Spelling Instruction through Etymology – A Method of Developing Spelling Lists for Older Students[1]

Greg Hutcheon, Marilyn Campbell & Judith Stewart
Queensland University of Technology

ABSTRACT

The purpose of this study was to investigate whether an approach to developing word lists centred on etymological roots would improve the spelling performance of older primary school students. Participants were 46 students in the last year of primary school in south-east Queensland (31 girls and 15 boys) across three classes, with two classes being assigned to control conditions. Students were evaluated pre- and post-intervention on three dependent measures: British Spelling Test Series spelling, spelling in writing and writing. The results of this intervention revealed improvements in spelling for girls but not for boys. The implications for improved teaching methods are discussed.

INTRODUCTION

The development of effective literacy skills is vital to success in school, professional life, and everyday activities, and learning to spell is a crucial factor in overall literacy development. Difficulties with spelling can divert attention from other important processes in writing (Juel, 1999) and inhibit the quality of compositions by forcing writers to select less appropriate words (Kohnen, Nickles, & Castles, 2009), forget what they have planned to write (Graham, 1990), or have less resources available to develop the narrative (Sacre & Masterton, 2000). As such, effective spelling instruction not only can increase children's performance on spelling tests but also may increase the length and proficiency of their compositions (Berninger et al., 1998). Teaching spelling effectively may also lead to higher levels of word reading ability. Although word reading (decoding) is not the inverse of spelling words (recoding), they are interrelated skills (Treiman, 1998). Learning to spell can enhance a child's phonological awareness (sounds in words) and alphabetic (matching groups of letters to sounds) understanding (Santoro, Coyne, & Simmons, 2006), which can lead to more fluent reading and general enjoyment of the reading experience (Perfetti, 1997). Conversely, children who experience early difficulties with literacy tend to avoid reading and this affects their long term progress (Cunningham & Stanovich, 1997). Indeed,

[1] Contact

Professor Marilyn Campbell
School of Learning & Professional Studies
Faculty of Education
Queensland University of Technology
Victoria Park Road
QLD, Australia 4059
tel: +61 7 3138 3806
fax: +61 7 3138 3265
email: ma.campbell@qut.edu.au

children who struggle with reading generally continue to experience difficulty with reading and spelling throughout their schooling (Shaywitz et al., 1999).

Given these potentially serious developmental outcomes, it is a cause for concern that the results of the National Assessment Program – Literacy and Numeracy (NAPLAN) have indicated that, since 2008, spelling has been the lowest area of performance across most year levels. Of even more concern is that, in Australia, 7.1% of Year 7 students (M = 12 years 6 months) were still performing at below the national minimum standard for spelling. Even in the later stages of primary school, many Australian children continue to struggle with spelling, and their difficulties are likely to persist into high school where they can have negative impacts on their overall literacy, confidence, and potentially their occupation (Snowling et al., 2001). Many children will not receive any formal teaching for spelling in high school. As a consequence, Year 7 in Queensland may be the last opportunity for the remediation of spelling difficulties in a classroom setting.

It is clear from the consistent percentage of children who experience difficulty with spelling (NAPLAN, 2010; Graham et al., 2008) that current teaching practices are not sufficient for all children. The reasons for persistent underperformance in spelling for some students may relate to teachers' failing to implement evidence-based strategies in an effective manner. Perhaps teachers are over-relying on some strategies at the expense of other important methods and using strategies that are developmentally inappropriate (Graham et al., 2008). Furthermore, there is a scarcity of spelling programs designed for older primary school children (Graham et al., 2008). By the age of 11 and 12, children are likely to be exposed to a large number of spelling lessons, often based around phoneme to grapheme correspondence and systematic word study procedures but with no focus on higher level skills such as orthography and etymology (Graham et al., 2003). In a review of teaching practices for spelling in primary schools in the United States, Graham et al. (2008) found that at least 90% of teachers spend at least 25 minutes a week on awareness and systematic study strategies. In addition, they use the *distributed practice effect* that has demonstrated that studying words on several brief occasions is preferable to longer but less frequent instruction (Graham, 1999). Graham (1999) identified four different perspectives for selecting words for weekly spelling lists: students select their own words; commonly misspelt words; commonly encountered words; and words that represent different but related patterns. Word lists can also be selected on the basis of class themes and units (Post & Carreker, 2002). Graham (1999) argues that using words that represent different but related patterns may be a useful approach if the patterns are appropriately selected and effective instruction is given.

