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THE EFFECTS OF DIRECT INSTRUCTION WITHIN
A WHOLE LANGUAGE SPELLING PROGRAM

by

Gladys M. Rosencrans

B.Ed., University of Manitoba, 1974

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in the Department
of
Education

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Abstract

This study was undertaken to investigate the efficacy of a classroom-based spelling intervention method that incorporated direct instruction within a whole language framework. The instruction focused on the development of cognitive spelling strategies that were applicable to pragmatic writing, rather than word or list specific, in contrast to traditional basal or contemporary, informal whole language methodologies. It was hypothesized that children would make gains in spelling achievement when given direct instruction within a literary context, focusing on cognitive strategies, rather than with predetermined word lists. One hundred and six students from five intermediate classes participated in the study. Sixty-one students comprised the treatment group, which received direct, formal instruction in generalizable spelling strategies. Forty five students, designated an 'observation' group, received only informal, incidental spelling instruction, through their writing program. Data were gathered from pre- and post-test measures of a standardized spelling test, through an independent writing sample analysis, and from a metacognitive questionnaire. The results of all measures showed significant increases in spelling achievement for students in the treatment groups. The intervention effects support the feasibility of providing direct, formal instruction in generalizable spelling strategies without the use of word lists.

Dedication

This work is dedicated to a wonderful teacher -
Lillian Altin. Without her support and model for excellence,
I would not have attained this goal. Thanks, Mom.

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I Introduction

While spelling may not be the most crucial element in determining student competency in language, it is worthy of attention. The ability to communicate fluently through the written word enables good spellers to express their thoughts without unnecessary interruptions, while poor spellers are hampered in their ability to communicate through this medium. Unfortunately, many students experience this difficulty and the majority of students labeled handicapped exhibit spelling problems (Graham & Miller, 1979). The exigency for the development of a meaningful and effective vehicle to facilitate the ability to communicate with written language has prompted this and past studies.

Spelling has often been viewed as a tangible symbol of student success and teacher effectiveness. Many parents complain that schools are not teaching spelling and grammar. Their evidence is that work comes home permeated with errors (Diakiw, 1991). Standard, or correct, spelling use is an overt, readily observable measure that, unfortunately, may often be equated with general accuracy and achievement in academic tasks. One reason is that it appears to be a rote skill that is readily assessed as 'right' or 'wrong' (Tarasoff, 1990). Research implications of the complex cognitive processing required to spell correctly (Wong, 1986) are easily overlooked in traditional classroom interventions and parental assessments. This oversimplistic view has interfered with the development of more efficacious programming for these highly visible students.

Spelling has a long and diverse history of research and practice. Current and historical research has provided a multitude of theories pertaining to how children learn to spell and how best to facilitate success, and yet spelling remains a controversial area that has generated heated, often unhealthy debate (Scott, 1990). The debate has generated polarized viewpoints with the resulting arguments focusing on the efficacy of one approach over another, rather than addressing the frustrations of teachers, parents and students for whom spelling is a struggle.

Ironically, the research itself, in its attempt to provide understanding and answers, has prompted an inauspicious dichotomy. Theorists who have documented findings as to the developmental levels associated with spelling appear to disagree with traditional theories of instruction (Groff, 1986). Both factions of research are based on exhaustive studies, making it difficult to ignore the implications, but the apparent incongruence of the findings has left many practitioners frustrated. Even the research designs have caused contention. Data about developmental theories have been gathered in qualitative studies while traditionalists favor quantitative methods. The challenge of the present investigation was to amalgamate the findings of such polarized research into effective practice.

Traditional theorists cite empirical evidence attesting to the efficacy of direct instruction, directed word study, and metamemory strategies (Graham & Miller, 1979) in the facilitation of spelling competence. Information as to optimum time allotments has been suggested by Horn (1947). The exigency of the inclusion of

instruction in phonics is well documented in the literature. This research has led to the development of several basal spelling programs such as The Canadian Spelling Program (Thomas, 1979). Such programs have been based on empirically developed lists of high frequency words and common error patterns at various grade levels. Words are grouped for study to reflect increasingly complex grapho-phonemic and orthographic generalizations. The instructional sequence is commonly a pre-test on Monday, followed daily by a set of prescribed word study exercises in which the entire class participates, with a final test on Friday. Study strategies and remedial interventions usually involve metamemory approaches to 'learn' the list of words (Graham & Miller, 1979). Spelling evaluation is based on scores obtained from the test.

In an analysis of classroom programs Hillerich (1982) found that large portions (28.7 to 82.7 percent) of teacher time were not devoted to any meaningful instruction, but rather to grading papers, discipline, and other inconsequential tasks. Of the time that was devoted to spelling, much was devoted to activities of questionable value. For example, listening to mechanical directions, writing words X number of times, workbook completion and oral correction reflected up to 81.6 percent of student activity. Similar dissatisfaction with traditional spelling programs has been documented by Cohen (1969) and Graves (1976). Cohen noted that the word study exercises were not only ineffective as compared to word usage, but may even be a deterrent to learning. Graves' comparative study found that spelling texts retained the emphasis on word study although some effort was evident in attention to

language arts skills. Most exercises retained the attribute of isolation. Concerns as noted by Cohen and Graves reflect the frustration felt by practitioners that basal programs have not been as effective as anticipated in developing an appreciation and application of standard English orthography.

Exhaustive qualitative analyses have indicated that spelling is a developmental process, in which children progress through a sequence of stages from pre-phonetic through phonetic to a more semantic focus (Gentry, 1982). Developmental theorists have been quoted as claiming that children should receive no formal spelling instruction until they have learned to spell correctly and that competence should be fostered in a naturalistic manner, through construction of a learning environment in which they can formulate their own hypotheses about English orthography (Groff, 1986). It was theorized that teachers could best facilitate these stages of development by many varied opportunities to read and write in a pragmatic manner (Beers, Beers & Grant, 1977).

Classroom application of this theory led to informal, incidental spelling instruction that occurred during individual reading conferences. Invented spelling is encouraged so as not to interfere with fluency in recording thoughts and ideas. Several difficulties have been perceived with this self-directed format. Classroom time constraints limit the frequency of student/teacher conferences and the amount of time allocated may be insufficient for the poor speller. Lack of direct instruction may deemphasize the importance of correct spelling and thus prompt the parent comments noted by Diakiw (1991). The essentiality of developing a thorough

knowledge of phonetic structure is not sufficiently addressed. Concerns such as these prompted this investigation as an attempt determine intervention methods that more efficiently facilitate the developmental process.

Many branches of educational psychology have provided information about how children learn. For example, neuropsychology has documented the impact of learning style preference on success (Dunn, Beaudry, & Klavas, 1989), and delineated environmental and instructional variables that facilitate success (Keefe, 1979). Cognitive processes have been the subject of much study over the past two decades, providing data relevant to the acquisition and application of orthographic knowledge (Henderson & Beers, 1980; Wong, 1986). Metacognitive awareness significantly impacts on the self-selection and regulation of these cognitive processes (Paris, Lipson & Wixon, 1983; Palincsar & Ransom, 1988). This impact has been researched in relation to both memorization of word lists (Torgeson, 1977) and application to pragmatic writing (Radebaugh, 1985; Block and Peskowitz, 1990). It does not appear that the findings of these bodies of research have been incorporated into traditional basal spelling programs that have not changed significantly nor into the informal emphasis of whole language instruction.

A final rationale for the present study, stemmed from the environmental changes that are currently evidenced in British Columbia schools. The 1988 Royal Commission in Education prompted a revision of philosophy as outlined in A Legacy for Learners, commonly called the *Year 2000*, (Sullivan, 1988). One

ramification of this document is the increasing inclusion in regular classrooms of all learners, even those with special educational needs. The required special education programming is, to a great extent, being delivered within the context of the regular classroom. Effective programs, therefore, must be adaptable to classroom presentation and monitoring rather than isolated strategies delivered within the traditional resource room approach.

