</td>
<td>Count: 14</td>
<td>23</td>
</tr>
<tr>
<td>% of Total</td>
<td>37.7%</td>
<td>62.2%</td>
</tr>
</tbody>
</table>

There is a relationship between progress in spelling age and changes in students’ attitudes to spelling over the intervention period (n=65, p=0.080, 1-sided) but this relationship is not significant at p < 5% level. The hypothesis is rejected for the non-intervention group (n=37, p=0.397, 1-sided) and no significant relationship is identified by analysis.

The interesting feature of the attitudes to spelling results is the similarity in the percentage of students in both the intervention and the non-intervention groups (29.2% and 29.7% respectively) whose attitudes improved during the intervention period. The distribution of these students differs, however, between the two groups and there is a greater percentage of intervention students (26.2%) who improved in attitudes and progressed in spelling performance by at least six months, compared to 16.2% of non-intervention students.
The crosstabulation results for ASK-KIDS Writing are shown in Table 43.

<table>
<thead>
<tr>
<th>Inv/Ninv Groups</th>
<th>SA Progress Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Inv group</td>
<td>negative</td>
<td>-3 to +0.4</td>
</tr>
<tr>
<td>ASK WRITE</td>
<td>% of Total</td>
<td>21.5%</td>
</tr>
<tr>
<td>positive</td>
<td>+0.6 to +3</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>24.6%</td>
</tr>
<tr>
<td>Ninv group</td>
<td>negative</td>
<td>-3 to +0.4</td>
</tr>
<tr>
<td>ASK WRITE</td>
<td>% of Total</td>
<td>32.4%</td>
</tr>
<tr>
<td>positive</td>
<td>+0.6 to +3</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>5.4%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>37.8%</td>
</tr>
</tbody>
</table>

These findings do not support the hypothesis for both intervention (n=65, p=0.319, 1-sided) and non-intervention (n=37, p=0.459, 1-sided) groups on Fisher’s exact test and there is no relationship between progress in spelling age and changes in students’ attitudes to writing over the intervention period. The percentages of students who demonstrated more positive attitudes to writing at the end of the intervention period are similar for both the intervention (20%) and non-intervention (18.9%) groups.

No significant relationships are found between changes in spelling performance and attitudes to reading, spelling and writing over the intervention period. The percentages of intervention and non-intervention students who show more positive attitudes are similar to each other for spelling and writing but in reading the percentage of intervention students is about twice that of non-intervention students and, at 35.4%, it is the highest score for positive change.
Bivariate correlations were calculated for spelling age and attitudes to reading, spelling and writing, for both pre- and post-tests. Table 44 sets out the results of Pearson correlations (1-tailed).

**Table 44**
**Correlations for Spelling Age and Attitudes to Reading, Spelling and Writing**

<table>
<thead>
<tr>
<th>Spelling Age</th>
<th>ASK-KIDS</th>
<th>Inv</th>
<th>NInv</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA 1 Reading 1 Pre-test</td>
<td>( r=0.29, \ n=69, \ p=.008 )</td>
<td>( r=0.31, \ n=38, \ p=.027 )</td>
<td></td>
</tr>
<tr>
<td>SA 2 Reading 2 Post-test</td>
<td>( r=0.26, \ n=65, \ p=.019 )</td>
<td>Correlation is significant at the 0.05 level (1-tailed).</td>
<td></td>
</tr>
<tr>
<td>SA 1 Spelling 1 Pre-test</td>
<td>( r=0.29, \ n=69, \ p=.007 )</td>
<td>( r=0.40, \ n=38, \ p=.006 )</td>
<td></td>
</tr>
<tr>
<td>SA 2 Spelling 2 Post-test</td>
<td>( r=0.38, \ n=65, \ p=.001 )</td>
<td>Correlation is significant at the 0.01 level (1-tailed).</td>
<td></td>
</tr>
<tr>
<td>SA 1 Writing 1 Pre-test</td>
<td>No correlation</td>
<td>No correlation</td>
<td></td>
</tr>
<tr>
<td>SA 2 Writing 2 Post-test</td>
<td>No correlation</td>
<td>No correlation</td>
<td></td>
</tr>
</tbody>
</table>

There are weak but significant linear relationships between spelling age and attitudes to reading and spelling for both pre- and post tests in the intervention group. There are also weak but significant linear relationships in the non-intervention group for spelling age and attitudes to reading and spelling, but only for the pre-tests. No linear relationships are demonstrated for either intervention or non-intervention groups in attitudes to writing and spelling age. These findings support the suggestion in the results of Fisher’s exact tests that there is a stronger relationship between spelling performance and attitudes to reading and spelling found in the intervention group than in the non-intervention group.

4.2.1.4.3 PERCEPTIONS OF PROGRESS

During the individual post-test session, Study Students (\( n=107 \)) were asked to rate their progress in reading, spelling, and writing. A five point scale was used with (1) indicating little progress and progressing to (5), relating to a high level of progress over the intervention
period. Because there are small numbers of students in some categories, for the purpose of this analysis levels (1) and (2) are combined for a “Low” rating, and (4) and (5) form the “High” rating group. Level (3) represents “Average”. Crosstabulations of spelling age groups and students’ perceptions of their progress in reading, spelling, and writing are presented in Tables 38, 39, and 40 respectively. The hypotheses are stated as follows:

\[ H_1 = \text{There is a relationship between spelling age improvement and students’ perceptions of their progress in reading [spelling] [writing] over the five months intervention period.} \]

The hypothesis is rejected for the intervention group \( (n=65, v=1.939, p=0.156, 1\text{-sided}) \) and accepted for the non-intervention group \( (n=37, v=6.360, p=0.026, 1\text{-sided}) \). There is a significant relationship between spelling age improvement and students’ perceptions of their progress in reading for the non-intervention group over the five months intervention period at
p <5% level. An important finding is that the highest percentage of intervention students (55.4%) rated their progress in reading “High”, whilst the highest percentage of non-intervention (40.5%) students considered their progress “Medium”. There is a difference in the percentages of intervention (43.1%) and non-intervention (13.5%) students who made greater progress in spelling performance and who considered their reading progress at a “High” level. These findings appear to indicate that the intervention students were more positive about their perception of their progress in reading than the non-intervention students. Table 46 sets out the findings in relation to perceptions of progress in spelling.

Table 46
Perception of Progress in Spelling* Spelling Age Progress Groups Crosstabulation

<table>
<thead>
<tr>
<th>Inv/Ninv Groups</th>
<th>SA Progress Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Inv group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Count</td>
<td>0</td>
</tr>
<tr>
<td>% of Total</td>
<td>.0%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Medium</td>
<td>Count</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>4.6%</td>
<td>20.0%</td>
</tr>
<tr>
<td>High</td>
<td>Count</td>
<td>13</td>
</tr>
<tr>
<td>% of Total</td>
<td>20%</td>
<td>52.3%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>16</td>
</tr>
<tr>
<td>% of Total</td>
<td>24.6%</td>
<td>75.4%</td>
</tr>
<tr>
<td>Ninv group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Count</td>
<td>2</td>
</tr>
<tr>
<td>% of Total</td>
<td>5.4%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Medium</td>
<td>Count</td>
<td>3</td>
</tr>
<tr>
<td>% of Total</td>
<td>8.1%</td>
<td>29.7%</td>
</tr>
<tr>
<td>High</td>
<td>Count</td>
<td>9</td>
</tr>
<tr>
<td>% of Total</td>
<td>24.3%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>14</td>
</tr>
<tr>
<td>% of Total</td>
<td>37.8%</td>
<td>62.2%</td>
</tr>
</tbody>
</table>

The hypothesis is rejected. There is no significant relationship between spelling age improvement and students’ perceptions of their progress in spelling for both the intervention (n=65, v=.766, p=0.427, 1-sided) and the non-intervention (n=37, v=2.773, p=0.144, 1-sided) groups. The main differences between the results of analysis for the intervention and non-intervention groups is that a greater percentage of intervention students (72.3%) perceived
their progress to be “High” in contrast to 48.6% of non-intervention students. The greatest contribution to the inter-group difference is from students who made seven months or more progress in spelling performance (Inv=52.3%, and NInv=24.3%). Findings for perceptions of progress in writing are presented in Table 47.

Table 47
Perception of Progress in Writing* Spelling Age Progress Groups Crosstabulation

<table>
<thead>
<tr>
<th>Inv/NInv Groups</th>
<th>SA Progress Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Progress</td>
<td>Progressed</td>
</tr>
<tr>
<td>Inv group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>Count</td>
<td>1</td>
</tr>
<tr>
<td></td>
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<td>% of Total</td>
<td>24.6%</td>
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The hypothesis is rejected. There is no significant relationship between spelling age improvement and students’ perceptions of their progress in writing in the intervention (n=65, χ²=0.294, p=0.500) and the non-intervention (n=37, χ²=0.196, p=0.500, 1-sided) groups. The only finding of noticeable contrast between the intervention and non-intervention groups in the crosstabulation table is that 49.2% of intervention students made spelling progress and perceived their progress to be “high”, as opposed to 32.4% of non-intervention students.
4.2.1.4.4 SUMMARY REMARKS FOR FOCUS QUESTION #4

These results indicate a trend for the intervention group to make more progress in both spelling performance and oral reading fluency than the non-intervention group, although a significant relationship is not demonstrated. The only significant relationship between spelling progress and attitudes and perceptions of progress is the non-intervention group’s perception of progress in reading.

Although the findings in answer to Focus Question #4 generally lend support to the positive result of the intervention program on spelling performance by improvement in oral reading fluency, attitudes to reading and spelling, and students’ perceptions of their progress in these areas, any association between these variables is not strong. The lack of evidence for positive attitudes and perception of progress in writing is disappointing. Whether the instruments used to answer Focus Question #4 were sufficiently sensitive for this purpose is open to question. In particular, a normative data instrument to test reading might have been a better choice than the oral reading fluency instrument used.

Nevertheless, students’ expressions of their attitudes and perceptions of progress in the ASK-KIDS inventory (Bornholt, 2000), the informal progress scale, and answers to open-ended questions about reading, spelling, and writing, as well as to lessons and learning, contribute to the body of findings already obtained from Focus Questions #1, #2, and #3, that can drawn upon during discussion of this work.

4.3 OVERVIEW OF STUDY AND RESULTS

The study was carried out in response to identification of the problem, “there are students in upper primary classrooms who do not spell at an age appropriate level of performance”, which led to the development of the four focus questions addressed in this chapter. Without doubt, a group of intervention students who experienced explicit spelling instruction for one hour per week over five months improved their mean spelling age (plus 16.3 months) by more than that predicted by the length of the intervention period (16.3–5=11.3 months). However, non-intervention students who did not participate in the intervention lesson program (NInv) also increased their mean spelling age (13.9 months) over this period (13.9–5=8.9 months). Importantly, there was a greater difference between the intervention and non-intervention groups in the progress of the lowest achieving students as the intervention Below Average students’ progress was more than twice that of the non-
intervention Below Average students. (Inv BAv mean average progress = 15.8 months; NInv BAv mean average progress = 7.2 months). Additionally, the percentage of students who were no more than six months behind their chronological age increased in the intervention group on post-test by 12.7% in contrast to only a 5.6% increase for the non-intervention group. Factors that could contribute to these findings are organized by four focus questions, and the results of analyses make it possible to draw some inferences and conclusions.

Focus Question #1 is mainly concerned with the progress made by students in the different standard score categories of spelling performance on pre-test and, in particular, it is found that the intervention lessons benefited the Below Average group more than the non-intervention group’s lessons assisted the non-intervention Below Average students. The intervention Borderline/Cut-off group of cognitive ability students analysed in the Focus Question #2 section also had a more positive response to their lessons than the non-intervention Borderline/Cut-off students. Focus Question #3 examines factors in classrooms that could influence students’ learning outcomes, which include aspects of the NSW QT model. Oral reading fluency and attitudes to reading, spelling and writing are considered in Focus Question #4.

Students in this study (n=207) are all mainstream Year 5 or Year 6 students and a subgroup of Year 5 children (n=107) comprise the Study Student group who completed a wider range of test instruments. Five classrooms form the intervention group (Inv students n=118) and four classes are the non-intervention group (NInv students n=89). The classes have the diversity in the student body that is expected in Sydney suburban schools (n=4) and include children from a range of cultural and ethnic backgrounds, although they are predominantly English speaking.

It is found that intervention students were nearly five and a half months (5.5 months) in mean spelling age above their mean chronological age (ChrA) on pre-testing, whilst the non-intervention group was ten months (10.2) in mean spelling age above their mean chronological age, a difference between them of over four and a half months. This indicates that the non-intervention group was ahead of the intervention group in spelling performance at the beginning of the intervention period. The mean progress in spelling age for the intervention students is over sixteen months (16.3 months) and for the non-intervention students it is almost fourteen months (13.9 months). The approximate two and a half months mean
difference, rather than five months as on pre-test, was achieved in five months of schooling and narrows the advantage of non-intervention students. Although there is no significant relationship between spelling age progress and intervention/non-intervention grouping, a greater percentage of intervention students (64.4%) than non-intervention students (58.4%) did make progress.

All five non-intervention teachers (two for Class 8) gave the impression of commitment to their work and competence. The proof of this is in their results. At least four of these teachers appeared to follow a conventional spelling program structure that involved working on weekly word sets, spelling tests, and a weekly targeted spelling rule, reinforced with practice and spelling games. The fifth teacher (of Class 6) had a low academic ability non-intervention class. Teacher 3a/6 could be very creative in his teaching approach, as witnessed when he taught an intervention class (Class 3) one year later, although his response to Q5 asking about his spelling program (Appendix C) indicates that he also followed the general spelling lesson format of his non-intervention teacher colleagues.

The progress in spelling made by both the intervention and non-intervention groups over the five months intervention period demonstrates the effectiveness of targeting a particular curriculum area for improvement. However, positive effects are not evenly distributed across the student body, and the following summary of findings associated with the Focus Questions identifies areas that were particularly influenced by the intervention program. The main results that support the position that the study has led to improvement in spelling performance levels are as follows:

1) A higher percentage of intervention Below Average students (70.8%) progressed seven months or more in spelling age compared to non-intervention students (52.9%). The intervention Below Average students’ mean spelling age progress is 15.8 months, compared to 7.2 months for the Below Average students in the non-intervention group.

2) Spelling lessons over the intervention period benefited the intervention group Borderline/Cut-off (Inv B/Co) students (25.8 months mean progress) to a greater extent than the non-intervention Borderline/Cut-off students (10.4 months mean progress). Thirteen of twenty (13/20) intervention students of lower cognitive ability achieved at least twelve months more in spelling age than was expected over the five month period compared to only one Borderline/Cut-off student of eleven
3) There is a significant relationship at p <5% between school Year and progress in spelling age for the intervention group only. The percentages of Year 6 students who progressed in spelling age are similar in the intervention (43.9%) and non-intervention (46.7%) groups but not for Year 5 students. Of the intervention Year 5 students 68.8% progressed compared to 55.7% of non-intervention students.

4) Intervention female students derived a significantly greater benefit at p <5% from their lessons (BAv n=5 and Av n=8 moved into higher standard score categories on post-test) compared to intervention males and non-intervention students of both genders.

5) 41.5% of intervention students and 27% of non-intervention students made at least seven months progress in both spelling age and oral reading fluency.

6) The percentage of intervention students (26.2%) who progressed in spelling age and developed a more positive attitude to reading is almost twice that of the corresponding non-intervention group (13.5%).

7) 43.1% of intervention students and 13.5% of non-intervention students who made greater progress in spelling performance, considered their reading progress to be at a ‘High’ level.

8) A greater percentage of intervention students (72.3%) than children in the non-intervention group (48.6%) perceived their progress in spelling to be ‘High’.

The success of both the intervention and non-intervention classes illustrates the positive effect of teacher interest in a particular area of study. Perhaps, if coupled with specific efforts such as diagnostic testing to address the educational needs of the poorer performers, the benefit to a class of diverse students would be even greater. The progress made by the students of lower cognitive ability in this study illustrates that a different teaching approach within a mainstream classroom setting can bring about very positive results for these children. The intervention lessons were designed to engage students’ interest and build a climate in which students could confidently participate. Their comments about the lessons and their progress are found in the Appendix F.

Whilst it is necessary to ensure that lesson content is commensurate with students’ cognitive development and meets curriculum responsibilities, there is scope in the classroom to expand students’ educational experiences beyond routine, conventional presentations. It is
impossible to deny the influence that more focused lesson content plus a competent classroom teacher exerts on the educational outcomes of students. In the study this is evidenced by the performance of Class 2 students who experienced the Teacher-Best-Practice intervention. The most progress was made by Class 7, a non-intervention class, which also had the advantage of a large proportion of academically high-achieving students. Class 1 had the benefit of explicit lessons, a cognitively stimulating lesson program, and my contribution which promoted a more interactive classroom climate. It is unfortunate that Teacher 3a/6 left his class halfway through the intervention period for Class 3. Nevertheless, the effect of his creative lesson program over one term resulted in improved student performance in Class 3, and it is not possible to judge the affect on student progress of the different situation in the second term. However, the disparate student performances of two matched classes (Classes 4 and 5) indicate that the classroom teacher is an important component that influences student learning outcomes, in association with an explicit, stimulating lesson program, presented with the motivational tool of a Team Learning System.

To summarise, the findings of this study lend support to elements of the three dimensions of the NSW QT model (NSW DET, 2003a) namely, pedagogy that promotes intellectual quality and a quality learning environment, and one that generates significance for the learning. Discussion of results in Chapter 5 attempts to clarity factors that marry the dual foci of a classroom environment that promotes student learning and the learning processes that are involved when the subject of the learning is spelling.
Chapter 5

Discussion

5.1 INTRODUCTION

The media interest in educational standards in Australia continues since this study was planned and it was recently stated on public television (McMullen, 2007) that 30% of Australian secondary school children are functionally illiterate. The definition of “functionally illiterate” is not explicit in this context but presumably it means that students do not have the level of reading and writing skills sufficient for their educational needs. This statistic contributes to the public debate about literacy standards and the implication is that it is the public schools that are failing to equip students with adequate opportunities for learning. Yet in the Organisation for Economic Co-operation and Development’s [OECD] (2004) survey report on reading standards for the 2003 Programme for International Student Assessment, Australia ranked fifth (but second in terms of statistical significance) of twenty-nine participating countries, beaten only by Finland, Korea, Canada, and Liechtenstein. Although there had been no significant progression since the 2000 survey, it is hard to argue that literacy standards in this country are poor and that the public school system is failing students, especially as 12% of fifteen year olds are in the top level of performance. Nevertheless, it is often the public face of written language skills that is the focus of discussion and the television program raised the question of whether grammar, punctuation and spelling should contribute to an assessment of proficiency for these surveys in areas other than English such as the sciences. Is it sufficient to demonstrate learning in a particular subject area without necessarily having mastery of the technicalities of written literacy to express that learning?
Underlying the public debate that is about literacy standards in relation to the distribution of resources, is the issue of what outcomes for students are most valued by any society.

One of the major challenges faced by education systems is to encourage high performance while at the same time minimising poor performance. The question of poor performance is particularly relevant to reading literacy because levels of literacy have a significant impact on the welfare of individuals, the state of society and the economic standing of countries in the international arena (OECD, 2004, p. 280).

The views of Peters (1985) expressed over twenty years ago about the social value of good spelling skills, as outlined in Chapter 1 above, have current relevance as they epitomise the educational goals in literacy that were prevalent when many of today’s public decision makers and parents were at school. Mastery of the technical skills of writing reflected educational status and implied cognitive worth, and it can be difficult for adults to relinquish beliefs acquired in their formative years. Frank (1995) is an educator who holds the view that the initial stages of writing should be unencumbered by concerns about the mechanics of writing as errors can be corrected later in the editing stage. According to Frank, an emphasis on technical skills results in “NO risk, NO stretching, LITTLE growth, and even LESS excitement or discovery” (p. 128) and she suggests that mini-lessons and reinforcement during writing sessions enable students to become “good fixers of their own material” (p. 129). Too little emphasis on what Frank (1995) calls the mechanics of writing can result in work that is punctuated by errors and tedious to correct at the editing stage; as opposed to an over-emphasis that can stifle creative expression. Either way might result in students in upper primary classes who are reluctant writers and who restrict their vocabulary to familiar words, and thus fail to thrive in their language development. But even in classrooms where teachers strive to achieve a balance between the creative and technical aspects of writing there can be children whose performances in spelling, punctuation or grammar are below the standard of their peers.

Yet there is profit in removing spelling, and indeed punctuation and grammar, from a situation where it can be perceived as a chore and the boring part of the production of a piece of writing. Technical mistakes can be presented as opportunities for learning about words and how the language system works and, in the process, students can also learn about how they themselves can more effectively and efficiently remember and learn. Further, students’ involvement in explorations and discussions about words gives rise to the possibility that their attitude to using words and interest in learning about the language system could bring about improved performance levels in both their creative and technical writing. These suppositions
formed the bases of this research as it addressed the area of spelling via the knowledge of words and the English language system, with particular concern for students who performed at a below average level of spelling performance. Lessons were not targeted to this group specifically, but were designed to be more inclusive of all ability groups in a whole-class setting.

The study had practical value for the students involved in that improved spelling performance supported them in their language skills and possibly their attitudes to using language. It was also timely as the students were nearing the end of their primary school experience, and soon to enter the environment of secondary schooling where there is an expectation that students have age-appropriate levels of skills. The locus was public primary schools, rather than independent schools, as they are attended by a larger proportion of the student population. It was undertaken in the belief that there need be no barrier to achieving appropriate educational outcomes in the area of spelling, unless a student has a physical or physiological condition that militates against acquiring such skills. These include some vision or hearing problems, damage as a result of brain trauma, or language learning difficulties of unknown aetiology, for instance. The pragmatic aspects of the study concerned working within constraints of time, resources and curriculum dictates, as well as the pedagogic objectives of the teachers within these public school classrooms.

The problem that this study sought to address is: “There are students in upper primary classrooms who do not spell at an age appropriate level of performance”. The approach taken has been to provide a learning environment that supports lower ability and lower performing students in a whole-class setting, yet also to be mindful of the learning needs of students who perform at age-appropriate levels. There are two groups of classes in this quasi-experimental study, the intervention group and the non-intervention group. The following sections discuss factors that have emerged from the findings of the study pertaining to both groups of participants. Factors that appear to have influenced larger cohorts of students are addressed, followed by those that might well have affected smaller categories of students within classes. Classroom events and learning experiences are related to dimensions of the QT model (NSW DET, 2003a), and the Neural Network for Written Language (NNWL) developed in Chapter 2 above, when applicable.
5.2 KEY FACTORS THAT INFLUENCED FINDINGS

Both quantitative and qualitative data were collected and organised to answer four focus questions, as described in Chapter 4 above. The principal measures referred to in discussion are spelling age (SA) and standard score (StSc) categories. When appropriate, features from individual classes are explored which can concern students, teachers, or pedagogic factors.

The main aim of the intervention program was to improve the spelling performance of the intervention students over a five-month intervention period and this was accomplished. Factors have been identified that contribute to the findings of this study and they are therefore subjects for discussion. These are: a) a study effect; b) threats to internal validity; c) class ability levels; and d) teaching style. Additionally, comparisons are made between intervention and non-intervention classes’ data, and aspects of the intervention lessons are explored to explicate factors related to the greater progress of the intervention group’s lower achievers compared to those in the non-intervention classes.

5.2.1 STUDY EFFECT

A paired-samples t-test for pre- and post-test data for mean spelling age using the TWS normative data instrument (Larsen et al., 1999) indicates that the mean spelling age progress achieved by students in five months is statistically significant at the p <0.1% level. Importantly, not only did the mean spelling age of the intervention classes experiencing the intervention lessons significantly increase an impressive amount (16.3 months), but so did that of the comparative group (13.9 months), the non-intervention classes. Although the magnitudes of the progress levels made by each group are noteworthy in themselves, so too is their similarity. Afterall, it was only the intervention group that experienced interventions and the mean progress of the non-intervention classes theoretically should be approximate to the value predicted by the duration of the intervention period, that of five months.

The range of progress in mean spelling age for the classes in the intervention group (Classes 1, 2, 3, 4, and 5) is from just over eleven months to nearly twenty months. The progress range for the non-intervention classes (Classes 6, 7, 8, and 9) is from eight and a half months to nearly two years. These findings give the intervention group a greater mean gain of only two and a half months over the non-intervention group for the five-month period. (The statistics for both groups also include the scores of students whose spelling ages “regressed” over this period which are denoted in calculations as negative values). It appears that the simple
measure of just setting up a study is sufficient to result in significant improvement in students’ learning outcomes and demonstrates the so-called Hawthorne effect (Clark, 1999), or a “study effect”, that might or might not affect both groups to the same degree. It might be that a research project carried out in a classroom environment focuses the attention of several tiers of personnel on the topic under investigation. School administrations ensure that any such study has university Ethics Committee and DET approval. As they are also aware that there must be university academic support, the study therefore has credibility. Their interest in the outcomes of the study is conveyed to participating staff who, if they are teachers of control or comparison classes in particular, are motivated to ensure that their results will be as good as they can achieve. Only teachers who are confident in their teaching would be willing to have such witness to their students’ performance levels. Teachers of intervention classes have less responsibility in this respect if a researcher is involved with the classroom activities. The levels of interest of parents and students in the focus area are also raised as it is often necessary to obtain parental permission for students to be involved, and students themselves are consulted about whether or not they will participate. This elevates a subject such as spelling, as in the present study, from being just part of the normal compulsory lesson repertoire to one where students consider that they have a measure of choice about the level of their participation. Parents themselves might be concerned about their child’s spelling performance level and they are frequently involved with spelling homework activities. Such factors contribute to a heightened awareness of the topic as well as an interest in learning outcomes by the majority of participants.

It is therefore suggested that a positive climate was established in all classes for outcomes in student performance to be greater than that predicted by the five-month duration of the intervention period. Although the greater than predicted gain cannot be wholly attributed to a Hawthorne or study effect, no doubt this was a factor that influenced these findings. Possibly a Hawthorne effect was experienced more by the intervention group than the non-intervention group as the former was the focus of the study; whilst the non-intervention classes were more subject to a passive “compensatory rivalry” threat (discussed in the next section). A class that experienced an alternative intervention focus, such as working with numbers (a Contact Group Control), might well have provided an indication of the strengths of these effects on spelling performance if this was of importance to the study.
It can be speculated that spelling performance scores might well be substantially improved by no more than the following three conditions: a) an event, such as participation in a national ‘spelling bee’, that focuses interest and attention on spelling; b) an event that necessitates performance being formally measured and compared to others; and c) competent teachers who take pride in their work. The major disadvantage of such a practice is that, although the mean spelling age of a class might improve, the poorer performers will not necessarily be students who benefit.

5.2.2 THREATS TO INTERNAL VALIDITY

A further condition that needs consideration in respect to the non-intervention group’s outcomes is the social interaction threat to internal validity (Mertens, 1998; Trochim, 2004) discussed in Chapter 3 above. The probability of discussions between intervention and non-intervention teachers about the study is not high, with the possible exception of Teachers 1 and 7. More particularly, as non-intervention classes were in the same schools as intervention classes, my weekly visits to the schools maintained non-intervention teachers’ awareness of the program. Additionally, all teachers were aware that the study would commence in Term 2 and there is a strong possibility that the non-intervention teachers, in particular, focused their attention on spelling during Term 1 to a greater degree than they might otherwise have done. There might therefore be a compensatory rivalry threat to internal validity which probably operated at an unconscious level. The evidence for this is seen in the mean pre-test spelling age (SA1) scores of three of the four non-intervention classes when they are compared to mean class pre-test chronological ages (ChrA1). All non-intervention classes (Classes 7, 8, and 9) with the exception of Class 6 have mean spelling ages well in advance of their chronological ages (13.3 months; 12.8 months; and 16.7 months respectively), in contrast to the mean class difference of 5.5 months for the intervention group. Classes 8 and 9 are situated in the same school (School C) as a parallel intervention class (Class 3) which has a difference in mean pre-test spelling age from mean chronological age of 5.2 months, substantially below that of its sister non-intervention classes.

Although the only condition in the non-intervention classrooms that could be controlled in this quasi-experimental study is that these classes did not experience a specific spelling intervention, the value of the non-intervention group to the study is that of a “comparison group”. It is through such an arrangement that similarities and differences in situations can be explored. The significant progress that both the intervention and the non-intervention groups
made is measured by the relationship between spelling performance levels and the chronological age of the subjects, referenced to normative data. On post-test the intervention group was nearly seventeen months (16.8 months) in mean spelling age above their mean chronological age and the non-intervention group’s performance was nineteen months above their age, an increase of over eleven months (11.3 months) for the intervention students and almost nine months (8.9 months) for the non-intervention group, compared to their pre-test spelling age/chronological age differences. In addition to the compensatory rivalry threat described above, (as far as it is possible to ascertain by reference to the non-intervention teachers’ responses to questions (Appendix C) and by my observations and conversations with the teachers), the conditions that brought about the improved performance of the non-intervention group are:

- A high probability that the full scheduled time for dedicated spelling instruction of about two and a half hours a week was actually utilised for this purpose (a further example of a compensatory rivalry threat). Teachers canvassed prior to the study usually plan for this length of time but admitted that their program is substantially subverted by other priorities or diluted by reading or writing activities. (The intervention lesson duration did not reach one hour and was usually in the range of forty-five to fifty-five minutes. Intervention students’ instruction in spelling per week (including the weekly word-lists and tests of Teachers 1, 3b, 4, and 5) remained little more than customary practice as canvassed prior to the study).

- A high probability that their spelling programs were conventional and aligned to a Direct Instruction model (Carnine, Silbert, & Kameenui, 1997). This mode of teaching was certainly suitable for the learning preferences of a number of their students, as demonstrated by their levels of progress. Question 5 of the Teaching Philosophy and Practices question list (Appendix C) asks teachers to describe their spelling programs. Generally, students were grouped according to ability, which dictated the spelling-list regime they experienced. Work with word-lists was moderated by word activities and games, and Teacher 8 in particular mentioned teaching spelling strategies and encouraging transference to writing activities.

All appeared to be very competent, confident teachers who were particularly interested in literacy development as well as one, Teacher 3a/6, who worked actively to engender a love of words in his students. The non-intervention teachers were proud of their classes’ progress and there is a strong probability that being a control group for a research study resulted in an
enhanced progress in performance. Nevertheless there is also a strong likelihood that without
the particular attention to spelling generated by the study the non-intervention students would
have at least equalled the level predicted by the intervention period. As the non-intervention
teachers’ practices were of greater benefit to the average and above average performers than to
the poorer achievers, any affect of a social interaction threat does not diminish the implications
of the difference in results between the intervention and non-intervention Below Average
spellers.

5.2.3 STUDENT ABILITY LEVELS

Although the non-intervention and intervention groups have features in common, there
are also comparisons that can be made. The general ability levels of non-intervention students
in Classes 8 and 9 (from School C) match the intervention Classes 1 (School A), Class 2
(School B), and Class 3 (School C) levels well, but there is one low ability class (Class 6, n=14)
and one high ability class (Class 7, Year 5 n=9, Year 6 n=14) in the non-intervention stable
(both from School A). Additionally, the high academic ability students in School D were not
part of the study and intervention Classes 4 and 5 are parallel classes comprising the remaining
Years 5/6 students, with a bias of the more behaviourally challenged children in Class 5. There
is therefore the possibility that the overall academic ability level of the non-intervention group
is higher than that of the intervention group. (The screening test used (Ouvrier et al., 1999)
does not determine level of ability other than whether a student is within the normal range).

Whilst there is no direct evidence to support the notion that schools’ perceptions of the
academic ability of their students correlate well with students’ spelling performance scores, the
percentages of students in the Above Average (AAv) standard score category on pre-test
indicate that 21.3% of non-intervention students are in the Above Average category compared
to 16.9% of intervention students. Percentages of students in the Below Average (Inv=20.3%;
NInv=19.1%) and Average (Av) (Inv=62.7%; NInv=59.6%) categories on pre-test are more
similar between the two groups. It is of interest to note that the percentage increase of students
into the Above Average category on post-test is virtually equal for the two groups (Inv=7.7%;
NInv=7.9%) and the non-intervention group thus maintains its lead at this higher level of
performance.

The movements in the lowest standard score category, however, differ in that 7.6% of
intervention Below Average students compared to 1.1% of non-intervention Below Average
students moved into the Average category. The intervention Average group remains static
indicating that the improvement in the performance of pre-test Below Average students on post-test balances that of the Average students, who move to the higher category of Above Average on post-test. In summary, these results suggest that, whilst the non-intervention group demonstrates a greater percentage of students in the Above Average level of performance on pre-test, the progress of the intervention Below Average students over the intervention period is superior to that of the non-intervention Below Average students.

A more detailed look at the results from the three classes situated in School A makes it possible to consider whether there is any relationship between overall class academic ability levels (as determined by school personnel assigning students to particular classes) and progress in spelling. The classes in School A are Class 1 (Inv), Class 6 (NInv) and Class 7 (NInv). Students in Class 6 (Years 4/5) are the lower academic achievers of the Year 5 cohort, seven (of n=14) of whom need the support of the STLD. Class 7 (Years 5/6) comprises a high proportion of the more academically successful students in upper primary. Students in Class 1 (Year 5) are mainly the middle level Year 5 achievers. The differences between the mean pre-test spelling ages and their mean chronological ages reflect the three ability levels of students that predominate in each class, namely twelve months below age (Class 6); 9.4 months above age (Class 1); and 13.3 months above age (Class 7). There are five Below Average students in Class 6, three in Class 1; and one in Class 7. Class 6 students gained a mean spelling age of nine months in five months; Class 1 students advanced a mean spelling age of 17.3 months; and Class 7 students made the greatest mean gain of all classes (23.6 months).

It is suggested that the outcomes for all three classes reflect the overall academic achievement level of the students in each class and were influenced by students’ classroom learning experiences over the intervention period. It is of interest to examine the results of the low achieving class (Class 6; NInv) more closely. When the progress (37 months) of one exceptional student for that class, the only Above Average student, is omitted from the calculation the mean spelling age progress of Class 6 is only one and a half months over the five-month period. In fact, only four other students made any progress at all. These students were in a composite class with Year 4 students and, in view of the higher than predicted progress made by Below Average and lower than normal cognitive ability students in intervention classes, it is possible that the progress of some of the Class 6 students might have been greater if they had experienced different pedagogic practices. The Class 6 teacher demonstrated that he is a very able, committed, and creative teacher when he designed the
lessons for the first half of the intervention period for Class 3, the following year. Three possibilities for the lower achievement levels of Class 6 arise: a) the level of lesson content was set at the requirements for a Year 4/5 class which might have been less cognitively challenging for the Year 5 students than if they had been in a straight Year 5 class (although one Above Average speller made substantial progress); b) the predominantly low academic ability levels of peers could limit learning opportunities, such as through peer scaffolding and student interactions; and c) Teacher 3a/6 might have been more narrow in his teaching strategy repertoire in Class 6 than he was a year later as an intervention program teacher for Class 3. Without a teacher’s journal for learning events over this period it is not possible to form any firm conclusions.

Teacher 7 (NInv) is dynamic and enthusiastic, and appears to be a person who enjoys the challenge of teaching high achievers. Teacher 1 gives a strong impression that her preferred teaching style is compatible with more expositional approaches than those that supported the intervention lessons. It is therefore mooted that the intervention program had a positive influence on Class 1 students’ learning outcomes. This is based on 77.3% of Class 1 students achieving at least seven months progress in spelling age above their pre-test spelling age which is approaching the 83.3% realized by the high achievers in Class 7. The teaching style and practices of Teacher 7 achieved substantial improvement in spelling performance outcomes for her higher academic ability students (nearly two years more than the pre-test level). The intervention for Class 1 was designed to be inclusive of lower achieving students such that it expanded students’ knowledge of the written English language, encouraged an interest in words, and provided students with a range of strategies for learning spellings. It was a richer learning experience in spelling than Teacher 1 normally provided and students across the pre-test standard score categories responded. The results of these classes support the notion that remarkable progress in spelling can be made when the student cohort can engage with the teaching practices to which they are exposed.

5.2.4 TEACHING STYLES

The most impressive demonstration of the influence of teaching style on the learning environment is the comparison of the results for the intervention classes, Class 4 and Class 5. The classes experienced the same intervention lessons yet outcomes for students are very different. Their student populations are comparable and students were assigned to each class at the beginning of the school year on the basis of a similar mix of overall achievement levels but
with a bias in respect to behaviour (Class 5 has a greater proportion of students with more challenging behaviour). As the pre-test difference between students’ mean spelling ages and mean chronological ages is greater for Class 5 students (6.3 months) than for Class 4 (1.9 months), and there was no deliberate attempt to place better spellers in Class 5 during class assignment, it is speculated that any difference in pre-test student performance can be related to the teaching they experienced in Term 1. The evidence for this assertion, in addition to a higher mean pre-test spelling age score for Class 5, is the smaller number of Below Average students on pre-test in Class 5 (n=2) compared to Class 4 (n=8) despite matched assignment at the beginning of the school year. This set the trend for better mean class spelling performance levels for Class 5 students than for the Class 4 students during the intervention experience, culminating in a marked difference in performance levels on post-testing. Class 5 gained 20.7 months mean spelling improvement over five months, compared to 11.4 months for Class 4. Class 5 students were 22.1 months above their mean chronological age in mean spelling age on post-test, compared to 8.0 months for Class 4 students. Notwithstanding these findings, Levene’s “Test for Equality of Variances” indicates that there are no significant differences between the pre-test and the post-test mean spelling ages, or the size of their progressions, for Classes 4 and 5.