To evaluate methods involved in teaching spelling, it is useful to understand English orthography. English orthography is reasonably regular if one considers the position of a sequence letter in relation to word boundary, the stressed or unstressed syllable, the part of speech, and the etymological origin of the word (Kreidler, 1971). The production of the correct spelling of a word may involve the application of three codes: phonological (the coding of sounds in spoken words); orthographic (coding of letters in written words); and morphological (word parts that can modify meaning at the beginning of words and mark tense, number, or part of speech at the ends of words). While the orthographic and morphological rules of spelling can sometimes be articulated (for example 'i before e'), often they are instead learnt implicitly through repeated exposure (Pacton, Perruchet, Fayol et al., 2001).

Traditionally, the progression of children from their earliest attempts at spelling through to mastery of the various codes and rules that contribute to effective spelling has been viewed as occurring in clearly defined stages whereby less effective strategies are replaced with more successful strategies over the course of time (Ehri, 1991; Gentry; 1992; Henderson, 1985). Henderson (1990) identified fives stages of learning to spell, from scribbling to being able to spell correctly: *preliterate* (scribbles and basic phonemic awareness); *letter-name* (phonemic awareness skills); *within-words patterns* (orthographic and morphological patterns); *syllable-juncture* (orthographic conventions and morphological strategies); and *derivational constancy* (roots of words and their derivations are learnt and this knowledge begins to be applied consistently).

More recently this view is being reconsidered, with researchers suggesting that even beginning spellers possess knowledge not only at the phonological level (Templeton & Bear, 1992) but also at the

orthographic (Cassar & Treiman, 1997; Pacton et al., 2001; Treiman, 1993) and morphological level (Pacton et al., 2005; Treiman & Cassar, 1996; Treiman, Cassar, & Zukowski, 1994). Recent spelling theories have considered an *overlapping waves* model of development wherein children are able to use the five stages of learning to spell at all points of time but switch reliance on to more effective strategies over time (Siegler, 1995; Varnhagen, McCallam, & Burstow, 1997). The stages in the overlapping waves model are consistent with previous theories but with a modification of when children are able to access these strategies (Ehri, 1991). Children who use multiple strategies such as phonological awareness, orthography, and visual storage decrease their spelling errors compared to those using one strategy in isolation (Frith, 1980). An effective teaching method should therefore target the growth of all of these stages. Stage-model approaches to spelling suggest that an intervention that targets morphological and orthographic knowledge will be increasingly important to older children (Ehri, 1991). Research has indicated that programs that teach morphological spelling rules can improve spelling performance (Nunes, Bryant, & Olsen, 2003; Post & Carreker, 2002; Zutell, 1993).

By Year 7, children most likely will have received spelling lessons that address knowledge of the alphabetic principle and some degree of explicit instruction in morphological and orthographic rules (Graham, 1999). However, students may not have had the opportunity to develop the wider range of strategies that are necessary for good spellers (Frith, 1980). Children should be able to rely on a number of strategies to spell a word correctly because no single strategy will always produce the correct spelling (Kwong & Varnhagen, 2005). The later stages of spelling development involve learning the orthographic and morphological principles and generalities of the etymological roots upon which many of the rules of English spelling are based (Henderson, 1990). However, there is a lack of formal instruction that targets these principles. There is a scarcity of spelling programs that use a whole-class approach for older students (Graham et al., 2008). The majority of programs that address spelling instruction are targeted at children who have a learning difficulty (Wanzek et al., 2006) and at younger children (Fulk & Stormont-Sprugin, 1995). What is missing are whole-class programs that meet the requirements of older students by targeting morphological and orthographic distinctions.

This study tested a spelling program that can be used in a typical classroom and offers a different approach to developing word lists centred on etymological roots. It was hypothesised that, as a result of this program, children would be able to learn the patterns and logic of the English spelling system and generalise these patterns and so improve their spelling performance in formalised testing and general writing activities. In turn, their newly acquired skills would enhance the quality of their compositional narratives. Presenting words with the same root provides a high degree of similarity and limits the amount of learning for each new word. Once the word root spelling has been learnt, children only need to learn a simple ending pattern for each new word. This enables the child to learn and understand not only the etymological root of the word but also to examine the variety of word endings that are possible for each word root. Once the spelling of the root word is learnt, the child can focus their energy on learning how to spell the morphological ending of the word. Throughout this study, common morphological word endings were encountered many times. It was expected that the pattern of orthography would become more predictable and understandable for the children and result in an improvement in spelling. This study also incorporated many well-established practices of spelling instruction including distributed practice, and systematic study strategies, creating activities based on the learning of the common word root, as well as common suffixes and prefixes.