This study attempted to investigate the efficacy of one such intervention method, based on the hypothesis that within a whole language framework, children will make significant gains in spelling achievement and in their use of standard spelling within written communication when given direct, formal instruction in generalizable spelling strategies without the use of predetermined word lists, as contrasted to self-directed, informal instruction. 'Whole language' is defined as a language acquisition philosophy which emphasizes inclusivity, thus negating the memorization of pre-determined word lists as an effective learning tool. 'Direct instruction' was operationalized as a structured period of time directly engaged in the didactic presentation of orthographic and strategic information, in contrast to 'self-directed' methods which were conceptualized as those where the orthographic instruction occurs during reading and writing activities. No formal time was set aside for teaching spelling. 'Generalizable strategies' were defined as techniques that provide a systematic means to analyze and remember spellings. These strategies focus on the process of spelling rather than on the memorization of word lists. Finally, 'gains' in spelling were operationalized as levels of competency as

measured by a standardized spelling test and in independent writing samples as well as the level of metacognitive awareness evidenced in a questionnaire. This hypothesis was tested with one hundred and six intermediate students which comprized a treatment and an observation group. Although much valuable data was gathered, a significant limitation of this study was the statistical incomparability of the two groups, which will be discussed later. This paper will present a synthesis of the pertinent research literature, describe the research method used to test the hypothesis, present the results of the investigation and offer a discussion of these results.

Review of the Literature on Teaching Spelling

Spelling has a long history of research and study, with contributions from a plethora of disciplines (cognitive and developmental psychology, linguistics, anthropology, neuroscience, and philosophy). It is one of the most widely studied fields in education (Graham & Miller, 1979). One of the reasons for this abundance is its conceptualization as an isolated subject that can readily be studied and measured empirically. For this same reason, spelling instruction has changed little over the past decades. Viewing spelling as learning (memorizing) letter sequences that were either right or wrong prompted oversimplistic attitudes to curricular, instructional methods and assessment and evaluation. Contributions from research in the past three decades has prompted a revision of these views.

Advances in neuropsychology have contributed to our knowledge of how the brain functions, providing us with conceptual models of these functions. Such models have broadened our understanding of various aspects of learning such as hemispheric differences, memory, and areas of brain specialization that impact on effective instruction.

Cognitive psychology has documented research into effective strategies for learning, including attitude, strategies, visualization,

auditory cuing and proofreading. The positive effects of metacognitive awareness has been the focus of much research.

Linguistics research has added greatly to our knowledge of cognitive processes, language acquisition and information processing. The result has been a more holistic approach to teaching language arts, in which spelling is viewed within the context of writing and has been documented as a developmental process, rather than a set of words and rules to be memorized.

Because of this research, some educators are questioning traditional views of spelling instruction, creating a dichotomous approach to language instruction. As memorization of selected word lists may not generalize into daily writing (Gentry, 1987) some practitioners are therefore abandoning formal spelling programs in favor of informal or incidental instructional practices. Others continue to adhere to traditional methods because they doubt the validity of the research or have been unable to synthesize the conclusions into tangible, explicit programs. Recognizing that the ability to spell remains important, teachers feel guilty about not 'teaching' spelling.

Both viewpoints have validity and are extensively research based. It is therefore incumbent on researchers and practitioners to integrate the insights and knowledge gained through this research into a more comprehensive 'whole', to better facilitate the creation of successful spellers in a pragmatic context.

Definition

Any study of spelling achievement must be prefaced with a definition. In its most simplistic form, spelling is, as Brueckner and Bond (1955) stated "the ability to produce in written or oral form the correct letter arrangement of words." (p. 346). Hanna, Hanna and Hodges defined spelling as "the process of encoding, or of rendering spoken words into symbols" (1971, p. 264). Neither of these definitions reflects a complete picture of the process. Spelling is a symbolic representation of spoken language, as suggested by Hanna et. al., but a more complete definition should also reflect the complexity of the process. Knowledge of, as well as the ability to recall and reproduce standard spelling is obviously essential in the production of written language. Reading and editing text require the ability to recognize standard spelling. Spelling may be processed in oral or written form and therefore cannot be separated from the speaking and listening components of language. The definition proposed by Graham and Miller (1979) is more reflective of this intricate process. "Spelling is defined as the ability to recognize, recall, reproduce, or obtain orally or in written form, the correct sequence of letters in words" (p.2). However, standard or accepted spellings differ depending upon the context in which they are used. Spelling is not a mechanistic operation of encoding words, but an

integral part of language and communication that includes contextual variations such as homophones, dialect, literary genre, or regional vagarities. It is modified and adapted according to the context in which it is used. For example, regional spellings may differ as in *neighbour* - *neighbor*, or in prose one would find *never* whereas in poetry the same word would be acceptable if spelled *ne'er*. Therefore, Graham and Miller's definition must be appended with 'relevant to the pragmatic context' to completely describe this multifaceted act.

Research Methodologies

Research in the field of education has traditionally been based on the methods of the behavioral sciences and has relied on empirical investigations. Specifically in spelling, research has focused on memorization techniques and effective teaching practices, to enable students to learn the spelling words (Graham & Miller, 1979). Quantitative studies have provided statistically analyzed data extrapolated from standardized pre-test, post-test measures of competency . They have produced lists of high frequency and error associated words (Thomas, 1979) as well as instructional sequences for phonetic and structural analysis (Horn, 1947).

While this information is interesting and valuable, such empirical analysis does not fully describe nor explicate the way in

which children learn to spell these words. They do not reflect cognitive processing, increased word knowledge, maturation, strategies used or attitude. For this reason, more in-depth qualitative studies have been undertaken to supplement this knowledge.

Attempts have been made to discover and understand children's thinking processes in relation to spelling, their belief system and interpretation of spelling generalizations and attitude. To uncover these cognitive and metacognitive processes, Wong (1992) suggested that we do so by "observing and studying experts or good students as they learn and perform" (p.150). This is most easily done in a qualitative study. Data for these qualitative studies have been gathered from exhaustive analyses of children's writing, interviews, observation, and practical teaching experience. Although these studies have been criticized (Groff, 1979, 1986) for lack of statistical evidence to support the positions, the conclusions posited have been replicated by numerous researchers (Gentry, 1982, Henderson & Beers, 1980, Buchannan 1989, Zutell, 1980, Henderson & Templeton, 1986). As the findings remain consistent and complimentary, it would be foolish to ignore them.

Qualitative research has provided a "preponderance of evidence that the way students spell is governed by their evolving belief systems about spelling." (Buchannan, 1989, p. 5). Approximations of accuracy become increasingly sophisticated as children experience,

interpret and understand and incorporate the complex orthographical system of English. Delineation of growth in spelling ability has prompted its reconceptualization as a developmental process which begins well in advance of formal instruction or even entry into school (Laminack, 1991). Children begin learning the communication process, of which spelling is one component, at birth. They bring a vast array of knowledge with them when they enter school. Our task, as educators, is to clarify and supplement this knowledge to support continued learning.

Learning Style

Because spelling is a cognitive process, it is important to consider evidence about the external and internal factors that affect learning. Research over the past decade has yielded valuable information on the correlation between achievement and the effects of biological and developmental characteristics. It is postulated that each person has a personal 'learning style' that reflects environmental, sociological, physiological, emotional, and cognitive preferences. The school learning process is a complex interdependent one. Keefe (1979) conceptualized this process as a triangular interaction in which learning environment, teaching style and learning style play equally important parts. Thus learning style is an area that merits further discussion.

Learning style, as defined by Dunn, Beaudry and Klavas (1989) is "a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for others." (p. 50). Pedagogical acknowledgement and awareness of these personal indicators of success can positively impact on instructional practices.

Differences have been attributed to the physiological, affective and cognitive domains (Keefe, 1979). The physiological factors are related to sex differences, nutrition and health as well as the physical environment and the need for mobility. Affective dimensions have to do with attention, emotion and motivation. Need for structure, persistence, curiosity, anxiety and locus of control can all have impact on learning. Cognitive styles are reflected as the learner's typical mode of perceiving, thinking, problem solving, and remembering. These illustrate the process of cognition in the areas of reception or concept formation (Messick, 1969). Perceptual modality preferences (kinesthetic, psychomotor, visual or auditory), analytic or global reasoning and the motivation to perform novel or difficult tasks are examples of factors affecting learning style.