The Zing system (TLS) has provision for each partnership of two or three students to have a keyboard and a boxed area of the projection screen (playspaces) for drafting their responses to activities. During the intervention lessons, each team discussed the problem in hand and their joint response to it. When each team was satisfied with their efforts, they then “posted” their playspace response onto the teamspace of the screen. When all teams’ responses had been posted there was discussion between the students and teachers. A system of allocating points evolved, and the criteria for earning points depended on the activity. For example, the scoring for the first correct answer posted, or every correct answer, or the most creative or useful effort (such as a new mnemonic or explanation of a problem) was voted on by all teams. Interactive exchanges took place between the partners in each team and between students and teachers. Activities were designed for each mini-lesson and the number of these per session depended on the time available when learning avenues had been explored after each one. Examples of mini-lesson topics and activities are: a) a cloze exercise for ‘their’, ‘there’, and ‘they’re’; b) ‘double or not?’ – benefited, committed, focused, inferred; c) ways to remember the number of ‘s’s and ‘c’s in necessary; and d) meanings and origins of morphemes, such as ‘tele’, ‘scope’, ‘phone’.
The teacher of Class 4 had very firm ideas about how students should be taught and preferred her customary pen and paper approach in the classroom where students usually worked individually on work-sheets or in exercise books after there had been an explanation of the topic using the chalk-board. During the intervention lessons Teacher 5 was more flexible in her teaching practices and allowed students to participate more fully in interactive exchanges. This involved expanding on a topic by noting students’ written responses to tasks and encouraging further discussion to clarify areas of uncertainty. Class 5 students were also invited to engage in classroom decision making about lesson processes and topics. The students in both classes worked well and stayed on task but the learning environment was more relaxed with Teacher 5. Teacher 4 was anxious to complete the list of mini-lessons on the lesson plan, whilst Teacher 5 allowed the learning needs of the students to dictate the pace. For example, a cloze exercise designed to reinforce the different meanings of similarly spelt words, for example *though*, *through*, and *thorough*, would finish when Class 4 students posted their responses on the teamspace and their efforts were briefly discussed; whilst for Class 5 avenues of instruction or discussion might open up to include other ‘ough’ words, with their different pronunciations, or relevant homophones. Teacher 4 was reluctant to expand the learning opportunities or take the subject of an activity in a direction that might be more suitable for her students than the one planned. A subjective appraisal is that Teacher 5 contributed substantially to the quality of the learning environment during the intervention program with her class and that, although Teacher 4 preferred her own way of presenting a lesson, she nevertheless participated to the extent that she found possible.

Figure 20 shows the number of Class 4 and Class 5 students in each standard score category on pre-test.

![Figure 20: Number of students in each standard score category on pre-test (Classes 4 & 5)](image)
The superior pre-test scores of Class 5 students compared to those in Class 4 are demonstrated by the greater number of Average and the smaller number of Below Average students in Class 5 at the beginning of the intervention period. This difference could be explained by an accidental bias that occurred when students were assigned to each class at the beginning of the school year. Alternatively, it could be an indication that during Term 1 the poorer performing students assigned to Class 5 were better assisted in their spelling lessons than those assigned to Class 4 such that they were largely in the Average category on pre-test. It also appears that the teaching of Teacher 4 produced a greater number of Above Average performers than the teaching of Teacher 5 during the first term of the school year.

Figure 21 shows a comparison between the numbers of students in Class 4 (n=11) and Class 5 (n=15) who progressed in spelling seven or more months above their pre-test levels.

![Figure 21: Number of students in Classes 4 & 5 in Progressed group.](image)

That seven of the eight Class 4 Below Average students progressed is a positive indication that these students were assisted by the intervention program. Figure 22 shows the progression in months of each student in the Progressed group (the post-test spelling age score is at least seven months more than pre-test score).
The mean number of months progression of two or more months greater than predicted for Class 4 (11 of 21 students) is 28.9 months; and for Class 5 (15 of 22 students) the mean progression is 31.2 months. The range for Class 4 is 9–63 months; and for Class 5 the range is 9–72 months.

A summary of findings related to the performance of Class 5 students compared to Class 4 students, despite being parallel classes and experiencing the same intervention lessons, is as follows:

- A greater proportion of Class 5 students (n=15 of 22) than Class 4 students (n=11 of 21) progressed =/> 2 months beyond their predicted spelling ages.
- The average progression of the students who progressed (the “Progressed group”) is greater for Class 5 students (31.2 months) than for Class 4 students (28.9 months).
- The mean average progression from pre-test to post-test for whole classes is greater for Class 5 (20.7 months in five months) than for Class 4 (11.4 months in five months).
- The greater gain for Class 5 students is despite their mean pre-test scores being 6.3 months in advance of their mean chronological age, compared to 1.9 months for Class 4 students.

It is possible to argue that these findings could support a premise that the academic ability levels of Class 5 students were higher than those of Class 4 students. This is countered by the numbers of students in each class who are in the lower cognitive ability group (B/Co).
on pre-test cognitive ability screening:

Class 4:  2 students of 21 in Class 4 (progressed 18 and 45 months).

Class 5:  6 students of 22 in Class 5 (progress range=12-72 months).

All lower ability students in Classes 4 and 5 progressed in spelling performance at least twelve months in five months of schooling which indicates that the TLS intervention assisted these children. In both classes the mean progress for Borderline/Cut-off students is 31 months, and substantial progress is made by three students in particular (45 months for one student in each class, plus another Class 5 student who progressed 72 months).

In contrasting the experience of teaching with both Teacher 4 and Teacher 5, the greatest difference lies in the degree to which the QT model (NSW DET, 2003a) was supported. The learning experience for students during the TLS intervention was enhanced by the better demonstration of all three dimensions by Teacher 5, particularly that of a Quality Learning Environment. It enabled students to argue their position and negotiate lesson directions. There were also more acknowledgements for effort, in particular for students who were usually reluctant to contribute in the normal classroom situation and student engagement appeared to be more intense. Teacher 5 showed several high-scoring characteristics of Productive Pedagogy (QSRLS, 2001), for example she was “more prepared to ‘subvert the curriculum’ to create spaces for learning activities that [she] valued” and appeared to “consider [herself] responsible for providing opportunities for student learning,” (Appendix A). Teacher 4, on the other hand, “appeared to have a strong focus on content, rather than on skills or concepts,” a low-scoring characteristic.

The results of students’ performance progress in Classes 4 and 5 not only indicate the influence of teaching practices on student outcomes but also illustrate that lower cognitive ability in a mainstream class cohort is no barrier to making substantial progress in an area such as spelling.

5.3 INTERVENTION LESSONS

The intervention lesson programs were built on the premise that “dedicated explicit spelling lessons of no more than one hour per week, designed for whole-class situations and which incorporate elements of the QT model, will improve the performance of all spelling ability levels”. The rationale for this statement will be discussed in relation to the findings from the study and activities in the classrooms. Firstly though, some aspects of intervention and
non-intervention groups’ contrasts in experiences are clarified. The principal difference between the intervention and the non-intervention groups is the pedagogic priority of the lesson programs they both experienced. Whilst both groups were concerned with augmenting the spelling performance of their students, the intervention lessons were designed to be more inclusive of below average performers. Teacher 2 was informally asked, “How do upper primary teachers decide what and how they are going to teach?” Her response was of particular interest because she has well over twenty years of teaching experience and is as follows:

There is no 'one model' for upper primary teachers. Many teach as I do. Many do not understand the intent of the syllabuses and so resort to text books etc and then try to work out what they are teaching from the syllabus. Many start with the syllabus and then look to text book activities and stencils to teach. Many were taught spelling as a memory activity with no conceptual understanding of language. Therefore this is how they teach spelling. I suspect these teachers don't really understand how children learn to read either. Many select a text book that will give them weekly lists at different levels relating to a specific rule or word group. Many have children do 'look, cover, write, check' which I personally think creates wrong spelling because if the student writes it incorrectly they then see it incorrectly and that is what they remember. Many have children use their spelling words in sentences for no apparent reason - the sentences are not linked to anything else that the children are doing or learning about. Many have children write their list in alphabetical order - again for no apparent reason. I think spelling is taught the same from kindergarten to year 6. I seriously think that teachers don't think about higher order thinking when teaching spelling and really do think that learning to spell involves memory (Teacher 2, personal email communication, 2007).

It is probably fair to say that the practices of the competent non-intervention teachers in this study are normally sufficiently effective to produce at least mean spelling age performance levels in their average students that equal those students’ mean chronological age, and appropriately higher levels of performance for the better spellers. This assumption is based on the mean pre-test spelling age scores of three non-intervention classes that are at least one year more than their mean chronological ages (Class 7=13.3 months, Class 8=12.8 months, and Class 9=16.7 months) and achieved during one school term by teachers reacting to the situation of an impending study. Although students’ mean spelling ages at the beginning of the school year are unknown, the assumption is made that extraordinary progress was made during Term 1.
As demonstrated by the non-intervention teachers, spelling performance can be improved by following teachers’ usual programs and by increasing the focus and time spent per week on spelling activities. Yet, although mean spelling age improves under these conditions it does not necessarily follow that there will be substantially more students who will no longer be inadequate spellers. Whilst average and above average spellers might thrive with the additional instruction time, the Matthew effect (Stanovich, 1986) can operate to disadvantage the Below Average performers.

The Standard Score distribution curve for the normative data of the instrument used (TWS) (Larsen et al., 1999) indicates that, as previously stated in Chapter 3 above, 25.33% of students are expected to be of Below Average spelling performance (at least two years behind their chronological age). In addition to these children, there is an almost equal percentage of students whose performance scores fall on the negative side of the mid-point of the normal spelling scale. When the Standard Error of measurement for this test (p. 28) is applied to an eleven year old with a standard score at the midpoint of the scale, he might be anywhere between six months behind his chronological age in spelling performance, and six months ahead. That indicates that 25% is a very conservative percentage value for the students who perform inadequately in spelling and concern for spelling standards needs to include the substantial number of children who perform at a level of six months or more behind their chronological age. On pre-test 43.2% of intervention students and 42.7% of non-intervention students fell into this category.

The success of any spelling program should not perhaps be measured by the improvement in mean spelling age per se, but by the percentage of children whose performance is better than six months below their chronological age (based on the normative data of the spelling instrument). In this study the percentage of intervention students who remained seven months or more delayed in their spelling age on post-test is 31.4% and in the non-intervention group the percentage is 34.8%; which represents an improvement of 11.9% (n=14) for the intervention group and 7.9% (n=7) for non-intervention students. It is proposed that more individualised assistance incorporated into normal classroom practice could profitably be directed towards students who demonstrate this lower level of performance.
Results from the Below Average group have been discussed in association with Focus Question #1 but further details are relevant to this section. On pre-test about one fifth of the total number of students were at least two years behind their chronological age in spelling performance (Below Average group=19.8%), and on post-test the percentage had fallen to fourteen per cent. The percentages of students in the Below Average category were almost equal for the intervention and non-intervention groups (Inv=20.3%; NInv=19.1%) at the beginning of the study. However, they were not equal on post-test (Inv=11%; NInv=17.9%) which indicates that the intervention lessons advantaged the intervention Below Average group over the non-intervention group’s lessons. The range of improvement for the poorer performers in the intervention group is from no improvement up to nearly four years (-6 to 45 months); and for the non-intervention group the range is from no progress to almost two years (-9 to 21 months). Students from three intervention classes achieved an improvement of forty-five months. Advantage to the intervention group is also seen in the results of lower cognitive ability children (B/Co) as described in Section 4.2.1.2 above.

These findings indicate that, not only does a spelling program of explicit word-focused lessons for one hour per week significantly improve the performance outcomes of upper primary students, but it especially benefits lower cognitive ability children and students who initially performed at Below Average levels. These latter results are in comparison to the non-intervention group’s findings. Thus, using no more time than is usually spent on spelling instruction per week, teachers can also be more effective in teaching children with poorer spelling ability and/or lower cognitive ability. If classroom teachers also carried out diagnostic spelling tests to ascertain the problem areas of individual students and specifically addressed their learning needs, then the benefits to students would undoubtedly be even greater.

5.3.1 INTERVENTION LESSONS AND QUALITY TEACHING

Congruency with the Quality Teaching (QT) model (NSW DET, 2003a) was not a consideration when this study was planned and first implemented as these events pre-dated available QT publications. Nevertheless, the tenets and educational aspirations that underpin the study design coincide with the educational philosophy that is expressed as “Dimensions” of the QT model. As a weekly visitor to the classrooms for the specific purpose of this study it was only possible to work within the circumstances of each particular class, as established by the classroom teacher. Individual histories and educational needs could not be specifically addressed. Regardless of these limitations, the QT model’s dimensions and elements
(Appendix B) are useful for identifying ways in which aspects of the intervention lessons support student learning.

As already discussed, the study taking place of itself had some measure of a positive effect on students’ outcomes in spelling as the attention of both the intervention and the non-intervention classroom teachers was focused on spelling and influenced their instructional priorities. The four interventions that involved five classes of students had a number of features in common and, additionally, there were factors that were pertinent to each individual class situation. Intervention lesson similarities include:

- Lessons involved approximately one hour per week (in two sessions for Class 2)
- Lessons were explicitly word- and language-focused throughout the duration
- Students were aware of each lesson’s purpose and outcomes expected of them
- Lessons were cognitively demanding
- Lesson formats were a departure from students’ usual experience of spelling lessons
- Students worked together in small partnerships to a greater extent than was customary

Congruency with the QT model (NSW DET, 2003a) was high for a number of elements but limited by the constraints of the lesson duration. All the elements of the dimension of Intellectual Quality were present, and High-order Thinking (Bloom, 1984) and Substantive Communication were particularly in evidence. Substantive Communication means that “students are engaged in sustained conversations about concepts and ideas they are encountering” (p. 11). The element of Student Direction in the Quality Learning Environment dimension was more difficult to satisfy as the learning event was confined by the timetabled schedule. Nevertheless, in the lessons designed by me, students expressed lesson topic preferences and areas that needed further attention. Social Support and Engagement were very much in evidence, and the latter was well demonstrated by the enthusiasm and speed with which students settled to work, participated in the lessons, the quality of their contributions and the virtual absence of adverse behaviour management events. The Significance dimension is an important aspect of the study which is based on the premise that students learn best that which they perceive to be important to them. Demonstrations of the element Narrative were difficult to identify under the circumstances of the study. Nevertheless, Cultural and Background Knowledge found expression in task-orientated exchanges which benefited from the ethnic and ability diversities
of the classroom students. The element of Inclusivity was particularly evident when products of activities were shared. Connectedness was well demonstrated when a Class 1 student spontaneously related an incident when he was able to teach his parents an aspect of one of the intervention lessons he had experienced.

There were two interventions for which I had no lesson planning responsibilities, except pre-program exchanges to establish common understandings of the lessons’ purposes, topic suggestions and the provision of any required resources. The two teachers welcomed the opportunity to put into practice their own ideas about how best to implement a more word-focused program, rather than just spelling per se, with a more explicit delivery. Teacher 2 conducted a Teacher-Best-Practice program features of which have already been described in Chapter 4 above, Section 4.2.1.3.2, and her lesson journal is found in Appendix D. She was also asked to actively teach spelling for transfer to reading and writing. Teacher 2 follows constructivist principles in her teaching and promotes inquiring habits of thinking in her students. Although this teacher complied with the request to explicitly focus on spelling for one hour per week, she considered this a less effective way of teaching for integration into reading and writing than her usual practice of exploring spelling as the opportunity arises. In spite of her reservations, her students progressed in mean spelling age by nearly seventeen months. The lower cognitive ability children (n=5) progressed nearly eight months and the Below Average performers on pre-test (n=6) advanced fifteen and a half months mean average for spelling age. One student, who is both of a lower than normal cognitive ability and a Below Average performer on pre-test, progressed eighteen months. During the intervention period Teacher 2 used more group work and the groups were based on either students’ general performance ability or other criteria depending on the purpose of the lesson, such as the “spelling used in students’ independent writing” (Week 1: Lesson Journal). As soon as the more able students could work independently in their groups, assistance was given to the less academically able students. Students investigated a range of topics including ‘wh’ words; finding the meanings of prefixes; and theme words such as those needed for a report on the House of Representatives.

The intervention for Class 3 also involved a lesson program designed by the classroom teachers (3a/6 for one term (Term 2) and Teacher 3b for the second part of the intervention period (Term 3). I assisted during the lesson under the direction of each teacher. Comments on lessons and teachers are made in Chapter 4 above, Section 4.2.1.3.3 and my Classroom
Journals (Appendix G). Teacher 3a/6 worked hard to achieve a literacy-rich environment and the intervention was a Teacher-Designed Creative Program. He was well prepared for each lesson. The purpose of each learning task was written on the chalk-board and also discussed with students when the topic was introduced. Each week, different activities had been planned and there was a range of lesson formats such as small group investigations using dictionaries, games to find particular words and meanings, or figures to construct for display of various rules. All lesson products were transferred to “clouds” and displayed around the classroom.

Both Teacher 2 and Teacher 3a/6 demonstrated high congruency with the QT model and with high-scoring characteristics on the Productive Pedagogies list (Appendix A). Teacher 3b was less successful in demonstrating these standards in my presence, perhaps because he was a novice teacher who had yet to acquire teaching experience and depth of knowledge about the English language. The lower cognitive demands on the students were particularly noticeable. Although only four intervention lessons were arranged by Teacher 3b over the second term, Class 3 progressed over fifteen months in spelling age over the two terms. It is assumed that Teacher 3b followed a more conventional spelling lesson program during the weeks when an intervention session could not be arranged. It was not possible to verify this.

These two interventions had the following aspects in common: a) a teacher designed program; b) the capacity to group children according to the planned outcomes for the particular lesson (knowledge of the abilities of each student); c) the capacity to accurately target lessons to students’ specific needs (knowledge of the errors children make in written language activities); and d) word-knowledge investigations for groups were not the teachers’ usual method for teaching about spelling and there was an element of novelty for the students. This latter aspect was shared with the two intervention programs of lessons that were designed for Classes 1, 4 and 5.

The researcher-designed programs were presented in a team-teaching capacity with the classroom teachers. The three teachers for Class 1, Class 4, and Class 5 were invited to co-plan lessons but preferred just to participate in the lesson presentation. A lesson-plan was supplied to each teacher at the beginning of each session and each person’s role was negotiated. After two or three lessons, Teacher 1 was more comfortable with the departure from the more expositional method of teaching spelling and played an increasingly supportive role. Teacher 5 quickly responded to the presentation mode and a good co-working relationship was soon
established. She was particularly skilled at exploring the avenues for discussion that the students opened up. The teacher of Class 4 never appeared at ease using a technology-based format for the lessons, or the different approach to teaching spelling. She only participated in proceedings when encouraged and presented the lesson as though in “chalk and talk” mode. Nevertheless, she conceded that her students worked well during the lessons and benefited from the program.

A humanist philosophy (Eggen & Kauchak, 1994) underlies the design of the programs for Classes 1, 4, and 5. A central tenet for this study is that students engage in formal learning experiences more readily when they perceive value relevant to themselves. A simple example of the planning ethos is the confusion that can still confront upper primary students about the choice of using there, their, or they're, even though their different contexts would have been explained to them many times in earlier classes. When students were asked why it is important to be able to differentiate between the forms, the longer term view gradually emerged that they will be written many times in future writing and that it is not useful to keep making the same mistakes. Although students can articulate the knowledge they have about the homophones, durable connections to the particular forms have not necessarily been made and can result in repeated errors of expression.

Constructivist principles express a humanist philosophy and suggest that learning that is actively constructed by the learner is more useful to the learner than when knowledge is already organised (Eggen & Kauchak, 1994). (The term useful is used in the context of adding value). Continuing the example of the above paragraph, an activity that explores ways to assist learning the different forms of the homophone there, their and they're, and opportunities to check the accuracy of recall, serves several purposes: a) students who do not consistently differentiate correctly between the homophone alternatives have an opportunity to amend or augment their learning. This is achieved by employing higher-order cognitive processes, such as Evaluation (Pohl, 2000), than when just trying to remember the differences; b) students who have already learnt to differentiate correctly are able to use their knowledge, understanding, and creative capacities for a purpose, which is to assist others. In the process, students consolidate their own learning and the products of their efforts are acknowledged. An example of this is the creation of the mnemonic ‘THE eyes (I’s) are (R) theirs’, which emphasises an association with person; c) learning directions are not confined to three forms of one homophone but encompass other avenues of investigation such as the concept of location (here, there,
everywhere) and opportunities to expand vocabulary; the concept of possession; the grammatical term pronouns and their function; the utilisation of apostrophes; the definitions of homophone, homonym and homograph; the origins and meanings of the morphemes; other words that utilise the morphemes and how meanings can be deduced; the etymology of words and how the English language has evolved from many other languages. Additionally, the range of educational opportunities extends to the areas of learning and memory through discussions on metacognition and metamemory. These in turn lead to activities that involve strategies for learning new information, concepts and skills and then further strategies to assist recall, such as using or inventing mnemonic devices.

One aim of the intervention lessons was to assist students to make connections between ‘Spelling’ and the greater dimensions of ‘Language’, rather than demonstrating more compartmentalised word-list learning and written product editing. Spelling is thus figuratively removed from the English K-6 Syllabus (BOS NSW, 1998b) narrow confines of a substrand of Writing and is placed in a central position for the study of Words and Language. Whilst the technical spelling of a word is just one part of what needs to be known about a word, it is an essential part, as it connects all learnings about a written word and is its visual identity. The lesson programs for the two interventions for Classes 1, 4, and 5 are thereby characterised by the Spelling-Knowledges of 1) phonological; 2) visual; 3) morphemic; and 4) etymological knowledge, as described in the NSW Department of Education document Focus on Literacy: Spelling (1998a).

5.3.2 INTERVENTION LESSONS AND LOWER ACHIEVERS

The important question to ask is:

What factors inherent in the intervention program lessons were of particular benefit to the Below Average achievers in spelling and the students with lower than normal cognitive ability?

One very obvious impact of the lessons with which I was involved was the enthusiasm with which students greeted my arrival. Whilst it would be flattering to suggest that their positive attitudes were directed at me personally, it has to be acknowledged that their enjoyment of the lessons was the primary driver of their reactions. Students rapidly settled down to work and eagerly awaited an outline of activities. They also expressed regret when the intervention period came to an end. Student 62 (Appendix F) commented that lessons “help remember words I didn’t know before. Working together more fun. Help each other. Got much easier. Sorry lessons have to finish – want to keep going.” No behaviour management issues were encountered except that the students in
Class 3 were increasingly less on-task as the second half of the intervention period progressed. My observation is that the students were less cognitively challenged and stimulated by the lessons designed by Teacher 3b than those presented by Teacher 3a/6. The spelling lessons enjoyed by Class 2 were not directly witnessed and further comments about classroom events arise mainly from experiences with Classes 1, 4 and 5.

The following main features that the intervention lessons had in common will be related when possible to the QT (NSW DET, 2003a) model’s dimensions of Intellectual Quality; Quality Learning Environment; and Significance, and the NNWL model in further discussion. The lessons involved approximately one hour per week (in two sessions for Class 2) and were explicitly word- and language-focused throughout the duration. Students were aware of each lesson’s purposes and outcomes expected of them. Lesson formats were a departure from students’ usual experiences of spelling lessons as they were more cognitively demanding and students worked together in small partnerships to a greater extent than was customary. A further feature that is relevant to the lessons of Classes 1, 4, and 5 is that student/teacher interactions became integral to the lesson designs and developed into “conversations” between students and teachers where the more usual protocol of students’ awaiting permission to speak after raising a hand was relaxed. This allowed the shared communications to be more natural and at no time was it necessary to reimpose formal rules. It was not initially an intended feature of the lessons but one that evolved as a consequence of mutual engagement in the learning experience.

Whilst it is possible that a number of these conditions were met in the non-intervention group’s lessons, for example students would have understood what was expected of them and no doubt at times experienced cognitive challenge, it is more probable that non-intervention lessons throughout the five months of the study period focused more on memory-based learning of vocabulary than on language-exploring activities. It is therefore proposed that factors were present in the intervention lessons (and less evident in the non-intervention lessons) that were responsible for the notable progress in spelling of the intervention group’s poorer spelling performers and students of lower than normal cognitive ability.

The strength of the intervention lessons lay in how they engaged students in the learning opportunities and allowed them to express their learning to their peers and in student/teacher exchanges. The QT elements of High-order Thinking, Substantive Communication, and
Engagement were prominent and it is suggested that the lower achievers on pre-test and children with lower than normal cognitive ability were particularly assisted by incidences of scaffolding. Additionally, the intervention lesson structures were compatible with the Neural Network for Written Language (NNWL), a model of language learning that was developed by me from the brain research studies of Pugh et al. (2001). This model (Figure 23) assists in linking the features identified in intervention lesson programs to processes involved in learning spellings.

**Figure 23: Neural Network for Written Language (NNWL) model of Learning Spellings**

The important concept illustrated by this model is that connections are formed between the sub-cortical neural centres and the network system in both directions. New inputs activate the language neural centres which, in turn, activate their interconnections through the network system and tap into prior learning. New learning comes about through cognitive processing, mainly at the cortical level, which forges new connections in the neural network. Links to these connections are fed back into the neural centres and are stored in the brain’s lexical memory in preparation for recall or expression of learning. McGeeham (2001) credits Hart (1999) with the term “brain-compatible” in reference to education that is designed to match “settings and instruction to the nature of the brain, rather than trying to force [the brain] to comply with arrangements established with virtually no concern for what this organ is or how it works best” (p. 7). The following discussion attempts to link classroom events during the interventions to outcomes in learning and theoretical perspectives.
There is a strong likelihood that intervention students experienced spelling instruction for a shorter period per week than the non-intervention students, though this is not an established fact. The compensatory rivalry effect suspected for the non-intervention groups, as discussed in Section 5.2.2, and the teachers’ written comments about their spelling lesson durations makes it highly probable that non-intervention students experienced about one half hour per day lesson instruction, plus their word-list homework. The intervention teacher, Teacher 2, certainly presented no more than two half-hour lessons per week (a total of one hour per week) and did not give her students spelling homework. Additionally, there was no work with word-lists, a customary practice in all other classes. An assumption is made that the teachers of the remaining intervention classes did not present instruction in spelling to their students in addition to the intervention lessons, as per prior arrangements, but they did continue with their weekly word-list homework and testing programs. It has to also be supposed that students were given time for dictionary work on their word-lists (the absence of completed journals makes it difficult to be sure of such events). A practice that was most probably common to all classes in both the intervention and the non-intervention groups is that there were teacher/student exchanges about words and spelling during reading and writing activities.

My concern about the time spent on spelling instruction stems from one of the findings of the QSRLS (2001). An item on the Productive Pedagogies list of low-scoring teachers (Appendix A) refers to a complaint made by teachers in this category about lack of time to get through the curriculum. Prior to this study, informal comments made by teachers when asked about their programming suggest that half an hour per day on spelling activities is usually planned but rarely achieved. For this reason, one of the pragmatic aspects of the study is to demonstrate that an improvement in the quality of students’ learning experience can compensate to some degree for the reduction in the quantity of time per week that frequently occurs. Whilst the results indicate that there might well be support for this notion, conditions were not sufficiently well controlled to state this with absolute confidence.

It is acknowledged that there is a “study effect” threat to internal validity affecting both the intervention and the non-intervention groups as all classes progressed more than the level predicted by the duration of the intervention period. However, statistically significant differences between the Below Average spelling performers and students of lower than normal cognitive ability (B/Co) in the intervention and non-intervention groups have been
demonstrated in Chapter 4 above and indicate the better performance levels of the intervention students in these categories. Briefly, of the intervention students in the lower cognitive ability category eighty percent (80%) made equal or more than seven months progress, compared to less than half (45.5%) of non-intervention Borderline/Cut-off students. One further Borderline/Cut-off intervention student made six months progress and none of the scores of the remaining three intervention students regressed more than six months (+3; -3; and -6 months). Of the eleven Borderline/Cut-off non-intervention students, the scores of the remaining six (who did not make progress) are 3; 3; 0; 0; -3; and -15 months. It is clear that the intervention lessons were of benefit to a greater percentage of Borderline/Cut-off students in that group when compared to the non-intervention Borderline/Cut-off students.

Of the intervention students who are in the Below Average pre-test standard score category (n=24), six are Borderline/Cut-off students, four are of normal cognitive ability, and the cognitive ability levels of fourteen are unknown. Seventeen students (70.1%) progressed equal or greater than seven months; four progressed six months; and the remaining three students had scores of -3, -3, and -6 months. The latter student (-6 months) is a student in Class 5 who had remedial mathematics lessons instead of intervention lessons for the majority of the time. Of the seventeen non-intervention Below Average students, four are Borderline/Cut-off students; one is normal; and twelve are in the ‘Don’t know’ category for cognitive ability. Nine (52.9%) of the students progressed equal or greater than seven months; one student progressed six months; and the remaining seven had scores of 3; 3; 0; -3; -3; -9; and -9 months. Of the total number of students in the study (n=207) forty-one students (19.8%) were in the Below Average category for spelling performance on pre-test, and only ten students did not progress at least six months in the five-month period. Three of these students (12.5% of Inv BAv students) were in the intervention group (one of whom was seldom present) and seven (41.2%) in the non-intervention Below Average group.

It is not possible to know the extent to which a study effect influenced these findings but, as it was a threat to both the intervention and the non-intervention groups, it is fair to say that the percentage of Below Average students who did not make progress in spelling over two terms is conservative and that it would be greater under normal classroom conditions. The important finding is the differences in percentages of intervention Below Average students (12.5%) compared to non-intervention Below Average students (41.2%); and intervention Borderline/Cut-off students (20%) compared to non-intervention Borderline/Cut-off students.
who did not progress. The least these results indicate is that the intervention lessons assisted a greater percentage of the intervention children in the Below Average and Borderline/Cut-off groups to progress in spelling than the lessons of the non-intervention group. It is hard to resist drawing the conclusion that the quality of the classroom experiences for these two categories of students in intervention classes was more important to their learning than the quantity of time spent by the corresponding non-intervention students on their lessons.

Discussion of aspects of the intervention lessons on students’ learning follow but there remains the question of the importance of time. Authors contributing to the literature might mention the duration of intervention lessons pertinent to their study but I have yet to locate one that recommends the daily length of a classroom spelling lesson and provides supporting evidence for their conclusions. As indicated earlier, classroom teachers frequently plan for half an hour per day and this time is often severely curtailed. Gentry’s (2004) commercially available spelling course is designed for fifteen minutes daily and his program centres on vocabulary building using word-lists and word-sorting activities. The non-intervention group’s findings suggest that thirty minutes per day can bring about commendable results in students’ spelling performance and the intervention lesson experience shows that less time can be effective. Logically, the mean average progress of the non-intervention Below Average students should have been greater than that of the intervention group as students had more time to spend on spelling activities during lessons prepared by competent teachers. Yet the contrary was the case. The conclusion can therefore be drawn that the non-intervention Below Average students did not engage in the learning opportunities of their classroom as fully as the intervention Below Average students.

Newby, Stepich, Lehman, and Russell (1996) consider that common criteria should be used to identify when learning has taken place. They refer to definitions of the process of learning outlined by Schunk in 1991 which centre on the concept of “change”: “1) a change, or capacity for such change, occurs in the learner’s behaviour; 2) the change, or its capacity, results from practice or other forms of experience; and 3) the change, or its capacity, endures over time. … Typically, learning is measured by the amount of change that occurs within an individual’s level of performance or behaviour” (p. 9). This is measured in this study by using the normative data spelling instrument of Larsen et al. (1999). As stated by McGeeham (2001), “new experiences physically change the brain causing neurons … to sprout new branches, or dendrites, and thus increase communication among neurons across … synapses. …
[It] *is the physical basis of learning and memory*” (p. 10). In reference to Figure 23, the NNWL model, the non-intervention lessons appear to have been less effective than the intervention lessons in stimulating cortical processing in the Below Average students to bring about modifications to students’ neural networks and lexical storage systems. This shifts the emphasis from change in the overt demonstration of learning to actual physiological change in the brain’s interconnections and neural centres. A greater understanding of these processes will pave the way for more effective pedagogic practices that will, in turn lead to the development of the most appropriate assessment procedures for the learning that has taken place.

The question of how the learning processes of poor achievers differ from average and above average students is pertinent to the pedagogic decisions teachers make. Zutell (1998) reports on early research and it was found that the notion of *difference* is not supported by evidence. Later studies (Invernizzi & Worthy, 1989, as cited in Zutell) indicate that “*both normally achieving and learning disabled students learned words in the same way when level of achievement was controlled*” (p. 225). Additionally, Zutell refers to work reported by Abouzeid (1992) who found that there “*is a close relationship between word knowledge in reading and spelling*” (1998, p. 226) and that word knowledge development showed similar patterns for normal and delayed readers. Although Westwood (2005) cites and acknowledges the work of Fulk and Stormont-Spurgin (1995) who propose that the learning difficulties of poor spellers “*may be related to underlying problems with language, memory, phonological awareness, visual processing and inefficient learning strategies*” (p.23), he also suggests that “*poor spelling skills may be indicative of inadequate or insufficient instruction*”, or that the latter compounds a student’s underlying problems. This view reiterates those of Henderson (1981) and Montgomery (1997), and the latter adds “*that children who have general learning difficulties may develop both reading and spelling difficulties which are consistent with their slower profile of development across a range of skills and abilities*” (p. 20).

These studies suggest that the main difference between the learning needs of low achievers and students of average ability is the amount of time needed to effect learning. Moats (1995) considers that “*children who are poor spellers are insensitive to the structure of spoken and written language and they need much more practice than good spellers to remember sound-symbol associations*” (p. 91). She further contends that “*poor spellers need more experience with print and more focus and repetition during that experience than good spellers*” (p. 90) so that patterns can be internalised. Simmons and Kameenui (1996) make the point that “*playing catch-up exacts an enormous cost on students, teachers, administrators, and parents … the best strategy is not to get behind in the first place.*” They go on to say
that “the … quality of instruction has the greatest potential to affect the needs of students with diverse learning needs” (p. 3). A further problem for low achievers is identified by Good and Brophy (1987, as cited in Gjesme & Nygard, 1996) in that “in the class, instruction and assessment behaviour of teachers differentiates between high and low achievers, to the disadvantage of the latter” (p. 63). It is appreciated that some of the work reported here refers to students who have greater difficulties with cognition than the majority of students in the mainstream classrooms of this study. Nevertheless, the key points raised are that poorer learners in spelling need more practice and more focused teaching, both of which make demands on teachers’ time.

Yet the Below Average and Borderline/Cut-off students in the intervention classes of this study experienced neither more learning time than their peers nor any individualised teaching, and still made significantly better progress in spelling performance than those in the non-intervention classes. It can be argued that, if the non-intervention teachers had addressed the individual needs of their lower achieving students to a greater extent during their half-an-hour per day lessons, the key findings of this study might be very different. More focused time on individuals might possibly have compensated for the greater demonstration of QT model dimensions experienced by the intervention students.

Drawing on “educated guesses” and the non-intervention teachers’ comments (Appendix C), non-intervention lessons can be related to the NNWL model of the learning process. Learning lists of words, based on mastery of easier words before moving on to the more complex, comes from a behaviourist perspective on learning (McInerney, 2005), and is the most common approach taken for spelling lessons that students experience. By the time they are in upper primary classes, their efficiency with this system has no doubt reached a plateau. Teachers advocate using the Look-Cover-Write-Check strategy (Horn, 1919, as cited in Peters, 1985) for learning spellings, and instruction about the words usually includes a spelling rule or a theme as a focus. Cooke (1997) contends that:

Proponents of the LCWC method of learning difficult spellings … rely on the learner’s capacity to remember the details of letters and the letter order in an irregular word by fixing it in the memory by visual means only. LCWC does not make full use of the alphabetic nature of the writing system nor the role of phonology in the spelling task. The LCWC method also seems to ignore the nature of the language activity itself (p. 240).
And in 1985, Henderson (as cited in Cunningham, 1998) wrote:

*Those who set out to remember every letter of every word will never make it. Those who try to spell by sound alone will be defeated. Those who learn how to “walk through” words with sensible expectations, noting sound, pattern and meaning, relationships will know what to remember, and they will learn to spell English* (p. 193).

In relation to the NNWL model described in Chapter 2 and above, such teaching strategies rely on repetition of input to lay down the learnings in memory in the sub-cortical neural centres. Although students are expected to attach meanings to the words they learn, which would involve active cortical processing to establish links to the neural network, how rigorously they do this depends on the interests and aptitudes of the individual children. A count of Study Students’ (n=107) responses to a question of whether they made sure that they knew the meanings of words they were supposed to learn (Appendix F) reveals that only seven of n=107 children ‘always’ did (NInv=2) and twenty-six students ‘mostly’ did (NInv=6). Twelve children admitted to never looking up meanings. Ten of sixty-nine intervention SS/5 students spontaneously stated that they are more interested in attaching meanings to words since the intervention lessons. It is of interest to note that the proportion of students who are sufficiently interested in words to want to know their meanings is much smaller than the group who appear to see dictionary work as just part of the spelling lesson procedure rather than of any direct interest or benefit to them personally. This disconnection with literacy development is analogous to performing arithmetic algorithms with no concept of number principles. Without student interest and commitment to establishing durable neural connections between the features that make up a word, the memory of a word’s letter features can only be transient.

Although work on increasing students’ knowledge about words, besides their word-list activities, was part of the non-intervention teachers’ programs, it is probable that the lower achieving students limited their learning opportunities by viewing learning spellings more in terms of procedural work than in enriching their education in language. There is a high probability that non-intervention students were less engaged in the learning process, in contrast to the intervention students, because of their familiarity with lesson procedures, and because they were less assisted in making connections between new learning and old, as well as in establishing the relevance and significance of learning about words. Active student participation in the learning events appears to be a key factor that advanced the progress in spelling of the intervention lower achievers over the non-intervention Below Average students.
and made it possible to accomplish this achievement in a shorter instruction time.

Educators such as Edwards-Groves (2003) and Cambourne (1999) refer to explicit teaching and learning events. “Explicit teaching refers to the practice of deliberately demonstrating and bringing to learners’ conscious awareness those covert and invisible processes, understandings, knowledge, and skills over which they need to get control if they are to become effective readers” (Cambourne, p. 126). According to Edwards-Groves, “explicit teaching establishes conversations that are productive, inclusive and learning-centred. It directly and intentionally prepares students for their literacy learning and informs them of the learning path” (p. 8). In the context of this study, the term is used more generally to mean that the intervention lessons were focused totally on words and language and allowed no opportunity for diversions into other areas. Conversations were about the work in hand, and instructions and explanations were conveyed in an explicit manner. Students were made aware of each lesson’s purposes and there were teacher/student conversations to establish the significance of the learning events.