METHOD

Participants

Participants were 46 students in the last year of primary school in Queensland whose parent/guardians had provided informed written consent and who completed both pre-and post measures. Ethical clearance was granted by the university to conduct the study. The average age of participants at the time the pre-intervention measures were completed was 11 years 9 months (*M*= 141 months, *SD*= 6). There were three intact Year 7 classes at the school. One class received the intervention while the other

two classes were used as controls and received spelling instruction as usual. There were no significant age differences between each class: Experimental Condition (*M*= 141.7 months, *SD*=4.7), Control Condition 1 (*M*= 142.8 months, SD=7.9) and Control Condition 2 (*M*= 140 months, *SD*=5).   Of the 46 students who had parental permission and completed both measures, 31 were girls and 15 were boys. There were 18 (11 girls, 5 boys, and 5 ESL (English as Second Language) eligible students in the intervention class, while the two control classrooms contained 12 eligible students (9 girls, 4 boys, and 3 ESL) and 16 eligible students (eleven girls, six boys, and 4 ESL) respectively.   Students had a variety of ethnic and socio-economic backgrounds which were considered to be controlled for by the allocation of students who attended the same school into their different Year 7 classes, without knowledge of the intervention.

Measures
      Two measures were used in the present study: a standard measure, and a writing task derived from the National Assessment Program - Literacy and Numeracy (NAPLAN).
      British Spelling Test Series: Spelling performance was measured with the British Spelling Test Series (BSTS) (Vincent & Crumpler, 1997). There are ten tests at five different levels of ability so that individuals from 5 to 24 years and over can be assessed. Each of the five levels has two equivalent forms to allow for retesting of subjects. The BSTS Form 3 (age range of 9 years 11 months to 15 years 1 month) was used in this study. The BSTS is a group-administered test that takes approximately 30-40 minutes to complete. The test series includes a variety of tasks, including proof reading and sentence completion, single word spelling (in dictation and picture naming), and writing sentences with dictation. Norms for this test were developed for each of the five levels using a sample of over 1,000 British students. Each form of the BSTS has high test-retest reliability (over .96) with norms split up into three-month bands for adolescents on the BSTS 3X/Y level. No gender norms are provided with this test. This measure was identified as being one of the most appropriate tests for ongoing assessment and measurement of treatment effects (Kohnen, Nickels, & Castles, 2009).
      Essay writing: To assess spelling performance in context, a measure of the students' general writing ability was created using the National Assessment Program - Literacy and Numeracy's (NAPLAN) Written Writing Task for Year 7, which is available in the public domain at http://www.naplan.edu.au/test_samples/writing/writing.html. The Australian NAPLAN writing task is administered yearly to grades 3, 5, 7, and 9 at the behest of the Federal government. The marking criteria are available in the public domain. Students are required to write a narrative in response to a stimulus page. The stimulus page consists of a number of pictures in addition to a small amount of text that provides ideas for the writing task. Prompts regarding how to structure the writing task are also presented. This study modified the stimuli provided in the 2008 and 2009 versions of the task which examined the themes of 'The Box' and 'Found'. Care was taken to ensure that the writing tasks provided in this study were comparable to these themes but distinct from what may have been seen by the students. Previous tests are available in the public domain and may have been encountered by students. The writing task given to all students before the intervention had the theme 'The Parcel' with the post-intervention task had the theme 'Revealed'. The prompts were developed to be equivalent to the original source. The marking rubric for the NAPLAN writing task provides ten criteria in addition to a total score, and includes detailed descriptions and sample scripts for each level of performance. The ten criteria are Audience, Text Structure, Ideas, Character and Setting, Vocabulary, Cohesion, Paragraphing, Sentence Structure, Punctuation and Spelling. These were used in this study to assess the children's spelling and writing skills.

Procedure
      The intervention program was conducted over one school semester (that is, two terms, 16 weeks in total) at a primary school in South-east Queensland. The program was presented and explained to the three classroom teachers prior to the commencement of the school year, with one teacher agreeing to conduct the program in place of her regular spelling program. The other two teachers consented to their

students participating in completing pre- and post-measures as controls. The two control classes were taught spelling using their standard curriculum as determined by their classroom teacher.