Neuropsychological research in the area of hemisphericity has indicated that differences in learning are connected to brain dominance. The terms right/left, analytical/global and inductive/deductive have been used to describe these characteristics. Studies by Dunn, Cavanaugh, Eberle and Zenhausern

(1982) and Cody (1983) found that right hemispherically dominated children were predisposed to distractors, casual settings, tactile methods and peer interactions, as compared to left hemisphere youngsters who preferred conventional settings, more structure and visual instructional resources. Bruno (1988) found that predominantly right hemispheric students achieved statistically higher test scores when taught with global rather than analytic strategies.

Learning to spell depends on multi-sensory input: 'speech and audition to encode the phonemes, vision for recall and recognition of graphic symbols and haptics (tactile/kinesthetic) to write' (Hanna, Hodges & Hanna, 1971). Sensory preferences influence the way children learn. Several studies (Dunn & Griggs, 1982, Dunn 1988) reveal that modality matched instruction facilitates statistically higher scores. Auditory preferences would favor a phonetic approach, visual would be facilitated by word study and orthographic patterns whereas haptics would experience the most success with extensive active writing. Urbschat (1977) found evidence of visual or auditory preferences in the spelling patterns of first graders that impact on successful recall strategies.

Sociological preferences must also be reflected in instruction as indicated in a study by Price (1980). For example, instruction must be multiformat, as in every class tested there was diversity found - there were students who learn best by themselves, those

who prefer to work with peers and others who wish to work directly with their teachers. As well, in general, older students appeared to be less 'teacher motivated' than their younger counterparts.

Students in grades nine through twelve experience a greater need to work alone, contrasting with younger children (except gifted) who learn better in small, well-organized groups. This may be related to the accommodation of mobility requirements, or the multisensory interactions of the participants assisting each other.

Students that are learning disabled or gifted also show distinctions in their learning style. According to Yong and McIntyre (1992), learning disabled children "prefer a formal design (environment) and auditory modalities (perceptual), studying in the late morning (physical) and were less motivated, persistent and responsible (emotional) than their peers who were gifted." (p. 128)

Research into learning style preferences "provides a basic framework upon which a theory and practice of instruction can be built. It makes obsolete any single framework for teaching all students." (Keefe, 1979, p. 131). The diversity of learning styles must be reflected by diversity in pedagogical strategies. The presentation of concepts using multi-sensory methods, flexible assignment and lesson formats accommodating various styles and environmental modalities will enhance learning for all students.

Assessment and Evaluation

The area of assessment and evaluation is one that has undergone changes and revised thinking. The traditional practice has been to simply score words as correct or incorrect. In light of developmental, cognitive and metacognitive research this method proves unsatisfactory, both for research and pedagogical use. A more informative and diagnostic technique is that of error analysis as a curriculum-based measure (CBM).

Research (Fuchs, Fuchs, Hamlett, & Allinder, 1990; Wong, 1992) confirmed the efficacy of CBM in determining and revising appropriate goals, judging student growth and monitoring and revising plans. CBM measures provide evidence and data that may be used in determining the etiology of the error, thereby providing a rationale for pedagogical decisions and research conclusions. Mean levels of student growth increased as the supplemental CBM information became more descriptive. Teachers who engaged in skills analysis cited a greater number of skills for instruction and showed greater proficiency in identifying phonetic errors, thus indicating that teachers became better able to design programs to enhance achievement.

The classroom based qualitative studies discussed earlier (Gentry, 1982, Henderson & Beers, 1980) have shown that because "most students engage in systematic, non-random attempts at spelling, a legitimate argument can be made for isolating possible error patterns." (Gable, Henderson, & Meeks, 1988, p. 116). These

error patterns reflect the child's knowledge base and developmental level. Knowledgeable inferences can also be made as to the cognitive or thinking processes the child employs.

Spelling evaluation for both research and teaching validity should take into account not only actual errors, but attitudes and interest, internal and external sources currently used, as well as the ability to recognize errors (Buchanan, 1989). Miscue analysis, as espoused by Goodman, Watson and Burke (1987) has been promoted to identify these qualitative aspects of reading. A similar analytic approach has been applied to spelling by Buchanan (1989). The Misspelling Analysis documents and records student's use or non-use of phonetics, phonics, syntax and semantics as a basis for individual and group pedagogical decisions.

Spelling as a Cognitive and Metacognitive Process

Spelling requires the co-ordination of several sources of information: individual sounds, phonemic relationships, orthographic patterns as well as semantic and syntactic knowledge of the word. Effective application of this word knowledge is a cognitive act requiring active metacognitive processing. Researchers in the field of cognitive based instruction have provided valuable knowledge and insights in assisting children in this application.

Because experts spellers have gained automaticity, their skills are 'tacit' or not obvious to themselves nor casual observers. If research can "build explicit models for formerly tacit processes, then it becomes possible to teach these processes, either directly or through appropriately selected practice." (Larkin, 1979, p. 110). Wong suggested that having experts "think aloud" (1992,p. 150) their thought processes continuously or on a new and difficult task will provide these models. The models can then be used in planning direct instruction and/or structuring activities for guided practice in the awareness and use of practicable strategies. Isolating these component processes and designing instruction to overtly teach them will facilitate increased achievement.

A study by Radebaugh (1985), involving third and fourth grade students indicated that children are able to identify strategies and give information that will assist the teacher or researcher in explicating and understanding these strategies. Her study provided data as to the strategies employed by good and poor spellers as follows:

1. poor spellers reported fewer strategies,
2. only good spellers used mental/visual imaging,
3. poor spellers used sound by sound or letter by letter strategies,
4. good spellers think about the sequence of letters or sounds,
5. good spellers broke words into parts (not necessarily

syllables),

6. good spellers think about smaller known words or parts of words,
7. good spellers combined larger word segments with a visual image of "how the word looks: (p. 536).

Block and Peskowitz (1990) also identified successful strategies. They found that competency increased when visual inspection was used after spelling and with the presence of auditory information through active pronunciation.

Components of a spelling program must, therefore, include not only activities that increase the child's word knowledge, letter/sound association and orthography, but also strategies to apply and monitor spelling accuracy. Wong (1986) found that neither knowledge nor strategies alone were sufficient to ensure accuracy. This was evidenced in an examination of the efficacy of placing concurrent and equal emphasis on self questioning strategies and structural analysis methods. The almost 80% retention rate achieved two weeks subsequent to the investigation attests to the importance of this dual emphasis of domain specific and strategic knowledge.

Despite the abundance of research, many school aged children still cannot spell. Those for whom spelling is a struggle, such as the learning disabled, emotionally disturbed as well as many regular education children, are often "passive learners" (Weins, 1983). Such

children exhibit little active cognitive exploration independent of teacher direction. Studies have indicated that they often lack an intent to learn as a result of cumulative failures and show a lack of efficient learning strategies (Torgeson, Murphey, & Ivey, 1979). Systematic instruction in creating motivation and overcoming these deficits is necessary for academic success (Weins, 1983).

The component of awareness and application of cognitive strategies and monitoring accuracy (metacognition) is one that merits further discussion. Research in this area, as reported by Wiens (1983, p. 144) highlighted the following rationalizations for instruction in metacognitive awareness:

1. the child is more likely to become an active learner,
2. cognitive monitoring is a developmental process that can be taught,
3. an understanding of metacognitive skills can greatly enhance the student's ability to use appropriate strategies.

Researchers (Paris, Lipson & Wixson, 1983, Swanson, 1989, Palinscar & Ransom, 1988, Wong, 1986, Wade & Reynolds, 1989) concur that effective learning is strategic. It requires "skill (knowledge) and will (conscious monitoring)" (Paris et al., 1983, p. 304, parentheses added) or a combination of "both strategies and domain-specific knowledge" (Wong, 1986, p. 172). Word knowledge and effective learning strategies are the underlying requisites for

accurate spelling, but metacognition, "*the knowledge of the factors that affect the learning activity, as well as control of these factors*" (Palinscar & Ransom, 1988, p. 784), determines how well these strategies are applied. These findings were confirmed in studies by Orsetti (1985) and Block and Peskowitz (1990), that provided evidence of metacognitive variables and their effect on learning to spell. Self-questioning and error-monitoring develop a "spelling consciousness" (Block & Peskowitz, 1990,p. 51) that enhances spelling competence. These strategies also appear to facilitate the subsequent acquisition of more complex multi-syllable words. Implications of these studies also suggest the necessity of direct verbal instruction in metacognitive skills for optimal effect.