The main part of the NNWL model that the explicit nature of the instruction served is the sensory learning input system. As students knew what they had to do and had some ideas of how to go about the tasks, their attention was focused on the matter in hand. Their learning was thereby assisted by the reduction of any distractions from their peers and their attention was heightened by their motivation to engage in the activities. The QT dimensions of a Quality Learning Environment and Significance were demonstrated as students were willing to participate in learning opportunities and were well aware that the lessons supported their educational needs.

Lessons were well-paced and students were on-task throughout (with the exception of Class 3 in the second part of the intervention when students were under-challenged). It was not possible to follow an explicit systematic lesson program, as suggested by various authors such as Cambourne (1999), Edward-Groves (2003), Graham, Harris and Loynachan (1996), and Moats (1995) in the circumstance of this study, if indeed it had even been considered desirable. Students in upper primary classes have experienced a number of years of graded vocabulary building and it has not proved a successful teaching strategy for the Below Average achievers in these classes, as this nomenclature implies. The main objective of the intervention lessons was not to present a spelling development program based on mastery principles, but to teach students what was useful to them at their educational level. Lesson topics were selected on
an “important-to-know” basis (in my judgement) and after consultation with classroom
teachers. They were decided in reference to spelling development literature, curriculum
materials, and background reading of commercially available spelling books as noted in the
bibliography, and after consultation with the students’ themselves.

One of the first questions that students were asked was, “What do you want to have
lessons about?” and the list they requested included: synonyms and antonyms; homophones;
silent letters; mnemonics; word families; and words that are long, big, new, root, hard, small
words in big, and different language words. More pointedly, they expressed how much they
liked to learn with games. These students were well able to articulate their learning needs and
they were confident that it was a genuine request for information which would be acted upon.
Spitzer (1996) makes the observation that “no matter how excellent any instructional program is,
learning will be no greater than the student’s level of motivation” (p. 45). He also adds that “any instruction
can be highly motivating if instructional designers put more emphasis on the motivational aspects of the
instruments they are designing” (p. 45). The Zing TLS (Classes 4 and 5) was very suitable for
designing lessons in a games format and students were very excited about using the technology.
Small groups of two or three students per team ensured that outcomes were arrived at by a
cooperative effort. During the second lesson they were asked if they liked learning with this
system. They thought it fun and an interesting way to learn. These students also liked to discuss
tasks with their partners and, interestingly, towards the end of the program two students
worked alone whenever they could as they preferred to challenge themselves rather than have
assistance from a partner. They were very task-orientated (Nicholls, 1984) and they liked any
achievement to be their own, thereby demonstrating Student Direction. Arrangements were
sufficiently flexible to accommodate such student preferences and there was a high level of
congruency with the QT model dimension of Quality Learning Environment.

A feature of the intervention lessons that was common to all intervention classes was
more small-group work than the students usually experienced in spelling lessons. Students were
accustomed to a teacher exposition to the whole class on the word-list theme or focus and,
after copying down their word-lists, would then individually commence investigating their
words using a thesaurus or dictionary. During the intervention period, the teachers of Classes 2
and 3 provided groups of students with language-related problems to investigate. As Classes 4
and 5 always used the TLS all lessons were conducted to small partnership groups. Whether
Class 1 worked as a whole-group or in small groups depended on the activity at the time.
Bandura’s (1986) Social cognitive (learning) theory places heavy emphasis on modelling or vicarious learning and has evolved from a behaviourist perspective. The lower achievers would have been exposed to the learning behaviours of their more able peers but it is not possible to know how this influenced their own learning outcomes.

Piaget and Vygotsky (Eggen & Kauchak, 1994) are cognitive theorists who stress the important role that social interaction plays in the learning process. It is a major theme in Vygotsky’s work and the concept of the “zone of proximal development”, which is “the phase in learning in which a student can profit from assistance” (p. 42) is particularly relevant to the intervention lesson investigations and tasks. One can speculate that the opportune scaffolding, a further concept developed by Vygotsky, of low achievers by their peers was an important factor that contributed to the greater progress with less instruction time made by the Below Average intervention students compared to the non-intervention Below Average students. Peer assistance was coupled with a motivation to complete “learning goals” (Pintrich & Garcia, 1991, as cited in Eggen & Kauchak) which are “goals that focus on the challenge and mastery of a task” (p. 449). The high level of Engagement and Social Support indicate features of a Quality Learning Environment.

The Discussion Paper of the NSW QT model (2003a) states that:

*Research has demonstrated that pedagogy focusing on high levels of intellectual quality benefits students, whether they are high or low achievers, from backgrounds typically identified as educationally disadvantaged or gifted and talented, or students identified with special needs in mainstream classes. The positive effects … have been found to influence individual student outcomes on both performance-based assessment measures and conventional standardised achievement tests* (p. 7).

The use of the word influence in relation to outcomes implies that what children learn can be demonstrated by a change in what students can do. It follows, therefore, that there is an association between learning and a change in students’ cognitive systems which drives the altered performance in outcomes. In the NNWL model this change takes place as a result of cortical processing that sets up new connections McGeeham (2001) in the neural network system which feeds back to the sub-cortical neural centres, and new learning is integrated with prior learnings. These centres connect directly with the output system for automatic recall or the slower route via the brain’s cortex if more cognitive processing is required. The whole process is initiated by new inputs that stimulate the appropriate neural centres, which in turn
activate the network system and leads to cognitive processing, thereby completing a recurring cycle. This picture is aligned to the processes of assimilation and accommodation that Piaget suggests are the mechanisms for using and adjusting schemata (Eggen & Kauchak, 1994). The concept of cortical processing involving new and old learnings to create new understandings, which in their turn contribute to the next generation or level of knowledge and understanding, leads in the direction of a constructivist perspective of learning. The model described here is closely aligned to network models incorporated in information-processing theories but takes a less mechanistic stance as it allows for emotions (McGeeham, 2001) to influence the efficiency of the synaptic junction connections as described in Chapter 2 above.

A pedagogy that focuses on Intellectual Quality is therefore one that promotes a high level of cortical processing so that links which are educationally useful can be made. This is an active process, as the term “constructivist” implies, which is more efficient when students are fully engaged in the learning situation, a view supported by Von Glasersfeld (1981) and Graves (1994):

> Words can be understood superficially or deeply. When a word is understood superficially, the underlying concept is not elaborated and there are few connections with other related concepts. In contrast, deep knowledge is richly elaborated and connected with many other concepts (Templeton & Pikulski, 1999, n.p.).

According to Chipman (1992, as cited in Bruer, 1993) “students who genuinely possess high-order skills in a subject domain not only have the requisite factual and procedural knowledge, they also can recognise when the knowledge is applicable and can be used appropriately” (p. 78). This suggests that these students have developed a rich network that integrates a wide range of different types of learning. Such a view concerning learning is consistent with the Cumulative Learning Model referred to by Bell-Gredler (1986). Sternberg and Spear-Swerling (1996) consider that skills such as comparing, contrasting, analysing, evaluating, and explaining can be taught, particularly if problem solving strategies are used in group situations. Bloom (1984) organised a taxonomy of such skills into a hierarchical order, namely knowledge, comprehension, application, analysis, synthesis, and evaluation, and one aim of the QT model (NSW DET, 2003a) is to encourage teachers to incorporate in their lessons opportunities for students to develop the higher level of skills.

In relation to the Productive Pedagogies model (QSRLS, 2001) Lingard and Mills (2003) found that “there is a strong correlation between the amount of intellectual demand, connectedness, social
support and academic outcomes” (n.p.). They also considered the situation when there is a lack “intellectual demandingness” and suggest that it “reflects the substantial amount of curriculum content teachers feel they must cover in a finite period of time; thus coverage becomes more important than the pursuit of higher order thinking, citizenship goals and so on” (n.p.). This attitude was directly experienced during the intervention lessons with Class 4 when Teacher 4 was reluctant to develop learning opportunities in a bid to complete the activities listed on the lesson program. Such a view is counter to an objective of the intervention program which was designed to foster a greater student interest in learning about words by providing cognitive challenges. An example can be illustrated by one of the ways Templeton and Pikulski (1999) consider that vocabulary knowledge grows, namely “relating new words to existing concepts (gigantic, huge)” (n.p.).

Activities might include:
1. brain-storming synonyms for a core concept such as ‘size’ (knowledge).
2. small-group exercise to search for more words (knowledge)
3. ordering words according to stated categories, for example adverbs, adjectives, nouns – or relating to people, place and other groupings (analysis)
4. examination of factors that contributed to categorising decisions (evaluation)
5. identifying roots of words and affixes (analysis)
6. exploring morphemes (synthesis)
7. exploring derivations (synthesis)
8. exploring ‘tricky’ spellings and ways to remember correct spellings (analysis and synthesis)
9. selecting most suitable synonym(s) for particular situation and justifying/arguing for decisions (evaluation)

As illustrated, work with synonyms (and antonyms) can not only be fun for students but also exercise the high-order skill of “evaluation”.

Reviews of previous learning took on a new guise in the lessons of Class 4 and Class 5, the Team Learning System classes. The concept of a “word-wall” (Green, 1993) was adapted for this medium and was used as a warm-up activity. Four columns of five words were on display and students had to find the words that were most suitable for answering a series of questions, such as “Find the word that: a) is an adjective and means extremely large (humungous); b) starts with a /k/ sound but has a silent letter because it derives from a Greek word (chemist); c) is the verb form of license rather than the noun form of licence; d) means that you
are too hot (hyperthermia) rather than too cold (hypothermia).” The correct words had to be selected from other reasonable alternatives and generated energetic discussions between members of the small groups.

Hamm (1989) believes that the first criterion of learning is intentionality and “it highlights the demand that learning is an activity that one engages in with purpose and intention to come up to a certain standard” (p.92). This factor was well demonstrated by the children in the intervention classes. If the Below Average students had had to work on their own for the above activities they might well have found them too challenging to be useful. Being members of small groups allowed them to contribute and also to learn from the discussions and reasoning of their peers. Correct spellings were always insisted upon in answers and there were no rewards for misspellings. Importantly, they saw (as answers were on public display) that even their more successful peers made mistakes, and this realisation gave the lower achievers more confidence to take risks, and to more actively participate in the learning experiences. Their attention was less on their emotions generated by being fearful of public ridicule and more on the task in hand (McGeeham, 2001). There were no personalised adverse consequences for making errors, only acknowledgement for the effort made when higher order thinking was demonstrated. The students were their own drivers for perfection in spelling and word activities as they enjoyed getting words “right”.

The intervention lessons challenged students to think about words and how language works on the premise that such cognitive activity would assist in laying down enduring connections for retaining learning. A further feature is the range of different activities in some of the lessons that ensured that there were opportunities for the diverse student cohort to experience success. An unexpected development in the lessons of Classes 1, 4, and 5 was the high level of Substantive Communication, an element of the QT Intellectual Quality dimension. This evolved from working with the classroom teachers in a team-teaching capacity. It became my role to initially outline each activity (as I had planned the lessons as per teachers’ preference) and their role to develop the lesson into an educationally meaningful experience as they were familiar with their students’ names and capabilities. I was also in control of the technology for the TLS with Classes 4 and 5. As these lessons comprised several mini-lessons, there was opportunity and necessity for frequent student/teacher communications and occasional teacher/teacher exchanges when a point needed to be clarified or developed. Student exchanges in the partnership arrangement were integral to using the
Zing system.

As Class 1 lessons were conducted in the classroom using only pen and paper resources, their format differed from that of the TLS lessons. The Class 1 situation was suitable for brainstorming and mind-mapping sessions (Buzan, 1991) about a range of issues including metamemory and metacognition. Metamemory refers to “the knowledge and control of memory strategies” (Eggen and Kauchak, 1994, p. 350) and Livingstone (1997) describes metacognition as involving “active control over the cognitive processes engaged in learning” (n.p.). Distinctions between “Knowing”, “Learning”, and “Memorising” were explored and discussed, for instance, as well as learning strategies. Also, it was possible to give demonstrations of multisensory strategies for learning spellings. Moats (1995) uses the initials VAKT to denote “visual, auditory, kinaesthetic, tactile” in reference to multisensory instruction and considers that:

One likely reason for the efficacy of the multisensory approach is that it encourages the child to externalize and focus upon the phonemic elements of the word by saying it slowly and deliberately, noticing how each phoneme is represented. This activity facilitates the 'comparator function' viewed as central to spelling by Lindamood, Bell, and Lindamood (1992), the active differentiation of similar word forms and conscious matching of sound to symbol. Moreover, more attention is deployed when several sensory modalities are engaged simultaneously, probably resulting in increased brain activation levels and increased chances for information storage (p. 91).

Cooke (1997) advocates multisensory approaches to teaching children with learning difficulties to spell irregular words as “these make explicit use of the visual, auditory and kinaesthetic experiences of spoken and written language to overcome the learner’s difficulty in mastering sound-symbol associations and remembering the details of letters and letter order in words” (p. 240). Interestingly, Teacher 1 requested me to have another multisensory strategy session three weeks after the first as some students surprised her by remembering the words learnt in the first session. (When questioned at the end of the study fourteen of twenty-three of the Class 1 students said that they found the technique useful). What is surprising though is that Teacher 1 did not repeat the lesson herself. I speculate that Teacher 1 did not pay heed to the first demonstration as she did not expect it to produce such positive outcomes.

The multisensory lesson leads to another aspect of the Class 1 experience. Initially, I deferred to Teacher 1 and took a secondary role in the conduct of the lesson. After the second lesson I took a more active stance as I considered that learning opportunities were being submerge by adherence to procedures. After my demonstration of multisensory strategies,
students were instructed to practice with a word from their weekly lists. Instead of starting the task, they asked a barrage of questions relating to procedure, for example: “Portrait or landscape? Pen or pencil? Coloured textas? Which colour? Which word? Big or small writing?” And so on – this despite an expressed permission to make up their own minds about such matters, consistent with promoting interest in the activity. A further initial problem encountered in Class 1 was that Teacher 1 paced the lesson to the slowest students, rather than scaffolding them, which resulted in the majority of students being under-occupied and therefore wasting learning time. Once that was resolved, a workable arrangement developed and Class 1 students responded well to the less formal lesson format and less restrictive teacher/student exchanges. There was a wide range of activities over the two-term period and the students fully participated.

Gradually a relationship developed between teachers and students in Classes 1, 4, and 5 that could be described as one of shared purpose. Students expressed learning and language concerns and preferences, and their needs were accommodated whenever possible. Lessons were focused more on learning about words than on learning words per se as it was considered the more productive option. Also, I took the view that when students know more about words, they are more interested in learning words for themselves. Nagy and Anderson (1984) state that:

Direct vocabulary instruction … can only cover a small fraction of the words that children need to know. Trying to expand children’ vocabularies by teaching them words one by one, ten by ten, … would appear to be an exercise in futility. Vocabulary instruction ought, instead, to teach skills and strategies that would help children become independent word learners (p. 328).

Cunningham (1998) enlarges on the work of Nagy and Anderson, stating that students in Years 5 and 6 encounter ten thousand new words per year and “most of these are big words – words of seven or more letters and two or more syllables” (p. 189). “Only 1,000 of these new words are probably truly new words, not related to other more familiar words” (p. 192). A simple calculation shows that vocabulary building measures based on about twenty new words per week from word-lists yields an increase of 600-700 words per year at most for this age group. Clearly there is a sizeable shortfall in necessary learning if students’ education in words is centred on such a narrow teaching strategy, and not substantially augmented by reading and writing activities or other measures. Nagy and Anderson hypothesize “that the principal force driving vocabulary growth is volume of experience with language” (p. 327) which indicates the value to students’ vocabulary development of Spelling Knowledge (NSW DET, 1998a) and knowledge of the English language system.
Bruner (1960) argues that gaining knowledge is a process, not a product that can be learnt by passive learners. His concerns are directed against expository teaching practices, and the intervention Below Average students demonstrated that more active participation in the learning experiences assisted their progress. The concept of “active learning” is central to the Authentic Pedagogy work of Newmann and colleagues who are interested in students “actively constructing meaning grounded in their own experience rather than simply absorbing and reproducing knowledge transmitted from subject-matter fields” (Newmann & et al., 1996, p. 280). They suggest that active learning “can be pursued through small group discussions; cooperative learning tasks, independent research projects …” (p. 281) but also acknowledge that in such circumstances active students do not necessarily produce work that demonstrates in-depth understanding of the topic. This concern is addressed by considering the practices of teachers. According to Newmann and others, there are principles of constructivist teaching practices that facilitate the learning process, which include: a) building on students’ prior knowledge; b) providing opportunities for higher-order thinking and understanding; c) providing opportunities for students to express learning (writing, conversations); d) facilitating learning rather than dispensing knowledge; and e) “if students are to devote the effort required for understanding, participants in the social setting for learning – students and teachers alike – must exemplify norms of collaboration, trust, and high expectations for intellectual accomplishment” (p. 286). This suggests that the quality of students’ learning experiences depends not only on how actively they engage in the learning process but also in how actively their learning is facilitated by their teachers.

5.4 CONCLUDING REMARKS TO DISCUSSION

The intervention lesson classroom events are encapsulated in the expression: Active Teaching / Active Learning, a précis of the authentic pedagogy principles of Newmann and colleagues (1996). Teacher 2 supported her students’ learning by questioning and encouraging independence in learning; and Teacher 3a set up investigations and problem solving activities. The students in Classes 1, 4, and 5, in which I was involved, had the attention of two teachers and a range of challenging and interesting tasks, based on what was ‘useful’ to them for their word- and language-learning development.

The active teaching component of the learning experience perhaps compensates for a shorter lesson time per week, as students were not left to independently follow procedures with which they had been familiar for a number of years. The notion of “active” can usefully be extended to the concept of an Active Learning Experience to reiterate the factors identified.
at the beginning of Section 5.3 as being common to all the intervention classes:

Students were actively engaged in cognitively demanding novel activities, for which they knew the objectives, in explicitly language-focused lessons, being supported in their learning by their peers, and scaffolded by student/teacher exchanges.

In the situation of the intervention lessons, active is a relative term. Teacher 4 was less actively engaged in teaching than her parallel teacher for Class 5 and was more anxious to complete the mini-lessons planned than to deepen the discussion and expand the learning opportunity. The mean progress of Class 4 students (11.4 months) was less than that of Class 5 students (20.7 months). It is of interest to note that the characteristics of low-scoring teachers on the Productive Pedagogies list (QSRLS, 2001) in Appendix A, are of a more passive tone than those of high-scoring teachers, for example “Saw themselves as explainers of information” [Low-scoring] as compared to “Focused on the development of skills and concepts, more than transmission of content” [High-scoring].

The expression Active Teaching / Active Learning aptly epitomises this study and the pedagogic perspectives that it reflects. The NNWL model encapsulates active cognitive processing in the development of written language and such models will underscore future learning theories as further evidence of our physiological processing systems emerges from neurological imaging research studies. QT (NSW DET, 2003a), Productive Pedagogies (QSRLS, 2001) and Authentic Pedagogy (Newmann 1995; 1996) have descriptives that reflect the active focus each promotes for enriching the learning experiences of students in our schools. Although the study was designed independently of the QT model, it is nevertheless concerned with aspects of classroom practices that relate to elements of pedagogy encapsulated in the dimension of Intellectual Quality, Quality Learning Environment, and Significance. Whilst the focus of this study is spelling, the philosophical perspectives and practical considerations that were assimilated to produce lesson programs that augmented students’ performance levels, are generalisable to other Key Learning Areas such as mathematics. Its contribution to the field of literacy is to stress that words are the smallest unit of reading and writing yet are the products of complex associations of word features that cannot be learnt in isolation. This complexity has to be accommodated in the teaching strategies that students experience. Importantly, this research has demonstrated that the low performance levels in spelling of some of the upper primary students who participated in this study can substantially improve when students are in an educational situation that actively promotes their learning. Unless there is an underlying physiological condition that causes literacy learning difficulties
there should be no barrier to a normal level of literacy development in a mainstream upper primary classroom.

The purpose of the study has been achieved in that it is demonstrated that the spelling performance levels of students who performed at below average levels on pre-test can improve to a greater extent than that predicted by the intervention period. Identification of the purpose arose from a statement of the problem that “there are students in upper primary classrooms who do not spell at an age appropriate level of performance”. Three benefits of this achievement were anticipated at the beginning of the study, namely:

1) Children who progress more than the predicted level for the five month period will gain in confidence about their ability with spelling words

2) It demonstrates to the teaching fraternity that a learning environment compatible with the dimensions of the NSW QT model (NSW DET, 2003a) improves the educational outcomes in spelling of all ability groups within a mainstream classroom

3) More classroom time will be available to individually address the problem areas of lower achieving students as a greater proportion of the class become competent spellers and require less error-correcting attention.

These items will be addressed in the Conclusions section of the following chapter. A summary of the study is presented in Chapter 6, followed by conclusions drawn from the findings of this research. The implications that arise from the results relate to teachers and their professional priorities. As discussed in this chapter, significant improvement in spelling performance levels can be achieved by classroom practices that are aligned to the pedagogic aspirations developed under the banners of Authentic Pedagogy, Productive Pedagogies and the NSW QT model.
Chapter 6

Summaries; Conclusion; Implications; Limitations; Recommendations

6.1 INTRODUCTION

As stated in Chapter 1, the focus of this study is to teach spelling to Year 5 and Year 6 students in a bid to address the problem: “There are students in upper primary classrooms who do not spell at an age appropriate level of performance”. It is particularly concerned with exploring ways to improve the spelling performance levels of below average spellers and those of students with lower than normal cognitive ability. This was accomplished through intervention spelling lesson programs conducted over two terms in five upper primary mainstream classrooms. There are both practical and pragmatic aspects to the study design which keep within the constraints of the resources, knowledge-base, and curriculum imperatives experienced by primary school teachers. Either of two outcomes could have resulted from the intervention program, each with opposing implications for teaching. They were first presented in Chapter 1 and related to differences in pre- and post spelling performance levels:

1) If differences are not statistically significant then poor spelling performance levels are more resistant to improvement by an expanded program of teaching strategies than anticipated; or

2) If differences are statistically significant it indicates that only a few modifications to teachers’ usual practices bring about improvement in students’ spelling performance standards.
The emphasis of the study is pedagogy in respect to spelling performance and it is timely as the intervention lessons are described within the framework of the Quality Teaching (QT) model (NSW DET, 2003a) currently undergoing implementation in a number of NSW schools. There have also been initiatives in the 2007 Federal Budget to address issues of in-service teacher training and low student performance by such measures as a financial incentive for teachers and a funded tutoring scheme for students.

In order to encapsulate the study as whole into this chapter, there is some reiteration of points outlined in previous sections. The chapter firstly provides summaries of the study design and the main findings, followed by conclusions that can be drawn from the results and from the practical experience of such a study. There are a number of implications from the findings that are pertinent to spelling lesson planning and classroom practices. It was not possible to accomplish all that was hoped for at the beginning of the research, or to cover as many aspects of the area of teaching spelling as is desirable in the context of the diversity of students’ learning needs in a mainstream classroom. The limitations of the study are therefore identified and lead to a number of recommendations for future studies. A final perspective is expressed in concluding remarks.

6.2 SUMMARY OF STUDY

The study was designed to investigate the effects of intervention spelling lesson programs in upper primary mainstream classrooms. It was expected that a student-centred pedagogy would enhance learning outcomes for students of all spelling performance levels but particularly for those who were low achievers on pre-test. Additionally, positive changes in the performance levels of students with lower than normal cognitive ability were anticipated as there was a high level of inter-student collaboration and frequent student-teacher exchanges which provided opportunities for scaffolding. An explicit focus on spelling was maintained throughout each lesson, consistent with a feature of pedagogy that Edwards-Groves (2003) identifies as conducive to improved learning outcomes for lower performers. Further features include informing students of a lesson’s purposes and ensuring that meaning is attached to the learning experience.

6.2.1 SUMMARY OF STUDY DESIGN

As subjects were not randomly assigned to groups it is a quasi-experimental study (Mertens, 1998) which involves an intervention group of five upper primary mainstream classrooms and a non-intervention group, or comparison group, of four classes (a Non-
Equivalent Groups Design). The different factorial designs of the five intervention classes makes the study consistent with features of a controlled trials study (Lesaffre & Verbeke, 2005) but it does not comply with the randomised group assignment stipulation. Four different spelling intervention programs served five classes, and the different factor for two classes experiencing the same lesson program is their respective classroom teachers. A computer-based Team Learning System (TLS) was utilised in the intervention lessons for these two classes. Of the remaining three intervention classes, students in one experienced whole-class discussions of metacognitive and multisensory strategies, as well as small-group activities; another was a Teacher-Best-Practice intervention; and the third involved classroom-teacher designed ability group investigations and problem-solving activities. Teachers of the four non-intervention classes were requested to continue with their usual spelling lesson programs. The endpoint was students’ spelling performance progress over the intervention period of five months.

The subjects (n=237) are Year 5 and Year 6 students in nine classrooms, situated in four schools in the outer urban areas of Sydney. The data from all students who completed a pre- and post-test spelling performance instrument that has two matched word-lists are included in analyses (n=207). The data of students (n=30) who were present for only one test for any reason were excluded from analyses of results. Additional whole class measurements included a Multiple Intelligences inventory, a test of reading comprehension, and an informal writing task. A number (n=107) of Year 5 students (n=114 initially; n=7 excluded as absent for one spelling test) from the main group are termed Study Students (SS/5) and they experienced individual testing of cognitive ability (screening test); attitudes to reading, spelling and writing; oral reading fluency; and their perceptions of their progress over the intervention period. Mainly quantitative data were collected, and the qualitative data comprises teachers’ answers to questions on their teaching philosophies and practices, as well as students’ answers to question about the lessons and their progress. Data on reading comprehension, the writing task and the Multiple Intelligences inventory were too unreliably collected to be used and this factor is one limitation of the study design.

The proximal similarity model (Trochim, 2004) was used to improve external validity and the subjects, locations of schools, and organisational factors were as similar as possible. Threats to internal validity were minimised but do arise from social interaction threats as it was not possible to achieve a geographic distance between the intervention and non-intervention
classes. Additionally, it is probable that there was a Hawthorne effect on the intervention classes and a compensatory rivalry threat (or John Henry effect) in the non-intervention classes. Nonetheless, these threats do not pose a problem in drawing significant conclusions from the results as the overall mean class spelling age improvement is secondary to the progress made by students of different ability levels.

The intervention lesson programs occupied one hour per week over a two-term period during Term 2 and Term 3. The lesson duration was arrived at following informal discussions with teachers who considered it realistic in normal classrooms conditions as a longer planned time was rarely, if ever, achieved. In the circumstances of this study, it is probable that the non-intervention teachers did ensure that the full allocated time of two to two and a half hours per week was spent on spelling instruction (compensatory rivalry effect) which resulted in an unequal lesson time for the two groups.

I had no involvement with the non-intervention classes other than to administer pre- and post-tests. Participation in the intervention classes was uneven. The teacher for the Teacher-Best-Practice intervention planned and conducted her lesson program independently. I assisted the teacher who designed small-group investigations but under his direction. For the remaining three intervention classes I planned the lessons and taught in team-teaching collaborations with the classroom teachers. There were minimal behaviour management problems as students were on-task throughout, with the exception of one class who experienced a change in teacher for the second half of the intervention period.

Classroom events and experiences that are consistent with Elements of the QT model (NSW DET, 2003) are identified when appropriate. It was expected that spelling performance levels would improve in the intervention classes by providing a spelling lesson program that had significance for the students, challenged their cognitive processes, and engendered a quality learning environment with a high level of interactive exchanges.

### 6.2.2 SUMMARY OF RESULTS

The focus questions that frame the results are:

1. *Will an explicit spelling lesson program improve the performance of students of all spelling ability levels, as categorised on pre-test, to a greater extent than that predicted by the duration of the intervention period?*
2. *Can student-related factors be identified that influence spelling performance outcomes,*
such as cognitive ability; gender; home language; preferred intelligence (MI); or school Year?

#3 Can classroom-related factors be identified that influence class spelling performance outcomes, such as a particular intervention design; overall class academic performance profile; pre-test spelling performance levels; and teaching styles?

#4 Are there significant relationships between spelling performance outcomes and progress in oral reading fluency; attitudes to reading, spelling, and writing; and students’ perceptions of progress in reading, spelling, and writing?

Appropriate statistical tests were utilised during analyses of findings and the one most often employed for categorical data is Fisher’s exact test as there is often too small a frequency in cells of crosstabulations for the Pearson Chi-square statistic to be suitable. Results for each focus question are found in Chapter 4 above, and specific findings related to low achievers are discussed in Section 5.3.2. Only a brief summary is presented in this section:

1) All nine classes made more progress in spelling age than that predicted by the length of the intervention period of five months and more than a year’s progress was achieved by both groups of classes.

2) The intervention lessons assisted the intervention Below Average students more than the non-intervention lessons advanced the spelling performance of the non-intervention Below Average students.

3) The levels of progress of the Average category of students in the intervention and non-intervention groups are fairly similar.

4) Spelling lessons were beneficial to a smaller percentage of intervention Above Average students than non-intervention Average students over the two-term period.

5) The ratio of Normal Cognitive Ability : Borderline/Cut-off students is about 70 : 30 for both the intervention and non-intervention groups.

6) Spelling performance achievement in a mainstream classroom need not be dependent on cognitive ability. Six intervention and two non-intervention Borderline/Cut-off students progressed to an Above Average level of performance on post-test (at least four years ahead of their chronological ages).

7) The intervention Borderline/Cut-off students progressed well over one year more (mean spelling age) than the non-intervention Borderline/Cut-off group.

8) The ratios of Year 6 students who progressed and did not progress are almost 50 : 50 and fairly evenly matched for the intervention and non-intervention groups.
For Year 5 students, in the intervention classes the ratio of Progressed : No-Progress groups is about 70 : 30, and that of the non-intervention group is approximately 60 : 40. This indicates more positive results for a greater proportion of Year 5 intervention students.

9) Female intervention students benefited more from lessons than male intervention students, as well as male and female non-intervention students.

10) There is no significant relationship between students’ home language situation and their progress in spelling in the intervention group. Findings suggest that the non-intervention “English only” students had the least commitment to spelling progress.

11) No significant relationships were found between oral reading fluency and spelling progress for either the intervention or the non-intervention groups although 41.5% of intervention students and 27% of non-intervention students made at least seven months progress in both spelling age and oral reading fluency.

12) There were no significant relationships between spelling age and attitudes to reading, spelling and writing, or students’ perceptions of their progress in reading, spelling and writing.

6.2.3 SUMMARY OF DISCUSSION

In the Discussion chapter above factors that influenced findings are identified and include a) a study effect and threats to internal validity; b) class ability levels; and c) teaching style. Additionally, aspects of the intervention lessons were explored in order to identify factors that could be related to outcomes that differed from those of the non-intervention group.

A so-called “study effect” is demonstrated by the remarkable progress in mean spelling age made by both the intervention (16.3 months) and the non-intervention (13.9 months) groups over the five-month period. Components of this effect, which are also threats to internal validity, might well be the Hawthorne effect experienced by the intervention group in response to the prominent role they play in the study, and the John Henry effect (or a compensatory rivalry threat) that affected the teachers of the non-intervention group. A positive climate had been created for the study by the approval of the school administration and the signed parental permission for student participation. It is speculated that a competent teacher could bring about improved spelling performance outcomes if influenced by little than any event that focuses interest and attention on spelling when performance is to be measured.
However, the crucial point is that the below average performers are the least likely to make substantial progress under these conditions as they have already demonstrated by their lower achievement that they do not thrive in spelling with the teaching practices to which they have to date been exposed.

It is possible that there was a “social interaction” threat to internal validity as the intervention classes were unavoidably situated in the same schools as non-intervention classes. However, with personal knowledge of the school situations, the threat is deemed to be very small. Evidence for a “compensatory rivalry” threat on the part of the non-intervention teachers for Classes 7, 8 and 9 is demonstrated by their students’ pre-test mean spelling ages which are well in advance of their mean chronological ages (13.3 months, 12.8 months, and 16.7 months respectively). It suggests that the pending study influenced their teaching practices during Term 1. Additionally, there is a high probability that the full amount of time per week scheduled for spelling lessons by the non-intervention was utilised (rather than being subverted for other purposes as informal conversations with other teachers suggest).

There is some evidence to suggest that the overall academic ability levels of students in each class, as assessed by school personnel, are reflected in mean pre-test class spelling performance levels. Pre-test mean spelling age/chronological age differences are: Class 6 (mainly low achievers) = -12 months; Class 1 (mainly intermediate achievers) = +9.4 months; and Class 7 (mainly high achievers) = +13.3 months; and their mean spelling age progress’ are (in order): 9 months; 17.3 months; and 23.6 months.

Class 4 and Class 5 experienced the same intervention lessons designed for a Team Learning System (TLS) set up in their school. They were parallel classes and so it was expected that their progress would be very similar. However, Class 4 students’ mean progress is 11.4 months and that of Class 5 is 20.7 months. The pedagogic practices of Teacher 4 and Teacher 5 were very different. Teacher 4 was not at ease with the teaching strategies required for the TLS and preferred a more expositional style of teaching. Teacher 5, on the other hand, was very flexible in her teaching approach and enriched the learning opportunities during the intervention lessons. Her style of teaching was more commensurate with the QT model (NSW DET, 2003a) than that of Teacher 4.
In Chapter 5 above, attempts were made to identify aspects of the intervention lessons that might have had a positive influence on intervention students’ achievement in spelling, particularly those of Below Average spellers and students with lower than normal cognitive ability. It is suggested that these include:

1) An explicit focus on words and language
2) Students were aware of each lesson’s purpose and outcomes expected of them
3) Lessons were cognitively demanding
4) Lesson formats were a departure from students’ usual experience of spelling lessons
5) Students worked together in small partnerships to a greater extent than was customary
6) There were frequent student/teacher exchanges.

There was a high level of congruency with many elements of the QT model and the Authentic Pedagogy notion of “active learning” (Newmann & et al., 1996) initiated the notion of Active Learning/Active Teaching, an expression that epitomises the intervention classroom experiences.

6.3 CONCLUSIONS

The purpose of this study was to demonstrate that the spelling performance levels of students who performed at below average levels on pre-test could improve on post-test to a greater extent than that predicted by the intervention period. Additionally, it was hoped that significant progression in spelling could be achieved by students with below the normal level of cognitive ability, as determined by a cognitive screening instrument. It was important that this should be achieved using no more resources than those available to upper primary mainstream classroom teachers and that the intervention program should operate within the normal constraints of time and curriculum imperatives. These objectives were met.

Significant progress was made by both the intervention and the non-intervention groups and no doubt all classes were influenced by what has been termed a study effect. Nevertheless it is possible to assert with confidence that the intervention program had statistically significant positive influences on the spelling performance progress of intervention low achievers, as identified on pre-test, and intervention students of lower than normal cognitive ability. Their cognitive ability status was determined by a formal cognitive screening instrument (Ouvrier et al., 1999). This finding contrasts with the results of the non-intervention group which indicate
that the non-intervention Above Average spelling performers made greater progress than the intervention Above Average achievers. The differences in the achievement comparisons between the intervention and non-intervention groups strongly suggest that the positive learning outcomes for the target group of intervention students can be attributed directly to the intervention program.

Lessons were explicitly focused on the subject throughout the lesson time, and had been planned with due regard to students’ language and learning needs. There was a coincidental high degree of congruency with elements of the QT model (NSW DET, 2003a), as documentation of the model was not accessed until after the interventions had been implemented. The QT dimensions of Intellectual Quality, Quality Learning Environment and Significance epitomise the lesson programs, and the concept of “active learning” developed in the Authentic Pedagogy work of Newmann and colleagues (1996) aptly describes students’ participation. To that can be added “active teaching” as there were numerous student/teacher exchanges, and lesson procedures were adapted as students’ learning needs developed and were perceived. Although there was an element of flexibility with procedures, lessons remained explicitly focused on words and language development.

Three main benefits to fulfilling the purpose of the study were anticipated in Chapter 1 above, and are herewith reiterated:

1) It is expected that the children who progressed more than the predicted level for the five-month period will gain in confidence about their ability with spelling words

2) It demonstrates to the teaching fraternity that a learning environment compatible with the dimensions of the NSW QT model (2003a) improves the educational outcomes in spelling of all ability groups within a mainstream classroom; and

3) (this derives from 2)), more time is then available to individually address the problem areas of lower achieving students as a greater proportion of the class become competent spellers and require less error-correcting attention.

In reference to the first benefit, it is acknowledged that the results from the instrument used to measure changes in attitudes to reading, spelling and writing were disappointing. However, a relationship between spelling age and changes in attitudes to spelling was demonstrated for the intervention group at a p=8% level, which suggests that changes in attitudes had occurred. Students’ (Appendix F) and teachers’ (Appendix E) comments about students’ progress are generally positive but do not necessarily reflect students’ spelling progress as measured using
the TWS instrument. This is an illustration that perceptions do not necessarily coincide with a more concrete measure.

There is more confidence that the second benefit has been realised, particularly for the below average and average performers, although all ability groups worked well in the learning environments compatible with the dimensions of the QT model (NSW DET, 2003a). Students responded positively to the obvious commitment of teachers to actively create opportunities for learning during the intervention spelling lessons. It is speculated that important additional factors in promoting learning in poorer performing students were the demands for cognitive engagement, scaffolding from peers and teachers, and an environment that promoted the attitude that learning was more important than being afraid not to be right. The main disadvantage of the intervention lessons in which I was involved is that they were carried out in a “visiting teacher” mode, rather than as “normal classroom practice” mode (Class 2, Teacher-Best-Practice is the exception). Individual needs were not specifically catered for which might have hindered the progress of some of the least able and most able students. Possibly, this is an explanation for the lower mean progress in spelling age for the intervention above average spellers compared to the non-intervention comparable group, where the specific educational needs of the more advanced spellers were known by their teachers and could be met. Although three of the four non-intervention classes made significant progress in spelling in parallel with the intervention classes, it was probably at the cost of more time spent on spelling than would normally occur and a greater concentration on spelling progress by non-intervention teachers, driven by a subconscious compensatory rivalry effect. A further study that controlled for such effects would clarify this. Nevertheless, the important outcome stands, and that is that the intervention lessons promoted significant learning achievements in spelling in students who were poor and average performers at the beginning of the study.