The intervention program was in accordance with the school's curriculum requirements and all classes fulfilled the requirements of the Standard English curriculum known as *English Essential Leanings* (Queensland Studies Authority, 2009). There was no risk of educational disadvantage associated with participation in any of the three programs.

Intervention class.

At the beginning of each term, the teacher of the intervention class provided a list of possible words and themes for words to use during the term. From this list of words, nine word lists, of ten words each, were created by the researcher for the first term, and seven lists, of ten words each, for the second term, according to common etymological roots. For instance, the theme of 'species in science' was adapted to the word root 'specie—sort / appearance' with ten words selected: species, specific, specifically, specify, specifiable, specificity, specification, specimen, specimens, and speciation. The word root and its meaning, along with a visual image to link the root to its meaning, were provided on a word list.

Definitions were included with each word in a brief and simple form, with only one meaning being provided for words with multiple definitions. Care was taken to ensure that the words selected did not exceed the learning capabilities of a typical 11- to 12-year-old student.

The researcher provided the teacher with eight spelling activities for each word list for her students to complete during the course of the week. These activities were created using Schoolhouse Technologies Vocabulary Worksheet 4 (Schoolhouse Technology, 2010) and consisted of the following: Word Shapes, Missing Letter, Decoding Letters, Crossword, Word Match, Word Search, Word Scramble, and Magic Square. The Word Scramble activity used the form of 'scramble by syllables' rather than letters so that children were able to recognize and learn the word roots through the activity.

The 'distributed practice principle' (Graham, 1999) was used. The teacher gave the children one task to complete in class and one task for homework for each of the first four days of the school week. The teacher had control over when each activity was presented, with the researcher requesting that the easier tasks be completed for homework and the more difficult ones in class. On the fifth day of each week, the students were tested on their knowledge of the week's spelling list (no pre-test was conducted).

Interviews with the intervention class teacher established that words were taught at the beginning of the week, with students guided in analysing the words and syllables. The teacher helped students look at the core meaning of the weekly root, with the students briefly reading through the words. The teacher encouraged the students to use multiple senses when learning the words, using 'look, listen, think' as a prompt. Kinaesthetic techniques such as tracing over words with left and right hands were also employed.

Modified instructional techniques were used with students according to their spelling ability. Strong students were encouraged to use a thesaurus to explore the word and create high quality sentences incorporating each word, while students who struggled with spelling received help from a learning support teacher. Students in the intervention class completed two writing tasks each week of approximately one hour's duration, and worked both on grammar and comprehension tasks for approximately 50 minutes each week.

Regular fortnightly meetings were conducted between the researcher and the teacher to ensure that the program was being implemented faithfully and that an appropriate amount of time was being spent on spelling instruction. The teacher estimated that approximately 1 ½ to two hours a week were spent on spelling instruction and activities.

Control classes.

The two control classes were instructed using their standard curriculum as determined by their classroom teacher. Interviews with their teachers indicated that the approach to the spelling curriculum was to create word lists each week based on thematic units or studied narratives of between ten and 13 words. The two teachers estimated that approximately 1 ½ to two hours a week were spent on spelling

instruction and activities, which was equivalent to the time in the intervention class. Students were encouraged to guess each word's meaning and then to discuss the real definition. They then used these words in context and were encouraged to find roots in the word. Words were examined at the level of letter/sound and children were asked to use the 'look, say, cover, check' technique as well as syllabification for homework activities. A revision test was performed on Thursdays with a final test on Fridays. Activities were provided by the classroom teacher for spelling activities both within class and for homework.

Assessing performance.

At the beginning of the semester, students in each class completed a pre-intervention measure of spelling ability (BSTS 3X), and a structured writing task in their first morning period across two consecutive days. On the first day, all students were given as long as they required to complete the tasks, taking approximately one hour. On the second day, the structured writing task completed by the children was 'The Parcel', with children given 40 minutes to do this.

In the third last week of semester, after 16 weeks of the intervention, the same procedure was completed at the same time in the morning across two consecutive days. The BSTS 3Y and 'Revealed' writing tasks were given, both of which were considered equivalent in difficulty to the pre-intervention measures.

RESULTS

The results are presented in three parts. For each variable (BSTS spelling, spelling in writing and writing), improvement scores were calculated for each individual by subtracting pre-intervention score from their post-intervention score. The complete data set was analysed to identify any outliers, with two subjects' scores being removed due to floor and ceiling effects on the BSTS spelling measure. A MANOVA was conducted to investigate overall effects. Due to a significant interaction effect between Group and Gender, separate MANOVAs were then conducted and the results are reported by gender.