An interview based study by Rule includes quotes from the child involved. They are indicative of reflective, metacognitive thought. "I don't think spelling matters until the final draft.", "When I read it through, it doesn't look right so I try again.", "The first time I spell the way I hear them."(1982, p. 383). Direct information such as this can prove invaluable to a teacher. Articulation of a student's thought processes can provide direction for learner focused instruction, as well as for evaluation of the instructional plan.

The importance of cognitive and metacognitive processing is emphasized with the melding of current and past research. Current research in language acquisition emphasizes the necessity of

maintaining the motivational link with meaning. Neuropsychological research has demonstrated the importance of accommodating individual learning modalities. Linguistics research has exemplified the complexities of the English orthographic system. Educational psychology has delineated several successful instructional strategies for recalling spelling words. There is no single successful strategy for achieving standard spelling for all words, for all spellers. Competence demands the self-selection of the most appropriate strategy, for the individual student, for the particular word being attempted, given the current available orthographic knowledge, as well as a secondary strategy to employ if the initial selection proves unsuccessful through accuracy monitoring. This self-selection and monitoring are only possible if the child has metacognitive awareness.

Developmental Spelling Research

As noted earlier there have been numerous analytic studies that explicate spelling and writing as a developmental process. The following sequence of conceptual development was noted by Ferreiro and Tegerowsky (1982) through analysis of writing samples of young writers:

1. A correspondence is noted between the quantifiable aspects of an object (length, size, magnitude) and the string of marks that represent the object.

2. Symbols are not repeated randomly or endlessly.

3. The linear order of symbols signify differences in meaning.

This progression exemplifies the process that evolves as children first attempt to represent objects and ideas symbolically. They are not 'spelling words', rather they are 'representing meaning' with symbols. This link with meaning provides the motivation and reason to spell and remains crucial to the evolution of spelling competence. (Graham & Miller, 1979) The fact that written expression is so irrefutably linked with conveying meaning is vital to effective instruction. Motivation to convey meaning is removed when artificial strategies such as word lists are employed. The goal, then becomes one of memorizing words for a spelling test rather than conveying meaning (Graves, 1976). The only motivation that remains is a good grade on a spelling test and does not transfer to pragmatic use. (Beers, Beers & Grant, 1977)

Developmental spelling levels have been similarly studied and described by Gentry (1978, 1982) and Henderson (1981). It is theorized that children initially reflect a *pre-phonetic* stage, which is characterized by a lack of knowledge about speech sound and letter correspondence. Letters are used indiscriminately to represent words, illustrating an emerging awareness of the link between oral and written language. The *semi-phonetic* stage reflects a growing connection between speech sounds and letter names, in which rudimentary signs of a phonetic awareness are

present. One or a few letter sounds are used, such as initial and/or final consonants. For example, a child might spell "monster as MSR; closed as KLS; swimming as SM" (Gentry, 1978, p. 92). The third or *phonetic* stage incorporates a more accurate letter-phoneme correspondence. In this stage the child might spell "closed as CLOZD; peeked as PEKT" (Gentry, 1978, p. 91). Increasing awareness of English orthography is noted in the *transitional* stage, where the child "relies heavily on morphological forms and visual memory" (Gentry, 1982, p. 57), although may not apply them correctly. The child might now spell "monster as MONSTOR; chirp as CHURP; toad as TAOD" (Gentry, 1978, p. 91). The child eventually reaches the final, *correct*, stage, in which the correct lexical representation or 'standard' spelling is used. (Henderson, 1981, Gentry, 1978).

Phonics

Phonics is probably the most controversial and widely debated aspect of written language acquisition. It has been severely criticized as a topic for direct instruction by proponents of developmental spelling (Gentry, 1982, Zutell, 1980, Read 1971, Forester, 1980, Personkee & Yee, 1971). But conversely, as Graham and Miller attest, "there is a large body of research (that) supports the contention that intensive phonics instruction creates greater gains in spelling than non-phonics approaches." (1979, p.5)

The influence of phonic instruction on spelling achievement was studied by Cramer in 1969. The evidence suggested that, although there is little agreement about what constitutes a good phonics program, there was a relationship between phonemic knowledge and spelling ability and therefore "some phonic training may be of substantial benefit to spelling achievement." (p. 502). This relationship could be influenced by the type of language program the children were exposed to. The group that received a broad exposure to language experiences in meaningful writing situations achieved better results. Auditory and visual discrimination was also seen to be a significant factor. A study by Ball and Blackman (1991) compliments these findings. They investigated the correlation between the development of spelling ability and phonemic awareness training. Conclusions were that phonemic awareness was predictive of success and that training in segmentation improved accuracy in children's invented spelling.

The most common evidence cited (Graham & Miller, 1979, Groff, 1986, Cramer, 1969,) in support of a phonics approach is a study conducted by Hanna, Hanna and Hodges in 1960 that indicates that 49% of 17,000 words could be spelled correctly using phoneme-grapheme correspondences and a further 37% could be spelled with only one error. Although vowels lacked regularity, consonants retained an 80% consistency rate. These statistics attest to English orthography as a patterned system, albeit incomplete, and therefore

predictable. This phonetic predictability is felt, by Patrick Groff (1979) to provide a "security base for children in spelling, a security base that should be eagerly sought." (p. 272) He further contends that an understanding of children's naturalistic attempts at spelling provide no special or superior recommendations for teaching.

Critics of formal structured phonics instruction derive their postulations from data gathered over the past two decades as to how children process spelling. The sources are mainly the qualitative studies discussed earlier in this chapter, but ironically, as well, the study by Hanna, Hanna and Hodges referred to above is also cited as demonstrative of the inefficiency of directed phonics instruction (Beers, Beers, & Henderson, 1977). Evidence extrapolated from the exhaustive qualitative studies theorists (Gentry, 1982) suggest that children should receive no formal phonics instruction, as it is felt that such instruction will restrict the fluency of written language production and create a dependency on memorization. Phonics is felt to inhibit active learning and concept development.

From investigations into spelling instructional practices, Personkee and Yee (1971) corroborate Hillerich's (1982) contention that "schools have done an excellent job of creating phonetic misspellers" (p. 301) because students often missapply generalizations they do not clearly understand. Clymer (1963) found that only eighteen of forty-five generalizations were useful. Beers and Henderson (1977) found that most misspelled words in

children's writing were phonetically correct. They feel that direct instruction in isolated phonics skills encourages children to rely on this singular method of encoding words, rather than on higher level cognitive processing skills. A similar study by Beers, Beers and Grant (1977) found three phonics based strategies accountable for most errors - letter names and insertion or substitution of vowels. "To learn to spell is not to get into the habit of associating sounds directly to letters." (Gentry & Henderson, 1978, p. 632)

Fluency and confidence in the expression of ideas is considered to be of paramount importance, therefore "nothing that teachers do should inhibit children in their writing." (Buchanan, 1989, p. 6). Beers, Beers and Grant theorized that it is more important to give children the opportunity to explore words in context than to write lists of spelling words. "Children develop their own spelling strategies by reading and writing, not by using phonics." (1977,p.242) The best way to facilitate this fluency and phonemic awareness is to provide many opportunities for creative or independent writing, utilizing 'invented spelling' and not being held accountable for adult spelling standards (Gentry & Henderson, 1978). Bean and Bouffler (1987) suggest that "the alternative to lists and rules is an integrated reading and writing program." (p. 72)

Instructional Implications of Developmental Spelling Research

Instructional implications of the developmental progression, described by Gentry (1982), and Forester (1980), are that children receive no formal spelling instruction until they reach the last stage - that of correct spelling. (Forester, 1980, Gentry, 1982). It is felt that direct instruction before this point would interfere with the natural development and that isolated skill instruction would actively negate the motivational concept of conveying meaning. Researchers conclude that in place of formal instruction, the child should be allowed and encouraged to "evolve and refine his own patterns of spelling, much as he evolved and refined the patterns of spoken language." (Forester, 1980, p. 186)

Co-ordination of developing lexical knowledge will be better facilitated by structuring activities and experiences that overtly guide and prompt the 'discovery' of spelling knowledge about phonemes in words, grapho-phonemic relations, orthographic patterns and semantic and syntactic knowledge (Wong , 1986). These experiences can and should be presented within the context of pragmatic writing and not as isolated exercises. Immersion in a language rich environment in which observations are celebrated, shared, and verbalized allows the child to self-select and refine from this context "those parts for attention for which he is ready" (Forester, 1980, p. 190) This will be most readily facilitated through the creation of an environment in which children write frequently, creatively and purposively. Such meaningful experiences

will allow children to "formulate, test and evaluate their own hypothesis about orthography" (Zutell, 1980, p. 64). Based on this research, it is incumbent on practitioners to actively and consciously structure numerous opportunities for discovery of orthographic generalizations as part of a spelling program.