The third benefit of the study refers specifically to the needs of lower achieving students. Whilst the QT model of pedagogy did promote improved learning outcomes in spelling for lower performers, no doubt there were some students who would have thrived even more if they had had the additional assistance of personalised attention. Time is a classroom resource that is always under pressure and time for individual needs is particularly hard to find. It might well be that a general classroom improvement in spelling competence would not necessarily lead to more time being spent on the poorer performers, but at the very least it would be possible to organise effective peer tutoring opportunities. In terms of error-correcting needs, it
is perhaps pertinent to suggest origins of students’ errors. The three main reasons that students make errors in spelling are probably: a) they have yet to learn the correct spelling of an unfamiliar word; b) they have learnt to spell the word incorrectly; or c) they are careless when they express their learning. Students who are interested in words and interested in how the English language operates are less likely to make errors in their writing as 1) they will take steps to learn the correct spelling; 2) they are more likely to detect their own errors in learning and self-correct as their knowledge and interest increases; and 3) they will be less inclined to be careless as their confidence and pride in demonstrating their skill increases.

My original objective was to design a research project that explored ways to teach spelling such that new learning for all ability levels was transferred to reading and writing activities. This was in response to an oft repeated complaint by teachers that correctly spelt test words would not necessarily be spelt correctly in a free writing activity. The direction for this exploration of development in literacy was anticipated to be via the foundation of word-knowledge, with an emphasis on promoting an interest in words and language use, which would then lead to assimilation into reading and writing processes. Pedagogy was a secondary strand and a means to achieve the outcome of improved literacy development. This study evolved in a different direction and pedagogy has become a more dominant focus, to the point where spelling can be considered the means to demonstrate the results of more effective pedagogy.

Unravelling why a more authentic pedagogy was so beneficial to the average and below average performers goes beyond “active learning /active teaching” and perhaps rests with motivation and attitudes. I never doubted that most of the lower achievers would progress beyond the level predicted by the intervention period because I expected them to want to engage in the interesting, pertinent, at times fun, stimulating, and word-knowledge enhancing lessons I planned. I also expected that the more openly expressed insights and products of their peers’ thinking would scaffold their learning, perhaps enabling them to make jumps in their understandings rather than having to evolve them by a more continuous, self-generated process. As far as the situation allowed, the learning environment was one of collegiality where teachers and students had a common purpose, that of student learning. This was supported by their teachers to the extent of the teachers’ own motivations and attitudes. Students demonstrated the attitude of being willing to engage in learning activities and appeared to be sufficiently motivated to work as well as they could. Motivation and attitudes to learning and
teaching were not explored and this is an oversight, particularly in view of the greater success of the non-intervention above average students in spelling compared to the intervention above average performers and the compensatory rivalry of the non-intervention teachers. But as indicated above, the planned intention of the study was to bring about improved performance standards in an area of literacy by improving skills and knowledge, and by this means concurrently to improve attitudes to literacy, rather than to explore the dimensions of affect in regard to learning and teaching as a prelude to the acquisition of skills and knowledge in literacy.

The title of this study is “The Effects Of Explicit Spelling Lesson Programs On Performance Outcomes Of Upper Primary Students” and the problem that it was designed to address is: “There are students in upper primary classrooms who do not spell at an age appropriate level of performance”. The most important effect of the explicit spelling lesson program is that it has demonstrated that a low level of performance is not a permanent condition and that it is responsive to a wider range of teaching methods and learning strategies than those to which students are usually exposed. It is also pertinent to emphasise that there is no extrinsic barrier to teachers providing a richer learning environment to accommodate the diverse needs of students in their educational care.

6.4 IMPLICATIONS

There are three main implications for classroom practices in the literacy area of Spelling that can be identified from the findings of this study. One is concerned with students’ progress in spelling, and two relate to teachers’ approaches to their teaching and the effects of differing classroom experiences on students’ learning in spelling. No strong implications that relate to reading and writing development can be drawn from the results which serves to illustrate one of the study’s unintentional limitations. Although students did make commendable progress in spelling performance there is no significant evidence that learning was transferred to the literacy areas of reading and writing as the test instruments for these areas were either unreliable or unreliably administered.

6.4.1 STUDENTS’ LEARNING

An implication that is related directly to spelling progress is that students’ capacity to learn should not be underestimated as a number of students demonstrated extraordinary development in a relatively short space of time. Fifteen pre-test Average students for example,
advanced almost five years in spelling age. What is particularly remarkable is that three pre-test intervention Below Average students made forty-five months progress, two of whom are at the Cut-off level of cognitive ability. This rebuts the statement made by one teacher who declined to participate in this study: “Once a poor speller, always a poor speller.” It also illustrates that a lower than normal cognitive ability is no bar to significant learning.

Successful learning in spelling has implications for the students themselves, as noted by their comments found in Appendix F. Student 22, for instance, says that intervention lessons “expanded vocabulary – especially when talking to parents and friends and writing – use more interesting words,” and Student 17 is “more aware of spelling – I like writing stories more because I know more words.” The overall impression from students’ comments is that they are more confident in their spelling ability, more interested in using words, and are pleased with their progress.

The intervention teachers were asked the question “What changes have taken place in students’ learning and learning behaviour as a result of this study?” (Appendix C). Teacher 2 felt that her students valued spelling more, were more prepared to take risks with unfamiliar words in their writing, and “most importantly students think that they CAN spell correctly.” Teachers 3b and 4 did not complete the list of questions so their views are unknown but Teacher 5 says: “I believe that since the study there has been a subtle shift in their attitude and involvement. They are more willing to see connections in words and also they now see good spelling as something to be valued.” The response from Teacher 1 is more expansive:

All students have changed to varying degrees. Those students who were already excellent spellers have had many things confirmed and have learnt some new ways of approaching spelling. Some students are more confident in their spelling abilities and are more willing to take risks in their spelling. With a larger emphasis placed on spelling each week some students have learnt the importance of spelling in their writing. There are a few students in the class who have changed quite noticeably, especially in their attitudes towards spelling. They are more confident and have learnt new ways of approaching learning spelling words and testing their attempts of spelling. These students have developed a positive attitude towards learning and using correct spelling and have achieved some success after using learned activities and strategies (Teacher 1, Appendix C).

It is gratifying that there was such a positive response from both teachers and the majority of students to the intervention lessons and it is unfortunate that there was no opportunity in this study to explore any connections to progress in reading and writing. Of
particular value is the progress made by the lower achievers and those with a cognitive
disadvantage. In retrospect, the value to students might have been even greater if students had
been given a diagnostic spelling test at the beginning of the study so that lesson foci could have
been more targeted. To counter this, such an approach is perhaps more suitable for classroom
arrangements set up for developmental grouping and individualised instruction.

6.4.2 TEACHERS' APPROACHES TO TEACHING

There is no doubt that the teachers who participated in this study were more focused on
spelling than might otherwise have been the case and that this has resulted in significant gains
in mean spelling ages for their students. As this effect was seen in both the intervention and
non-intervention groups of classes it highlights the impact that teachers' instructional
imperatives have on student performance. Whilst these might have their origins in different
motivations and circumstances (compensatory rivalry on the part of non-intervention teachers
and support for the intervention program by the intervention teachers), it nevertheless
illustrates the power of teacher engagement in a focus area. That all intervention classes made
greater than predicted progress in spelling, despite different factorial designs, lends weight to
the suggestion that the principal influence on student outcomes emanates from their teachers.
The differing mean progress outcomes for Class 4 and Class 5, despite parallel conditions,
support the argument that teachers' attitudes, motivation and practices are primarily
responsible for the educational welfare of their students.

If the attention to spelling demonstrated by the study teachers is generalised to their
overall teaching practices it has implications for student outcomes across the KLAs. One
finding of the QSRLS (2001) is that high-scoring teachers on their Productive Pedagogies list
of characteristics (Appendix A) were more inclined to take responsibility for students’ learning
rather than to blame students for not learning. Such a view is expressed by Teacher 2
(Appendix C, Q.1) when describing her teaching philosophy: “Every child can learn well. If a child
is not learning in the way that I am teaching, then I must change the way I am teaching. Teachers make the
difference.” During an informal discussion Teacher 2 stated that her priority when planning a
lesson is not what she is going to teach but how she will teach so that the least able student can
learn.

Further support for the impact of teaching practices on student learning comes from a
recent report on teachers’ effectiveness (Leigh, 2007). Differences in primary school students’
test scores were measured over a two-year period and the findings suggest that a teacher in Queensland at the ninetieth percentile, for example, can accomplish in half a year what a teacher at the tenth percentile takes a year to achieve. Studies that provide statistical evidence that indicate levels of teachers’ effectiveness in terms of students’ learning outcomes have implications for teachers’ professional reputations, particularly if they are an evaluation tool that impacts on teachers’ levels of remuneration. The present study collected data that concerned just one small part of the upper primary curriculum and, whilst it is possible to make observations based on students’ performance in only the area of spelling, it can be foreseen that teachers’ performance across the KLAs will come under increasing scrutiny as test instruments such as Leigh’s are developed and refined. It remains to be seen how such a change in circumstances and established practices, should it occur, influences teachers’ attitudes and motivation and whether greater scrutiny of professional practices will translate into improved student learning outcomes. At issue is whether change in the less effective teachers’ attitudes can only be brought about if they are subject to extrinsic pressures or if they can be persuaded to make intrinsic adjustments in response to the evidence of studies such as this.

6.4.3 DIFFERING CLASSROOM EXPERIENCES

Chi-square analyses indicate that there are significant relationships between spelling age improvement and Class. This holds well when the classes are analysed per intervention/non-intervention group, but not per intervention/non-intervention group when there is no Class grouping. It leads to the conclusion that conditions in each Class have some influence on students’ spelling performance outcomes. The categorising of students according to their standard score on pre-test has assisted in ascertaining that the performances of subgroups of students within a class are differentially affected by classroom events. The progress made by intervention low achieving (on pre-test) students indicates that these children were assisted by a change in how lessons were delivered as they were not accessing more specialised assistance or individualised programs. It suggests that no additional resources are necessary to improve the performance of at least some of these sub-groups of students in a mainstream classroom. The fact that the intervention lessons were of significant benefit to the intervention pre-test low achievers and that the non-intervention below average spellers showed less progress, and that the non-intervention lessons achieved greater progress than the intervention lessons for above average students has implications for lesson designs and presentations.
This implication also concerns students of lower than normal cognitive ability. The progress of the Borderline/Cut-off children in the intervention group (and not in the non-intervention group) was such that on post-test there was no longer a significant relationship with standard score categories of spelling performance, reflecting the substantial mean progress made by these students (25.8 months compared to 10.4 months for the non-intervention B/Co students). The differing intervention/non-intervention group findings can be summarised as follows:

The intervention Below Average and Borderline/Cut-off students made more progress than their non-intervention counterparts; and the non-intervention teachers were more successful with their students who were at an above average level of performance and with those of normal cognitive ability.

Although there is a strong indication that the different lesson designs and/or lesson presentations that the intervention group experienced compared to the non-intervention group are responsible for the differing foci of success, it is not possible to make confident comparisons between the two groups’ experiences as the non-intervention lessons were not documented. Nevertheless, there is a strong probability that the intervention lessons were more aligned to a constructivist approach than the non-intervention group’s lessons and that the non-intervention students experienced lessons more representative of a behaviourist model. Regardless of the detail of this assumption, it is possible to make the statement that the intervention students participated in lessons that differed in presentation from their previous experiences and that their new classroom experiences in spelling differed from those of the non-intervention students.

As their category nomenclature implies, on pre-test the Below Average performers demonstrated that they had failed to thrive educationally with the spelling lessons they had up to then experienced as their spelling ages were at least two years behind their chronological ages. Remarkably, on post-test six of the intervention Below Average students (total Inv BAv n=24) had progressed at least two years in spelling age (three of these had progressed forty-five months), a level of progress not achieved by any non-intervention Below Average students. A link has to be made between the unusually large progressions of these intervention Below Average students over five months and the “different from usual” spelling lessons they had recently experienced. These findings demonstrate that teaching strategies in mainstream classrooms can accommodate the learning style needs of the lower achievers without prejudicing the progress of the main student body.
Teachers during their pre-service and in-service education and training have been exposed to a wide range of theoretical perspectives on teaching and learning as well as witnessing or experiencing how they can be applied in practice. The Multiple Intelligences work of Gardner (1993) is well known in primary and secondary educational settings, and the 4-MAT system of McCarthy (1996) describes four core elements of the learning cycle. They both contribute to the body of knowledge concerning teaching strategies and learning styles, which also includes applications of Sternberg’s “triarchic theory of learning” (Sternberg, Torff, and Grigorenko, 1998) as well as a plethora of literature on multisensory learning techniques, metacognitive strategies, thinking skill products, and differentiated instruction programs. The implication is that no more was done during the intervention lessons than any primary-trained teacher could do, as illustrated by Teacher 2 and Teacher 3a/6.

There are many teachers who do assist their students in achieving remarkable outcomes in learning but regrettably there are others who do not. The circumstance of this study makes it possible to identify the one factor that enabled me to present these programs of lessons but is difficult for classroom teachers to find, and that is time for planning and consulting the literature. More importantly though, I had interest, incentive and motivation, and they often influence how the resource of time is utilised. Therefore, in parallel with the second implication of the findings of the study, this third implication indicates that teachers’ attitudes and motivation are at the core of their pedagogic decisions that ultimately determine the learning outcomes of their students.

Lingard and Mills (2003) consider that teachers are central to effective school reform, in reference to the QSRLS, and they point to the influence of teachers’ professional practices on student learning outcomes. The implications of this present study go deeper than just classroom practices and suggest that teachers’ motivation to provide an enriching learning environment with relevant, interesting learning opportunities is manifested in the quality of the learning experience. The differing experiences of Class 4 and Class 5 students illustrate that the “quality” of the contributions from each teacher to the common lesson program influenced the learning outcomes for their students.

The importance of teachers’ attitudes and motivations are recognised by the present implementation program for the NSW Quality Teaching model (2003a) which is designed so that teachers are persuaded by evidence to reform classroom practices, rather than being
“forced” by policy. The work of Edwards-Groves (1998) strongly suggests that a “collaborative focused reflection” model of professional development within schools is an effective vehicle for in-service reforms as it has teacher interaction and communication at its core, as well as the component of personal reflection. Within such a framework, a culture of collegiality can be developed that opens pedagogic discourses to the possibilities beyond each community’s present experiences. Although individual teachers do have the motivation to continually reflect on their current practices and to keep professionally informed, it is through school leadership initiatives that reform can most effectively be developed, disseminated and sustained.

6.5 LIMITATIONS

A number of limitations of this work are identified. They mainly concern difficulties with measurement instruments which contributed to a redirection of primary focus, and shortcomings in the study design that did not fully deal with issues of validity. The principal limitation is that the effects of improved performance in spelling on the processes and products of reading and writing have not been established. They were important to the initial direction of the research but the measurement protocols implemented in the classrooms were not of sufficient standard to have confidence in the veracity of the data. There is a strong suggestion that the improved spelling performances of intervention students did have a positive effect on their oral reading fluency but the relationship was not found to be significant. Although students were individually tested by me the scoring system proved insufficiently precise for my purpose. A more suitable instrument might well yield a different result and its selection in future research should well be considered.

Further disappointment was experienced with the data from the Multiple Intelligences inventory and the instrument used to assess changes in students’ attitudes to reading, writing and spelling. The MI inventory was not given to all study students, as I had requested, and some of those returned were incomplete. These unsatisfactory outcomes are a result of treading the fine line between ensuring that the necessary data is collected and maintaining a positive relationship with the teachers involved by reducing the “nuisance” factor of too many demands on their classroom time. The ASK-KIDS instrument (Bornholt, 2000), an acronym for Aspects of Self Knowledge about Activities, is designed for rating students’ attitudes and self-concepts. I unfairly and inappropriately challenged the instrument by attempting to work with differences between pre- and post-test data at global student levels.
The change in direction from a primary focus on literacy to that of pedagogy exposed a serious shortcoming in the data collected about the non-intervention classes. The non-intervention teachers were not asked to keep journals of their spelling lesson activities and details as I did not want them to unduly focus on spelling and pose an internal validity threat. As I was initially mainly interested in any relationship between spelling development and progress in reading and writing, details of their activities were given less importance than they should have had. Consequently, with the change in the study focus, teaching events in the non-intervention classrooms have been subject to speculation. This lack of a fidelity check on the activities experienced by the non-intervention classes has limited the scope of any comparative discussion on the two student groups. A future study should ensure that there is systematic documentation for all participating classes of teaching practices, lesson content, and how experimental procedures are conducted. Additionally, as there was no control of instruction content and methods in the non-intervention classrooms it is not possible to consider this group of classes a control group for the intervention classes. Nevertheless, as one group experienced intervention lessons and the other group did not, the latter can be considered a comparison group for the former. Comparisons can therefore be made between the outcomes of a group of classes that experienced intervention lessons and another group in which all classes were taught with a more conventional pedagogy. However, it is important to interpret the different effects with caution and with reference to the context of these particular schools and classes.

In the ideal experimental situation, students and teachers would have been randomly assigned to the different groups and I, the researcher, would have had full control over all conditions, procedures and events. As this is not possible when research is applied to real situations that involve people operating in previously organised or intact groups, it has led to this non-randomised comparison pre-test/post-test quasi-experimental design. According to Burns (1997), a number of validity problems are associated with this design, some of which are apparent in this study and identified in the following paragraphs. He also discusses the problem of “demand characteristics” which refer to factors that influence outcomes additional to the specific intervention, such as the Hawthorne effect, John Henry effect, and experimenter bias. Possible problems associated with the first two have been discussed in a previous chapter. The effect of the latter has been reduced by the collection of quantitative data using norm-referenced instruments.
Problems with differences in testing, instrumentation, maturation and mortality have largely been avoided as each group experienced identical tests over the same duration of time and subjects were excluded only on the grounds that both the pre- and post- spelling tests were not completed. A problem of history would have been avoided if I had conducted all the spelling lessons in all the classes but not only was this impracticable, it was also undesirable in this case. There arose, therefore, the problem of a so-called “teacher effect” which was both an advantage and a limitation in this study. I was present for the duration of the intervention lessons in four of the five intervention classes and provided a common influence on lesson procedures and content. As Classes 4 and 5 were well matched (same school, balanced assignment to each class, same student profiles, same lessons which were designed by me), it is possible to strongly suggest that the difference in student performance outcomes in the two classes can be attributed to the effect on student learning of the two different classroom teachers. Potentially, it would have been possible to test a teacher effect on the learning outcomes of two other classes as the same teacher (Teacher 3a/6) taught in both a non-intervention class (Class 6) and an intervention class (Class 3). It is unfortunate that Teacher 3a/6 left School C halfway through the intervention period and therefore no comparisons can be made in this respect. If the intervention class had performed significantly better with this teacher than the non-intervention class, it would have added important support for the findings of this study. Conversely, a negative outcome in respect to the intervention class under these circumstances would seriously undermine the conclusions that can be drawn.

It can be argued that the study might have been improved by using a wait-list control design to counterbalance the effects of the intervention and non-intervention groups’ experiences. One group could have experienced the intervention program during one term or semester, and then the second group for the next term or semester. Thus, their roles would change and each would be an intervention or non-intervention group in turn. It is a factor to be considered in another study but it would have been difficult to arrange for the present one. It is doubtful that at least some of the teachers would have agreed to support the study for two semesters as this would interfere with their program for one school year (four terms). Changing the experience of each group after only one term would have compromised the efficacy of results as the intervention duration would have been no more than about eight weeks. Additionally, as the classroom teachers were present during the intervention lessons it is possible, even probable, that teachers for the first intervention group would not fully revert back to their pre-intervention teaching practices for their non-intervention period and thus
could not be an effective counterbalance to the second intervention group.

Whilst it is appreciated that a random sample of students might have posed less of a threat to validity than the recruitment method used for this work, it needs to be reiterated that I worked within the limits of what was possible. The treatment that each class would experience was determined during discussion with the classroom teacher and reflected each teacher’s preference. The demographics of the classes were unknown to me at the beginning of the study, with the exception of their Year levels and that all had male and female students. One advantage of this non-random sample is that the intact classes are representative of real classroom situations, which adds to the credibility of this applied research.

The non-random sample gives rise to the possibility of a regression artefact. Although the pre-test cognitive ability screening test results indicate a similarity between the groups in that 69% of intervention SS/5 group had normal cognitive ability compared to 72% of the non-intervention group students (a difference of only 3%), a factor that might influence this statistic is the academic ability profiles of the students. In this study, the top third of academic achievers in School D did not participate in the study, which might have contributed to the slightly lower percentage of normal cognitive ability students in the intervention group, and this is a situation that should be avoided in any future research. Additionally, the possibility that three of the four non-intervention teachers focused on spelling during the term before the start of the study, as discussed in a previous chapter, to a greater than usual extent, makes it difficult to establish statistical equivalence with confidence. Testing students at the beginning of the school year, one term before the start of the intervention period and before their performance could be influenced by their new teachers, would have ascertained a base-line spelling age value for individual students and whole classes. An additional problem associated with quasi-experimental designs and non-random grouping is a ceiling effect when one group scores higher on pre-test than the other and their progress is constrained by the upper limit of the test instrument. A ceiling effect is identified as a problem in this study with Above Average spellers but it relates to both intervention and non-intervention groups. However, Below Average and Average performers are of primary interest to this study and the problem of a test ceiling does not influence the findings.

The potential of the study has not been realised as fully as had been anticipated. Issues of student diversity such as gender, home language, age or preferred learning style have only
received superficial attention. Lessons were designed to accommodate whole-class rather than individual or sub-group needs as time was limited. A study designed to incorporate in-classroom involvement with students at a more personally interactive level would no doubt be more effective in developing an understanding of diverse student issues and ensure that all students had the opportunity to progress. An additional limitation of this study design is that the sustainability of effects has not been tested and a further post-test at the end of the school year (one term after the end of the study) would have demonstrated whether students who progressed in spelling performance maintained their gains.

It was a great disadvantage in setting up this study not to have established relationships with schools as it was difficult to find teachers willing to participate, even when their school principals encouraged interest. I am therefore very grateful to the teachers who did agree. In order to reduce nuisance value, I was careful not to encroach on classroom time any more than was necessary. This caution was detrimental to the quality of the data collected, as indicated above, when it was left to the teachers to administer the tests at their convenience (but within a timeframe). On the other hand, as the pre- and post-test regimes were quite time-consuming and the intervention lessons required one hour per week, by being non-demanding it was possible to maintain a good relationship with the teachers throughout the period of the study.

Threats to the validity of this study have been identified and salutary lessons for a researcher have been learnt. It is clear that a greater control of procedures, more strategies to reduce validity threats, and more intensive documentation of classroom activities are essential for any future study and might well be achieved with an action research or case study methodology. Although there are limitations with the quasi-experimental approach taken, this research project nevertheless finally evolved into a study that can contribute to debate about the value of providing quality learning opportunities to children in upper primary mainstream classrooms.

6.6 RECOMMENDATIONS FOR FURTHER STUDY

The question of how word- and language-focused lessons influence development in reading and writing is still unresolved. Intervention students report in their informal comments that they had made good progress in these literacy areas and had also developed a greater interest in learning about and using words. These views are supported by their teachers. There are positive indications that lessons which bring significance to word-learning activities in a
learning-enhancing environment will produce significant gains in performance across the language arts areas. A further study that explores any such relationship would need to ensure that controls are in place to minimise a compensatory rivalry threat to internal validity, in particular. It would also be imperative that the test instruments and procedures be selected with great care.

The quasi-experimental methodology with different factorial designs has merit for studies that seek to make comparisons of performance under different conditions. The KLA of mathematics stands out as a potential source of further research, particularly as it is embroiled with issues relating to gender, ethnicity, cognitive processing theories, and learning style preferences, for example. In the present research study, the quasi-experimental design proved its value in enabling comparisons to be made between different learning environments and it can be foreseen that it will be an appropriate means to assess the effectiveness of the Quality Teaching model (NSW DET, 2003a) against established practices as the QT implementation process gathers momentum.

Below average performers and students with lower than normal cognitive ability have been target areas for this research and it is demonstrated that a learning environment aligned to the NSW QT model effectively facilitates their learning, in this case, in spelling. I have speculated that greater cognitive demands and an interactive learning environment have assisted these students, perhaps by being more compatible with students’ cognitive learning processes and behaviour as demonstrated by the NNWL model. But this is only speculation. A study designed to explicate their accelerated progress can only serve to better inform those who are responsible for their future educational welfare.

This research study is situated in a transitional period between traditional language learning and the advent of advanced technological integration into learning environments. Future studies cannot ignore the changing climate in regard to conventional spelling prowess in a literate society; the role of ICT in learning; and also the necessity to learn spelling in order to use technology. Computerised spell-checkers will become increasingly sophisticated and will incorporate not only spelling, grammar and syntax checks but will also indicate contextual incongruities that arise from the selection of incorrect homophones. Mobile phone text facilities have led to the development of a new written language format and it can be foreseen that greater use will be made of software that automatically translates text language to
conventional written language when required.

The spelling reform movement’s objective to simplify written English that is in general use has been unsuccessful, largely because it involves relearning how words look on the part of proficient readers, writers and spellers. Reform has become less of an imperative since the proliferation of home computers and the influence of American spelling. Many American English words have simpler or more logical word forms than British spelling conventions, such as *color* for *colour*, *gray* for *grey*, and it is increasingly acceptable to use alternative spellings, for example either a ‘z’ or an ‘s’ in words like *realize*. Additionally, the use of voice-recognition software can only become more widespread. Although it can be envisaged that instructional insistence on learning correct spellings for expression in writing may decline, it is difficult to conceive how technological innovation will diminish the role of spelling in the reading process. How teachers can incorporate advances in communication technology with the NSW QT model to prepare students for their changing linguistic needs in the twenty-first century is a pertinent area for exploration.

6.7 CONCLUDING COMMENTS

A study was put in place to explore how a program of word-focused lessons would influence, not only spelling performance, but also the reading and writing processes. What emerged is a study that demonstrates that the attitudes and motivations of teachers are the most important factors that influence students’ learning outcomes. They dictate the pedagogic perspectives which drive classroom practices.

The relevance of these findings to the Quality Teaching model (NSW DET, 2003a) literature is high as they demonstrate very clearly the positive outcomes that can be generated when the model is applied to a classroom setting. The study is particularly timely in view of the ongoing QT model implementation process in NSW schools. It has been demonstrated that a learning environment that encompasses the QT dimensions, expands learning opportunities for a diverse range of student abilities and therefore affords the study credibility.

Teacher 2 and Teacher 3a/6, who designed the lessons for two intervention programs, drew on their respective more than twenty years teaching experiences plus their on-going formal and informal professional development practices to produce learning environments that fully supported their students’ literacy learning needs. They augmented their students’ learning
experiences by modelling their genuine interest in the English language and embraced the opportunity to have their practices tested by this study. My contribution to the two intervention programs involving three classes was an interest in applying perspectives of classroom practices that the literature and pre-service education indicated would assist learning. The three teachers with whom I team-taught brought with them their teaching experiences and their various levels of enthusiasm for the project and their knowledge of the English language system. Teacher 5 was outstanding in her appreciation of the language needs of her students, and her enthusiastic and pertinent development of learning opportunities as they arose.

The key features inherent in the intervention lesson programs were teacher interest, enthusiasm and commitment, factors which translate to positive attitudes to facilitating students’ learning, and motivation to ensure that teaching was supported by the requisite knowledge and skills. Therefore, not only does the study demonstrate transferability to other areas of the curriculum but it also has the aspect of confirmability. Nothing was brought to the interventions that is beyond the intrinsic and extrinsic resources available to primary school teaching personnel.

This study has convincingly demonstrated that there is no practical barrier to raising the spelling performance standards of students in upper primary mainstream classrooms. Some students made extraordinary progress in response to lessons that stimulated their interest in words, and the pedagogic principles of the NSW Quality Teaching (2003a) model facilitated the translation to improved learning outcomes. Although the QT model does not stand alone with such an attribution, the pedagogic perspectives inherent in this and similar models undoubtedly contributed to the positive outcomes brought about by this research project. Importantly, the study has shown that mainstream students with lower than normal cognitive ability and those who are behind their age level in spelling performance can make substantial progress when they engage in the educational process.
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# APPENDICES

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## PRODUCTIVE PEDAGOGIES CHARACTERISTICS

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<th>HIGH-SCORING TEACHERS</th>
<th>LOW-SCORING TEACHERS</th>
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<tr>
<td>Acknowledged that they could not force students to learn</td>
<td>Expressed the belief that students were responsible for their own learning</td>
</tr>
<tr>
<td>Considered themselves responsible for providing opportunities for student learning</td>
<td>Held that factors totally outside the teacher’s control largely ‘determine’ student outcomes</td>
</tr>
<tr>
<td>Viewed all learners as capable of improving</td>
<td>Aimed instruction at the ‘middle level’ of the class</td>
</tr>
<tr>
<td>Spoke of themselves as facilitators of learning</td>
<td>Assumed that some students would learn, others would not – it was up to the student</td>
</tr>
<tr>
<td>Saw it as their task to set up environments where students could explore and where there was some openness about what students would produce</td>
<td>Saw themselves as explainers of information</td>
</tr>
<tr>
<td>Focused on the development of skills and concepts, more than transmission of content</td>
<td>Complained of the lack of time to get through the curriculum</td>
</tr>
<tr>
<td>Were more prepared to ‘subvert the curriculum’ to create spaces for learning activities that they valued</td>
<td>Appeared to have a strong focus on content, rather than on skills or concepts</td>
</tr>
<tr>
<td>Problematised assessment practices more often than the low-scoring group</td>
<td>Did not readily discuss assessment limitations</td>
</tr>
<tr>
<td>Tended to have high levels of extracurricular involvement</td>
<td>Seemed largely in the dark about the pedagogical work of their colleagues</td>
</tr>
<tr>
<td>Engaged in professional conversations with colleagues about their teaching</td>
<td>Were more guarded than their high-scoring colleagues about their own work</td>
</tr>
<tr>
<td>Were willing to talk about their failings and about changes they had made to their teaching</td>
<td>Reported a greater sense of feeling under surveillance in conducting their work</td>
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**Reference:**

## QUALITY TEACHING DIMENSIONS AND ELEMENTS

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<tr>
<td>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.</td>
<td>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.</td>
<td>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.</td>
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<td>Student direction</td>
<td>Knowledge integration</td>
</tr>
<tr>
<td>High-order thinking</td>
<td>Social Support</td>
<td>Connectedness</td>
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<tr>
<td>Metalanguage</td>
<td>Engagement</td>
<td>Narrative</td>
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<tr>
<td>Substantive communication</td>
<td>Self regulation</td>
<td>Inclusivity</td>
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**Reference:**

The list of questions was given to teachers at the end of the intervention period. Their responses were typed and herewith reproduced verbatim. Additionally, Teacher 1 answered a number of interim questions (oral) at the beginning of Term 3, midway through the intervention period.

QUESTIONS:

1. Describe your teaching philosophy and teaching style.
2. How do you cater for individual differences in students’ a) learning styles and b) performance levels?
3. What techniques do you employ to improve reading and writing performances?
4. What place does spelling have in reading and writing outcomes?
5. Describe your usual spelling program study.
6. How much time per week is usually spent on spelling activities?
7. How do you feel about the reading/writing/spelling achievement levels of your class?
8. If you had more time and/or resources, what more would you do to promote literacy skills?

ADDITIONAL QUESTIONS FOR INTERVENTION TEACHERS:

9. What changes have taken place in students’ learning and learning behaviour as a result of this study?
10. What changes have taken place in your teaching philosophy and teaching behaviour as a result of this study?
1. I believe that I have a responsibility to motivate, encourage and guide my students to the best of my abilities. It is my duty to be positive and fair and treat students in an equal manner. This does not mean making every child the same, but giving to each child what they need. I need to cater for the learning styles and abilities of every student. This means that I need to change my teaching style and activities regularly so that each child has opportunities to learn in the way they do best. The key is variety. Learning needs to be based on previous learning and taught sequentially. Where possible I need to cater to the students’ interests and give them choice in their learning. I also believe in fostering children’s curiosities and special talents. I believe that an integrated program is the best. Where possible KLAs should be related to one another so that learning is meaningful and students can see a reason for why they are learning what they are learning. I try to relate most KLAs to a central topic. Of course there will be times when activities cannot be totally related but are necessary for study at that time. For example, a word spell wrongly, or grammatical errors need to be addressed when they appear. This may mean pausing to focus on these or planning a one-off lesson to address the issue. Students need to learn in a positive and encouraging environment where they are supported. They need to be allowed to take risks. They should be encouraged not to compete against their peers but against their personal achievements.

2. a) I try to cater for different learning styles by varying my teaching styles and activities to suit the topics and the students. This may mean using individual work, pair or group work at various times, or providing activities which are aural, written, discussion or visual.
   b) Differing performance levels are catered for by using group work. Some groups can be ability groupings in which activities are set at the right level for all and success is possible, or they can be mixed groupings in which students can assist each other and learn from each other.

3. I try to teach, then allow for practice and perfection. I correct mistakes where needed so students can make corrections next time. I try to encourage students and give them success so they will be motivated to improve. I make time for at least a couple of writing activities per week, one where students can freely write without stress of perfection (writing for fun) and one where students need to focus on correct grammar, spelling, sentence order, etc. Reading activities – as a group, independent, oral and written questioning, ongoing observation, running record etc. With everything I attempt to model first and then where needed whether it be the oral reading of a novel, or joint construction of a text.

4. Spelling is an important place in reading and writing. Correct spelling is not always necessary for reading or writing to be done, but it is essential for complete understanding and meaning. These three aspects of literacy intertwine. They cannot stand alone. Each one is dependent on the other. You cannot read without knowing the words, you cannot read them if you can’t spell them. You cannot write without knowing the words and you need to correct spellings for the writing to be understood fully. There is no point in spelling by itself. Spelling is in writing and reading. Spelling cannot be taught alone. There is no point in knowing words unless they are used in context.

5. The spelling program consisted of a weekly list of words to be learnt for a test at the end of the week. The words were given on Monday and tested on Friday with a dictation. As a class we would discuss the meanings of the words, put them into sentences and write them in both homework and spelling books. During the week I would give practice tests and a couple of other activities as well as a spelling game.

6. Approximately 2 hours a week was spent on formal spelling activities. This does not account for reading and writing activities in which spelling was discussed or corrected etc but was not a major focus.

7. How do I feel? I am not sure what you are after. This is quite general. I feel that some students are excelling and using special talents and working hard. I feel that some are working to their full potential which may not be great. I feel some are not achieving as well as they should be due to a variety of factors such as self motivation, self-confidence, parent encouragement, home life and previous school experience.

8. If I had more time as a teacher I would give more time to reading with individual students and giving them feedback on their reading. I would conference with the students more frequently so together we could work out where they used excellent words and phrases and identify spelling and grammatical mistakes and make corrections.

9. All students have changed to varying degrees. Those students who were already excellent
spellers have had many things confirmed and have learnt some new ways of approaching spelling. Some students are more confident in their spelling abilities and are more willing to take risks in their spelling. With a larger emphasis placed on spelling each week some students have learnt the importance of spelling in their writing. There are a few students in the class who have changed quite noticeably, especially in their attitudes towards spelling. They are more confident and have learnt new ways of approaching learning spelling words and testing their attempts of spelling. These students have developed a positive attitude towards learning and using correct spelling and have achieved some success after using learned activities and strategies.

10. I’m not sure if my teaching philosophy and behaviour have changed, but I do know that during this study I was reminded of important things that I as the teacher need to be focused on and continually aware of. I need to give more time to individual assessment and conferencing.

TEACHER 1: Interim Interview (oral responses) at the beginning of Term 3.

1. Philosophy of teaching?: All under the umbrella of social, academic and welfare. Need to sort out welfare first. Individuals, listening and viewing students. Learning types – present in different ways. Integrate KLAs. Relate literacy arts to topic.


3. What sort of student were you?: Not too bad – sufficient at everything.

4. What are you mainly concerned with in the classroom?: Management and getting through the curriculum – quite a bit of pressure. Like to start where the students are at.

5. How do you do this?: Observation. Look at their history. See their writing. See how they approach a task. Look at reports from previous years. Do informal tests.

6. Comment on the statement “I teach for the Middle”: I can understand that. Usually advised to make sure G & T needs are met – also those that need support of the STLD. Haven’t actively thought too much about what you call ‘the fringe’ (my term ie >STLD but <average performance). Generally support all students where can. Haven’t thought too much about how High School teachers view situation. Am aware that students need as much help as possible for their Secondary years. Feel for some of them as doubt that they will cope too well.

7. What affect have our one hour spelling lessons had so far?: have helped – some students in particular have benefited from more strategies – and use them. One got all spelling words right for the first time and was quietly pleased. More prepared to take risks. Don’t know what affect they have had on writing – or perhaps reading. Was surprised at reading comprehensions results of some students – thought they would be better. I got it right with their MI in most cases. Students like the different tasks. Spelling folders have been good and will continue with them. Will also use some of the strategies in future teaching. It has been worthwhile – and more interesting for students.
TEACHER 2; Class 2

1. Every child can learn well. If a child is not learning in the way then I am teaching, then I must change the way that I am teaching. Teachers make the difference.

2. a) I know and understand the ways Gardner suggests people learn and program to include all learning styles. I allow students to demonstrate their understanding and achievement in a variety of ways over a period of time. Students have the opportunity to work alone and in groups.
   b) Students demonstrate their achievement Outcomes in many situations over time. At any one time students are not expected to have achieved an Outcome (Outcomes are designed to take 2 years to achieve) – they will all be at different levels of achievement. I often teach to the highest level first, then those students go off to practise; then I teach to the next level down and so on until I am left with the students with the greatest need. I teach them and then allow them to practise at their level. Other times I teach using a learning mountain – with the minimum level of skills and understandings at the bottom and the maximum (open ended) level at the peak. I tell the students that we’re going to start to climb a mountain. I tell them the checkpoints along the way and then we begin our journey. I also use a handy little device to see who is understanding and who isn’t. The students rate their level of understanding and skill on a scale 1 to 5. 1 means they have no idea what I’m talking about – it makes no sense. 2 means they understand a little. 3 means they can do it with help. 4 means they can do it alone. 5 means they can teach it to someone else. The students quickly become very used to assessing their learning and understanding in this way. Making level 1 sound like it is the teacher’s fault (ie the teacher made no sense!) allows the students to admit to this level easily. Following through with further explicit teaching and peer teaching (using 5s to teach 1s and 2s) means the 1s and 2s know they will soon understand too.