Overall Scores by Intervention or Control Group

A three-way MANOVA was performed to investigate group differences in spelling and writing, based on the pre- and post-intervention data. Three dependent variables were used: BSTS spelling, spelling in writing and writing. The independent variables were group, gender, and age. Preliminary testing of assumptions was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance, and multicollinearity. No serious violations were noted. There was a significant interaction effect between Group and Gender $F (10, 60) = 2.06$, $p=.042$; Wilks' Lambda=.55;partial eta squared=.26. This finding suggested that the level of the dependent variables varied according to both group and gender.

The results were then considered separately at the level of the significant Group and Gender interaction, using a Bonferroni adjusted alpha level of .01. The BSTS spelling measure was found to reach significance at the level of the interaction $F (2, 34) = 5.14$, $p=.01$; partial eta squared=.23. None of the other dependent variables was found to be significant at the level of the interaction between Group and Gender; spelling in writing $F(2, 34) = 1.42$, $p=.26$; partial eta squared=0.8, writing $F(2, 34)=2.06$, $p=.14$; partial eta squared=0.11.

An inspection of BSTS spelling data (as shown in Figures 1 and 2) reveal that the girls showed a significantly greater improvement in the intervention group than in the control groups. Boys' improvement in BSTS spelling was higher in one of the control groups than either the intervention or the other control group. The interaction was examined further by splitting the data by gender and performing MANOVAs for boys and girls separately. Due to the small group size, Pillai's Trace was used as MANOVA test statistic as it is the most robust in these conditions (Field, 2005).
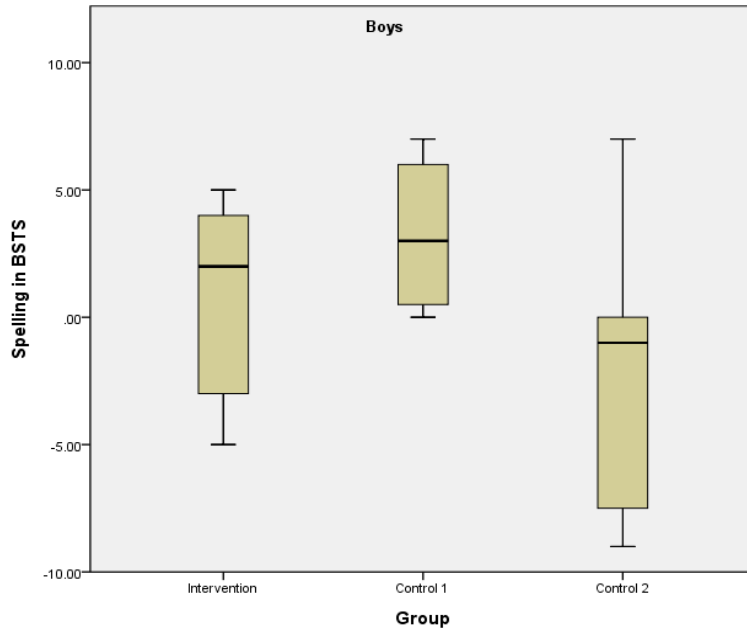
Figure 1. Interaction between group and boys for BSTS Spelling
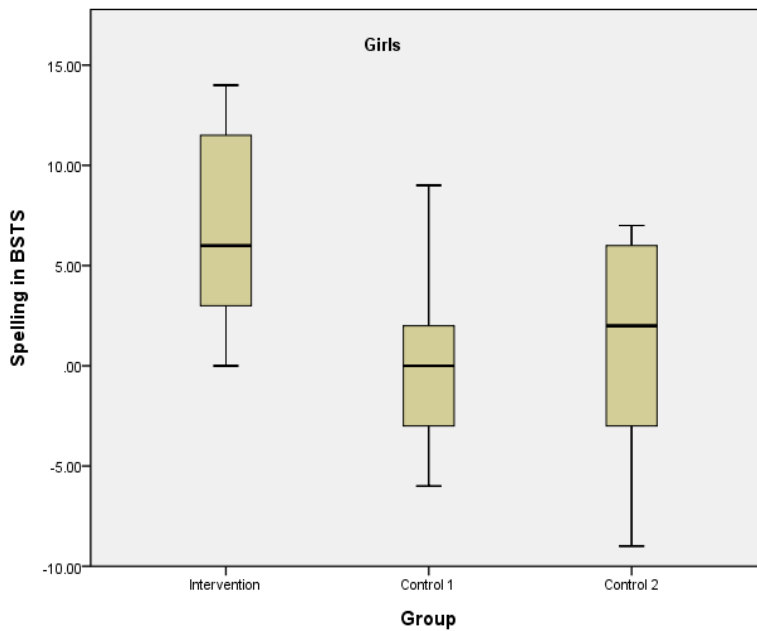