The necessity of accommodating developmental spelling research in classroom instruction gains new and additional importance with the current educational trend of inclusion of all children, including those with special educational needs, within the regular classroom (Stainback & Stainback, 1988). Increasingly diverse groupings of abilities, age ranges and special needs children are evidenced in today's classrooms. The British Columbia Ministry of Education philosophy (Sullivan, 1988, Primary Program Foundation Document, 1990) reflects and encourages such diversity. Traditional, domain and level specific spelling programs will meet the needs of only a relatively small percentage of the classroom population, thus further supporting the exigency of open-ended lessons that allow for self-selection and individual developmental progression.

Traditional Spelling Curricula and Methodologies

Research has yielded numerous effective word study techniques devised to aid children in learning to spell individual words. These include, among others, the Visual-Vocal Method

(Westerman, 1971), the Horn Method (E. Horn, 1954), the Gilstrap Method (Gilstrap, 1962) and the Corrected Test Method (T. Horn, 1947). The commonality of these methods is their application of a perceptual modality to the memorization of a pre-determined word list. Their success corroborates learning styles research and provides strategies for rote memorization or recall of individual words. However pragmatic application may be limited to a small number of troublesome words.

Traditional spelling curricula have persisted with basically the same sequence and categories of activities or exercises (Graves, 1976), some of which are actually felt to be detrimental (Cohen, 1969), thus pointing to a need for re-evaluation. A study by Fitzsimmons and Loomer (1971) and confirmed by Allred (1977) found that instructional practices are influenced more by habit than research results. Spelling programs, as documented by Dietrich (1973) and Jobes (1975) reflect a predetermined sequence of progression and strategies and leave little room for teacher discretion or accommodation of individual student growth. Little accommodation is noted of the incorporation of the developmental spelling research previously discussed. The weekly exercises generally follow an introduction, pre-test, word study, post-test sequence. The word list is the same for all children regardless of developmental level or ability. Individualization, if any, usually occurs through the often unmanageable use of a variety of texts or

groupings or in a reduction of the number of words to be studied for less able students. An aggregate analysis of basal spelling lessons indicates that they emphasize phonics (33.6%), affixes and inflectional endings (23.7%), language arts skills (20.2%), word meaning (14.6%) and syllabication (7.9%) (Cohen, 1969). The insular nature of pre-packaged basal programs creates a curriculum separate from the writing program and as such are not congruent with language acquisition research as previously discussed.

There is a lack of studies of the efficacy of using word lists in teaching spelling. Graves (1976), however, indicated that learning to spell lists of words and learning to spell are two different processes. Beers, Beers and Grant (1977) postulated that memorization of lists does not indicate understanding. Teachers often complain that children perform well on weekly tests of these words yet still evidence poor spelling in their writing (Gentry, 1982). Graves maintains that this is because the message the Friday test carries is that "spelling is for exercises, not for writing." (1977,p. 90).

The word lists that have formed the basis for most basal spelling programs do reflect intensive research. Numerous studies have documented and confirmed the high frequency words that are consistently found in children's reading and writing. (Gates, 1937; Thomas 1979) at varying grade levels. The Canadian Spelling Program (1979) is based on research findings from two Canadian

studies conducted by Ves Thomas (1972, 1976). The method of research was computer analysis of 8000 children's compositions which yielded a core list of 3000 most frequently used words, of which 360 were identified as frequently misspelled. Similarly, Jacobsen analyzed 22,650 student compositions from students in grade two through twelve for the types and frequencies of words children use. The consistency of spelling errors has also received much attention. (Gates, 1937; Spache, 1941) The lists generated have been broken into weekly components and presented in formal and informal spelling programs with accompanying exercises to help children 'learn' or memorize them.

As Henderson and Templeton (1986) pointed out, the difficulty has not been in the selection and sequence of words, but rather in our lack of understanding and application of how children learn to spell. No textbook or recommended word list can account for individual student differences. Only a competent teacher has that information. Student reading expertise, interests, dialect, and words utilized in current independent writing are individual to each student and classroom. Consequently formal word lists can provide useful and interesting guidelines for word study, but do not, in themselves, constitute a spelling program.

The program developed by Thomas (1979) is based on the following assumptions, most of which (boldface added) do not differ significantly from developmental and cognitive theorists:

- 1. Spelling is an essential aspect of writing.**
- 2. Learning to spell is a challenging task requiring time and effort.**
3. A core of high-utility words is a practical and logical basis for a spelling program.
4. Words in list form focus attention better.
- 5. Systematic reintroduction of problem words yields better results than singling out such words for special attention.**
- 6. Instructional strategies must include the transfer of basic spelling skills to writing in context.**
- 7. Knowledge of sound-symbol relationships is essential, however, it should not be overemphasized.**
- 8. Opportunities should be provided to focus on particular oral and visual aspects of words.**
9. The pretest-study-test sequence is the most effective approach to organizing instruction.
- 10. The self-corrected test increases the possibility of success. Analysis of spelling errors provides valuable diagnostic information.**
- 11. Individual record-keeping provides feedback to the learner and teacher.**
- 12. Planned proofreading practice will help pupils to recognize misspellings.**

13. The ultimate goal is self-diagnosis and self-correction of spelling errors.

The difference lies in the philosophical belief that spelling is an integral part of language and cannot be effectively taught as an isolated curriculum. To remove it from the context of writing adversely affects development of spelling use and knowledge.

Alternate Curricular Emphases

Other researchers have been less radical or dogmatic in their opinion. Graham and Miller acknowledged the challenges to phonics instruction but summarized that "both theory and evidence suggest that phonics instruction may be of some benefit in learning to spell" (1979, p.172). Personkee and Yee cautioned teachers to avoid the danger of assuming an "all-or-nothing" or "either-or" stance (1971, p. 19).

The controversy about the inclusion or exclusion of phonics overemphasizes the belief that English orthography is purely alphabetic and therefore children must rely on memory of phonics rules or irregular words for mastery. A further perspective of spelling must be examined; namely that of the relationship of spelling and literacy.

Our orthographic system is an orderly and systematic one when viewed and described linguistically. An analysis of spelling presented by Henderson and Templeton delineates a progression of

the purely alphabetic system into subsystems of pattern and meaning relationships. "Through such order, English spelling achieves a near optimal visual presentation of our complexly derived language "(1986, p. 314). The primary representation is largely an alphabetic one - letters match sounds, but the diversity of the ways in which these sounds can be represented has been thought to be the cause of spelling difficulties. For example, the consonant digraph *gh* represents different sounds in the words *ghost*, *enough*, and *high* . The logic only becomes apparent in consideration of two other ordering principles - *within word patterns* and *meaning*. The sound a letter or letters make within a syllable depends on position and the other letters that surround it. Examples of this are the CVC and CVCE patterns that are often found in words. The third principle identified by Henderson and Templeton is that of morphology or meaning. Words or word parts having the same or similar meaning retain a visual relationship to each other. This has particular application to more advanced application, such as homonyms and words such as *condemn* and *condemnation*, or *incline* and *inclination*.