3. I integrate Reading, Writing, Talking and Listening as well as HSIE and Science. Students read then must discuss their reading with a friend (this is proved to improve understanding and recall). The friend does not necessarily have to read the same text – he or she simply asks questions until he or she understands what the text was about. We do modelled, guided and independent Reading, Writing and Talking and Listening. Modelled Reading uses a text at a group’s average level; Guided Reading uses a text at the group’s dependent reading level (90-95% accuracy and understanding). Students are taught to evaluate their own writing using a criteria based marking system, which includes punctuation, spelling, purpose, audience, sentence types, structure. Students also form writing conference groups, which include students from all levels within the classroom, to evaluate one another’s writing. Students write reflections about their reading and writing achievements and set goals.

4. Spelling is fully integrated – I don’t teach spelling as separate from reading and writing. Throughout reading we look at words and take them apart – listing everything we know about the word eg part of speech, plural/singular, how to change from one part of speech to another, suffixes/prefixes/root word, syllables, other words we know that follow same rules, where the word came from etc. throughout writing we focus on words, applying known rules and thinking of other words we know to spell unfamiliar words. Spelling is implementing a series of strategies just as reading and writing are implementing a series of strategies. Spelling is not memory work.

5. As above except without the taking words apart bit. I tried to teach spelling separately as part of the study but found it time consuming with no benefits. It also fragmented spelling away from reading and writing, making it irrelevant to the students’ reading and writing and making it less likely to be transferred to their reading and writing. Knowing spelling strategies helps a student’s reading enormously as they can predict what sound a given letter or group of letters will make in any given word. I think teachers often forget the link between spelling and reading – many even forget the link between spelling and writing!

6. Hard to say as I don’t teach spelling separately. Basically all literacy sessions emphasise spelling, so 10 hours per week.

7. I feel quite vindicated in the way I teach spelling as to me the test for spelling is in the students’ reading and writing. I have noticed a huge improvement in students’ spelling within their writing as well as the students taking risks and using complex words and spelling them correctly. Have also noticed them using their spelling strategies to help them decipher unfamiliar words in their reading. To me, giving a list every Monday, having students LCWC every day, then testing them on Friday only teaches students whether they can spell or not. Some get 100% every week. Some get less, even though they really try to memorise the spelling. In my experience, they
don’t transfer their spelling to their reading or writing. Also, I don’t think LCWC works as the student may write the word incorrectly then study it and so learn an incorrect spelling. At worst they see the word written incorrectly when they are concentrating on ‘learning’ correct spellings and so they recall the incorrect spelling, not the correct spelling. Much better to teach strategies to spell correctly. Teaching spelling through memorisation is no more successful than teaching reading through memorisation. Correct spelling is a skill, as good reading is a skill, and skills cannot be memorised!

8. Have such a huge resource of books that every student would have lots of books that they wanted to read. Educate parents about the importance of turning their child onto reading as young as possible (Paul Jenning’s book on this subject should be given out free to every parent as they leave hospital with their baby!). Good readers are generally good writers and spellers and vice versa. I’d also in-service teachers on strategies to teach integration of spelling with reading, writing and grammar. I’d do away with textbook lists and lists of words to learn every week ready for the Friday test! Teachers think that giving the words in a teacher-made dictation tests the students’ ability to transfer their spelling into their writing! I’d do away with fragmented literacy sessions where, in a 2-hour block you teach 30 minutes of spelling, 30 minutes of writing, 30 minutes of grammar and 30 minutes of reading! In my position I’m thinking on a whole school level – on a personal level I’m happy with the way I teach spelling!

9. Students are valuing correct spelling more, as they know I value it. Students see themselves as good spellers. Students see good spelling as something everyone can achieve. Students are more likely to take risks with their writing using unfamiliar words and attempting to spell them correctly. Students are more likely to proofread and edit their writing for correct spelling (among other things!). most importantly students think they CAN spell correctly.

10. The study allowed me to question and look carefully at my teaching philosophy and behaviour. I have very high expectations of students and know that every child CAN learn. The study changed my teaching behaviour by more explicitly teaching spelling strategies and more explicitly linking spelling strategies to reading and writing for the students. Letting the students into the ‘secret’ of what they will be learning has increased their awareness of the spelling strategies they can bring to their reading and writing. My teaching philosophy didn’t change, however I now feel much more confident in the way I teach spelling. I more clearly now see spelling as totally integral to reading and writing. I have now really looked at the results (ie the students’ transference of spelling strategies to their reading and writing) and can see that the way I teach spelling has made a difference.
TEACHER 3b; Class 3

1. All children have the ability to learn. All children learn at different rates and in different ways. Teaching programs need to cater for this. Teaching programs should aim at bringing out the best in all children — developing each child's potential. Adopt various teaching styles e.g. group work, individual work, chalk and talk, research, investigations, experiments etc.

2. Individual differences — group work — different groups working at different levels and on different materials.

3. Modelled and joint construction of writing. Guided reading sessions in graded groups using level appropriate reading material.

4. Very important. Spelling correctly helps children decode words in reading and improves vocabulary choice in writing.

5. Spelling groups — each do different lists at appropriate level — activities based on word lists done during week e.g. dictionary meanings, alphabetical order, sentences etc — test on Fridays.

6. 2½ hours per week on average.

7. Most children are progressing well and at age appropriate levels.

8. Home reading / incentive schemes to engage in reading.
1&2. Child-centred learning. I teach a) the class; b) groups; and c) individuals – Using the conference method, individual and group conferences in reading and literacy. As far as possible I mark work in front of children. Children often mark their own work under my direction and then I check it.

3. The Yr 6 children choose their own novels and I tailor activities accordingly. Yr 6 read silently and in pairs. Yr 5 read sets of books. They read aloud in a group, in pairs and silently. Both Yr 6 and Yr 5 complete reading activities ie story maps, chapter summaries, book reviews, Readers Theatre. In writing we have concentrated on text types using modelled, joint and independent constructions. The children then edit their work in preparation for inclusion of samples onto their digital portfolios. They have become proficient at this and really enjoy activities.

4) In spelling we have a weekly spelling list. The spelling is taken from HSIE, science school magazines that we are currently studying in class. The children have a fun style spelling test each Friday and have made great progress. Children use dictionaries and write in their own personal dictionaries after having requested a word. I believe in a holistic approach to literacy study of words, grammar, punctuation and I believe that the key to enjoyment at primary level is by starting with a text – that way spelling is always in context ie I use an overhead. Children underline parts of speech in different colours, and word meanings are discussed and explained. And in some cases word linkages are made ie word families, derivations etc.

(Question list was not completed by Teacher 4).
TEACHER 5; Class 5

1. My personal philosophy is that teaching is dedication and commitment to the development of other human beings. It is the teacher’s function to help, guide, develop and instruct his/her pupils. The teacher needs to establish rules for his/her class and needs to be democratic and consistent in implementing them. A child relies on consistent behaviour and attitudes to feel secure in an environment that may command conformity but which doesn’t threaten his/her individuality. Meaningful learning can only take place in a class where there is unity, cooperation, harmony, love and respect between members. Praise is essential in promoting a positive classroom environment. Our teaching needs to be a blend of new ideas and traditional methods. Children need to develop responsibility and values through the blending of learning experiences from the school, home, media, community and peer groups.

2. a) I cater for individual differences in students learning styles by firstly making the children aware of the variety of learning styles and encouraging them to understand how they learn best.
b) I then try to ensure that lessons have a visual, written and oral component to engage all learners. The wide variety of abilities in a class is best catered for by using ability-based grouping.

3. Reading: I use reading groups and oral reading practice to improve fluency. The children read from novels, the school magazine and also do a novel study in a class. These are used as a basis for comprehension exercises and also for developing understanding of texts. I also encourage reading as part of the children’s homework routine. Writing: to develop an understanding of the requirements of the wide range of text types taught in the senior primary. I present the class with models which are discussed. We then move to joint construction and finally to independent writing.

4. Spelling must now be explicitly taught, thank heavens. Spelling is an integral part of the literacy cycle. Reading helps the child know how a word is spelt and can also assist with word meanings. Writing is assisted and made easier if you are a competent speller. Also writing the words reinforces spelling and learning.

5. My spelling program contained three lists: the first was composed of words based on etymological knowledge ie root words, prefixes and suffixes. List 2 contained words based on phonological and visual knowledge, and List 3 was a theme list based on words from the HSIE and science topics being studied.

6. I would spend about 20 minutes per day on spelling activities.

7. My class is a blend of good average to low average students with three special needs students. Prior to the study I felt they were unmotivated to learn academic subjects, especially spelling, seeing it as unnecessary. I feel this attitude has changed and they are more aware of words and how they are formed. This has certainly improved their reading and writing.

8. I would purchase a range of novels that the students would enjoy and engage with. My class is very involved in sport and it is often to engage them with the novels available.

9. I believe that since the study there has been a subtle shift in their attitude and involvement. They are more willing to see connections in words and also they now see good spelling as something to be valued.

10. For me the study showed how valuable technology such as Zing can be in motivating students as a tool for learning.
Appendix C-6

TEACHER 3a/6; Class 3, first part of intervention period (2004) and Class 6, 2003 intervention period. Questions answered when teacher of Class 6 (2003).

1. My personal philosophy of teaching is based on the following premises:
   - Education should be learner-centred rather than teacher-centred
   - Education should be meaningful and active as possible
   - Different people have different styles of learning so a variety of approaches must be utilised
   - Flexible grouping must be utilised to help each child to meet her/his needs
   - Assessment should be the starting point of education, not the finish
   - Learning programs must be designed to build on what the child already knows
   - Textbooks should be an aid to the learner and the teacher, not an entire learning program
   - Differentiation of curricula must occur to maximise learning for each individual
   - Parents, teachers and students share the responsibility for educating each child. Therefore, they must work together
   - Successful learning has a chance of occurring where a fair, firm discipline code is in place
   - The setting of high expectations is an essential prerequisite for successful learning and teaching
   - The most successful learning environments are those where the learner feels secure, happy and willing to take risks with their work
   - Classrooms should be attractive, stimulating work environments
   - Schooling is concerned with educating the ‘whole child’; encouraging academic, moral, physical, social and spiritual growth
   - The classroom and school must be a place of equal opportunity regardless of gender, age, race, religion, sexuality, appearance or any other distinguishing feature of an individual
   - Parents should be encouraged and welcomed into the classroom

2. a) I ensure that I present work in variety of ways. I always give both oral and written instructions and explicitly discuss the steps involved in completing tasks. These steps are usually written on the board for children to follow. The class is also practising creating their own steps in multi-level tasks using flowfigures. They are starting to rely less on me and are trusting their own planning and judgment more.
   b) I employ flexible grouping strategies in most KLAs. Children are often grouped according to ability with a specific outcome. This allows me to cater for different performance levels. There are also some individual programs in place for spelling, literacy and maths. Having a Teacher’s Aide and STLD support also helps to cater for the different ability and performance levels.

3. I try to create a ‘literacy-rich’ environment. We play with words and I read to the class often. I introduced a Reading Motivation scheme called ‘Radical Reading’ but it was less successful here (School A) than at other schools. I display my own enthusiasm for reading and writing. Children are grouped according to ability with some children having individual programs. The Reading program includes comprehension, viewing and listening tasks, oral reading (using Reciprocal Teaching techniques) and practical activities eg cooking, craft etc.

4. Spelling is integral to success in writing, especially at the point of publishing. I encourage creative spelling during draft writing and stress the need for perfect spelling in published work. Children are encouraged to use spell checkers, dictionaries and thesauruses.

5. During Term 2 each child focused on a combination of personal and group lists. During Term 3 they have group lists.

6. One and a half hours of structured spelling lessons are planned but this often is reduced to one hour. The children have spelling homework four nights a week – learning their list and completing activities. Some children have small group and individual spelling tuition during the week for approximately an hour.

7. My class’s literacy level is quite low. A significant number of children attend lessons with the STLD or have individual reading and spelling programs that are administered by our TA or volunteer parents. Their reading and writing levels have improved significantly but I feel the improvement has been much less in spelling. They have difficulty transferring that is learnt and practised in spelling, reading and writing lessons to their own work in other areas.

8. I would read to my class more. I would like to have more time to let children share information about good books they have read. I would have more integrated literature-based units of work and more ‘rich-tasks’ that relied on reading and writing (eg radio production unit we are currently doing).
1. As a teacher I believe that every child is an individual and learns at an individual rate. I provide a learning environment that is enjoyable and encourages all students. I believe students should be provided with challenging work that is suitable to their cognitive, aesthetic and physical development.

2. a) By ensuring that my teaching methods reflect a variety of styles and that students can relate in a personal way to the content being taught.
b) I have one very low performer and one exceptionally high performer in my class. I have to cater for these students by providing work that is allowing them to move at their own pace. For example, one-to-one, more directed learning and extension activities.

3. I make sure that all my teaching activities in reading and writing maximise learning by providing students with interesting, hands-on, discussion based activities that integrate all KLAs.

4. It is important however, not considered vital in achieving reading and writing activities.

5. My spelling program consists of 3 groups 10, 20 & 30 words. Students are allocated groups according to ability. The words are selected from 3 areas: 1) core spelling words; 2) theme spelling words – based on units of work; 3) rule words – based on one rule per week. Students participate in a variety of activities eg crosswords, find-a-words, grammar, buzz activities, look cover write check, dictionary work, etc and dictation. Students are tested weekly on the words.

6. ½ hour each day, 5 days a week

7. I would like the writing performance levels to improve.

8. I would simply like more time in a day to be able to address all English activities more thoroughly, eg using kits and some texts. I create all my own reading stations. This takes a lot of time but it is certainly worth the effort. Reading books – theme based would be very useful.
1. My teaching philosophy consists of: creating a stimulating, positive learning environment in which students can learn concepts, life skills, interact with peers and enjoy being at school whilst engaging in lots of educational activities. Regarding teaching styles: with having taught senior classes for approximately 10 years, I have adopted a firm but sensitive approach towards classroom management. I respect my students both in what they can and can’t do and try to get the best results I can from each student. I manage a democratic classroom where students are given the opportunity to decide many things/vote on issues or how we will approach tasks. Other times I manage a more authoritarian approach to teaching ie spelling, grammar, some mathematical concepts to name a few.

2. a) Catering for individual differences in students’ learning styles: I provide alternatives to activities ie a child may learn better visualising an activity rather than listening or vice versa. I also give a mixture of teacher directed / child centred learning activities, depending on students’ abilities. I also use a lot of group work related activities.

b) Performance levels: by grouping students according to ability. This is done for spelling and maths. I expect a good standard of work from all my students, ‘raise the bar’ so to speak — expecting improvement in results and encouraging students to do well. I also use rewards for improvement and a high standard of work achieved.

3. I use a lot of good teacher modelling, guided/scaffolding techniques for both reading and writing activities. I also expose the children to well written/read examples/samples of reading and writing. I compare these in order to show students what is expected of them and what they can strive toward. I encourage lots of home reading both oral and silent and writing practice.

4. We incorporate spelling into every KLA. We value spelling as a necessary tool for life, therefore the need for correct spelling in all subject areas is very important and should be a big part of your teaching program.

5. Students are grouped according to ability. Students are encouraged to learn words/spelling techniques and transfer these into their writing and everyday school activities.

6. Time spent on spelling activities: 1 hour (during my 2 days of teaching) on specific spelling/grammar activities.

7. We have a wide range of spelling abilities regarding reading/spelling/writing. Each child is encouraged to work hard in these areas to improve his/her performance. Some children need a lot of one on one teaching to reinforce concepts, while others are quite independent.

8. I would like to concentrate on more one to one teaching for those students who are particularly weak in literacy. Also having more help in the classroom (aide) to do group work, involving literacy tasks and monitoring students’ performance levels more closely. Using better spelling teacher books and related grammar activities.
TEACHER 9; Class 9

1. Value of each child underpins my work. Independent creative and co-operative skills are included in program, delivery of academic/knowledge is planned from syllabus to suit my style and that is always evaluated and therefore changing! I tend to do a lot of investigation – discussion – collaborative planning etc.

2. a & b) Talk through a problem enables individuals to be helped in their learning in eg maths, peer-mentor to model work habits, presentation, organisational skills are always modelled.

3. Modelled and joint construction – looking at structure and features of text to understand how writers create meaning, convey feelings etc. independent work consists of lightning writing, researched tasks, idea development through planning (webs, matrix etc) and peer/teacher editing following self proofreading. Group work in reading and writing.

4. Spelling is integral to reading/writing outcomes and provides/promotes skills of engagement. Reading relies on decoding, writing on vocabulary skills – drawn from spelling programme.

5. Based on developmental lists – placement from the SA Spelling test given Week 1, 3 parts to each of the ¾ lists. ½ of each list is high frequency words drawn from units of work. Activities are word study, phonograms, decoding/play games as well as thesaurus, dictionary, word origins, suffixes and pre-fixes based upon lists. Movement between groups is based upon performance over two weeks (16/20).

6. Per week: 30 minutes / day, 2 ½ hours per week dedicated.

7. Progress is good over time – students seem to develop in ‘bursts’, where ‘suddenly’ they are more accurate and using more sophisticated strategies. Home practice (daily) reflects in this burst of improvement. A background in phonological spelling program (Spalding) means that many rely too heavily upon phonogram choices. I focus upon developing word knowledge through exposure!

8. Do more shared reading of quality literature – all forms (novel, picture books, poetry, video, dramatic performance, plays). Attend author interviews / book reviews. Home reading – though not all responded to the Premier’s Reading Challenge so perhaps there is a need to inspire parent interest also.
Appendix D

JOURNAL OF TEACHER 2

**Week 1: Term 2:**
**Wed 11.05 -11.30**
- Divided students into 3 groups based on the spelling used in students’ independent writing.
- Words with a long ‘a’ sound. Looked at individual words. Students wrote down their words from their lists.

**Thurs 9-9.30**
- Students looked up selected words in the dictionary.
**Reflection:** Not happy with 3 different lists. Would prefer students to select words from a list.

**Week 2: Term 2**
**Wed 8.45-9.15**
- Continued long ‘a’ sound. Wrote a list of words on board and asked for strategies to remember their spelling. Students selected 3 words from list and wrote them into their books along with their strategy to remember how to spell them.
- Looked for long ‘a’ words in reading text school mag. Discussed the job the ‘bossy e’ did. Wrote 3 words from past and new list into their books along with their strategies to remember their spelling.

**Thurs 8/5 8.45-9.45**
- Emphasised spelling during writing lesson.
**Reflection:** Still not sure the students will transfer their knowledge of spelling. Will endeavour to integrate spelling with reading and writing.

**Week 3: Term 2**
**Mon 12/5 9.45-10.15**
- Looked at words students will need to use in an information report on the House of Representatives.
- Discussed strategies for remembering how to spell them eg root word ‘govern’ is in government.

**Thurs 15/5 9.00-9.30**
- Gave students a list of words misspelt in their writing and discussed ways to remember their spelling.
**Reflections:** Need a more routine – will make games and activities for students to work on in pairs and groups.

**Week 4 Term 2**
**Mon 19/5 8.45-9.00**
- Foundation group – ‘wh’ words – read narrative in school mag and identified words beginning with ‘w’. Then looked at which ones began with ‘wh’.

**9-9.15**
- Extension group – Discussed ‘root words’, prefixes and suffixes. Read information report/recount in school mag and identified words with root words/prefixes/suffixes/Thurs 22/5 8.45 -9
- Foundation group – played a game matching ‘wh’ and ‘w’ beginnings to endings.

**Reflection:** Much better. Students seeing a way to remember spellings! Will continue and develop more activities and games. Groups will not be static – mainly just L, J, M and L in bottom group and rest of class in extension group.

**Week 5 Term 2**
**Mon 26/5 9-9.30**
- Foundation group. Spelling of long ‘i’ sounds. List ways to spell long ‘i’ sound. Students find words for each spelling.
**Week 6 Term 2**

Mon 9-9.30
- Extension group – using suffixes to change the part of speech eg solid = noun or adjective. Solid + ify = verb.
- Students find other adjectives and nouns that change to verbs using this suffix eg liquid(fy); calcium(calcify); beautiful(fy); magnitude(fy)
- Foundation: long ‘o’ sound. List spellings of long ‘o’ sound. Students find words using each of the spellings.

Wed 10.15-10.45.
- Extension: comparative and superlative suffixes eg new +est or er; old(er)(est).
- Foundation: ‘ough’ saying long ‘o’ eg though, although, dough, doughnut. Students make up a silly sentence to help them remember these spellings.

**Reflection:** Extension students didn’t know about comparative and superlative! They were very interested and engaged. Found ‘ify’ hard to understand. Need to use other suffixes to demonstrate how suffixes can change the word’s part of speech. Foundation students found ‘ough’ difficult but ‘o’ and ‘bossy e’ quite easy.

**Week 7 Term 2**

Mon 9-9.30
- Extension – adding a suffix to change the part of speech eg run-runner – verb to noun; happy–happiness – adjective to noun; peace; depend; safe
- Foundation – Spelling for the long ‘e’ sound. List the different spellings for long e sound. Students find all long e sounds in a passage in the school magazine.

Wed 10.15-10.45.
- Extension – students list words ending in ion. They see if they can think of a rule for when to use tion and sion.
- Foundation – students make up sentences using as many long e words as possible, from list in magazine.

**Reflection:** Extension children finding changing part of speech challenging. They can think of a suffix for the root word but find it difficult to determine the parts of speech. Sion-tion not well done. Foundation – students enjoyed finding words. At first only looked for letter es, until they realised not every e says it’s a long sound and that long e sound can be made without the letter e.

**Week 8 Term 2**

Mon 9-9.30
- Extension – adding the suffix ly to verbs to make adverbs eg quick(ly); slow; happy; sudden.
- Foundation – spelling the ‘aw’ sound. List spellings of the aw sound. Find words in school magazine with aw sound.

Wed 10.15-10.45.
- Extension – suffix ist to mean a person who does it eg art(ist); cycle; type; reception.
- Foundation: students use as many ‘aw’ words as they can in silly sentences.

**Reflection:** Extension – students found ‘ly’ quite easy so only one lesson was spent. They found ‘ist’ a little more difficult to find examples. Foundation – students found aw words difficult to differentiate from or words.

**Week 9 Term 2**

Mon 9-9.30
- Extension – mathematical prefixes eg milli; kilo; deci; quad; tri; semi/hemi. Find meanings and examples.
- Foundation – ch sound. Ch; tch; ge; dge. Find words that use these spellings in reading.
material. Student who finds most, wins. Go through rules for usage.

**Wed 9.55-10.45**
- Extension – mathematical prefixes deca; mono; poly.
- Foundation – students play a game where they have word beginnings and endings.

**Reflection:**
Extension – students were interested in the maths prefixes and wanted to find more.
Foundation – students found it difficult to differentiate between the different spellings of ch sound. They enjoyed the game though I don’t think they really got them correct.

**Term reflection:**
I don’t think this way of teaching spelling is any more effective in achieving transference than lists and weekly tests. I think the children’s reading may have improved – especially the lower readers – as they now have more idea about how different digraphs may sound. I think a more integrated approach is needed.

**Week 1 – Term 3**
**Mon 9-9.30**
- Whole class – while reading during modelled reading, stop and look at certain words eg words where ‘c’ says it is soft sound. We can then find a rule and try to see if it is always followed eg ‘c’ says its soft sound if it is followed by an e or an i.

**Thurs 9-9.30**
- Students find words where c is followed by an e or an i; to see if they follow the rule we came up with.

**Reflection:**
A whole class approach is easier than groups. All children seemed to enjoy investigating the rule rather than being told the rule. They enjoyed testing the rule.

**Week 2 – Term 3**
**Mon 9-9.30**
- Looking up one syllable words when adding an ending that begins with a vowel eg words ending in -ing, -ed, -er, -est.
- Students find one syllable words that end in a single consonant preceded by a single vowel eg Bat – batted; hit-hitter; rub-rubbing etc. NB all have short vowel sounds. (Double the final consonant).

**Thurs 9-9.30**
- Students find words that follow this rule.

**Reflection:** children could find many one-syllable words and had no trouble doubling the final consonant. They noticed that the vowel said its short sound.

**Week 3 Term 3**
**Mon 9-9.30**
- Adding endings beginning in vowels to words of more than one syllable:
  - (1st syllable accented – don’t double last letter) eg carpet(ing); garden; employ; gallop; limit; visit
  - (Last syllable accented – double last letter) eg forbid(ding); begin; forgot; submit.

No further lessons due to BST.

**Reflection:** students understood but I’m not sure they’ll remember which one doubles and which one doesn’t.

**Week 5 Term 3**
**Mon 9-9.30**
- Adding endings beginning in a vowel to one syllable words with 2 final consonants or 2 vowels then one final consonant: eg aim(ing); toss(ed); boast(ing); moan(er); old(est).

**Wed 9-9.30**
- Revision – students played a game where they had root words and endings beginning with vowels. They had to say which root words doubled the final consonant and why eg boast doesn’t because it has 2 final consonants.

**Reflections:** Students still need much practice before they can apply this rule to their writing.
Week 7 Term 3
Mon 9-9.30
• Students play a game in 2 teams. Teacher says a word eg press. A student in team 1 spells it with the ending -ing. If correct, keeps standing, if incorrect sits down.
Wed 9-9.30
• Teacher writes a set of words and students write them with endings beginning in vowels.
Reflections: students still unsure. Momentum is slowing – end of term or need to change strategy.

Week 8 Term 3
Mon 9-9.30
• Decided to change strategy and allow students to demonstrate their understandings. I wrote the word govern on the board and asked students to tell me everything they could about the word eg
  - GOVERN: ‘o’ says ‘u’; 6 letters; verb; hard g followed by ‘o’; digraph ‘er’. GOVERNMENT: noun.
  - I then gave them the word ‘democracy’ to do in pairs.
Reflection: students slowly found some things to tell me about the word. I like this approach and will continue to use it.

Week 9 Term 3
Mon:
• Students given the word alphabet and asked to list: Part of speech – change to others; syllables; digraphs/blends; other words with digraph/blend; word origin; meaning.
Thursday
• Students given words accident and accept and asked to list:
  - Syllables; part of speech – change to others; meanings; digraphs/blends; origin; interesting – first ‘c’ = hard; second ‘c’ = soft; word building.
  - Students divided into pairs, to complete the above. They have 10 minutes to do this. Then I select one person from each pair to report.
Reflection: (not completed).

Week 10 Term 3
Words: Author; answer; anyhow; awful; cough; they'll; knife; noticeable; quiet; scrubbed; argument.
(Lesson not described).

Term 3 reflection:
Throughout this term I have emphasised editing work for many things including spelling. I have explicitly taught how to transfer rules and generalisations formed in spelling to written work. At worst students are aware of the need for them to use spelling strategies in their writing. At best many are applying strategies they’ve found. I feel like if the focus is removed they will immediately revert to old attitudes ie that it’s the teacher’s job to correct their spelling (and other) mistakes.

Term 4 focus will include editing as they write as adult writers do – as they write a few words/sentences, paragraph, quickly rereading and correcting before going on. (Thank you Thelma for this insight).
TEACHER A; Class 1 students

2. (3): Definitely improved – since beginning of year. Taken strategies and used them. Has got rules in head. Improved quite a lot – has gone up a spelling group.
4. (5): Has always been good. Would know a lot already – but would use new stuff.
5. (6): Quiet one – does not say a lot in class. Has made small improvements – not majorly. Has gone from a few wrong to most right each week. Needs to use the new strategies.
7. (13): Benefited, like (1). Mostly confidence has gone up. Spelling test results have improved. Success breeds success. Is more interested – and is up for more words.
12. (9): Quite a big improvement – sucks up information. More willing to put hand up – more confident. Almost up another group. Will have a go.
13. (10): Always good – always takes an interest. Has taken interest in lessons and applies strategies. Also comes up with own – and extends others for own purposes.
15. (17): Always good. Show her something new and she will use more.
18. (20): Improved. Not good this morning but always involved in lessons. Had good attempt at spelling. When new to the school (this year) he spelt phonetically.
19. (21): Has always been good – started at a high level. Is really quiet – does not give a lot but takes a lot in. Knows quite a few rules in her head and uses them. Knows a lot of words – does a lot of reading and writing – more than talks. Has made small improvement – nothing major. Lost a lot of schooling this year – in NZ and sick.
20. (22): Really good improvements – has matured quite a lot – and with that comes wanting to improve in work and all things. Tried to take in new and use it. Spelling has improved a lot. Is clever and has a good memory.
21. (23): Does not express herself well verbally – it is a struggle to understand her – is really quiet. Has made some improvements but not to the same extent as others. Is slow at doing work. Is reluctant to take chances and get it wrong. Has better test results in spelling – occasionally illogical.
TEACHER 4; Class 4 students

“There is a big differentiation in performance between students. Lessons are flawed because they are not themed to work” (Teacher 4).

4. (64): Enthusiastic – works well in a group situation. Made a lot of progress. Came here at the beginning of the year from a private school. Writing and spelling have improved. Good at maths. Responsive to Zing.
5. (56): A silly girl – giggles. Has a lot of potential. Collaborated well with Al in Zing. Has very good literacy skills.
6. (59): Follows ‘As’ but not far behind. Is keen because ‘As’ is keen. The Zing partnership was good for them.
7. (61): A quiet achiever – bright. Literacy skills good (a future writer). Enjoyed Zing. Tends not to give much orally – is shy and softly spoken. But behind all that is very capable.
8. (63): Is very easily distracted – keeping her on task is difficult. Once engaged, she is very good. When she sees relevance, then becomes enthusiastic. Has good literacy skills. Surprised that she liked to work on her own with Zing – is very capable.
9. (57): Left school before end of intervention period.
TEACHER 5; Class 5 students

1. (68): Bright child, involved. Good learner – one of highest in class for skills – top for reading, spelling and writing. Lessons made her think a bit – kept her motivated as easily distracted. ? ADHD but also bright.

2. (71): Lessons good for her. She has difficulty organising thoughts and gets confused under pressure. Gave her more confidence – a non stressful way to learn.

3. (72): Has a brighter sister and is an average student. Literacy is ok but not the best. Benefited from lessons because all the responsibility was not hers. Tried her best to get it right.


5. (73): Poor little one – can learn and then gets all mixed up. Now has better understanding of how language ‘works’ and how words form. Lessons helped her organise words a little better. Benefited from having someone to collaborate with.

6. (65): Came in Yr 3 with high IQ but could not spell words. Has god comprehension but poor spelling ability. Zing broadened understanding of words – how they are formed and why. Performance has improved. General writing has improved. Now has a good average performance but potential for better. The ‘knowledge’ will be used later. Comprehension is really good – better long-term gains.

7. (66): Good average student. Was very careless with handwriting and spelling. Spelling has improved and takes more care with handwriting. Is spelling more difficult words. Needs more collaborative skills.

8. (67): Enjoyed lessons. Will take it on board – how words are formed etc but ? will put it into practice. Slightly below average learner but brilliant reader. Poor fine motor skills so writing is laborious. Has good language skills and is a sophisticated speaker.

9. (69): Well below average student. Mildly intellectually handicapped (IQ 65-70). Literacy skills: quite a good reader but poor comprehension. Can write recount but can’t understand structure of other genres. Lessons appealed to him. Better for him that pressure not on him. [Started to shake when found he had made so much progress in his spelling performance].


11. (74): Left before end of intervention period. Missed many lessons as having remedial maths at the time.
QUESTIONS FOR STUDENTS RE. THEIR PROGRESS

Study students only (n=107)

Post-test questions:

1. How much progress have you made in the past 6 months in SPELLING?
2. How much progress have you made in the past 6 months in READING?
3. How much progress have you made in the past 6 months in WRITING?
4. What is the best way for you to learn how to spell?
5. Do you make sure that you know the meanings of the words you learn to spell?
6. What is your favourite lesson area, out of reading, writing, spelling, maths and drawing?

Intervention students’ extra questions:

7. Have the lessons on ‘words’ in the past 6 months been very useful to you?
8. In which ways have the lessons benefited you?

Classes 4 and 5 extra question in reference to Zing:

9. What do you think of the Zing lessons?
## STUDENTS’ COMMENTS ON THEIR PROGRESS

<table>
<thead>
<tr>
<th>No.</th>
<th>Cls</th>
<th>progress spelling</th>
<th>progress reading</th>
<th>progress writing</th>
<th>best learning method</th>
<th>know meanings</th>
<th>Fav-ite lesson area</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>No</td>
<td>A bit better</td>
<td>Easier – using different words and making stories longer</td>
<td>In head – syllables. Don’t use MS – it would help if did so</td>
<td>Sometimes – most of time</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Moved up a level</td>
<td>Doing pretty good – easier to read</td>
<td>Don’t know – yeah – a little bit</td>
<td>LCWC. MS puts it into head – sometimes</td>
<td>Sometimes</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>A bit</td>
<td>A little bit</td>
<td>Use more interesting words – easier to get going</td>
<td>Keep writing down. Don’t use MS</td>
<td>Most of time – more since lessons</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>A lot</td>
<td>Better than before</td>
<td>Same as before</td>
<td>Write/rewrite. Use MS when hard</td>
<td>No not really – sometimes look up meanings – if have time</td>
<td>M</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Lots</td>
<td>Some</td>
<td>Lots – write more</td>
<td>Read words over. MS a bit</td>
<td>Sometimes</td>
<td>D</td>
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<tr>
<td>7</td>
<td>1</td>
<td>LEFT SCHOOL</td>
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<tr>
<td>8</td>
<td>1</td>
<td>A lot</td>
<td>Yes – a lot</td>
<td>A lot</td>
<td>Keep trying – rewriting. MS works – yes</td>
<td>Sometimes</td>
<td>M</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>A lot</td>
<td>A lot</td>
<td>A lot</td>
<td>Sounding out – try to say syllables. MS good – sometimes</td>
<td>Sometimes – more interested now</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>A lot</td>
<td>Not much</td>
<td>Improving</td>
<td>LWCC</td>
<td>Yes</td>
<td>M</td>
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<tr>
<td>11</td>
<td>1</td>
<td>A little bit</td>
<td>Good – a lot</td>
<td>No</td>
<td>Practise – read words</td>
<td>Sometimes</td>
<td>R</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Yes – think so</td>
<td>Some</td>
<td>Yes – a little</td>
<td>Sound out – MS yes – sometimes</td>
<td>Sometimes – no difference</td>
<td>D</td>
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<tr>
<td>13</td>
<td>1</td>
<td>Good – a lot</td>
<td>Same</td>
<td>A little better</td>
<td>Sounding out – write/read over and over</td>
<td>Sometimes / never</td>
<td>D</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Learnt to spell properly – what words mean by breaking it up – some progress</td>
<td>Can read faster</td>
<td>Can write stories and reports properly now. Have more words to use. How to store words in head</td>
<td>Write them over and over again. Write them all sorts of ways – neat. then tidy. Change the size – use colour pens etc. sometimes close eyes</td>
<td>Always – more interested in words</td>
<td>S</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>More than before – now on higher level</td>
<td>Pretty good – better than before</td>
<td>Use wide range of words – longer piece of writing</td>
<td>Practise – spell out – saying. MS sometimes helps – more difficult words</td>
<td>Sometimes – more often now</td>
<td>S</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Heaps</td>
<td>Getting more into it – reading heaps – more since lessons</td>
<td>Getting good</td>
<td>LCWC – sound out. Not use MS</td>
<td>Sometimes – more than before</td>
<td>W</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Pretty good – wasn’t that good – a lot better now</td>
<td>Was good – same now</td>
<td>Better than before</td>
<td>Looking over and over – spell words in head</td>
<td>Most of time – usually do well in tests</td>
<td>D &amp; R</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Quite a lot</td>
<td>Lots</td>
<td>A little bit</td>
<td>Syllables – write down – MS works – sometimes</td>
<td>Sometimes – more interested</td>
<td>W</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Heaps</td>
<td>A lot</td>
<td>A lot</td>
<td>Rewriting – MS worked – use it now</td>
<td>Always</td>
<td>S</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Quite a lot</td>
<td>A bit more</td>
<td>Improved a lot</td>
<td>Sound it out – affixes – how words are made up – what they mean. MS sometimes</td>
<td>More interested in knowing meanings</td>
<td>M</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>Improved a lot</td>
<td>Good –</td>
<td>Better – write</td>
<td>LWCC – MS</td>
<td>Sometimes</td>
<td>R</td>
</tr>
<tr>
<td>n o.</td>
<td>Cts progress</td>
<td>spelling</td>
<td>reading</td>
<td>writing</td>
<td>best learning method</td>
<td>know meanings</td>
<td>Fav-ite lesson area</td>
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<tr>
<td>22</td>
<td>Pretty good at it now – achieved a little bit more</td>
<td>Can sound out words better now – can understand better now what I am reading</td>
<td>Big difference when hard word comes – can work out how to spell it straight away</td>
<td>Get it off novels – try to sound words out. LCWC – learn words got wrong in test the MS way – improved on spelling test – used to get 3 or 4 wrong</td>
<td>Know meanings – always have</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Very good</td>
<td>A lot quicker – can read harder words</td>
<td>A bit – can work out unknown words quicker</td>
<td>Write-rewrite word in centre and then write around until paper full – used to write lists</td>
<td>Most of time – more likely to now than before</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Pretty good – same as always</td>
<td>A little bit</td>
<td>More enjoyable – like creative writing</td>
<td>Sounding out – have a go. Don’t know how would go about learning words</td>
<td>Sometimes</td>
<td>M &amp; D</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>A bit</td>
<td>A lot</td>
<td>Good</td>
<td>Syllables. Try out different versions and then find the most likely</td>
<td>Sometimes</td>
<td>R</td>
<td></td>
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<tr>
<td>26</td>
<td>A bit easier</td>
<td>Going well – reading more</td>
<td>A lot easier – because easier way teacher teaches it</td>
<td>Writing in stories</td>
<td>Sometimes</td>
<td>M &amp; D</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>A bit better – not very much</td>
<td>Improved a lot</td>
<td>Not very much</td>
<td>Spelling tests – use a dictionary – relate to other words</td>
<td>Sometimes</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>A bit better Better than before</td>
<td>Sort out ok – same as before</td>
<td>Sound out – look how long they are – learn in syllables in order. Get dictionary if can’t sound them out. Or guess</td>
<td>Sometimes</td>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>A bit</td>
<td>Improved a lot</td>
<td>Middle</td>
<td>Copying off board – and reading – sound out – clap syllables</td>
<td>Sometimes</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Don’t know – a little bit</td>
<td>Good – quite a bit</td>
<td>A little bit</td>
<td>Don’t know</td>
<td>Sometimes</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Average</td>
<td>More progress – faster</td>
<td>Same as always</td>
<td>LCWC</td>
<td>Sometimes</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>LEFT SCOOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Some improvement</td>
<td>A lot</td>
<td>Alright</td>
<td>Word – syllables – take it apart</td>
<td>Sometimes</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Alright – better than alright – quite good</td>
<td>Excellent</td>
<td>Better than ever</td>
<td>Think about word – can remember</td>
<td>Sometimes</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Not much Better – a lot of progress</td>
<td>A lot of progress</td>
<td>Sound it out – look for little words in the word and then build on it</td>
<td>No – never</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>A little bit – a lot</td>
<td>Improved a lot</td>
<td>Not too good</td>
<td>Practise – LCWC</td>
<td>Find another word if don’t know meaning – sometimes</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>A little bit</td>
<td>A little bit</td>
<td>Quite a bit</td>
<td>Study for quite a long time – check in book – read it in dictionary</td>
<td>Sometimes</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>A lot – made everything fun. Everyone joined in</td>
<td>A little bit – like it more. Reading more difficult books</td>
<td>Yes – use more describing words – made it sound more interesting. Easier to make a start</td>
<td>LCWC – sometimes MS but LCWC better</td>
<td>Yes – usually</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>100% improvement – because got more</td>
<td>Yes: interested in long books now because</td>
<td>Easier to get started. Using longer words</td>
<td>Games – Buzz Off – LCWC</td>
<td>Yes – mostly</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>n o.</td>
<td>Cts</td>
<td>progress spelling</td>
<td>progress reading</td>
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<td>best learning method</td>
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</tr>
<tr>
<td>40</td>
<td>3</td>
<td>interested in words – because activities were fun</td>
<td>since lessons, more interested in spelling and know more words – can cope with reading better</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>41</td>
<td>3</td>
<td>Ok – it was more fun – interesting games and other activities. Helped learning because fun and wanted to learn</td>
<td>Like ‘accelerated reader’ program (purpose)</td>
<td>Better. Know what to focus on eg adjectives</td>
<td>MS</td>
<td>Sometimes when need</td>
<td>D</td>
</tr>
<tr>
<td>42</td>
<td>3</td>
<td>A lot</td>
<td>A lot – read quicker – reading a novel now – used to read only short stories. Can sound words out faster – so lessons helped</td>
<td>Good – write more interesting words</td>
<td>MS</td>
<td>Yes – mostly</td>
<td>M</td>
</tr>
<tr>
<td>43</td>
<td>3</td>
<td>A little better – sounding out</td>
<td>A lot – read more often. Reading logs for homework. Enjoying more. Getting more into books. Trying more</td>
<td>Getting neater. Writing longer words. Don’t take as long. Easier to get started</td>
<td>Sound out. LCWC sometimes</td>
<td>Yes – mostly</td>
<td>D</td>
</tr>
<tr>
<td>44</td>
<td>3</td>
<td>A bit – not too much – tests help</td>
<td>No progress</td>
<td>Neater. Use more descriptive words. A little easier to get started</td>
<td>Sound/sight. LCWC. Rewrite</td>
<td>Yes- usually</td>
<td>D</td>
</tr>
<tr>
<td>45</td>
<td>3</td>
<td>A lot easier – harder words easier to figure out. Know more how words constructed, so not so worried about spelling them wrong</td>
<td>Know more rules</td>
<td>Not really</td>
<td>MS helped</td>
<td>Sometimes</td>
<td>D</td>
</tr>
<tr>
<td>46</td>
<td>3</td>
<td>A lot – sounds – Mr C’s teaching – home practice</td>
<td>A bit – a lot – Mr C’s teaching – joining small words to make larger</td>
<td>Yes – Mr C’s teaching: “Not a word has to be wasted” – use longer words – write longer pieces</td>
<td>Spalding: by knowing meanings and learning sounds</td>
<td>Yes – almost always</td>
<td>D &amp; W</td>
</tr>
<tr>
<td>47</td>
<td>3</td>
<td>A little bit – not much. Learnt more things (homonyms etc)</td>
<td>Yes – new words</td>
<td>Yes – writing more. Putting in more punctuation and grammar. Using better words</td>
<td>Syllables. LCWC</td>
<td>Yes – mostly</td>
<td>D</td>
</tr>
<tr>
<td>48</td>
<td>3</td>
<td>A bit – know a few more</td>
<td>Good – read bigger</td>
<td>Good – better at running</td>
<td>MS – close eyes etc. LCWC sometimes better</td>
<td>Yes – most of the time</td>
<td>M</td>
</tr>
<tr>
<td>No.</td>
<td>Cts</td>
<td>progress spelling</td>
<td>progress reading</td>
<td>progress writing</td>
<td>best learning method</td>
<td>know meanings</td>
<td>Fav-ite lesson area</td>
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<tr>
<td>48</td>
<td>3</td>
<td>words</td>
<td>(longer) books</td>
<td>writing. Easier to get started. Not easy to end</td>
<td>LCWC – sound out. Sometimes MS</td>
<td>Yes – mostly</td>
<td>D</td>
</tr>
<tr>
<td>49</td>
<td>3</td>
<td>Improved – can pronounce separate syllables a bit better – and then get word</td>
<td>Yes – more chapters and reading more – because reading for homework and now more interested</td>
<td>Yes – lot of compliments for handwriting and neat bookwork. Writing longer pieces</td>
<td>LSCWC – big sister helps. Write and rewrite in book</td>
<td>Yes – mostly</td>
<td>D &amp; S</td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>Pretty good. Rules. Learnt more words – fun</td>
<td>Kind of – read quicker and read longer words</td>
<td>Not really. More describing words</td>
<td>MS mostly</td>
<td>Yes – sometimes</td>
<td>D</td>
</tr>
<tr>
<td>51</td>
<td>3</td>
<td>ABSENT – at end of term</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>3</td>
<td>ABSENT – at end of term</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>3</td>
<td>Better – finding words in same family and group. More interested because of Mr C's teaching. Like Word Wall</td>
<td>Better – need more practice with punctuation</td>
<td>Better – understand more about writing process</td>
<td>Sounding out – breaking up words – if not sure about 'look', look it up</td>
<td>Mostly</td>
<td>S</td>
</tr>
<tr>
<td>54</td>
<td>3</td>
<td>Yes – games fun and get attention. Good way to learn. Spelling skills</td>
<td>Yes – more expression. Can read more words</td>
<td>Yes – practice</td>
<td>LCWC – MS</td>
<td>Yes – mostly</td>
<td>D</td>
</tr>
<tr>
<td>55</td>
<td>3</td>
<td>Not sure – thinks is better – much better marks since beginning of year</td>
<td>Better than before. Groups easier. Reading all right</td>
<td>Good at writing – improve since beginning of year</td>
<td>Sounding out word in Kinder – use dictionary – ask teach (she writes it down). Zing helped – for hard words – tells you what half of the word means</td>
<td>Yes – just know – write sentence</td>
<td>D</td>
</tr>
<tr>
<td>56</td>
<td>4</td>
<td>LEFT SCHOOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>57</td>
<td>4</td>
<td>A bit – used to get 5/10 – now 9 or 10/10. Why? – because want to learn more words and meanings'</td>
<td>Bit more progress – read more – like reading more – know more words and meanings – understand more</td>
<td>More writing skills – longer stories, more words (1 – 1.5/2 pages). Enjoying writing more – have more words can use</td>
<td>Rhythm – go over words, tests, learn the ones gets wrong – test again. Keep going over them</td>
<td>YES</td>
<td>M</td>
</tr>
<tr>
<td>58</td>
<td>4</td>
<td>Helps because don't always understand – a lot better</td>
<td>Yes – think understand more words</td>
<td>Yes – think before write – know more words – write longer pieces</td>
<td>Zing. Close eyes, go over words 100 times – rewrite</td>
<td>YES – sometimes can’t be bothered – mostly</td>
<td>D</td>
</tr>
<tr>
<td>59</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<td>n o.</td>
<td>Cts</td>
<td>progress spelling</td>
<td>progress reading</td>
<td>progress writing</td>
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<td>know meanings</td>
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<tr>
<td>60</td>
<td>4</td>
<td>A lot</td>
<td>Improved</td>
<td>A bit</td>
<td>LCWC</td>
<td>YES – mostly</td>
<td>R</td>
</tr>
<tr>
<td>61</td>
<td>4</td>
<td>Better – know more rules</td>
<td>Understand more words – read more – read quicker</td>
<td>Improved – using spelling rules – use more descriptive words</td>
<td>Spelling test – practise before. LCWC</td>
<td>No – sometimes look up words – look them up after learnt them sometimes</td>
<td>R</td>
</tr>
<tr>
<td>62</td>
<td>4</td>
<td>Better – harder words get easy</td>
<td>A bit – know more words</td>
<td>Not really</td>
<td>Practise – redo over and over – in mind and rewriting</td>
<td>YES – usually</td>
<td>M – close with spellin g</td>
</tr>
<tr>
<td>63</td>
<td>4</td>
<td>A bit – quite a lot. Mnemonics</td>
<td>No</td>
<td>Yes – spelling and understand more words. Use more words. Longer work</td>
<td>Make songs out of words – find words that rhyme. Think about how can use them</td>
<td>No, not really. Sometimes. Can’t be bothered. Am interested but only bother sometimes (most of time but not always)</td>
<td>W</td>
</tr>
<tr>
<td>64</td>
<td>4</td>
<td>A lot. Know more words. Find it easier to spell them – especially silent letters – practice – fun way to learn</td>
<td>Yes – faster and words easier to read and pronounce – and know more words now</td>
<td>Think so. Can write a long time without stopping (because know how to spell more words). Use more adjectives to explain. Enjoy writing more. More confident in writing.</td>
<td>Practise – LCWC</td>
<td>Yes – mostly. Bother more since lessons</td>
<td>M</td>
</tr>
<tr>
<td>65</td>
<td>5</td>
<td>Quite a lot</td>
<td>A bit faster</td>
<td>Quite a lot – punctuation better. More complex sentences. Enjoy more because new words learnt</td>
<td>Resay and rewrite</td>
<td>Yes – usually</td>
<td>W</td>
</tr>
<tr>
<td>66</td>
<td>5</td>
<td>Learnt a couple of words – eg necessary. Words didn’t know now know – 6/10 progress</td>
<td>Heaps better – understand more words and pronunciation s – silent letters – therefore easier to read</td>
<td>Got better with spelling – more interesting stories and narratives – using more different words eg coincidence. More interesting words</td>
<td>Dictionary meanings – then syllables</td>
<td>Mostly – think about words and their meaning since lessons</td>
<td>Like them all – hard to choose</td>
</tr>
<tr>
<td>67</td>
<td>5</td>
<td>A bit – but not much – getting more right with spelling tests (now 4 or so wrong – used to be 6-8 wrong)</td>
<td>Yes – faster – longer books</td>
<td>Complete work faster. Neater. Easier to get started. Write more</td>
<td>Look – write and rewrite</td>
<td>No – usually not</td>
<td>D</td>
</tr>
<tr>
<td>68</td>
<td>5</td>
<td>A lot</td>
<td>Not much</td>
<td>Not much</td>
<td>Syllables</td>
<td>Not really</td>
<td>S</td>
</tr>
<tr>
<td>69</td>
<td>5</td>
<td>Not much</td>
<td>Much</td>
<td>Improved</td>
<td>Syllables – phonemes – pronounce words (don’t write them down)</td>
<td>Yes – sometimes. Look up ones you don’t know</td>
<td>W</td>
</tr>
<tr>
<td>n  o.</td>
<td>Cls</td>
<td>progress spelling</td>
<td>progress reading</td>
<td>progress writing</td>
<td>best learning method</td>
<td>know meanings</td>
<td>Fav-ite lesson area</td>
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<tr>
<td>70</td>
<td>5</td>
<td>Yes – good at spelling</td>
<td>Yes – good at reading</td>
<td>Yes</td>
<td>Study – never mind how. Practice</td>
<td>No – often</td>
<td>R</td>
</tr>
<tr>
<td>71</td>
<td>5</td>
<td>A bit</td>
<td>A bit</td>
<td>A lot – don’t know why – enjoy more. More confident. Lessons have helped</td>
<td>Syllables – break words up. Make words out of syllables eg ‘ous’ – make sure it is not spelt another way. Write down long words but not shorter</td>
<td>Try to – (not if have too little time)</td>
<td>W</td>
</tr>
<tr>
<td>72</td>
<td>5</td>
<td>A lot better – learn them more easily</td>
<td>Yes – faster – words are easier</td>
<td>Still a bit hard – no real change</td>
<td>Put it right. Not LCWC. Rewrite</td>
<td>Not usually</td>
<td>M</td>
</tr>
<tr>
<td>73</td>
<td>5</td>
<td>A lot – not as bad as used to be – learnt other ways of learning words</td>
<td>Not really – always been a good reader</td>
<td>Write really good stories but spelling bad. A little bit better now – happier about writing because less embarrassed about spelling</td>
<td>Writing them down. Thinking about them in head, sometimes with eyes shut, and then rewriting</td>
<td>Yes – sometimes – usually know meanings</td>
<td>R</td>
</tr>
<tr>
<td>74</td>
<td>5</td>
<td>LEFT SCHOOL</td>
<td>A lot. Know more words</td>
<td>Sort of but not really – already ok</td>
<td>Sort of – write sort of better now – practice – sentences better – more interesting because use more words. Sometimes longer ones</td>
<td>Rewrite and practice – visualise. Cover and rewrite</td>
<td>Yes – always – most of time</td>
</tr>
<tr>
<td>75</td>
<td>5</td>
<td></td>
<td>Ok – some</td>
<td>Good progress</td>
<td>A little</td>
<td>Break words into syllables – memory prompts eg FAT_HER</td>
<td>Sometimes</td>
</tr>
<tr>
<td>76</td>
<td>6</td>
<td>Don’t know – a little – getting better with tests</td>
<td>Going well – good progress</td>
<td>Ok – getting better</td>
<td>Look at words – write them down four times</td>
<td>Sometimes</td>
<td>D</td>
</tr>
<tr>
<td>77</td>
<td>6</td>
<td>Dome alright – some progress</td>
<td>A little but not much</td>
<td>No progress</td>
<td>Write it down – sound out – test results</td>
<td>Usually</td>
<td>D</td>
</tr>
<tr>
<td>78</td>
<td>6</td>
<td>A little but not much</td>
<td>A bit</td>
<td>Better – but not much</td>
<td>Look for long time – then try to spell it in mind</td>
<td>Sometimes</td>
<td>D</td>
</tr>
<tr>
<td>79</td>
<td>6</td>
<td>Don’t know – some</td>
<td>Don’t know</td>
<td>Yes – think so</td>
<td>Sound it out – syllables – learn words quickly</td>
<td>Sometimes</td>
<td>M</td>
</tr>
<tr>
<td>80</td>
<td>6</td>
<td>Big progress</td>
<td>Slight</td>
<td>Big improvement (PWA)</td>
<td>Say/write/spell out. Sometimes cover</td>
<td>Sometimes</td>
<td>W</td>
</tr>
<tr>
<td>81</td>
<td>6</td>
<td>Don’t know – getting better marks now</td>
<td>Getting better and faster</td>
<td>Improved a lot – focusing - getting picture in mind – get it done faster</td>
<td>Sound out – repeated writing</td>
<td>Most of time</td>
<td>D</td>
</tr>
<tr>
<td>82</td>
<td>6</td>
<td>A bit – 95-100%</td>
<td>Last term – not that good. Now 40-90% improvement</td>
<td>Pretty good</td>
<td>Sound out. Write in spelling book – only write once</td>
<td>Sometimes</td>
<td>M</td>
</tr>
<tr>
<td>83</td>
<td>6</td>
<td>Don’t know – some</td>
<td>A lot</td>
<td>A lot</td>
<td>Re-read – rewrite. Sometimes LCWC</td>
<td>Sometimes</td>
<td>D</td>
</tr>
<tr>
<td>84</td>
<td>6</td>
<td>Don’t know – some</td>
<td>A lot</td>
<td>Some</td>
<td>Sound out – practice. LSCWC</td>
<td>Not always</td>
<td>D</td>
</tr>
<tr>
<td>85</td>
<td>6</td>
<td>Don’t know – unsure</td>
<td>Ok</td>
<td>Don’t know</td>
<td>Sound of word – letters to go with sound. Write it down</td>
<td>Not really</td>
<td>M</td>
</tr>
<tr>
<td>86</td>
<td>6</td>
<td>Pretty much the same</td>
<td>Have become more confident</td>
<td>More confident</td>
<td>Syllables. LCWC</td>
<td>Always</td>
<td>S &amp; D</td>
</tr>
<tr>
<td>n. o.</td>
<td>Cts</td>
<td>progress spelling</td>
<td>progress reading</td>
<td>progress writing</td>
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<td>know meanings</td>
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<tr>
<td>88</td>
<td>7</td>
<td>Pretty good</td>
<td>Better than before</td>
<td>Same as before</td>
<td>Write and rewrite</td>
<td>Sometimes D</td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>7</td>
<td>Getting better marks – quite pleased with progress</td>
<td>Lots</td>
<td>Getting neater – using words is getting better</td>
<td>Break words into syllables. Spell each syllable at a time – repeat process a few times</td>
<td>Always – look up words</td>
<td>R</td>
</tr>
<tr>
<td>90</td>
<td>7</td>
<td>Maybe a little</td>
<td>Same as before – usual progress</td>
<td>Improving</td>
<td>Memorising; looking, memorising, try to spell – saying out loud</td>
<td>Sometimes M</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>7</td>
<td>Good</td>
<td>Better</td>
<td>Yep – very good – a little progress</td>
<td>Sound it out, then write it down – sometimes more than once</td>
<td>Sometimes S</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>8</td>
<td>A little – can remember words a bit better</td>
<td>Read more fluently</td>
<td>No</td>
<td>Looking and remembering – write words for homework</td>
<td>Mostly M</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>8</td>
<td>A bit – know a few more words</td>
<td>Getting faster</td>
<td>Find it easier to write – quicker to get started</td>
<td>Write words out twice – get most right</td>
<td>Usually D</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>8</td>
<td>Quite a bit – learnt more things</td>
<td>Good – better – not stumbling</td>
<td>Better – easier to start</td>
<td>Doing spelling test – not LCWC</td>
<td>Yes – usually R</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>8</td>
<td>Improved a lot</td>
<td>Still good – fluent</td>
<td>Like story writing – very imaginative – heaps better</td>
<td>Practise – write and rewrite. LCWC always</td>
<td>Sometimes if asked to – sometimes not D</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>8</td>
<td>Quite a bit – practise at home more</td>
<td>Good – can read more long words than before – so reading more fluently</td>
<td>Better – used to write short sentences and paragraphs – now longer. Easier to get started</td>
<td>Sounding out. LCWC – usually</td>
<td>Yes – mostly M</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>8</td>
<td>Better – learn more easily</td>
<td>Better – more expression – word attack easier</td>
<td>Getting better</td>
<td>Homework – practise for tests. Write down when someone says word</td>
<td>Yes – sometimes D</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>8</td>
<td>Yes – usually 18/20 – now 20/20</td>
<td>Sort of</td>
<td>About same as used to be</td>
<td>Spell words out</td>
<td>Yes – sometimes M</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>8</td>
<td>LEFT SCHOOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>8</td>
<td>More confidence. Practising more. Now 20/20 – was 16-18/20</td>
<td>In 2nd highest group. More confident. Used to stutter when didn’t know word – now pause and think about it and try to sound out</td>
<td>Easier to get started. Preparing it quicker. More confident. Used to write ½ page – now full page</td>
<td>Syllables – relate to previous knowledge</td>
<td>Yes – try to – forget sometimes</td>
<td>M</td>
</tr>
<tr>
<td>101</td>
<td>9</td>
<td>Have got pretty good</td>
<td>OK – yes progress – understand more words and harder words</td>
<td>Yes – write more fluently</td>
<td>Spell out with no distractions</td>
<td>Yes – half of time D</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>9</td>
<td>Good</td>
<td>Better</td>
<td>OK – not much progress</td>
<td>Syllables. Yes LCWC sometimes</td>
<td>Yes – sometimes D</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>9</td>
<td>Not good at spelling. Sort of made progress</td>
<td>A little better. Don’t pause to think of word so much (know more words)</td>
<td>Better at creative writing</td>
<td>Spelling in class. LCWC a little</td>
<td>Yes – sometimes – not all the time W</td>
<td></td>
</tr>
<tr>
<td>n o.</td>
<td>Cts</td>
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<td>progress reading</td>
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<tr>
<td>10</td>
<td>9</td>
<td>A lot – can now spell ‘tricky’ words</td>
<td>Not much</td>
<td>No</td>
<td>Syllables and phonetics</td>
<td>Yes – mostly</td>
<td>M</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>Sort of</td>
<td>A little</td>
<td>A little – writing easier</td>
<td>Syllables – sort of LCWC</td>
<td>Usually</td>
<td>D</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>Better – more confident</td>
<td>Expression better. Know lots more words</td>
<td>Can write a lot – improved</td>
<td>Sound syllables out – LCWC</td>
<td>Yes – sometimes</td>
<td>D</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>A bit</td>
<td>Better</td>
<td>Better</td>
<td>Homework – lists – write and rewriting – LCWC – don’t really need to now</td>
<td>Sometimes</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>A little – now getting 20/20 – before got 19/20</td>
<td>Getting better – Premier’s Reading Challenge helped. Do better if like the book</td>
<td>Enjoy writing – got a lot better</td>
<td>Activities around words – learn harder words</td>
<td>Most of time</td>
<td>D</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>Some</td>
<td>Don’t miss words and read them correctly</td>
<td>Some improvement – easier to get started – use more difficult words</td>
<td>Sound out syllables</td>
<td>Yes – mostly</td>
<td>D</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>Don’t know</td>
<td>Good – read lots at home</td>
<td>Good</td>
<td>LCWC – sometimes</td>
<td>Yes – sometimes</td>
<td>W</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>Ok – good</td>
<td>Yes – learn more difficult words</td>
<td>Use harder words</td>
<td>LCWC – usually</td>
<td>Yes – sometimes</td>
<td>D</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>A lot – learn more words more quickly</td>
<td>Read longer stories – know more difficult words</td>
<td>Organise better – longer and harder words</td>
<td>Dictionary – ask parents. LCWC – used to – not any more</td>
<td>Yes – usually</td>
<td>D</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>A bit – getting more right (17/20)</td>
<td>Very good – not much difference over 2 terms</td>
<td>Same</td>
<td>Not sure. Keep reading over and over</td>
<td>Yes – sometimes</td>
<td>M</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>LEFT SCHOOL</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

327
## INTERVENTION STUDENTS’ EXTRA COMMENTS RE. LESSONS

### Class 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Class</th>
<th>Lessons useful?</th>
<th>How benefited from lessons?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Left school</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Yes</td>
<td>How to spell big words. Meanings of different parts. More interested. More confident</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Yes</td>
<td>Doing better – some subjects. S &amp; R. Understanding more things</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Yes</td>
<td>Help write more interesting words and find meanings of words</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Yes</td>
<td>Help with spelling and how to use words in sentences – more confident with spelling and writing assignments. Starting to like writing more – can use more interesting words</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Yes</td>
<td>Learning more words and meanings</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>Left school</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Yes</td>
<td>More interested in words</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Yes – a lot</td>
<td>Helped to spell difficult words – improved handwriting – developed reading a lot – know more words</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Yes</td>
<td>Don’t know – more confident in reading, spelling and knowing meanings</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Yes</td>
<td>Meanings – how to spell – strategies</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>Yes</td>
<td>Don’t know</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Yes</td>
<td>Showed different ways – strategies. More interested in words</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>Yes</td>
<td>Helped to break down word – sound out. More confident using words</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>Yes</td>
<td>Know more (prefixes) – more interested in words</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>Yes</td>
<td>Learning more in writing and spelling – use longer words and more words</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>Yes</td>
<td>More aware of spelling – like writing stories more because know more words</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>Yes</td>
<td>Increased vocabulary – use longer words – longer pieces of work – a little bit more interested – words and language developed</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>Very</td>
<td>Know more words – how spelled – silent letters – more interested in words</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>Yes</td>
<td>Helped remember when copying things down. Learn big words by breaking it down. Know lots of meanings. More interested</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>Yes</td>
<td>Learnt more words – MS method</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>Yes</td>
<td>Expanded vocabulary – especially when talk to parents and friends and writing – use more interesting words</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>Yes</td>
<td>Get more right than before. Only get 2 or 3 words wrong in tests now – used to get half of them wrong before</td>
</tr>
</tbody>
</table>
## Classes 2 and 3

<table>
<thead>
<tr>
<th>No.</th>
<th>Class</th>
<th>Lessons useful?</th>
<th>How benefited from lessons?</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>2</td>
<td>A bit</td>
<td>Don’t know</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>A little bit</td>
<td>Only used one syllable words – now use words with 2 or 3</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>A little bit</td>
<td>Can do a lot more – easier, quicker and understand more</td>
</tr>
<tr>
<td>27</td>
<td>2</td>
<td>Strategies have helped</td>
<td>If on own, don’t work. Have more to use now</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>Yes – teaching differently</td>
<td>Teaching how to spell better</td>
</tr>
<tr>
<td>29</td>
<td>2</td>
<td>Yes</td>
<td>Helped spelling and reading – therefore know how to find was round words better (how words work)</td>
</tr>
<tr>
<td>30</td>
<td>2</td>
<td>Yeah</td>
<td>Don’t know</td>
</tr>
<tr>
<td>31</td>
<td>2</td>
<td>D/k</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>Left school</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>2</td>
<td>Yes</td>
<td>How to spell – what they mean</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
<td>A little</td>
<td>Use the new words have learnt</td>
</tr>
<tr>
<td>35</td>
<td>2</td>
<td>Not really</td>
<td>A little bit</td>
</tr>
<tr>
<td>36</td>
<td>2</td>
<td>A little bit</td>
<td>Know more technical skills eg paragraphs</td>
</tr>
<tr>
<td>37</td>
<td>2</td>
<td>Yes – a little</td>
<td>Sentences, paragraphs, finding syllables</td>
</tr>
<tr>
<td>38</td>
<td>3</td>
<td>Yes</td>
<td>Exciting. Look forward to lessons. Good way to learn</td>
</tr>
<tr>
<td>39</td>
<td>3</td>
<td>Yes</td>
<td>More interested in words</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
<td>Yes</td>
<td>Liked words that were used – fun – or different or unusual</td>
</tr>
<tr>
<td>41</td>
<td>3</td>
<td>Yes</td>
<td>Read faster. Taught a lot of new things. New words. More interested in words</td>
</tr>
<tr>
<td>42</td>
<td>3</td>
<td>Yes</td>
<td>Learning more words. Seeing different words. Liked activities. Good way to learn</td>
</tr>
<tr>
<td>43</td>
<td>3</td>
<td>Yes</td>
<td>Help with sounds. More time on spelling has been helpful</td>
</tr>
<tr>
<td>44</td>
<td>3</td>
<td>Y</td>
<td>More fun – understand more</td>
</tr>
<tr>
<td>45</td>
<td>3</td>
<td>Yes</td>
<td>Words with prefixes. By putting words in groups, found common theme</td>
</tr>
<tr>
<td>46</td>
<td>3</td>
<td>Yes</td>
<td>Lists of groups of words (Word Wall). Learn more by going games and group activities</td>
</tr>
<tr>
<td>47</td>
<td>3</td>
<td>Some were</td>
<td>Play games – having fun. Like group activities</td>
</tr>
<tr>
<td>48</td>
<td>3</td>
<td>Yes</td>
<td>Learnt about prefixes and homophones. Booklets and dictionary meanings. Expanded vocabulary. Liked group work</td>
</tr>
<tr>
<td>49</td>
<td>3</td>
<td>Yes</td>
<td>MS approach – new ways. Some activities helped learning eg Word Wall</td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>Yes</td>
<td>Learning spelling words. More confident. Can learn bigger words now. Liked lessons. Liked Word Wall</td>
</tr>
<tr>
<td>51</td>
<td>3</td>
<td></td>
<td>ABSENT at end of term</td>
</tr>
<tr>
<td>52</td>
<td>3</td>
<td></td>
<td>ABSENT at end of term</td>
</tr>
<tr>
<td>53</td>
<td>3</td>
<td>Yes</td>
<td>How to learn. Spell better – new techniques. Learnt more words</td>
</tr>
<tr>
<td>54</td>
<td>3</td>
<td>Yes</td>
<td>Helped make own writing more interesting. MS good way – fun. Enjoyed them</td>
</tr>
<tr>
<td>55</td>
<td>3</td>
<td>Yes</td>
<td>Lots of tests show have improved. More confident. Used to get 13ish/20. Now get 18-19/20. (MS helped because words seen in head)</td>
</tr>
<tr>
<td>No.</td>
<td>Class</td>
<td>Lessons useful?</td>
<td>How benefited from lessons?</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>56</td>
<td>4</td>
<td>Yes –</td>
<td>I didn’t know what the words meant before – couldn’t remember. Use longer words now</td>
</tr>
<tr>
<td>57</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>4</td>
<td>Yes</td>
<td>Know more words and how to spell them</td>
</tr>
<tr>
<td>59</td>
<td>4</td>
<td>Yes</td>
<td>Remembering –know more words. More interested in beginning</td>
</tr>
<tr>
<td>60</td>
<td>4</td>
<td>Yes</td>
<td>Now more accurate; more fun; ask meanings of words more – more interested</td>
</tr>
<tr>
<td>61</td>
<td>4</td>
<td>Yes</td>
<td>A bit helpful. Some wasn’t. ‘Put it right’ was useful</td>
</tr>
<tr>
<td>62</td>
<td>4</td>
<td>Yes</td>
<td>Use High School words – getting used to them – more confident. Bigger words – easier to get. Less afraid of big words</td>
</tr>
<tr>
<td>63</td>
<td>4</td>
<td>Sometimes – not always. Sometimes ‘know’ the word</td>
<td>Liked the Word Wall and fixing words – makes you think more about the words</td>
</tr>
<tr>
<td>64</td>
<td>4</td>
<td>Yes</td>
<td>Getting more right on tests. Learning more words. Using more words in work</td>
</tr>
<tr>
<td>No.</td>
<td>Class</td>
<td>Lessons useful?</td>
<td>How benefited from lessons?</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>66</td>
<td>5</td>
<td>Yes</td>
<td>More interested in words and can put them in speeches and stories – use them – understand more words in reading</td>
</tr>
<tr>
<td>67</td>
<td>5</td>
<td>Yes</td>
<td>Get more right. Know meanings of more words</td>
</tr>
<tr>
<td>68</td>
<td>5</td>
<td>Yes</td>
<td>They have helped me to get better results in spelling tests and have put more words in my mind that I would come across in the future</td>
</tr>
<tr>
<td>69</td>
<td>5</td>
<td>Yes</td>
<td>Meanings – helped learning</td>
</tr>
<tr>
<td>70</td>
<td>5</td>
<td>Can’t remember</td>
<td>Sometimes</td>
</tr>
<tr>
<td>71</td>
<td>5</td>
<td>Very useful</td>
<td>Learnt a lot of new words and found out meanings. Learnt longer words. More confident in reading and writing</td>
</tr>
<tr>
<td>72</td>
<td>5</td>
<td>Yes</td>
<td>Easier working with partner</td>
</tr>
<tr>
<td>73</td>
<td>5</td>
<td>Yes</td>
<td>Not to be shy – about learning words that others know – to not give up – learnt to bother to learn words. Learnt to really try. More confident – don’t mind making mistakes so much</td>
</tr>
<tr>
<td>74</td>
<td>5</td>
<td>Left school</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>5</td>
<td>Yes</td>
<td>Know more words – how to spell better. Put in sentences better. More confident in learning to spell</td>
</tr>
</tbody>
</table>
RESEARCHER’S CLASSROOM JOURNALS

(T = Teacher; TL = Researcher)

Journals were kept for all five intervention classes and all communication and contact with the schools and teachers involved were recorded. Only entries related to intervention lessons I attended are herewith presented.
Class 1

Lesson 1/ Term 2

- Last week, T asked for advice re lesson content – suggested ‘Explore the letter E’. I had in mind that students in small groups would be given words in which ‘e’ featured in different ways – eg weigh, mute, receive, read, reed, deer, piece, monkey, silent ‘e’ changes short vowel to long vowel etc – and that students would discover some general principles.
- T took long ‘e’ sound and asked students to find as many words as possible with that sound. They worked well – discussing, suggesting and looking up in dictionary.
- Went around groups – suggested students exaggerate mouth movements to form short and long sounds – then would know whether a word had long sound.
- T then wrote on board list of letters that made long ‘e’ sound in words
- Students colour-coded their words

Reflections:
T obviously out of her comfort zone – but admired her for giving it a go. She had not thought to use more constructivist methods. Although the lesson was not as I would have designed, it was a good start because it was well within the comfort zone of T ie students worked well and with enjoyment – and T felt there was educational value in the process.

Lesson 2/ Term 2

- Similar to last week but explored ‘ay’ sound. Students hadn’t connected it to ‘eigh’ but thought of others when ‘eight’ hinted.

Reflections:
T followed same format as last week but it did not work as well as for the letter ‘e’. Did not want to interfere with lesson but felt it was limited and boring. Students given too much time to complete tasks – geared to the slowest students who have no incentive to work quicker, or no assistance when they are out of ideas. Will have to take a more active role in lessons as the time is not well utilised.

Lesson 3/ Term 2

- Spoke to T about fluency scores – very few stus at age level. Suggested that stus need to know more words.
- Instead of taking lesson myself, asked T to lead discussion on MEMORISING LEARNING KNOWING. Started off quite well. Students asked how they learned spelling words – most said look/cover/write/say. One student said she wrote out words repeatedly until learned.
- TL asked who learned words for spelling test without knowing the meaning of the words. About half the class admitted to this. T looked a bit taken aback and told them that nobody should do that.
- TL drew graph on board to show learning curve for spelling – from Monday to Friday (day of test) and into the next week. Showed 3 lines – one never learned them; another memorised them but some drop-off on Friday; the third learned them for longer term
- TL talked about learning being like money in the bank – have choice whether to use it or not. Learning words are like that – wealth. Cannot use what do not have.
- Discussed word from week’s spelling list (extension group) – GAUGE. Referred to ‘au’ making the ‘ay’ sound when it is usually ‘o’ as in MAUVE or ‘or’ as in NAUTICAL. Asked what it meant. After two or three suggestions, one student said it was for knowing how much petrol was in tank. TL said it also meant estimating distances.
- Discussed another word from list – this time ACCELERATOR. Asked what needed to be careful of eg 2 c’s, one l, e in the middle and or at end. Referred to motor and radiator on list and pointed out that ‘or’ often at end of a device word whilst ‘er’ usually referred to a person doing something.
- Then demonstrated multisensory approach to learning spellings – tracing word in air, saying syllables out loud, writing word in different ways, choosing colour, writing words with eyes shut and
saying word as write it.

- Handed out paper and told them to practice. Some students disconcerted by not being given more instructions – asked whether paper should be landscape or portrait, what colour to use, could they use more than one colour, how many times should they write it etc etc

- They finally got going. Some were more interested in playing with stacks of textas or trying to write with two colours at same time. A couple of students wrote words in capitals and it was again explained that better to use lower case to get shape of word. Two boys were drawing outline of the capital letters in different colours. I obviously had not got the point across to them – explained that the object was to learn the word rather than just draw a pretty picture of the letters – but if that was the way they would learn the word then sobeit. Suggested that they try the way I had shown them but they were more interested in their art work. Two girls really got into it and made a glorious confusion of colours and words – looked good. Showed them to the class.

- Suggested to T that I would try to find some plain paper books for the students to have their own thesaurus – she thought that a good idea.

**Reflections:**
I think I will emphasise the need to learn more words – both to students and T. When give out the booklets – will say that at least one new word must be put in each day – and that no word could be put in that students did not know the meaning. Also that students may keep them for ever – that they can decide how they set the words out etc. – The purpose? - Hopefully to encourage ownership. Next week will try mindmapping similies – in groups – and start their thesaurus. Early days.

**Lesson 4/ Term 2**
- Could not find books in price range with unlined pages so bought folders plus sheets of brightly coloured paper. Put four sheets of different colours in each folder. Did not have time to give them out but T said would do so later. Told students that they could decorate the folders as they like and 1) enter one new word per day; 2) must know meaning of word, 3) must know how to use word.

- Students worked in small groups – mainly four. Had sheet of paper each but told to confer. Each group given a theme word – they had to add as many words as possible on that theme eg space, time, substances, communication, living things, motion.

**Reflections:**
Students worked well and tried – but needed to draw too much on their own experience rather than it being an opportunity to learn more words or to get to know more spellings. Said we needed to have some thesauruses available and T said she would ask around for some. Even so, this might not be a suitable way as adult thesaurus can be a bit daunting. Will make up thesaurus sheets myself and distribute each week for a while.

**Lesson 5/ Term 2**
- T hoped I had prepared something – which I had (as always)
- Asked her whether had written in journal – hadn’t – which is what I expected. Wrote note to herself to remind her to do so. T got it off shelf and she remarked that at least she knew where it was. Asked her to include reflections of any changes in thinking or doing on her part and on students’ part.

- When asked about word folders, admitted that hadn’t done anything with them except hand them out on Thursday (day after my visit) and that students had decorated covers

- T asked students whether any had included words in folder. About 5 had. One word. One student had put in *memorabilia* but was reluctant to give definition. I thought he knew it but was not confident to voice it. This boy, plus two girls, had organised their sheets to put in words in alphabetical order. At least this is a start. Suggested that need not put in one new word a day (difficult for students to do without given the opportunity by T) – they could see how many they could put in. This will be easier for them. Did emphasise that they need to know the meanings of the words.

- Had prepared mindmaps of words centred on ‘looking good’ and ‘looking not-so-good’. T started off mindmap on board, asking contributions from students, whilst I added anything I wanted to say
about word eg what to be careful of in the spelling, or the origin of the word eg bene for beautiful.