Figure 2. Interaction between group and girls for BSTS spelling

Boys' Scores in the Intervention and the Control Groups

A one-way MANOVA was performed to investigate differences in the dependent variables for boys. All dependent variables were included, with the independent variable being group. Preliminary assumption testing revealed no serious violations. There were no significant differences between the intervention and control groups (F (10, 18) = 1.91, p=.11; Pillai's Trace=1.03; partial eta squared=.52).

Girls' Scores in the Intervention and the Control Groups

Similarly a one-way MANOVA was performed to investigate differences in the dependent variables for girls. No serious violations of assumptions were revealed. There was a significant difference between the intervention and control groups on the combined dependent variables F (10, 50) = 2.09, p=.00; Pillai's Trace=.59; partial eta squared.3. When the results of the dependent variables were considered separately, using a Bonferroni adjusted alpha level of .01, only BSTS spelling was found to be significant F (2, 28) = 5.84, p=.008; partial eta squared=.29. Spelling in writing F(2, 28) = 3.5, p=.04; partial eta squared=0.2 was not significant. The other dependent variable of writing was not significant.

DISCUSSION

This study evaluated a spelling intervention for Year 7 primary school students that used etymological similarities to enable a systematic approach to the learning of the morphological and orthographic nature of spelling. While there is a considerable body of research that has examined early spelling instruction and instruction for individuals with learning disabilities, there is a scarcity of research that examines whole-class approaches for developing the higher level spelling skills of older students. The efficacy of an approach that targeted the development of higher level spelling skills to improve the spelling performance in both formal testing and general writing activities was explored.

Analyses of the data indicated a significant interaction effect between group and gender. As a result, separate analyses were conducted on girls' and boys' scores. However, the sample size for the boys was too small to interpret results meaningfully.

The etymological spelling program had a significantly positive effect on spelling performance by girls, as measured by the BSTS. This result supports teaching that focuses on examining morphological and orthographic rules of spelling.

Girls who participated in the etymological program demonstrated an improvement in spelling ability in a writing sample, but this improvement in spelling in writing was not found to be significant unlike the spelling ability in the BSTS. Given the short nature of the intervention, this finding is encouraging. An intervention that ran over the full duration of Year 7, or even began in Years 5 or 6, may have had a more significant effect on generalising the improvement in spelling in general to writing tasks. The NAPLAN scoring system for spelling also may not be sensitive enough to measure the change in spelling performance because it rates performance on a scale between 0 and 6. As such, a moderate improvement in spelling may not always result in an increase in the score on the spelling measure of a NAPLAN writing task.

On the writing task, girls' overall performance was not significantly improved compared with girls in the intervention class. Spelling ability has previously been linked to overall writing ability, so this result was not expected. However, the relatively short timeframe of this intervention may not have provided sufficient time for an increase in spelling performance to lead to an increase in overall writing performance. Increased knowledge of spelling may lead to a higher level of confidence and an increased willingness to engage in reading and writing, which in turn leads to higher levels of writing comprehension. However, this process may take longer than a school semester to occur.

The results of this intervention indicate that this approach to spelling for older primary school children might be effective in a whole class teaching environment. The small sample size created problems for analyses and interpretation of results, but there is evidence that an etymological approach to teaching spelling can be effective for girls. A larger study that includes more boys is needed to determine if this intervention is effective for boys as well as girls. This whole-class approach to developing the

higher level spelling skills of older primary school students was able to demonstrate a significant increase in spelling performance as measured by a structured spelling test (for girls) over a relatively short period of time. However, this did not always generalise to spelling in writing or writing competence.

REFERENCES

Berninger, V. W., Vaughan, K., Abbott, R. D., Brooks, A., Abbott, S. P., Rogan, L., Reed, E., et al. (1998). Early intervention for spelling problems: Teaching functional spelling units of varying size with a multiple-connections framework. *Journal of Educational Psychology*, *90*, 587-605.