This view of spelling concurs with a study entitled Project 1991, documented by Hanna, Hanna and Hodges (1971) about the predictability of the language based on morphology, and their conclusion that only about 3% of words are "spelling demons" (p. 97) and then only parts of those words. As well, it reflects the

phonemic and transitional stages described by Gentry (1982) and others.

The generate and test strategy is suggested as an effective alternative to phonics instruction (Simon & Simon, 1973). It is a technique that encourages children to generate the best possible spelling based on their current phonetic knowledge and then to visually inspect the word to check accuracy. This monitoring encourages children to attend to parts of the word and to apply linguistic and morphographic knowledge. It is an integrated approach that requires direct instruction.

Few experts would disagree that a good knowledge of grapheme-phoneme relationships are beneficial in achieving orthographic accuracy and yet the postulations of developmental spelling research are equally substantive. The difficulty, as with word lists, appears, therefore, to be not in the efficacy of phonics instruction but in the methodologies employed. Strategies and structured activities that actively encourage the observation, awareness and generalization of phonics 'rules' within the context of children's natural reading and writing would appear to be the primary requisite of effective spelling programs. " A model that focuses on a combination of effective approaches to teaching spelling will show that apparent conflicting approaches are in fact complimentary parts of a complete spelling process" (Tarasoff, 1990, p. 2). Effective spellers tend to use phonological strategies

initially and then add visual orthographic or morphological strategies which eventually predominate (Buchanan, 1989; Gentry, 1982; Tarasoff, 1990). Assessment of the current developmental level will provide clues to the types of activities that should be structured in order to assist children in their spelling progression.

Graham and Miller contend that "each student must be taught an efficient and systematic technique to spell new words" (1979, p. 10). The efficacy of direct formal instruction has been supported by a variety of researchers (Simon & Simon, 1973; Graves, 1977; Ball & Blackman, 1991; Wong, 1986; Horn, 1969; Allen & Ager, 1965; Lie, 1991). It is only the focus of the instruction that has proven controversial.

Buchanan, for example, (1989, p. 11-12) outlines the following suggestions for providing instruction and yet retaining the integration of spelling within the 'whole' language curriculum:

1. real experiences with language in order to formulate hypotheses
2. practice in predicting and testing the spelling of words
3. practice in using the words they have learned how to spell
4. feedback from teachers and peers in the form of conferences and peer editing activities
5. some strategies to help them remember difficult or frequently used words
6. oral language development opportunities

From an analysis of historic, developmental and learning styles research, Tarasoff (1990) has suggested twelve areas that merit emphasis in a spelling program: metacognitive awareness, intrinsic motivation, vocabulary development, risk-taking and invented spelling, visualization, auditory cuing and patterning, kinesthetic/tactile cuing, graphophonic patterns, syllabication or word parts, affixes and inflectional endings, word origins and meanings, and mnemonic devices.

Strategies such as these address the concerns of both developmental and phonics advocates in that they enable the teacher to actively encourage the awareness of phoneme-grapheme relationships, the predictability of written language, and the importance of standard spelling. They do not interfere with pragmatic writing nor fragment language, they facilitate a positive attitude and encourage a monitoring system without relying on isolated skill instruction.

Conclusion

The research presented here indicates a need for revision of spelling curricula, amalgamating the findings from the diverse fields of study.

Both researchers and practitioners will gain more insightful and practicable information through the use of criterion-based measures than with standardized, right/wrong measures alone.

Error analysis methods can provide deeper understanding of how children process their spelling knowledge, as well as information as to the developmental levels, upon which more reliable conclusions and decisions can be made. Data would be extrapolated from children's daily, pragmatic writing.

The complex cognitive processing required for spelling can be facilitated by ensuring that children develop metacognitive awareness. Spelling requires, not only orthographic knowledge and understanding, but strategies for applying their knowledge as well. Application and monitoring strategies of good spellers can be identified and taught, thereby encouraging children to be active learners.

Structured, didactic instruction is felt to be more efficacious than indirect learning in ensuring progress for all students. Traditional drill and practice activities relying on the memorization of a predetermined word list, though, do not appear to be effective and should be substituted with activities that enable children to develop their own generalizations. Activities should be devised to make phonetic structures explicit to children, as there is a high correlation between phonetic awareness and spelling competency. Structural and semantic patterns which reinforce the predictability of our orthographic system should become the focus of spelling lessons as children move to the transitional and correct stages of development.

A variety of generalizable spelling strategies, such as visual imagery, auditory cuing and mnemonic devices would incorporate our increased understanding of the impact of individual learning styles, as would the use of methodologies such as co-operative group activities. Shared student observations and discussion will facilitate internalization and metacognitive awareness of emerging understandings through verbalization. Guided practice should be a part of spelling programs, but should reinforce application and monitoring of the generalizable strategies within the context of pragmatic writing. Proofreading skills should also be encouraged.

In conclusion, spelling instruction should focus on *how* to spell not *what* to spell.

III Method

Hypothesis

It was hypothesized that within a whole language framework, children will make significant gains in spelling achievement and in their use of standard spelling in written communication when given direct, formal instruction in generalizable spelling strategies without the use of predetermined word lists, as contrasted to self-directed, informal instruction.

'Whole language' was defined as a language acquisition philosophy that emphasizes that "language is inclusive, and it is indivisible." (Goodman,1986, p27) Theorists such as Gentry (1982) and Beers and Henderson (1977) have emphasized that spelling should not be taught through isolated memorization of selected word lists, but rather through integration with reading and writing. In accordance with this research, the spelling methodology described here subscribed to the goal of developing skills that enhance the child's ability to use standard or orthographically correct spelling in their independent writing., rather than by isolating predetermined word lists to be learned.

For the purposes of this study, 'direct instruction' was operationalized as a structured period of sixty to seventy-five minutes per week, directly engaged in the didactic presentation of

strategies aimed at increasing the child's awareness and application of spelling knowledge and strategies. A more complete explanation of the methodology will be presented later.

'Self-directed' methods were conceptualized as those where the teacher points out spellings, patterns and generalizations while the child is involved in reading and writing activities. No formal, structured time is set aside for teaching spelling.

'Generalizable strategies' were defined as techniques or methodologies that focus on the process of spelling rather than just on the orthography. They are intended for use in independent writing as opposed to memorizing word lists. Elements of an effective strategy enhance phonemic and orthographic knowledge, provide a systematic means to analyze and remember spellings, as well as develop metacognitive awareness to facilitate the use of this knowledge to create written communication.

'Gains' in spelling were operationalized as levels of competency as measured by a standardized spelling test, the increase in the percentage of standard spelling used in independent written communication, and the level of metacognitive awareness of a variety of spelling strategies and orthographic generalizations as expressed in direct questioning.

Methodology

Subjects

A total of sixty-five students received instruction in the strategy-oriented methodology being examined in this study. They comprised three classes of grade four, five and six students which will subsequently be referred to as the 'treatment group'. Data were also collected from two classes that received only informal, self-directed instruction. As these classes were a grade four and a grade seven, statistical comparisons are not practicable, but the data gathered will be presented as information. This group will be termed the 'observation' group. All subjects were from the suburban school district of Burnaby. The two schools involved were geographically proximate and socio-economically similar.

All classes involved were regular education classes containing heterogeneous groupings of ability and each class contained a number of children for whom English is a Second Language (ESL) and at least one Severe Learning Disabled (SLD) child, reflecting the district's philosophy of inclusion for students with special learning needs.

In the treatment group, two classes were grade four/five split classes, and one was a grade five/six split class. Subjects ranged in age from 8.1 to 12.8, (mean age 10.63; standard deviation: .96). As indicated above, the observation group involved a grade four class and a grade seven class. Classes participated in the study as

complete units as the treatment was presented within the regular language arts curriculum. For this reason, the only students that were excluded from the study were a group of ESL students from the grade seven class that were receiving instruction in another setting during the presentation times.