Students completed their own maps as went along.

- Students came up with a lot of ideas. A few we had to class vote on when in doubt. O offered ‘sexy’ which T agreed to include.
- Gradually it evolved that I wrote on board whilst T dealt with selecting students to answer
- Sometimes wrote to side and got students to spell words – wrote them whilst they spelt out, including mistakes. Then wrote correct version and asked them to choose – which one looked right. Took a few goes to get the ‘h’ in ghastly – but one student did.
- Emphasised that most times ‘ious’ but a few words ‘eous’ eg hideous and gorgeous

Reflections:
Do not think T gives any thought to these lessons until, virtually, I arrive on the doorstep. She is by no means obstructive – more that she feels no commitment or deep interest. After this lesson, commented that thought it worthwhile and when I said I would compile further collections for word file, was keen that I should do so. I promised to do flowfigure using ‘perimeter’. T said that would be relevant as now doing perimeters in maths.

Spontaneously asked me to do more MS spelling sessions as two or three students could still spell ‘gauge, accelerator. Was impressed with that. Interesting that doesn’t think to do that herself.

I felt that this lesson was useful to the students. There were a range of students who participated frequently and all of them were engaged with their mindmaps. Will do more. Promised that we could play some games when we had built up a bigger word store – that students themselves could make some games up, if they wanted. One made a suggestion of a game.

T remembered that will not be available next Wednesday and asked if we could skip a week. Said that as I needed to keep a weekly journal, really did want a session next week. Agreed on Thursday morning.

Lesson 6/ Term 2
- T had relied on me having organised something – fair enough. Was happy to go along with whatever.
- Asked students how many remembered how to spell ‘gauge, accelerator. All put up their hands – don’t know how real this is though.
- I suggested that they learn their weekly lists in this way
- Spoke about multisensory learning – discussed it with studs – then learnt two words from “most frequently misspelt words – FAVOURITE and CANOEING. Will do two each week.
- Will ask students to learn whole weekly spelling list this way – will tell them we want to see if they have better results.
- Did lesson on PERIMETER and on the meanings of the origins of the parts of the words. Did flowfigure.
- Had good discussion on meanings of TELE, SCOPE, PHONE etc – went well
- One student had looked up DYSLEXIA for her folder – will talk more on that next lesson
- Students wrote meanings of parts of words for their folders

Reflections:
Seemed to go well – students contributed and did flow figures. Will give more definitions and word examples.

Lesson 6/ Term 2
- Took ages to get going with lesson – money collecting, roll etc. Should be no more than 5 minutes but was nearer to 10.
- Two students allocated to computers for an English project – one is in study, the other not. Therefore could not take part in lesson.
- T selected two words for MS learning: RESTAURANT & EMBARRASS. Left it to T (or rather, did
not take over) – to take this part. Spent a lot of time on these two words – a lot more than needed. Students appeared under-engaged after a while. 40 minutes into the lesson, suggested to T that perhaps we should move on – she gave students another one minute. Too long.

- Went on to more Greek and Latin origins – BI & BIO this time. Students came up with suggestions. Added them to their file. Not enough time spent on this part – could have discussed more prefixes.
- Started lesson by asking stus whether had put any words into their folder. One girl has added ANNIHILATE. Duly praised for this.

**Reflections:**

Very frustrating – felt that a lot of time was wasted. Do not think T thinks these lessons particularly important – is really still doing me a favour. I think her own spelling skills are less than optimal – probably accounts for lack of enthusiasm. However, is more ready to admit this and checked spelling with me a couple of times – ie more comfortable about admitting this to me. My role today was really to give word definitions and to be consulted re. spelling. This was fine. I deliberately did not behave more actively as wanted to see how T would take lesson. Was disappointed that so much time was allowed for each task – way over what was needed (students not on task after a while). Not sure how I will handle this in future. Need a balance between getting more done and not interfering too much.

Asked T to ask students to learn their weekly spelling list the MS way. I said needed to get over the habit of transferring the MS method to other learning. Really, I was also trying to get the concept of transference over to the T. Asked whether I wanted the students to do it this week – said YES – and T made comment that they probably had time to do this before their test on Friday (2 days). Have difficulty understanding why the MS method should take any more time to prepare for the test than any other method. Will make note of results and see who has improved. Not sure what to do. It is a bit frustrating working with a T who is not enthusiastic about words and spelling.

**Lesson 7/ Term 2**

- dictated proverbs – students asked to write as quickly as possible (as wanted to see level of automaticity).
- meanings of proverbs discussed, then wrote proverb on board.
- students asked to correct own work – but not rub out errors. Collected sheets for further perusal.

**Reflections:**

Stus worked well – contributed as much as possible but had difficulty not being too literal in deriving meanings eg ‘A stitch in time etc’ – all examples were around sewing. Interesting illustration of the literalness of the thinking of this age group. T felt it had been a useful lesson – commented that she would dictate faster in future as students were well able to write more quickly when pressed – though not very neatly.

**Lesson 8/ Term 2**

[Not written up].

Two lessons missed at request of T (other commitments).

**Lesson 1/ Term 3**

- Talked about ‘antidisestablishmentarianism’ as being the longest ‘real’ word (I think). Suggested students had a go at writing it. Repeated word several times and asked them to say it with me 2-3 times. Then they had a go.
- 1 boy got it right – all else had errors.
- On board – started at root and then added suffixes and prefixes – discussing changes to meaning at each stage. Finally reached full definition.
- students then played game of finding how many words using letters available in target word – most was about 78 (> 3 letters)
- Erased word from board and asked students to turn over paper and write ‘anti etc’ again. About half had it right and some more had only one or two errors – major improvement.
• T suggested played Buzz-off – T used word file words for the game.

Reflections:
Went in early to interview T about students’ progress – went well. Felt better about project after talking with T as she felt there had been some positive results from my visits for some children. T said visits had been beneficial ie more interest in words and meaning and some stus more willing to take risks. Does not know whether any improvement in writing and will be interested to see if there is improvement in comprehension.

Lesson went well – students ‘enjoyed’ having a go with ‘antidisestablishmentarianism’ – and finding words. Obviously enjoyed Buzz-off. I was pleased that T used words from the word file folder.

Lesson 2/ Term 3
• Wrote passage on board and students corrected spelling, punctuation and semantic mistakes on their own and then shared results. Went well – students enjoyed doing it. Will do another – this time harder and give students individual sheets.
• Talked about root words, prefixes and suffixes again – emphasised that students need to identify root word for meaning and then alter the meaning according to the affixes.
• Worked a little on ‘anti’ – but ran out of time before could explore the different meaning of ‘ante’.

Reflections:
Did not prepare very well for this lesson but it went off ok. Was not sure what to do. Will take the tip from T2 and prepare a passage for students to pick out the various letter combinations making different sounds.

Lesson 3/ Term 3
• Compiled a worksheet for students on doubling rules – have collected their efforts.
• Went well with T – she said that it was a useful lesson - for students and her. Gave her a copy of worksheets

Reflections:
Today went well – felt it was useful.

Lesson 4/ Term 3
• Compiled list of ‘ph’ and ‘ch’ words – brainstormed with students – went well.
• Started lesson by talking about ancient Greece, Parthenon and Athena. Suggested stylised Parthenon or smiley face of Athena (goddess of wisdom) in ‘p’ when learning a ‘ph’ or ‘ch’ word. (Ch pronounced ‘k’)
• Talked about meanings of roots and affixes.
• Ended lesson with proof reading exercise. T said she would finish it later.

Reflections:
T likes blackline masters – students usually doing one when I arrive. Likes the proofreading sheets – probably for that reason. Wants to photocopy them. Work quite well together in lessons now. Students work well – certainly respond – who knows what difference to learning??? Don’t think T has changed anything she does generally – will be interesting to see what she says at the end of the term.

Lesson 5/ Term 3
[Not written up]

Lesson 6/ Term 3
• Compiled sheet of silent letter words. Handed copy to T – suggested she went ahead.
• Put some words up on board for students to identify silent letters
dictated words for students to try to spell – put their versions on board – asked them to vote on what looked ‘right’

asked them meanings of words

No time to do anything else – although had something else prepared

**Reflections:**
T is taking and keeping more control of lessons – which is good. Encouraged to do so by me as she knows the students etc – also leaves me opportunity to intervene when I see fit. Works well. T more inclined to check that students know meanings – as has seen that they often do not when I ask them. T tends to use lesson time up on only one item – I feel could do more in the time – don’t know whether this because she thinks it is sufficiently useful to take all the time or because perhaps thinks it is ‘easier’ – less trouble. T has copied proofreading sheets and says does one a week – also hands them out for homework. Students contribute readily.

**Week 7/ Term 3**
[No lesson – class away at camp]

**Lesson 7/ Term 3**
- Repeated 24 words of first spelling test – collected them.
- Then went through them, asking students for their efforts and class deciding which were correct.

**Reflections:**
Not too sure how useful the session was for the students as T did not enlarge on the learning. I tried to make associations with other words and point out tricky bits. It will be interesting to see comparison results with normal controls.

**Lesson 8/ Term 3**
Last time so took donuts
- Gave examples of suffixes and students had to come up with own eg –ism (interestingly they remembered antidisestablishmentariansism).

**Reflections:**
Helped students to appreciate more what root words are because all the words they came up with were not root words with a suffix eg table. Once they got the hang of it they came up with good contributions.

A student expressed regret that I would not be taking lessons again

Left list of points that could contribute to a brainstorming session of spelling/words etc – T promised she would give lesson this week – didn’t want to assign a time with me as timetable usually peculiar in last week.
Class 3
Lessons designed and implemented by T. I assist under direction.

Lesson 1/ Term 2
• Played support role mainly. T had story on overhead, using words like ‘got’ and ‘nice’ over much. Students identified faults in construction and content – key words identified. Students in groups expanded on key words – one per group.
• Shared some of results. Products to be transferred to ‘cloud’ paper, then to be put on ‘word wall’. (T’s idea is to expand on literacy by putting words and rules and families on word wall).

Reflections:
Students worked well and enthusiastically. Did not necessarily ‘connect’ with the part of speech of the key word and get the idea to keep their suggestions consistent. Made many spelling mistakes. Generated much material for further lessons. Came up with a few good words eg devastated.

T keen – wants ‘control’ of all lessons – fair enough – and is very creative. A good start.

Lesson 2/ Term 2
Arrived to find butcher’s paper on table – ready to go:
• Students allocated to groups and told these would be their groups for these lessons (unknown to students – grouped roughly by ability)
• I demonstrated multisensory strategy for learning spellings
• Mystery word ‘planiped’ on board – students asked how to pronounce it – various versions – I was asked and said that it would depend to some extent on the meaning of the word – that often helps with determining the pronunciation.
• This led into the lesson – ie knowing the meanings of words or their parts helped in spelling and determining their use.
• ‘Perimeter written on board – meanings of each of the two parts asked for but no answer given – just meant to focus students on purpose of lesson – ie knowing meanings of parts can help in knowing meanings and in using words correctly
• each table given a part of a word: peri; meter; tele; ped; ???
• students to find other words using these parts and thereby derive meaning of that part
• Groups worked well – but one or two got focused on a furphy eg meter as an instrument for measuring rather than just ‘measure’
• Results shared and discussed – led to discussion on where words originated eg ancient Greece or French
• ‘ped’ brought up biped, quadruped, tripod, podiatrist, pedantic
• last quick part of lesson explained ‘multi-sensory’ way of learning spelling – meaning of ‘multi’ also explained.

Reflections:
Work from last week edited and on wordwall. Students worked well and enthusiastically – came up with some insights when questioned eg why a word was correct in the grouping or not. Appeared to get the idea that parts can have meaning to help understand the whole. Some students found the multisensory approach might have merit for them. Altogether – a well organised lesson which appeared to be fruitful.

Lesson 3/ Term 2
Lesson ready to go when arrived – butchers paper already on table and textas distributed.
• Had a few minutes practice with multisensory approach to learning to spell – had to use one from their own list. They tested each other afterwards.
• The main lesson was to explore the rule or theme from a list of words – one list for each group – List 1: whether or not you double the last letter with a suffix depends on the sound of the vowel – can also depend on whether or not the root word ends in an e. List 2: how e at the end of a word
changes the vowel from short to long. List 3: ‘I’ sound at the end of a word is usually made by adding a ‘y’ and not an ‘i’. List 4: ‘ible’ ‘able’ ? sound very similar so need to take care.

- Lesson started by students looking for the words on their list – they had their letters jumbled up – so they had to be aware of the letters in the word – they were distributed in various places all around the room.
- Stus instructed to work as a team
- When they had decided what the rule or theme was – they confirmed it with T or myself – then had to put it in words and write it down.
- Lesson ended before they could do this.

Reflections:
Students worked really well – enjoyed hunting for the words – appeared to work well as a team – were pleased when they discovered their theme etc. More work will be done on this lesson later in the day. They are constructing their word wall using the material from these lessons.

T says he will not be around for the next 2 terms – but that the casual teacher will continue. He will leave ideas and methods etc. I was a bit concerned at first but realized that they have had a good experience this term which will endure – hopefully.

Week 4/ Term 2
[No lesson because of strikes etc]

Week 5/ Term 2
[No lesson this week because T not with usual class and also class excursions. Will go twice next week].

T reported that students asked when having next lessons and complained that they hadn’t had one last week. They enjoy adding to their Wordwall.

Lessons 5 & 6/ Term 2
One lesson yesterday (9th) that lasted over one hour – and another today that was only about 40 minutes because of matters outside T’s control.

Yesterday:
- T had constructed a Blankety Blank game. Students had previously worked on word lists beginning with a particular prefix eg mis, sub, dis ???. Had to make up sentences leaving the target word a blank – and person in hotseat had to know when it was their team’s word. Also had to know meanings of their words.

Reflection:
Students work with enthusiasm and involvement. Look up words in thesaurus and dictionary – and really tried. T questions students very well and scaffolds well.

Today:
Students had completed game in a lesson this morning. Went in after lunch again today.
- Students entered room with enthusiasm and settled down quickly. Students required to look up and write the definitions of synonyms, antonyms, homophones, prefixes (4 different colours). This is prelude to writing a class thesaurus with these groups of words. Students then found entries for these books. Will gradually add to them for rest of year.

Reflections:
Asked T whether felt students were making progress – particularly in terms of transferring greater knowledge of words to reading and writing. T said felt writing in particular had improved – more adventurous and confident in writing. Also had good attitude to these lessons.

Another lesson cancelled as “something involving whole school planned for this pm” so unable to have
Lesson 7/ Term 2

- T had organised 4 word games – 1) 9 letter matrix and as many words as possible using the letters, 2) work out a code, 3) start with one word, change one letter at a time, to reach the final word of the ladder, 4) as long a sentence as possible without using the letter ‘e’.
- students worked in pairs. Worked with a will and enthusiasm. Looked up words in dictionaries and tried hard.

Reflections:
The word wall looks good. The last lesson with Teacher 3a/6 (a great pity as students working well and enjoying the lessons this teacher prepared).

Lesson 1/ Term 3
[These lessons designed by Teacher 3b]

- Had two lists of words on the board – one double-letter words and the other ‘sc’ and ‘scr’ words.
- Students in groups and had to choose which list they worked with. Had to add to lists – then to make up a story using the words (in groups).
- Came up with surprisingly good efforts

Reflections:
T explained what he wanted students to do but not why. Did not explain what the point of the lesson was. Students worked well enough for most of the time – some increasingly not on task towards the end. I suggested that there should be some discussion of the rules for double-letter words – and the origins of some ‘sc’ words – why different pronunciations – why some have ‘sk’ for same sound etc.

I don’t know how these lessons will go – can only hope enough progress from last term to make a difference. Will talk to T about being more explicit and defining purpose of the lessons. Suggested ‘wordwall; lent him my spelling book.

Lesson 2/ Term 3

- Two lists of words – one with mute ‘e’ – and the other hard ‘c’. Students had to add to these lists.
- As always most students worked well. Discussed some words that did not make the previous vowel ‘say its name’. Suggested to T that he explain more clearly that students should look for words ending in a mute ‘e’, preceded by a consonant – and a vowel before that. One student pointed out a couple of words that did not conform to the rule (saying vowel’s name) – and I suggested to her that she makes a separate list to share later. Pointed this out to T so that he could follow it up. Had to point out to him that it was ci, ce, and cy combinations that made a hard ‘c’ – and not cu or co (couldn’t think of any, anyway). Towards end of lesson, students told to choose 20 best words and put them on paper for pinning up.

Reflections:
Students’ behaviour different than with T 3a/6. The children are good children and work because of that. However, some are obviously underchallenged and know that they can get away with being off task. Their behaviour is not disruptive – just not on task eg cutting a pencil in half with scissors; also another cutting bits off a plastic ruler and then playing around sticking bits on again. A couple of boys were just staring into space.

Each word written on the board began with a capital letter, even though a lower case word. The fact that they had capitals was remarked on by one student, but no explanation was given (students used to common words listed with lower case initial letter). When suggested to T that should use lower case as the pattern of the word important for word recognition and remembering – T replied that his computer listed them with capitals and he didn’t know how to stop it – annoying. Pointed out to him that it was possible to change that by going into options or some such place (but he need not have used capitals on the chalkboard!!). T replied that he had a lot to learn – in that he is quite right.
His initial student questioning is very poor – as he hasn’t got his mind clear about the point of the lesson – or, indeed, about linguistics as a subject. Did suggest that he be more explicit about the purpose of the learning experience – especially important for students who are not quite so ‘on the ball’ as others. Pointed out that they needed help to focus on what they needed to learn. T accepted these comments with good grace and did not appear to mind. Said he would think of another exciting activity for next week.

I am concerned that students will not maintain any good effect from T 3a/6 classes of last term – so will retest them with the initial spelling test next week. Then at least I shall see whether there has been much gain up to now.

**Week 3/ Term 3**
[T sick – so no lesson].
Went in to give the Yr 5 group the first list of spelling test again. They really are excellent students – very well behaved and co-operative.

**Lesson 3/ Term 3**
Lesson got going after a while (first lesson in morning so administration needed to be done first). Students very good – got out books and did silent reading or quietly chatted. Impressive.

- Two lists of words on board, 1) list of compound words and 2) homophones. Students asked to write out one list and add three new words of own. Each compound word had to be written in a sentence, eg ‘Some and time equals sometimes.’ Students to look up and write definitions of each homophone.

Most finished before end – most did a reasonable job of it – students appeared to find the task easy but did as they were asked because they are ‘good’ children. Certainly they were more ‘off task’ towards the end than T 3a/6 would have tolerated. One student was looking for homonyms as well as homophones – for her own diversion.

**Reflections:**
I really think that this young man knows very little about ‘language’ and his inexperience with teaching is very apparent – did not know that list 1) were ‘compound words’ and students ed List 2) as homonyms instead of homophones. The latter had been discussed with students last term to my certain knowledge – so students knew the difference. Wrote out the definitions of homophones, homonyms and homographs and suggested that he give students examples and get them to decide which category each are in. Thought it good idea. Is very receptive to correction and suggestions – or appears to be so – (try to do it tactfully). Had ‘licence’ and ‘license’ on list on homophones – explained to T the reason for the different spelling and he asked me to tell the class – gave them “I advise you to take my advice.” T gracious about these situations – but – surely he should know these things already?

**Week 5**
No lesson – class at camp

**Week 6**
No lesson – T sick

**Week 7**
No lesson – because Education Week and T said things were too disorganized.

**Lesson 4/ Term 3**
- 2 lists on the board as per usual. One list had words making sound /ble/ at end. Other list had double letters (I think). Lesson uninspiring – almost pointless. Students wrote dutifully in their spelling books as T dictated – doubt that anything made much connection – students just needed to do as they were told.
Reflections:
As went into room, a number of students expressed pleasure that I was there – they live in hope that the lesson will be as it was last term, I think. Sadly disappointed.

Week 9
No lesson – class had to get ready for an art exhibition.
Classes 4 and 5

Lesson 1/ Term 2

- **As many 'e' words as possible:** a lot of copying and some missing the point altogether. Would have run better if teacher and myself had been more experienced with system -- but students ok with it.
- **Silent letters:** choice of 'guest' ok -- but 'call' and 'folk' not optimal. Students had a good go -- but not as useful as it might have been -- Silent component too obscure.
- **Write 'Wednesday and Handkerchief:** quite a useful exercise. One group got Wednesday wrong - and all missed the 'd' in handkerchief. Got them to experiment, with me writing suggestions -- until it was right.
- **Words with 'a' only:** had time to finish with 'a' words. All had to find one with more than 2 a's -- one girls' group got 6

Reflections:
Students excited by using the technology and try to do what is asked. Tend to look at other's efforts and then copy -- but this will gradually get sorted out. Did go 'incognito' at times -- but they find it more difficult when can't see as they write. Class 5 class felt that they didn't get much out of the lesson -- but do admit to being able to now spell 'guest' -- so T5 pointed out that some was useful!

Lesson 2/ Term 2

Class 4

- Started off with 'looking good' synonyms -- came up with some good efforts eg luscious and gorgeous. Used them by typing in their suggestions and repeating word until they got the correct spelling and it 'looked right'. Also talked about the origin of 'beautiful'
- Asked them what they wanted to learn --
  1. like learning with games
  2. synonyms and antonyms
  3. finding small words in big
  4. mnemonics
  5. homophones
  6. want to spell big words
- what strategies do good spellers use?
  1. look cover write check came up often -- but perhaps a few still use this
  2. what value is knowing meaning of words
- how can use Zing
  1. think Zing fun
  2. suggest one word and trying it out (as with luscious and gorgeous)

Reflection:
T thought it a useful lesson as it got students thinking.

Class 5

- talked about spelling of words raised in Looking good' -- told them about beau
- tried out variation of 'pretty' and 'beautiful' -- to see what looks right
- 'what want to learn':
  1. word games
  2. new words
  3. root words
  4. hard words
  5. silent letters
  6. mnemonics
  7. long words
8. word families
9. different language words

- strategies:
  1. They use LCWC and practice
- How use Zing:
  1. fun
  2. interesting way to learn
  3. like to discuss word when I type it
  4. ask about words that confuse
  5. like to see if right or wrong

- tested on using ‘there’ – some still get it wrong – will work on it –
- this led to parts of speech – did not know ‘their’ was a pronoun – needs more work

T disconcerted to find that so few knew parts of speech. Thought it a useful lesson – keen to continue.

Reflections:
Lessons need to be only loosely constructed – works well enough when I type in a word. Can prepare some cloze exercises. Less copying going on this time – kept asking them not to and it seemed to decrease. Will work better when it is more dynamic

Lesson 3/ Term 2

Class 4
- Gave T outline of lesson – she went to back of room.
- Started with Wordwall 1 – encouraged T to participate
- I read the clues and students found the words – first one got 5 points and subsequent right answers got one – worked well. (Will test on words used next week)
- Did cloze exercise using ‘there etc’ – will test again
- To double or not? – used words: benefited, focused, inferred, and committed – to talk about the emphasis placed on the part of word dictated whether to double last letter.
- Went on to talk about necessary (put up as having 2 ‘c’s’ -)

Class 5
- Repeat of above lesson. T not present at the beginning (Relief teacher) – but they have changed arrangements so that T will be present for lessons. Better to have her around as she knows the students better and what they know – will facilitate ‘just-in-time scaffolding’
- Finished up by getting students to list ‘looking not so good’ words – then discussed words such as ‘hideous’

Reflections:
Not sure what to say about these lessons – have no idea how much learning is going on. Will probably find out in time when test students on past work. Will repeat a cloze using ‘there’ etc – to check that out.

The two teachers are fine – T4 joined in when encouraged but turned it into ‘chalk and talk’ more than it should be. T5’s attitude is that anything is better than nothing – and that they need all the help they can get.

Will have to think a little more about the type of lessons to present. Early days.

Lesson 4/ Term 2

- T4 very intense but ok. She would prefer not to take time out for these lessons because she is anxious about the shortage of time to get everything done during the term – but nevertheless goes along with these lessons with reasonably good grace.
• Started off with the Wordwall – students enjoy that. Got student to score. T4 reluctant to participate (because is unsure what she can contribute)
• Discussed licence/license – etc – students had to decide when used
• Same format for ‘cle’ and ‘cal’
• Asked meaning of ‘multi’ and gave examples of words
• Gave telephone, telescope and television – gave definitions of second part of words – asked for meaning of ‘tele’
• T5’s class also played game correctly spelling misspelt words

Reflections:
Lessons flowing a lot better. Students enjoy Wordwall and correcting spelling. – anything that is presented as a game. Need to give them clues and scaffolding to arrive at answer to problems such as licence/license. Don’t know how many will remember but some certainly work at it. Need to discourage them from just copying each other – and also to ensure change keyboarder. Seem to work well. Some get a kick out of being first to get something right.

Both T’s thought the lesson was worthwhile. T5 also thought that she had learnt something herself. Asked them to let me know if they wanted me to use any words in particular.

Week 6: A public holiday. Phoned earlier in week to see whether they wanted me to go another day this week – but, as I thought, they didn’t want to give the time. Understandable.

Feeling better about these lessons – getting to grips with how to present the material.

Lesson 5/ Term 2

Reflections:
Didn’t enjoy the day – but it was probably better than my perception. T4 is not very useful for helping the flow or for directing into areas opened up by the students. This is certainly not her preferred way of teaching – but she does make some attempt.

So what was wrong – or rather – what wasn’t right. Wordwall went on a little long – disappointing that more didn’t get the ‘there’ words right – Class 5 did better. T4 said over coffee that she thought it too hard and too long for her group – that the G&T would have coped but not hers. I don’t know whether they would have done better if she had run with the opportunity a bit more – or whether she is indeed right about it being too hard. Some of the students try really hard and like the success. You can see the concentration on their faces – and they like to get it right.

Got further with T5’s group – will be interesting to see what results show.

Lesson 6/ Term 2

Last lesson for this term.

Reflections:
Went well. ‘Insisted’ that T4 participated more actively. We started to correct mistakes before students put them up on the team space – and we both thought that a useful learning tool. (‘ie’ words – cloze exercise). Running a little short of time so T4 opted not to use the keyboards for meanings of proverbs. She is not particularly comfortable with these lessons but tries. One concern for her is that students copy what another has typed – distressing when the first one has it wrong, as in ‘I’, for instance. That is the trigger to start correcting as we went – so not a bad move afterall. T4 referred to the copying business again later but I pointed out to her it is an opportunity for discussion – which she reluctantly conceded. Lessons are less than an hour (about 50 minutes) because students have to do physical exercise daily now).

Class 5’s lesson – always more active as T5 is a more willing participant – was better from the point of view of flow and engagement. The ‘jumbled words’ was more useful in that students made a better
attempt at writing their own. The cloze exercise for ‘ie’ words was well discussed – especially as corrected mistakes as went, as in previous lesson. Kept trying to reinforce this. ‘Homonyms’ was well worked – and got through them all. Also students wrote their meanings to proverbs. The lesson was about an hour with this group – so got more done. More time plus teacher style makes all the difference.

When looking at ‘received’ and ‘I’ – etc – (cloze exercise mentioned above) – asked students to vote on which one ‘looked right’ – then repeated the rule etc – and all wrong made corrections. One female student asked how you tell that something ‘looks right’. Difficult. Had to say you have to try to remember the pattern of letters between the ends. Will think about that a little more and try to design an appropriate lesson.

Chatted to T5 later along these lines:

TL: How effective do you think is this platform for teaching?
T5: Don’t know – some of them don’t seem to be learning much or doing much.
TL: don’t know what they are learning but most of them appear to be doing something – they appear to be engaged in the lesson – and try to participate actively. Some try really hard.
T5: true – but – students not the same as they used to be – ie not as far ahead in literacy as years ago. Also, not as questioning or switched on.
TL: well – students are not the same – grow up in a multimedia world. Same teaching strategies used in past do not work for all the children of today.

(Then spoke about 20-30% of students not having adequate literacy skills to cope with being independent learners once they reach High School. Pointed out the tragedy of this – lifelong. Also pointed out that the primary schools are failing to teach these children adequate skills. T5 looked taken aback, as though she had not thought of that before. I really do think that a number of primary teachers are not fully aware of the consequences of their students not reaching adequate levels).

T5: A few of the students are willing to participate in these lessons, when in the classroom they say nothing.
TL: Is it the value of using a different teaching method – it will suit some – perhaps those that the usual pen and paper activities do not suit
T5: Perhaps you are right.

Reflections:
Perhaps this conversation has been the most valuable I could have had. We further discussed whether dealing with the two classes differently would have been of value (if allowed) and concluded that the different teacher might be the most important variable to look at.

Lesson 1/ Term 3
Reflections:
T5’s lessons always go better than T4’s because T5 runs with what I initiate. T4 is still out of comfort zone. She says that lessons are too academic for these students. She might be right and will try to simplify next time. (Eq – ante (says should give examples in sentences to make it easier – rather than a few examples of words. Liked ‘put it right’. Interesting that I thought that was the part with the least point. Have to accept that I might be out of touch with what is useful or with what these students can do. T4 wants a more integrated approach but she could not explain what she meant by that. I suggested using a score sheet: T4 didn’t want to score – but T5 ran with it and it was an important motivator.

Week 3:
No lessons as students at an art gallery

Lesson 2/ Term 3
Reflections:
Had a good day today – in both classes. Interesting how the same program is handled by each teacher. T4 seems to be very picky on matters of punctuation whilst T5 is more focused on the words and their meanings etc. T5 likes the point system and expands on it whilst T4 tolerates it and uses it sparingly. Worked out well today in T5’s lesson as used points for all parts. That meant that those with different strengths had a chance to gain points – and it altered the balance such that two girls who had no chance to have the highest marks usually because spelling skills poor, actually won today. They were thrilled. The student with Asberger’s syndrome contributed the meaning of ‘territory’ and shook my hand at the end of the lesson.

Did Wordwall as students had asked for it. Included some words we had had in previous lessons and some we had talked about eg ‘word meaning afternoon (postmeridian)’. Also, ‘past of ‘throw’ – knew some would put ‘through’ – and one even wrote ‘thorough’ (opportunity to get student to read what he had written so he discovered own error). More work on morphemes – will continue with these (students said this was useful). Prepared another proof reading passage. This is particularly liked by T4 – who is very picky about the punctuation.

Students worked well and time passed quickly. T4 happier with this lesson. Good.

Lesson 3/ Term 3
Wordwall went well, especially with T5’s lesson. T4 did not want to score – says it takes too much time. T5 makes a deal of scoring which gratifies the students. Am putting in words that are revision from previous sessions and trying to include opportunities to think eg “part of the word means “against” (contradicted). We had talked about morpheme ‘against’ last week. When one or two students get something right when others haven’t, am inclined to give them 5 points instead of 3.

Continued with morphemes – all to do with numbers up to 10. Again, T5 expanded on this more effectively. T4 just wanted to get through the list.

Secrets of ‘c’: put up list of words beginning with ‘c’, followed by a vowel – students asked to explore the list of words and make comments on what they found. T4 gave very strong hints, being very uncomfortable about leaving it to the students to find that there were two groups, one starting with /s/ sound and the second /k/. One of T5’s students noticed the difference in beginning sound. T5 then got the students to put the words into the two groups and then try to work out ‘the rule’ – with a little help they got there. Much more satisfying use of the lesson than with T4.

Both teachers like the proofreading exercise of ‘Put it right’ – T5 likes the scoring process where points are taken off the total number of words for each mistake. Students join in with the counting and discussion of points occurs. T4 focuses on punctuation and capitalization, in particular.

Also did ‘Which one is right’ (left over from last week for T4’s class).

Reflections:
Got through the whole program this week with both classes. T4’s had the extra ‘which one is right’ left over from last week. T4 pleased to have got through. T5 spent more time with scoring and taking opportunities for teaching.

Is getting through the curriculum equated with a useful teaching experience for T4?, whilst T5 uses the lessons more as an opportunity for learning – herself included.

Lesson 4/ Term 3
T4 away so had casual. Always more difficult with a casual. First part taken up with repeating List A. Did Wordwall and Which one is right. Don’t know how useful the lesson was because hard going with casuals.

Less time for T5’s lessons from now on because students need to have dancing practice (45 mins if lucky). Repeat of Class 4lesson – not too sure how useful really as emphasis now seems to be on the
score. How much learning goes on, I don’t know. Will think about it.

Lesson 5 and Lesson 6/ Term 3
T4’s lessons are always harder – because she is does not run with the lesson too well. She thinks that I ask too much of the students – and she is right. For instance, I had a fill-in lesson of a list of words to dictate for spelling – but she pointed out that students needed to see them first – and then dictate. It is difficult for students when the words have not been related to previous learning. She is right. T4 seems pleased when we get through all the items of the lesson, rather than ensuring that all items are a worthwhile experience. Said later in recess that she thought the lesson this week was ‘good’. Had taken results of the repeat spelling test in – said that she would look at it over recess – there were a couple of birthdays to celebrate but still time. Brought them to her attention at the end of recess and said they were available when she wanted to see them. We shall see – I wont mention them again – but I doubt she will ask for them.

T5 works with the material a lot more enthusiastically – but scoring is now a prominent part of the lesson. Even so, she takes more opportunity to get the students to think and make decisions – it would be very good if these were lessons designed and presented by her.

Lesson 7/ Term 3
Did last lesson this week. As always, students very keen – two girls ran up to me outside and wanted to know if having Zing – pleased we were. Said they liked the lessons very much.

Both lessons went well today – T4 participating more and seems quite happy. Gave students donuts at end of lessons – some thanked me very much – said had learnt ‘heaps’.
## LESSON TOPICS

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<th>Class 3</th>
<th>Classes 4 &amp; 5</th>
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Appendix I

‘BELOW AVERAGE’ (SPELLING) STUDENTS’ DATA

A synopsis of data pertaining to the Below Average spelling performers on pre-test is herewith presented. Only 15 of the 41 students in this group are Study Students and therefore the range of data available is limited. However, 10 of the 15 SS/5 students are in the Cut-off or Borderline categories of cognitive ability. This data is made available as it provides indications of the performance and ability backgrounds of the lower spelling performers and the progress they can make. It is not included in the main body of the text as the number of students for whom the full range of data is available is too small to draw firm conclusions yet it indicates that further studies might yield fruitful directions of investigations.

Table I 1
BAv students as percentage of total number of students

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Table I 2
BAv students as percentage of Inv and NInv groups

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### Intervention (Inv) group data (continued)

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Students who gained 45 months in five months:

Stu. Nos. 57 69 126

- No. 57 Inv SS/5 student (Class 4, Year 5, male) left the school before individual post-testing could be carried out. He was at Cut-off level of cognitive ability. His pre-test Oral Reading Fluency (ORF) was at a Year 2 level and his spelling age at an early Year 3 level (at age on post-test). Attitudes to reading, spelling and writing were at the Medium level.

- No. 69 SS/5 Inv student (Class 5, Year 5, male) has a LOTE background (6) and is also at Cut-off level of cognitive ability. He progressed in spelling from thirty-one months below age to nine months above his chronological age (Av StSc category). There is no improvement in ORF which remains at an early Year 4 level. Attitudes to reading and spelling declined during the intervention period but improved in writing from a Medium to a High level. These attitudes to reading, spelling and writing were reflected in his scaled perceptions of progress (Low, Medium and High respectively). In open-ended questioning, though, he did not think he had progressed much in spelling, though a moderate amount in reading and improved in writing – his favourite lesson area. In regard to intervention lessons, he felt that he had benefited ‘sometimes’ and learning meanings had helped learning. He would like more lessons. His teacher reports that he is a well below average student who is mildly intellectually handicapped. Although he is quite a good reader is comprehension is poor. In writing he can recount but has difficulty with other genres.

- No. 126 Inv student (Class 2, Year 6, male): BA on pre-test (33 months below age) and Av on post-test (7 months above age). Nil else known.

Students who gained 24 months in five months:

Stu. Nos. 3 42 152

- No. 3 Inv SS/5 student (Class 1, Year 5, female) is barely in the BA group (25 months below chronological age) and of normal cognitive development. On post-test she is only six months behind her chronological age in spelling performance. There is no progress in ORF and she remains at the early Year 4 level. Her attitude to reading is Medium. It is High for spelling and improves further on post-test. Writing moves from High to Medium level on post-test. Perceptions of progress are High for reading and spelling and Medium for writing. In open-ended questioning she is pleased with her progress in spelling and also finds reading easier. She is not sure that much progress has been made in writing. Her favourite lesson is mathematics and this corresponded to her preferred Intelligence on the MI inventory. Her teacher comments that she has improved greatly in spelling and that she got quite a lot out of the lessons.

- No. 42 Inv SS/5 student (Class 3, Year 5, male) is at Cut-off level of cognitive ability. He moved into the Av StSc category on post-test but his SA remains behind his chronological age (-9 months). ORF remains at about the Year 2 level. His preferred Intelligence is Naturalistic and his favourite lesson area is drawing. His pre-test attitudes to reading and spelling are Medium and Low for writing. Writing improves to High on post-test and on questioning he states that he is using longer words and that it is easier to get started. He also states that he has made a lot of progress in reading. Progress in reading and writing are rated High and for spelling he rates his progress as Medium. This does not reflect the two year progress in spelling performance on post-test.

- No. 152 Inv student (Class 4, Year 6, female). No further details are available.

Students who gained 21 months in five months:

Stu. Nos. 154 173 231

- No. 154 Inv student (Class 4, Year 6, female): No further details available.

- No. 173 Nonv student (Class 6, Year 5, male): No further details available.

- No. 231 Nonv students (Class 9, Year 6, female): No further details available.

Students who gained 18 months in five months:

Stu. Nos. 23 24 63 125

- No. 23 Inv SS/5 student (Class 1, Year 5, female) moved into Av category on post-test but remained behind age (14 months) in spelling age. She is of normal cognitive ability and her dominant Intelligence is Spatial and favourite lesson area Drawing. Her ORF improved from a Year 2 level to a Year 3. Attitudes to Reading remained High and writing remained Medium. Spelling attitudes improved from Medium to High and is reflected in a High perception of progress. Progress in reading is rated by student as Medium but in writing it is High. In open-ended questioning she is positive about her progress in reading and spelling and less sure about writing. Her teacher remarks that she has made less progress than others and is slow at doing work, although her results in spelling are better.