Bryant, P., & Nunes, T. (1998). Learning about the orthography: A cross-linguistic approach. In S. G. Paris & H. M. Wellman (Eds.), *Global prospects for education: Development, culture, and schooling* (pp. 171-191). Washington D.C: American Psychological Association.

Byrne, B., & Fielding-Barnsley, R. (1990). Acquiring the alphabetic principle: A case for teaching recognition of phoneme identity. *Journal of Educational Psychology*, *82*, 805-812.

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, *33*, 934-945.

Ehri, L. C. (1991). Learning to read and spell words. In L. Rieben & C. A. Perfetti (Eds.), *Learning to read: Basic research and its implications.* (pp. 57-73). Hillsdale, NJ : Lawrence Erlbaum Associates.

Field, A. (2005). *Discovering statistics using SPSS (2nd ed.).* Thousand Oaks, CA: Sage Publications.

Frith, U. (1980). Unexpected spelling problems. In U. Frith (Ed.), *Cognitive processes in spelling* (pp. 495-515). London: Academic Press.

Fulk, B. M., & Stormont-Spurgin, M. (1995). Spelling interventions for students with disabilities: A review. *The Journal of Special Education*, *28*, 488 -513.

Gentry, J. R. (1982). An analysis of developmental spelling in gnys at wrk. *Reading Teacher*, *36*, 192-200.

Graham, S. (1990). The role of production factors in learning disabled students' compositions. *Journal of Educational Psychology*, *82*, 781-791.

Graham, S. (1999). Handwriting and spelling instruction for students with learning disabilities: A review. *Learning Disability Quarterly*, *22*, 78-98.

Graham, S., Harris, K. R., & Fink-Chorzempa, B. (2003). Extra spelling instruction: Promoting better spelling, writing, and reading performance right from the start. *Teaching Exceptional Children*, *35*, 66.

Graham, S., Morphy, P., Harris, K. R., Fink-Chorzempa, B., Saddler, B., Moran, S., & Mason, L. (2008). Teaching spelling in the primary grades: A national survey of instructional practices and adaptations. *American Educational Research Journal*, *45*, 796-825.

Henderson, E.H. (1985). *Teaching spelling.* Boston: Houghton-Mifflin.

Henderson, E.H. (1990). *Teaching spelling. (2nd ed.)* Boston: Houghton-Mifflin.

Juel, C. (1991). Beginning reading. In R. Barr, M. L. Kamil, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research, Vol. 2.* (pp. 759-788). Hillsdale, NJ: Lawrence Erlbaum Associates.

Kohnen, S., Nickels, L., & Castles, A. (2009). Assessing spelling skills and strategies: A critique of available resources. *Australian Journal of Learning Difficulties*, *14*, 113-150.

Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the input hypothesis. *The Modern Language Journal*, *73*, 440-464.

Kreidler, C. W. (1971). Teaching English spelling and pronunciation. *TESOL Quarterly*, *6*, 3-12.

Kwong, T. E., & Varnhagen, C. K. (2005). Strategy development and learning to spell new words: Generalization of a process. *Developmental Psychology*, *41*, 148-159.

NAPLAN 2010 Summary Report (2010) Retrieved from http://www.naplan.edu.au/verve/_resources/NAPLAN_2010_Summary_Report.pdf

Pacton, S., Fayol, M., & Perruchet, P. (2005). Children's implicit learning of graphotactic and morphological regularities. *Child Development*, *76*, 324–339.

Pacton, S., Perruchet, P., Fayol, M., & Cleeremans, A. (2001). Implicit learning out of the lab: The case of orthographic regularities. *Journal of Experimental Psychology: General*, *130*, 401-426.

Perfetti, C. A. (1997). The psycholinguistics of spelling and reading. In C. A. Perfetti, L. Rieben, & M. Fayol (Eds.), *Learning to spell: Research, theory, and practice across languages.* (pp. 21-38). Mahwah, NJ: Lawrence Erlbaum Associates.

Post, Y. V., & Carrecker, S. (2002). Orthographic similarity and phonological transparency in spelling. *Reading and Writing*, *15*, 317-340.

Queensland Studies Authority (2007). *English essential learnings by the end of year 7.* Queensland: Queensland Studies Authority.

Sacre, L., & Masterson, J., (2000). *Single word spelling test (SWST).*

Windsor, Berkshire: NFER-Nelson.

Santoro, L., Coyne, M., & Simmons, D. (2006). The reading–spelling connection: Developing and evaluating a beginning spelling intervention for children at risk of reading disability. *Learning Disabilities Research & Practice*, *21*, 122-133.