Instruments

Test of Written Spelling: The Test of Written Spelling (TWS) is a group-administered test that was designed to measure spelling achievement from grades one through eight. It consists of subtests of *predictable* words which indicate "mastery of a certain number of rules and generalizations" (TWS, p. 9) and *unpredictable* words "that do not conform to frequently applied rules" (TWS, p.9). Words in each of these categories are dictated in isolation and in a sentence. The results of this test may be used to determine grade equivalency scores, spelling quotients and spelling ages. The test was chosen because the standardization population generally reflected the representative population used in this study in the variables of location, socioeconomic status, grade level and age, as well as for its feature of dividing words into predictable and nonpredictable words, allowing more in-depth data analysis. Item validity was strongly supported by large coefficients, ranging from 51 to 63 percent (TWS, p. 22) of students spelling each word

correctly, thus making the TWS a valid indicator of spelling ability. Reliability measures reflected statistically significant coefficients of 89 to 91 (p. 24) at the grade levels being studied in this project. Correlation with other standardized measures of spelling ability also revealed significant ($>.01$) levels of confidence.

Informal Writing Analysis: Analysis of an independent writing sample was completed for each subject in order to measure the application or transfer of spelling knowledge to pragmatic writing. A sample of independent writing was obtained at the beginning of the study and the same sample was dictated to the student as a post test measure. This repetition attempts to control the extraneous variables of maturation and complexity of language.

Scoring involved a calculation of the percentage of errors in the writing sample, based on the total number of words. Misspelled words, including omission and substitution of capital letters were counted as errors. For the purposes of this study, sentence punctuation errors were not included.

Metacognitive Questionnaire: A written questionnaire was developed to investigate the students' awareness of a variety of spelling strategies and to reflect their attitude to and application of these strategies. This questionnaire was based on one developed by Graham (1986). It was included in this study for the purpose of exploring the effect of the treatment on metacognitive awareness.

The questionnaire was developed prior to commencing this research and administered to three separate intermediate classes as a pilot. The sample responses for questions 1, 2, 3, 4, 6, 7, and 9 were listed, categorized and rated as indicative of metacognitive awareness. From this, a marking key was devised, with a total possible of fourteen. Each question was assigned a value of 0-0.5-1.0-1.5-2.0. A score of 2.0 was awarded for responses revealing awareness and/or application of more than one spelling strategy. For example, question 2 required the subjects to relate how they spell words when they are writing a story or journal. An answer that included "I don't know" or no strategy listed was scored as 0, whereas a response that indicated at least two different strategies was scored as 2.0. A complete scoring key has been included as Appendix 2. The questions not included in the numerical scoring were included for anecdotal information.

Two versions of the questionnaire were developed to provide pre- and post-test comparisons. The questionnaires differ only in question format and the inclusion in the post-test of items in the advocacy scale reflecting strategies taught during the study. The full ten item test and five item advocacy scale were administered to all subjects prior to training. The post-test administered to the treatment groups included the additional items, whereas, the one administered to the observation groups did not. Copies of the two

versions and the scoring key have been included as Appendices 1 and 2.

Procedure

The instructional part of this study was presented to the students as a part of the regular language arts curriculum. As it in no way constituted an alteration of normal programming, it was not deemed necessary by either the school principals nor the Administration Officer for the school district to obtain written consent for participation. The course of study spanned a period of six months, from November to May. Data collection in each class were concurrent. The instruction, as well as the pre- and post-testing, in two of the three treatment groups was carried out by the researcher and in the third by the classroom teacher in consultation with the researcher. Every effort was made to maintain consistency in teaching methodologies. No separate instruction was given to the observation groups. Pre- and post-test measures were administered by the classroom teacher to ensure reliable results.

Prior to beginning instruction, the students were pretested with the measures previously described. The TWS was administered to the each class. A sample of independent writing was collected from a journal entry or a piece of draft writing. The students wrote on a thematic topic and had the opportunity to proofread their writing independently if they chose. A copy of this writing was

made and retained to be presented as a post-test measure. The metacognitive questionnaire was completed as a group, with the classroom teacher and the researcher being present to explain or give individual assistance as required. Any answer that was unclear was later clarified orally with the student by the researcher.

Training

Observation Group: The observation group consisted of forty-one students in two classes. One class was a grade four with a total of 21 students with a mean age of 9.44, (standard deviation: .34) and the other was a grade seven class with 22 students. The mean age was 12.6 (standard deviation: .31). They received no intervention from the researcher. Spelling instruction for this group consisted solely of informal, incidental methods presented within the reading and writing program, as suggested by Gentry (1982) and Bee, Beers, and Grant (1977). Spellings, patterns, and 'rules' were incidentally pointed out while the students were involved in reading and writing activities. Proofreading of draft writing was encouraged, with the teacher monitoring errors and providing instruction during individual conferences. Although some phonics instruction was given in conjunction with the reading program in one of the classes, no formal spelling program was used with students in these two classes.

Treatment Group: The treatment group consisted of three classes containing twenty-one, twenty-two and twenty-two (mean 21.6, standard deviation: .58) students. These students were introduced to generalizable spelling strategies (which will be subsequently described in greater detail) through didactic instruction during a structured, scheduled spelling program. The rationale for the strategy was discussed, the format described and examples modelled, first by the teacher and then by students. Practice was followed by discussion and recording of applicative observations and understandings in a 'Spelling Log' (described later). Average instruction time allotted to spelling was sixty to seventy-five minutes per week, this being posited as optimum by Graham and Miller (1979). Practice in strategy use was encouraged during independent writing activities integrated into all areas of the curriculum.

The teaching methodologies used to present the strategies and provide practice were geared to help students become aware of and apply semantic and syntactic knowledge in conjunction with phonics through discussion, observation and use within context. An example of such a methodology is *cloze* activities or "minimal cue messages" (Buchanan, 1989). A piece of literary text was prepared by omitting words or letter clusters, thereby forcing the students to rely on semantic and syntactic cues. The passage was presented either using an overhead projector with the whole class, or in small

co-operative groups to encourage meaningful discourse. The words were spelled by volunteers and a rationale for the spelling provided. An overview of a specific lesson utilizing this teaching strategy, entitled *Cloze Encounters of a Spelling Kind*, has been included as Appendix 3.

Brainstorming and categorizing activities (Brownlie, Close & Wingren, 1988) were used to extend awareness of graphophonemic patterns. These techniques were used specifically to develop knowledge related to prefixes and suffixes. As a large group, words that contain affixes were brainstormed and recorded, and a copy of the list of generated words was given to small co-operative groups. The students were directed to sort the words into categories. The categories devised by the groups reflected such orthographic patterns as the semantic nature of the affix and the 'rules' of adding suffixes. These were presented to the large group, discussed and recorded in the students' own language. *Flower Power*, an outline of a lesson utilizing these strategies, has been included as Appendix 4.

Proofreading was another major emphasis during daily lessons. Block and Peskowitz found that "visual discrimination increased the number of students who were *discriminating decision makers*" (1990, p162). Proofreading of personal writing was felt to encourage and provide practice in such visual discrimination, thus facilitating a "spelling conscience - a desire to spell words correctly" (Graham & Miller, 1979, p7). Techniques used included

proofreading of an overhead transparency of a student's writing, working with a student partner, or small co-operative group proofreading of student recorded, brainstormed lists as described above. Students were encouraged to share their thinking, 'ask an expert' (peer or teacher), and to use word lists or dictionaries.

The Spelling Log, adapted from Brownlie, Close and Wingren (1990) was a personal notebook kept by each student, in which were recorded observations, understandings and new learning gleaned through class activities and discussions. For example, following a discussion or activity the students would respond in their own words to prompts such as "Tell how or when you use this strategy", "What did you learn about adding endings/'bossy R's' today?" "How will this strategy help make you a better speller?". It was also used to assess and evaluate student progress, as the entries made were read by the teacher and/or researcher. Personal dictionaries were also kept by each student, in which they recorded the correct spelling for new or misspelled words in writing activities or words that interested them.