- No. 24 Inv SS/5 student (Class 2, Year 5, male) is at Cut-off level of cognitive ability. He remains in the BA category on post-test (~30 months behind age). Pre- and post-test ORF show some improvement but performance in fluency is at a Year 2 level. His main Intelligence is Naturalistic and
his favourite lesson areas are mathematics and drawing. His attitudes to reading, spelling and writing are Medium and he considers his progress in reading and writing to be Low and in spelling it is Medium. Answers to open-ended questions reflect these perceptions although he finds creative writing more enjoyable.

- No. 63 Inv SS/5 student (Class 4, Year 5, female) is of Borderline cognitive ability. She has moved up to the Av category in spelling and is about one year behind her age on post-test. ORF improved from a Year 2 to a Year 3 level. Attitudes to reading and spelling are Medium and for writing it is High. Perceptions of progress indicate only Medium in reading (says made no progress on questioning) and High in both spelling and writing. She states that progress in spelling has assisted progress in writing and that writing is her favourite lesson area. Her main MI intelligence is Interpersonal. Her teacher considers her easily distracted but “once engaged is very good” (Appendix **).

- No. 125 Inv student (Class 2, Year 6, male): Remained in BAv group on post-test (SA 33 months behind chronological age).

Students who gained 15 months in five months:

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</table>
- No. 77 NInv SS/5 student (Class 6, Year 5, female) is at Cut-off level of cognitive ability. Although she has moved up to Av category of spelling performance, she is twenty months behind her age on post-test. Her ORF remains at a Year 1 level. Her attitudes to reading and writing improve from Low to Medium, whilst spelling remains at Medium. Perceptions of improvement indicate a High level for reading and writing, and Medium for spelling and these ratings are supported by open-ended questions. Her favourite lesson area is drawing and her dominant Intelligence is Spatial.

- No. 81 Nlnv SS/5 student (Class 6, Year 5, female) is of normal cognitive ability. She is sixteen months below age on post-test but has moved into the Av category. Her main Intelligence for MI is Naturalistic and her favourite lesson area is writing. Her ORF level improves from low Year 2 to low Year 3. In terms of attitudes to reading (High), spelling (Medium to High), and writing (High), these are supported by her perceptions of improvement (all High). On open-ended questioning she considers that “big progress” has been made in spelling and writing but progress in reading is only slight.

- No. 221 Nlnv student (Class 8, Year 6, female) improved to Av category on post-test.
- No. 223 Nlnv student (Class 9, Year 6, male) improved to Av category on post-test.

Students who gained 12 months in five months:

<table>
<thead>
<tr>
<th>Stu. Nos.</th>
<th>64</th>
<th>118</th>
<th>149</th>
<th>153</th>
<th>102</th>
<th>202</th>
</tr>
</thead>
</table>
- No. 64 Inv SS/5 student (Class 4, Year 5, male) is of normal cognitive ability and in Av category on post-test, although still seventeen months behind age in spelling performance. Reading fluency (ORF) improves from a Year 1 level to a Year 2. His attitudes to reading have improved from Low to High, and for spelling and writing they remain at the Medium level. However, perceptions of progress are High for reading, spelling and writing, and consistent with answers to open-ended questioning. He remarks that he bothers more since lessons and thinks they are a fun way to learn. The TLS (Zing) was fun and effective and he realized that it is alright to make a mistake. His favourite lesson area is mathematics (no MI result). His teacher says that he has made a lot of progress in writing and spelling, and is enthusiastic.

- No. 118 Inv student (Class 2, Year 6, male). He gained a year’s progress but remains two years behind age in spelling performance.
- No. 149 Inv student (Class 4, Year 6, male) moved from BAv to Av category on post-test.
- No. 153 Inv student (Class 4, Year 5, male) is about two years behind age in spelling on post-test.
- No. 102 Nlnv SS/5 student (Class 9, Year 5, male) is at Cut-off level of cognitive ability. He remains in the BAv category of spelling performance (twenty-nine years behind age on post-test). His ORF remains at a Year 1 level. Attitudes to reading improve to Medium, spelling remains at Medium, and writing is High. His perceptions of improvement reflect a Medium level for reading and spelling, and High for writing. This is inconsistent with open-ended questioning which indicates High for reading, Medium for spelling and Low for writing. His favourite lesson area is drawing.

- No. 202 Nlnv student (Class 8, Year 5, female) who is two years behind age on post-test.

Students who gained 9 months in five months:

<table>
<thead>
<tr>
<th>Stu. Nos.</th>
<th>116</th>
<th>138</th>
<th>216</th>
</tr>
</thead>
</table>
- No. 116 Inv student (Class 1, Year 5, male) is nearly three years behind age in spelling on post-test.
- No. 138 Inv student (Class 3, Year 6, male) is twenty-nine months behind age in spelling on post-test.
- No. 216 Nlnv student (Class 8, Year 5, male) is two years behind age on post-test.
Students who gained 8 months or less in five months:

<table>
<thead>
<tr>
<th>Nos.</th>
<th>28</th>
<th>38</th>
<th>82</th>
<th>99</th>
<th>134</th>
<th>135</th>
<th>156</th>
<th>167</th>
<th>122</th>
<th>170</th>
<th>196</th>
<th>200</th>
<th>203</th>
<th>205</th>
<th>225</th>
</tr>
</thead>
</table>

- No. 28 Inv SS/5 student (Class 2, Year 5, female) is of normal cognitive ability. Her ORF remains at Year 1 level on post-test. Her attitude in reading on pre-test was High and on post-test, Medium. Spelling attitudes remain at Medium and writing remains at High. Perceptions of reading and spelling progress are high, and for writing they are Medium. These perceptions are supported by answers to open-ended questions. Her principal Intelligence (MI) is Spatial and her favourite lesson area is mathematics.

- No. 38 Inv SS/5 student (Class 3, Year 5, female) is of borderline cognitive ability. ORF is at Year 2 level, her main Intelligence is Interpersonal and her favourite lesson is drawing. Attitudes for reading change from Medium to low, spelling remains at Medium, and for writing they change from High to Medium. Perceptions of progress are Medium for all three areas. This differs from answers to open-ended questions when she is enthusiastic about her progress in spelling and writing and moderate in reading.

- No. 82 NInv SS/5 student (Class 6, Year 5, female) is at Cut-off level of cognitive ability and her ORF is at about Year 2 level. Attitudes to reading and spelling improve from Medium to High, and for writing they change from High to Medium. Perceptions of progress are rated as High for all three areas and these are supported in open-ended question answers. Her dominant Intelligence is Linguistic and her favourite lesson area is drawing.

- No. 99 NInv SS/5 student (Class 8, Year 5, female) is at Cut-off level of cognitive ability. Her attitudes to reading were Medium, spelling High and writing High on pre-test. Her dominant Intelligence on MI inventory is Intrapersonal. Unfortunately student left the school before individual post-tests could be carried out.

The remaining students in this group are not Study Students and data are therefore limited.

- No. 134 Inv student (Class 3, Year 6, male).
- No. 135 Inv student (Class 3, Year 6, female).
- No. 156 Inv student (Class 4, Year 5, male).
- No. 167 Inv student (Class 5, Year 6, male).
- No. 122 Inv student (Class 2, Year 6, female).
- No. 170 NInv student (Class 6, Year 5, female).
- No. 196 NInv student (Class 7, Year 6, female).
- No. 200 NInv student (Class 8, Year 6, female).
- No. 203 NInv student (Class 8, Year 5, male).
- No. 205 NInv student (Class 8, Year 5, female).
- No. 225 NInv student (Class 9, Year 6, female).
UNIVERSITY OF WESTERN SYDNEY

Locked Bag 1797
PENRITH SOUTH, DC NSW 1797
23 August 2002

Thelma Leonard
5 Stannix Park Road
Wilberforce NSW 2756

Dear Thelma

Re: Research Project: “To what extent does children’s awareness of strategies for spelling support their performance at spelling?”
Registration Number HEC 02/094

The Committee has reviewed your responses to the issues raised and has agreed to grant an ethics approval for the above research project.

You are advised that the Committee should be notified of any further changes to the research methodology should there be any in the future. You will be required to provide a report on the ethical aspects of your project at the completion of this project. The form is attached and also located on the Research Services Web Page.

The Protocol No. HEC 02/094 should be quoted in all future correspondence about this project. Your approval will expire 30 March 2005. Please contact the Human Ethics Officer, Kay Buckley on tel: 4570 1136 if you require any further information.

The Committee wishes you well with your research.

Yours sincerely

[Signature]

Professor Elizabeth Deane
Chairperson
UWS Human Research Ethics Committee
Cc Associate Professor Alison Elliott
Corrections to be made to PhD thesis by Thelma Monica Leonard following examination

<table>
<thead>
<tr>
<th>IDENTIFIED ISSUE</th>
<th>HOW ADDRESSED</th>
</tr>
</thead>
</table>
| Some brief further discussion of the changing nature of spelling in the 21st century | **CHANGES IN 21ST CENTURY**  

p. 275

This research study is situated in a transitional period between traditional language learning and the advent of advanced technological integration into learning environments. Future studies cannot ignore: the changing climate in regard to conventional spelling prowess in a literate society; the role of ICT in learning; and also the necessity to learn spelling in order to use technology. Computerised spell-checkers will become increasingly sophisticated and will incorporate not only spelling, grammar and syntax checks but will also indicate contextual incongruities that arise from the selection of incorrect homophones. Mobile phone text facilities have led to the development of a new written language format and it can be foreseen that greater use will be made of software that automatically translates text language to conventional written language when required.

The spelling reform movement’s objective to simplify written English that is in general use has been unsuccessful, largely because it involves relearning how words look on the part of proficient readers, writers and spellers. Reform has become less of an imperative since the proliferation of home computers and the influence of American spelling. Many American English words have simpler or more logical word forms than British spelling conventions, such as *color* for *colour*, *gray* for *grey*, and it is increasingly acceptable to use alternative spellings, for example either a ‘z’ or an ‘s’ in words like *realize*. Additionally, the use of voice-recognition software can only become more widespread. Although it can be envisaged that instructional insistence on learning correct spellings for expression in writing may decline, it is difficult to conceive how technological innovation will diminish the role of spelling in the reading process. How teachers can incorporate advances in communication technology with the NSW QT model to prepare students for their changing linguistic needs in the twenty-first century is a pertinent area for exploration.
<table>
<thead>
<tr>
<th>Some brief critique of testing processes faced by teachers in the neoliberal context</th>
<th>NEOLIBERAL CONTEXT AND ACCOUNTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>The intervention lesson programs took place during the middle two terms of 2003 and 2004 when debate on perceived or actual poor ‘literacy standards’ was, and still is, a recurring theme in the media. In accordance with the increasingly widespread neoliberal approach of the past twenty-five years to economic management in the Western world, the NSW government (1999) had implemented a program of increased public accountability and reporting for school-based procedures and policies. According to Earl (2005) “accountability and data are at the heart of contemporary reform efforts worldwide. Accountability has become the watchword of education …” (p. 6). This affects both school administrations and teaching personnel and underpins a more economic rationalist approach to the educational environment. Both National and State governments, aware of social and political pressures for reform, had supported initiatives to improve learning outcomes for students by establishing national benchmarks, providing more funding for support personnel, and by implementing the Quality Teaching (QT) pedagogic model (Department of Education and Training [DET], 2003) in New South Wales (NSW) schools. The vocal “back to basics” cry frequently focused on reading and writing standards but it was often the area of poor spelling that was singled out to illustrate what was commonly identified as a literacy problem.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address the conflation of ‘whole word’/’whole language’ identified by examiner</th>
<th>WHOLE WORD/WHOLE LANGUAGE CONFLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is probable that the most contentious issue today in respect to literacy teaching is still the so-called whole-word/phonics debate. With the whole-word approach to learning to read, students acquire a sight vocabulary by learning words as whole units and do not break words down to their component letters, syllables or morphemes in the first instance. According to Mayer (2003) the whole-word approach has now been incorporated into the whole-language philosophy of written language acquisition which takes the view that literacy should be taught from within the context of meaning. The child’s school-based written literacy education therefore begins at the text level and the mechanics of language, including grapho-phonetic correspondence, are taught as texts are experienced and when they have relevance to students’ literacy developmental needs. Phonics-based literacy education, on the other hand, begins literally at the sound level. Sounds are represented by letters and the sounds of letters within words blend together such that the word can be pronounced. Reading skills develop as students learn to recognise words and can utilise their lexical store of correctly spelt sight-words. This is a bottom-up approach to literacy acquisition as opposed to the whole-word top-down approach. According to Henderson (1981) these two approaches to learning to read emerged in a formal sense in the 1870s and there has been ongoing debate about the merits and otherwise of each system since. Edwards-Groves (1998) considers that “these discussions have drawn on conflicting theoretical paradigms and have focused on skills-based versus meaning-based approaches” (p. 13). Debate has widened in more recent times to include a “critical socio-cultural dimension to literacy practices” (p. 13) and there is recognition that the skills and knowledge that students are required to display are influenced by social and educational perspectives.</td>
<td></td>
</tr>
</tbody>
</table>

| Inclusion of primary research studies in literature review | SEE ATTACHMENT A AND AMENDED LITERATURE REVIEW |
In view of the intervention program that is central to this empirical study, and my need to minimise the impact on usual classroom practices, a qualitative methodology that involves participant observations was not adopted. I considered a mixed quantitative and qualitative case study methodology unsuitable as the principal approach to data analysis because my main interest is on outcomes rather than processes. Although a “program logic model” (Yin, 2003) was considered, it became clear during the process of seeking participants in the study that it would not be logistically possible to investigate outcomes of a chain of events (for example, periodic testing of spelling performance in response to intervention events) leading to an ultimate outcome (an increased number of students spelling at age-appropriate levels) under the arrangements in place in the schools. An action-research design would have been possible with the teachers who showed enthusiasm for participating in the study but I feared that the less motivated teachers would find the process onerous.

A quasi-experimental design was more suitable for the conditions under which the study was conducted as it was less disruptive to normal classroom routines and required only as much involvement in lesson planning and accommodation as the teachers volunteered. Additionally, I was an active influence on the process of the lesson in four of the five intervention classes. Although students’ progress was not tracked over time with the present design, the difference between their pre-test and post-test spelling performance scores nevertheless indicates when progress has been made. This is not to suggest that students would necessarily improve at a steady monthly rate. However, an intervention period over two terms is sufficiently long for changes in spelling age performance to take place, if only because of a maturation effect over half of the school year. Testing of spelling was carried out in students’ classrooms under conditions with which they were very familiar and a practice that they had experienced (usually) on a regular weekly basis throughout their previous primary school years. Although it is not possible to say with certainty that no student was adversely affected by the experience, it can be stated that the students were made aware that their participation was on a voluntary basis and all appeared to be comfortable with the process.
| Some discussion of the categorising of the QT elements | PARAGRAPH EXPANDED  
|------------------------------------------------------|----------------------------------------------------------------------|
| p. 14  
They are described in terms of the three “Dimensions” of the QT model, namely: 1) Intellectual Quality; 2) Quality Learning Environment; and 3) Significance (Appendix B, p. 299), and encompass providing students with optimal opportunities for meaningful learning in an environment that supports their learning. The “Elements” that contribute to the attributes of each dimension have been selected on the basis of research that links them to improved student learning outcomes within the context of the dimension they describe. | PARAGRAPHS EXPANDED  
|------------------------------------------------------|----------------------------------------------------------------------|
| p. 65  
The QT model (NSW DET, 2003a) has been referred to in earlier sections and its components, which comprise a number of elements within the three dimensions of Intellectual Quality; Quality Learning Environment; and Significance, are itemised in Appendix B, page 284 of this document. The elements that support a Quality Learning Environment, those of Explicit Quality Criteria; High Expectations; Student Direction; Social Support; Engagement; and Self-regulation, relate not only to creating learning opportunities within the classroom but also to encouraging students to support each other and their own learning. Significance, the third dimension, “lies in the connections between and among the student as an individual and social being, the nature of the work at hand, and the contexts in which such work matters” (NSW DET, 2003a, p. 14). It is described by the elements of Background Knowledge; Cultural Knowledge; Knowledge Integration; Connectedness; Narrative; and Inclusivity which not only support children from a range of backgrounds but also cater for diverse learning aptitudes.  
The dimension of Intellectual Quality includes the elements of Deep Knowledge; Deep Understanding; Problematic Knowledge; High-order Thinking; Metalanguage; and Substantive Communication. It draws heavily on the conceptual framework known as “Bloom’s Taxonomy”, developed by a team of academics in about 1956 to assist planning of education objectives [ETC – AS IN ORIGINAL COPY]. | Discuss why alignment with QT model was ‘compliance’ (eg p. 165) or remove references to this term  
|------------------------------------------------------|----------------------------------------------------------------------|
| THE WORD ‘compliance’ REPLACED BY MORE GENERAL TERMS, EG ‘demonstrate’; ‘agreement’ OR ‘congruence’. ALL OTHER INSTANCES OF USAGE OF ‘compliance’ AMENDED. 
EG:  
“It is difficult to discuss the teaching of Teacher 3b in terms of the QT model as I observed very few instances when QT dimensions were well demonstrated.” |  

More detail on the school contexts should be provided

<table>
<thead>
<tr>
<th>SCHOOL CONTEXTS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p. 79</td>
</tr>
</tbody>
</table>
| The subjects of the study are Year 5 and Year 6 students (n=237) and their teachers (n=11) in nine mainstream classrooms located in four public primary schools (A, B, C, and D). Primary schools in Australia correspond to elementary schools in the American system and public schools are under the control of state governments, in this case, NSW. They comprise six primary Year levels and the age of students is mainly from five years to twelve years.

The schools in the study are in the outer environs of Sydney, NSW, and located in areas above the mean (1000) of the average range (800-1200) on the Socio-Economic Index for Area (SEIFA01) which is a measure of the Index of Relative Socio-Economic Advantage/Disadvantage (Australian Bureau of Statistics, 2001): … Schools A (SEIFA = 1004) and D (SEIFA = 1064) are surrounded by older-style housing and Schools B (SEIFA = 1054) and C (SEIFA = 1152) are recently built in new housing developments. The immediate environs of School B suggest that it is located in one of the higher income parts of the area included in the SEIFA (1054), whilst the suburb for School C has experienced in recent years a high level of redevelopment. |

A specific statement about ethics approval to be included in the methodology chapter

<table>
<thead>
<tr>
<th>SECTION ADDED AS FOLLOWS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p. 116</td>
</tr>
<tr>
<td><strong>3.5. ETHICAL CONSIDERATIONS</strong></td>
</tr>
<tr>
<td>The following measures have been taken in this thesis to protect the anonymity of the people and places referred to in this study:</td>
</tr>
<tr>
<td>• The location of the four public primary schools involved is described by general terms such as “the outer environs of Sydney, NSW” or “the outer suburbs of Sydney”.</td>
</tr>
<tr>
<td>• Each of the schools is arbitrarily identified by one alphabetic letter A, B, C or D.</td>
</tr>
<tr>
<td>• Each of the nine classes is identified by a numeral (Class 1 to Class 9), the intervention classes in the range 1 to 5, and the non-intervention classes in the range 6 to 9. The numeral assigned to each class in each of the two groups is for identification purposes only and has no other significance.</td>
</tr>
<tr>
<td>• Teachers are identified by the numeral assigned to their class (Teacher 1 to Teacher 9). A teacher’s gender is identified if I consider it relevant to the text.</td>
</tr>
<tr>
<td>• Each student is referred to by a numeral (1 to 237) and their gender is disclosed if I consider that this feature contributes to the discussion.</td>
</tr>
</tbody>
</table>

Care has been taken in reporting this research not to misrepresent or falsify evidence, data, findings or conclusions, and all significant data are represented without omission. Ethics approval for this study was granted by the University of Western Sydney Human Research Ethics Committee: Registration Number HEC 02/094 (Appendix J).
Research findings: some discussion of the shortcomings of a quasi-experimental approach and how project could be redesigned to address these.

<table>
<thead>
<tr>
<th>SHORTCOMINGS OF DESIGN IDENTIFIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>p. 270</td>
</tr>
<tr>
<td>WHOLE “LIMITATIONS” SECTION REWRITTEN</td>
</tr>
</tbody>
</table>

PROBLEM WITH QUASI-EXPERIMENTAL APPROACH

p. 271
In the ideal experimental situation students and teachers would have been randomly assigned to the different groups and I, the researcher, would have had full control over all conditions, procedures and events. As this is not possible when research is applied to real situations that involve people operating in previously organised or intact groups, it has led to this non-randomised comparison pre-test/post-test quasi-experimental design. According to Burns (1997) a number of validity problems are associated with this design, some of which are apparent in this study and identified in the following paragraphs. Burns also discusses the problem of “demand characteristics” which refer to factors that influence outcomes additional to the specific intervention, such as the Hawthorne effect, John Henry effect, and experimenter bias. Possible problems associated with the first two have been discussed in a previous chapter; the effect of the latter has been reduced by the collection of quantitative data using norm-referenced instruments.

PROBLEM WITH QUASI-EXPERIMENTAL APPROACH

p. 273
An additional problem associated with quasi-experimental designs and non-random grouping is a ceiling effect when one group scores higher on pre-test than the other and their progress is constrained by the upper limit of the test instrument. A ceiling effect is identified as a problem in this study with Above Average spellers but it relates to both intervention and non-intervention groups. However, Below Average and Average performers are of primary interest to this study and the problem of a test ceiling does not influence the findings.

LAST PARAGRAPH OF “LIMITATIONS”

p. 274
Threats to the validity of this study have been identified and salutary lessons for a researcher have been learnt. It is clear that a greater control of procedures, more strategies to reduce validity threats, and more intensive documentation of classroom activities are essential for any future study and might well be achieved with an action research or case study methodology. Although there are limitations with the quasi-experimental approach taken, this research project nevertheless finally evolved into a study that can contribute to debate about the value of providing quality learning opportunities to children in upper primary mainstream classrooms.

Correct the typographical errors as indicated

| ALL INDICATED ERRORS CORRECTED |

Add a copy of ethics approval

| COPY OF ETHICS CLEARANCE ADDED AS APPENDIX J |
## EXAMINER 2

<table>
<thead>
<tr>
<th>Correction of the referencing errors identified</th>
<th>CORRECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addressing the central tenet of the Virginia Spelling Studies as outlined</td>
<td><strong>VIRGINIA STUDIES</strong>&lt;br&gt;p. 29&lt;br&gt;Henderson's basic tenet is that learning to spell is a developmental process. A child's knowledge of English orthography begins from a foundation of associating letters with sounds and meaning, and progresses through to knowing all the morphemic elements that constitute a word's identity. Interestingly, this is an invariant progression irrespective of any learning difficulty, culture, first language or social status. Information about individual students' developmental level on this continuum can be gleaned from the errors they make in writing and assists in planning instructional programs.</td>
</tr>
<tr>
<td>Inclusion of primary research studies in literature review, with particular reference to the <em>teaching</em> of spelling</td>
<td><strong>SEE ATTACHMENT A</strong></td>
</tr>
<tr>
<td>Re-write conclusion on the basis of adjustments in the table below on validity problems</td>
<td><strong>WHOLE “LIMITATIONS” SECTION REWRITTEN</strong>&lt;br&gt;p. 270</td>
</tr>
<tr>
<td>Addressing the issues of internal and external validity as per table below:</td>
<td><strong>SEE TABLE (next page)</strong></td>
</tr>
</tbody>
</table>
1. Add a table to show student characteristics.

### Table 4
Gender; Home Language; and Cognitive Ability Groupings of SS/5 Group at Start of Study

<table>
<thead>
<tr>
<th></th>
<th>Inv</th>
<th>Ninv</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>35</td>
<td>13</td>
<td>48</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>47%</td>
<td>33%</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>40</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>53%</td>
<td>67%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>English only</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>57</td>
<td>30</td>
<td>87</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>76%</td>
<td>77%</td>
<td>76%</td>
</tr>
<tr>
<td><strong>LOTE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>18</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>24%</td>
<td>23%</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Normal Cognitive Ability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>52</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>69%</td>
<td>72%</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Borderline/Cutoff</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Inv/Ninv group</td>
<td>23</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>% Total SS/5 students</td>
<td>31%</td>
<td>28%</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total no. students</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Total</td>
<td>75</td>
<td>39</td>
<td>114</td>
</tr>
</tbody>
</table>

2. Try to establish equivalence between experimental and control groups. The first thing to demonstrate, if possible, is that the two groups are equivalent before the intervention. A one way ANOVA will do. If this is not possible, then we need to describe the similarities between the groups in terms of age, SES, background, etc.

SES: (as per SCHOOL CONTEXTS – Examiner 1)

ALSO SEE 3 (a) BELOW
3. Describe the limitations of the experiment--the examiner has identified these as follows:

<table>
<thead>
<tr>
<th>Limitation</th>
<th>Equivalence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) lack of a test of equivalence in the pretest-</td>
<td>p 84</td>
</tr>
<tr>
<td>establish equivalence if possible by making some comparison at pretest.</td>
<td>The four schools are located in areas with Socio-Economic Index for Area</td>
</tr>
<tr>
<td>scores which are above the mean (1000), and range from 1004 for School A</td>
<td>scores which are above the mean (1000), and range from 1004 for School A</td>
</tr>
<tr>
<td>to 1152 for School C. Equivalence between the intervention and non-</td>
<td>1152 for School C. Equivalence between the intervention and non-intervention</td>
</tr>
<tr>
<td>intervention groups is demonstrated by their ratios of Year 5 students</td>
<td>groups is demonstrated by their ratios of Year 5 students to Year 6 students</td>
</tr>
<tr>
<td>(6:4) in each group; a home language of English only versus a language</td>
<td>(6:4) in each group; a home language of English only versus a language other</td>
</tr>
<tr>
<td>other than English (3:1) in each group; and by their similarity of about</td>
<td>than English (3:1) in each group; and by their similarity of about 70% of</td>
</tr>
<tr>
<td>70% of students in the normal cognitive ability range, and</td>
<td>students in the normal cognitive ability range, and approximately 30% below</td>
</tr>
<tr>
<td>approximately 30% below this level of ability in each group.</td>
<td>this level of ability in each group. The gender distributions are less</td>
</tr>
<tr>
<td></td>
<td>equivalent as, whilst the male:female ratio in the intervention group is</td>
</tr>
<tr>
<td></td>
<td>about equal, there is a higher percentage of female (57%) than male (43%)</td>
</tr>
<tr>
<td></td>
<td>students in the non-intervention group, a consequence of the enrolment</td>
</tr>
<tr>
<td></td>
<td>patterns in the classes involved.</td>
</tr>
<tr>
<td>(b) lack of test of sustainability of effects</td>
<td>SUSTAINABILITY</td>
</tr>
<tr>
<td>(e.g., long-term effects which can be tested with a delayed posttest</td>
<td>p. 274</td>
</tr>
<tr>
<td>some time after the posttest)—recognise this is a limitation and</td>
<td>An additional limitation of this study design is that the sustainabilty of</td>
</tr>
<tr>
<td>suggest future research should address this.</td>
<td>effects has not been tested and a further posttest at the end of the school</td>
</tr>
<tr>
<td></td>
<td>year (one term after the end of the study) would have demonstrated whether</td>
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<tr>
<td></td>
<td>students who progressed in spelling performance maintained their gains.</td>
</tr>
<tr>
<td>(c) lack of a random sample--suggest that</td>
<td>RANDOM SAMPLE</td>
</tr>
<tr>
<td>future research should address this, but also</td>
<td>p. 273</td>
</tr>
<tr>
<td>recognise that in real classroom situations this is not always possible,</td>
<td>Whilst it is appreciated that a random sample of students might have posed</td>
</tr>
<tr>
<td>and in fact, using real classes may have its merit in applied research of</td>
<td>less of a threat to validity than the recruitment method used for this work,</td>
</tr>
<tr>
<td>this kind.</td>
<td>it needs to be reiterated that I worked within the limits of what was possible.</td>
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<tr>
<td></td>
<td>The treatment that each class would experience was determined during</td>
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<td></td>
<td>discussion with the classroom teacher and reflected each teacher’s</td>
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<td></td>
<td>preference. The demographics of the classes were unknown to me at the</td>
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<td></td>
<td>beginning of the study, with the exception of their Year levels and that</td>
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<td></td>
<td>all had male and female students. One advantage of this non-random sample</td>
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<td></td>
<td>is that the intact classes are representative of real classroom situations</td>
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<td></td>
<td>which adds to the credibility of this applied research.</td>
</tr>
<tr>
<td>(d) no counterbalancing of experimental and</td>
<td>COUNTERBALANCING</td>
</tr>
<tr>
<td>control groups--can suggest this for future research, e.g., using a delay-</td>
<td>p. 272</td>
</tr>
<tr>
<td>list control design such that the experimental group starts with</td>
<td>It can be argued that the study might have been improved by using a wait-</td>
</tr>
<tr>
<td>the intervention in the first semester; then the two groups swap such that</td>
<td>list control design to counterbalance the effects of the intervention and</td>
</tr>
<tr>
<td>the control group becomes the experimental group in the second semester.</td>
<td>non-intervention groups’ experiences. One group could have experienced the</td>
</tr>
<tr>
<td></td>
<td>intervention program during one term or semester, and then the second group</td>
</tr>
<tr>
<td></td>
<td>for the next term or semester. Thus, their roles would change and each</td>
</tr>
<tr>
<td></td>
<td>would be an intervention or non-intervention group in turn. It is a factor</td>
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<tr>
<td></td>
<td>to be considered in another study but it would have been difficult to</td>
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<tr>
<td></td>
<td>arrange for the present one. It is doubtful that at least some of the</td>
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<td></td>
<td>teachers would have agreed to support the study for two semesters as this</td>
</tr>
<tr>
<td></td>
<td>would interfere with their program for one school year (four terms). Changing</td>
</tr>
<tr>
<td></td>
<td>the experience of each group after only one term would have</td>
</tr>
</tbody>
</table>
Compromised the efficacy of results as the intervention duration would have been no more than about eight weeks. Additionally, as the classroom teachers were present during the intervention lessons it is possible, even probable, that teachers for the first intervention group would not fully revert back to their pre-intervention teaching practices for their non-intervention period and thus, could not be an effective counterbalance to the second intervention group.

(e) different teachers in different classes, so there may be teacher effects unaccounted for—recognise that this is a limitation which may not be easy to avoid. Suggest have the same teachers each teaching 1 exp and 1 control class so as to minimise teacher effects. If possible, carry out a quick analysis with that teacher who taught two classes (1 exp and 1 control?). If the pattern is right, then you can say that the 2 classes the same teacher taught yielded the same pattern of results as the other classes; then there may be better support for the conclusion.

(f) difficulty in interpreting intervention effects when instructions in control classes all vary--recognise this is a limitation and in fact in most applied classroom research, the reality is that the control group is really no control. What we can say about the intervention effect is that the intervention tends to work better than conventional teaching, and conventional teaching is actually what the teachers have been doing and are doing at the time of the research. What we can say is that the effects should be interpreted with caution and with reference to the context of that school and those classes

(g) lack of fidelity check--either add details of how the experimental procedures were followed plus an account of the instructional contents of the control classes or say this is a limitation and should be done systematically

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**TEACHER EFFECT**

p. 272

...a so-called “teacher effect” which was both an advantage and a limitation in this study. I was present for the duration of the intervention lessons in four of the five intervention classes and provided a common influence on lesson procedures and content. As Classes 4 and 5 were well matched (same school, balanced assignment to each class, same student profiles, same lessons which were designed by me) it is possible to strongly suggest that the difference in student performance outcomes in the two classes can be attributed to the effect on student learning by the two different classroom teachers. Potentially, it would have been possible to test a teacher effect on the learning outcomes of two other classes as the same teacher (Teacher 3a/6) taught in both a non-intervention class (Class 6) and an intervention class (Class 3). It is unfortunate that Teacher 3a/6 left School C halfway through the intervention period and therefore no comparisons can be made in this respect. If the intervention class had performed significantly better with this teacher than the non-intervention class, it would have added important support for the findings of this study. Conversely, a negative outcome in respect to the intervention class under these circumstances would seriously undermine the conclusions that can be drawn.

**CONTROL CLASSES**

p. 271

Additionally, as there was no control of instruction content and methods in the non-intervention classrooms it is not possible to consider this group of classes a control group for the intervention classes. Nevertheless, as one group experienced intervention lessons and the other group did not, the latter can be considered a comparison group for the former. Comparisons can therefore be made between the outcomes of a group of classes that experienced intervention lessons and another group in which all classes were taught with a more conventional pedagogy. However, it is important to interpret the different effects with caution and with reference to the context of these particular schools and classes.

**FIDELITY**

p. 271

Consequently, with the change in the study focus, teaching events in the non-intervention classrooms have been subject to speculation. This lack of a fidelity check on the activities experienced by the non-intervention classes has limited the scope of any comparative discussion on the two students groups. A future study should ensure that there
in future research.

is systematic documentation for all participating classes of teaching practices, lesson content, and how experimental procedures are conducted.

4. For the 30 students excluded from the analysis, either demonstrate that they were missing randomly—or provide explanation.

EXCLUDED STUDENTS

p. 85
The sole criterion for excluding students’ data from analyses is because they were not present for both the pre- and the post-spelling test.

5. For the ORF instrument, admit the weakness of the measure and suggest that a better instrument be used in future research.

ORF

p.270
There is a strong suggestion that the improved spelling performances of intervention students did have a positive effect on their oral reading fluency but the relationship was not found to be significant. Although students were individually tested by me the scoring system proved insufficiently precise for my purpose. A more suitable instrument might well yield a different result and its selection in future research should be well considered.

6. If possible, report the reliabilities and psychometrics of the instruments. If they were established instruments, these would not be hard to find in their manuals and related publications. If they were newly developed measures, supply reliability analysis.

RELIABILITY OF TESTS - TWS

p.92
The TWS (Larsen et al., 1999) is a norm-referenced spelling test for students in Years 1–12 and the authors state that the test has been found to be statistically reliable, with reliability coefficients of above .90. The “degree of homogeneity among items within the test” (p. 27), content sampling, was tested and the average alpha coefficient for Form A is .94 and for Form B it is .93. When both forms were tested during one session using a procedure for estimating error described by Anastasi and Urbina (1997, as cited in Larsen et al.), the means and standard deviations at every age interval were found to be similar, with all but one coefficient showing a relationship of more than .90. The authors of TWS confidently state “that the forms of the test are indeed equivalent” (p. 29), and they further assert that the test-retest reliability is acceptable at, for example, .97 for Sixth Grade students. Interscorer differences were also tested and the results for the three sources of potential test error are summarised in Table 12 (reproduced from Larsen et al., p. 31).

<table>
<thead>
<tr>
<th>TWS-4 Values</th>
<th>Sources of Test Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Content Sampling</td>
</tr>
<tr>
<td>Form A</td>
<td>94</td>
</tr>
<tr>
<td>Form B</td>
<td>93</td>
</tr>
</tbody>
</table>

RELIABILITY - SYSTEMS

p. 95
The validity of the measure is in terms of sensitivity and specificity. “Sensitivity is the proportion of children who are correctly identified by the test as in need of further assessment. Specificity is the proportion of cases who are accurately excluded by the test” (Ouvrier et al., 1999, p. 8). According to the instrument designers, the test has internal consistency across age groups with a Cronbach alpha coefficient of .92. Inter-rater reliability was tested by
two researchers administering the test to the same children in a counter balanced order within one day of each other and the scores were highly correlated (.94). The test-retest reliability (.94) examination involved retesting three groups of students over different time periods of two weeks, four weeks, and twelve weeks.

RELIABILITY - TORCH

p. 98
“The exercises in the TORCH tests are constructed around questions. A context is given to cue readers into the sorts of answers they should give” (p. 1). Using the Kuder-Richardson Reliability Coefficient (KR20), the authors state that:

One can be … about 68 per cent certain that the student's true raw score is between a lower limit set one SEM [Standard Error of Measurement] below the obtained score and an upper limit set one SEM above the obtained score. One can be about 95 per cent certain that the true score lies between a lower limit two SEMs below the obtained score and an upper limit two SEMs above the obtained score (p. 22).

As it is “widely accepted that the best indicator of the content validity of a general subject area achievement test such as the TORCH tests is obtained by a detailed and thorough examination of the content [and is] largely a subjective process” (p. 22), no satisfactory statistical test has been used to establish content validity. The decision to use TORCH was made after consultation with an STLD who considered this instrument the most suitable for the age group of interest to the study.

RELIABILITY – ASK-KIDS

p. 97
“Aspects of Self Knowledge about Activities” inventory (ASK-KIDS) (Bornholt, 2000) provides a profile of self-knowledge students have in relation to various activities. It was completed only by the Year 5 Study Student group (n=107) during the individual testing sessions (pre-test and post-test) and took about five minutes to administer. Although the inventory covers a range of activities and other categorisations for assessing self-concepts, only three components are included in the data analysed, namely attitudes to Reading, Spelling, and Writing.

Students were asked to rate their attitudes to spelling, reading and writing activities on a five-point rating scale. “ASK-KIDS about Activities uses items-in-common between two sources of self-concepts: the activities … and salient aspects of competence” (Bornholt, 2000, p. 21). The latter were “current and future performance”; “natural talent”; “effort needed”; and “task difficulty”. The ideal student responses “are a profile that reflects the child's motivation to choose the next challenging task, to persist and complete activities” (p. 6). Test-retest correlation co-efficients are available for reading, as shown in Table 14, and “range from -1.0 to +1.0, where * indicates that the correlation is significantly different from zero (p<.05)” (p. 7).

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Test-retest Reliability of ASK-KIDS about Reading</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Follow-up Interval</td>
<td>Good at Natural Talent</td>
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<tr>
<td>-------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>One week</td>
<td>.79*</td>
</tr>
<tr>
<td>Three months</td>
<td>.22</td>
</tr>
<tr>
<td>One year</td>
<td>.26*</td>
</tr>
</tbody>
</table>

7. Do not claim reading age as a better score than percentile score or standard scores. Argue that results using standard scores yielded similar results (advise re-analysis using standard scores to check if this is true).

8. Regression to the mean: establish equivalence of some kind in the pretest to show that is would not be a major issue. However, because of the small group sizes, may need to group students together in a way that has larger group sizes for ANOVAs (usually > 5 in each group); otherwise, need to admit the weakness and suggest a better way to do it in future research.
NEW REFERENCES

* = new references related to teaching spelling