Schoolhouse Test - Test maker for teachers. (2007) Retrieved from http://www.schoolhousetech.com/vocabulary.

Siegler, R. S. (1987). Strategy choices in subtraction. In J. A. Sloboda & D. Rogers (Eds.), *Cognitive processes in mathematics* (pp. 81-106). New York: Oxford University Press.

Siegler, R.S. (1995). Children's thinking: How does change occur? A microgenetic study of number conservation. *Cognitive Psychology, 28*, 225-273

Snowling, M., Adams, J., Bishop, D., & Stothard, S. (2001). Educational attainments of school leavers with a preschool history of speech-language impairments. *International Journal of Language & Communication Disorders*, *36*, 173-183.

Templeton, S., & Bear, D. (1992). *Development of orthographic knowledge and the foundations of literacy: A Memorial Festschrift for Edmund H. Henderson*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Treiman, R. (1993). *Beginning to spell: A study of first-grade children*. New York, NY US: Oxford University Press.

Treiman, R. (1998). Why spelling? The benefits of incorporating spelling into beginning reading instruction. In J. Metsala & L. Ehri (Eds.), *Word recognition in beginning literacy.*(pp. 289-313) Hillsdale, NJ: Erlbaum.

Treiman, R., & Cassar, M. (1996). Effects of morphology on children's spelling of final consonant clusters. *Journal of Experimental Child Psychology*, *63*, 141-170.

Treiman, R., Cassar, M., & Zukowski, A. (1994). What types of linguistic information do children use in spelling? The case of flaps. *Child Development*, *65*, 1318-1337.

Varnhagen, C. K., McCallum, M., & Burstow, M. (1997). Is children's spelling naturally stage-like? *Reading and Writing*, *9*, 451-481.

Vincent, D. & Crumpler, M. (1997) *British Spelling Test Series Manual 3X/Y*. NFER-Nelson: Windsor.

Wanzek, J., Vaughn, S., Wexler, J., Swanson, E. A., Edmonds, M., & Kim, A. (2006). A synthesis of spelling and reading interventions and their effects on the spelling outcomes of students with LD. *Journal of Learning Disabilities*, *39*, 528 -543.

Zutell, J. (1980) Children's spelling strategies and their cognitive development. In E.H. Henderson & J.W. Beers (Eds.), *Developmental and cognitive aspects of learning to spell: A reflection of word knowledge* (pp. 52-73) Newark DE: International Reading Association.

Zutell, J. (1993 December). *Directed spelling thinking activity: A developmental, conceptual approach to advance spelling word knowledge*. Paper presented at the Literacy for the new millennium First International Conference and 19th National Conference of the Australian Reading Association. Retrieved from http://www.zaner-bloser.com/about/newsandresearch/research/detail.aspx?id=4822

Author Details:

Greg Hutcheon is currently a Masters of Educational and Psychology Student at the Queensland University of Technology. Previous to this Greg has worked as a therapist and student aide with children with autism and other disabilities.
Contact: Greg Hutcheon BPsychSc (Hons)
             5/96 Dornoch Terrace Highgate Hill, 4101,
             Brisbane, 4101..
             Mob: 0413399693
             Email: gregory.hutcheon@gmail.com.au

Marilyn Campbell is currently a professor at the Queensland University of Technology Previous to this Marilyn supervised school counsellors and has worked in infants, primary and secondary schools as a teacher, teacher-librarian and school counsellor.
Contact: Dr Marilyn Campbell MAPS
             Professor School of Learning & Professional Studies
             Faculty of Education
             Queensland University of Technology
             Victoria Park Road QLD Australia 4059
             Tel: +61 7 3138 3806
             Fax: +61 7 3138 3265
             Email: ma.campbell@qut.edu.au

Judith Stewart taught in primary schools for 35 years, over 30 of those as a Support Teacher - Learning Difficulties. The spelling program discussed in this thesis was the product of her experience working with children with writing / spelling difficulties. For 5 years she was a Curriculum Resource Reviewer and currently, is working as an Education Advisor for the Home Education Unit.
Contact: Dr Judith Stewart (Diploma of Teaching, Bachelor of Educational Studies, Graduate Diploma Teaching
             Exceptional Children, Graduate Diploma Educational Administration)
             240 Learoyd Road,
             Willawong. 4110
             Mob: 0407 637 543
             Email: judith.stewart@deta.qld.gov.au