"The single most effective technique in learning to spell is when the student corrects his or her own errors immediately after taking a spelling test" (Graham & Miller, 1979, p.11). This postulation was supported by student comments on the pretest questionnaire used in this study, which indicated that they felt that taking spelling tests was beneficial in learning to spell. For this

reason, a weekly spelling test was incorporated. The students worked with partners and dictated ten words to each other. These words were randomly chosen by the dictator from the dictatee's personal dictionary rather than from predetermined word lists. Following dictation, each student corrected his/her own test with support or assistance available from the teacher. Errors and successes were shared as a large group which included deductive rationalization for errors, difficulties with individual phonemes or structural analysis, or strategies used. The students really seemed to enjoy this activity, as evidenced by numerous positive comments and enthusiastic interlocution.

Strategies:

Wong(1986) concluded that both word knowledge and effective strategies should be emphasized concurrently. She suggested that "strategies are necessary to activate spelling schemata of words and prompt children to check accuracy"; (P. 172). The four spelling strategies used in this study were adapted and developed by the author based on the research findings discussed in Chapter II. Each attempted to provide children with efficient, transferable means of achieving standard spelling in their writing.

Spelling is " a cognitive act in which children co-ordinate several sources of word knowledge" (Wong, 1986, p169), including phonemic patterns and relationships as well as semantic and

syntactic knowledge. Elements of each strategy focused on increasing or developing phonemic and word knowledge by cuing students to analyze configurations either visually or auditorily. Such word analysis should access prior word knowledge as well as provide opportunities for increased awareness of graphophonemic generalizations. All strategies were presented through direct instruction as this method has been suggested to be the most effective and efficient by Horn (1979) Allen and Alger (1965) and Groff(1979), in a whole class format. Opportunities were provided for practice during curricular writing activities. Each strategy was given an acronym or mnemonic title because it was felt that this would better enable the students, particularly the poor spellers, to remember and apply them.

One aspect of metacognition is the awareness of and ability to self-select from a variety of successful strategies (Palinscar 1988). For this reason, and through incorporation of research in learning styles (Dunn 1988), four strategies were taught to all students in the experimental group. These will be described in greater detail below.

Image Copy Examine: (ICE) is a strategy that directs students to *imagine* the visual configuration of the word they are trying to spell in their mind by thinking of the last time they saw it. They then *copy*, from the visual image, onto their paper and finally *examine*

the word to see if it 'looks right'. A more comprehensive profile of this strategy has been included as Appendix 5

The rationale for ICE was provided by numerous studies (Graves, 1976; Radebaugh, 1985; Simon & Simon, 1973) which suggest that visual analysis of words is beneficial in recalling the spelling of words. It was evident from the Radebaugh (1985) study and substantiated by the metacognitive pretest used in this study, that children, especially poor spellers, are often able to cite only 'sound it out' as a strategy to spell new words. As this may be an ineffective strategy for particular words or for visually oriented learners, ICE was included to encourage the use of visual imagery as a alternative strategy.

Students were encouraged to see similarities in orthographic form as they created images (Templeton, 1986) as well as actively explore the connections between spelling and meaning as they wrote and checked accuracy. The overt emphasis on visual analysis provided opportunities to observe and internalize orthographic generalizations, thus providing a more direct link with phonics rules (Templeton, 1986). The self-checking aspect (examine) was included to facilitate metacognitive awareness and self-monitoring, as suggested by Wong (1986) and Block and Peskowitz (1990).

Sound In Parts: (SIP) is a strategy that endeavored to facilitate grapho-phonemic encoding skills through the development of

auditory discrimination. The positive effects of phonics has been documented by a number of experts (Cramer, 1969; Graham & Miller, 1979 ; Hanna, Hanna & Hodges, 1971), therefore SIP was included to attempt to address these findings. The ability to discriminate auditory units is predictive of spelling success (Ball & Blackman, 1991), but may not develop optimally without training. Phonological awareness of segmentation can be successfully augmented through direct instruction (Lie, 1991). Radebaugh (1985) discovered through interviews with children that poor spellers attempt to 'sound out' words letter by letter, while good spellers more efficiently sound words in parts or phonemes. Her subjects reported that they "combined larger word segments with visual images of *how the word looks* "; (P.536). SIP was adapted and developed from suggestions by Tarasoff (1990) to provide direct instruction in these skills. Through didactic instruction and teacher modelling, children were taught to break words into parts, not necessarily syllables, and to spell each part individually. Monitoring through self questioning ("Does this look right?") was emphasized once the word had been written. It was felt that such segmentation would facilitate the use of known word parts as well as application of generalizations. The smaller word parts would also be less threatening to poor spellers thus inspiring confidence and a positive attitude. Closer approximations of standard spelling and increased chance of self-correction should be possible as there was more chance that at least

part of the word would be spelled correctly. This aspect of SIP was supported by Simon and Simon's (1973) research leading to the *generate and test* strategy. They attested to the benefits of children being encouraged to attend to parts of words and using them as a basis for generating and self-checking possible spellings. As with ICE, SIP overtly fostered word analysis and metacognitive awareness of an efficient methodology. Grapho-phonemic 'rules' or generalizations should become more apparent as they are 'generated and tested'. SIP allowed and encouraged children to use a combination of phonetic and morphographic knowledge (Templeton, 1983) to spell. It was felt to be a method of teaching that did not isolate rules to be memorized (Gentry, 1982) and yet allowed for internalization of rules through pragmatic use. Presentation of the SIP strategy is described in more detail in Appendix 6.

Morphographs: The spelling strategy entitled 'Morphographs' attempted to cue students to analyze and internalize the lexical structure of English orthography in order to supplement phonological information and resolve the ambiguities of irregular words.

Morphology, as defined by Thorndike and Barnhart (1967), is "the branch of the science of language that deals with the forms of words as affected by inflection, derivation, etc.". Spelling maintains this relationship with meaning visually rather than changing to represent changing sounds (Henderson and Templeton,

1986; Hanna, Hanna & Hodges, 1971). Therefore it was felt to be beneficial to include a strategy that directly encouraged such analysis. Morphographic information aids the application of appropriate graphophonemic information by providing a more visual basis for structural word analysis (Templeton, 1986), and provides for the concurrent development of strategies and structural word analysis necessary for long term success (Wong, 1986).

The inclusion of Morphographs as a spelling strategy was also supported by developmental theorists such as Gentry (1987) and Bean and Boffler (1987). Spelling competence develops through the "extrapolation of new levels of order on the basis of words they know, use and examine" (Henderson & Templeton 1986, p314). These levels of order are increasingly abstract in nature, beginning with simple letter/sound associations, evolving to the spelling/meaning connection (Gentry, 1987).

The areas of focus incorporated research such as Henderson and Templeton (1986) and Buchannan (1989), which indicated that vowel patterns in polysyllabic words, silent and sounded consonant patterns, affixes and homophones related to semantic and syntactic knowledge were appropriate for grade four to seven students who were in the later stages of spelling development. For the purposes of this study, the linguistic areas emphasized were *accidence* - the changes in words that show case, number and tense, and *etymology* - the derivation of words. Primary emphasis was on suffixes and

syllables, although Greek and Latin derivations and homophones were also explored and discussed.

The procedure used for this strategy was to have the students 'observe' (either through contrived or incidental means) a structural pattern, to promote discussion as to the rationale and application of the observed pattern and then to provide practice in the use of the pattern. The practice took the form of generating word lists, locating incidences of use in writing through proofreading or cloze activities and/or direct practise through dictation. Strategy use was prefaced with self-questioning. To spell a new or unfamiliar word the students were directed to ask themselves:

Is there a root word or morphograph I know for this word?

Do I have to change anything to add the ending or prefix?

(After writing the word) Does this look right?

Use in conjunction with SIP and ICE was encouraged. As with the other strategies, practice was followed by recording new understandings in the Spelling Log. Appendix 7 provides an overview of the Morphograph strategy.

RAP: was a strategy that used auditory cuing and patterning to facilitate memory of spelling or to generate possible spellings. It was named to appeal to the current popularity of the musical genre of 'Rap' songs which reflect intonation and rhythm.

To use this procedure, students were instructed to first pronounce the word and then to articulate the letters in a memorable rhythm or intonation. This was repeated several times to 'memorize' the word. They were encouraged to group common graphemes such as '*ght*' or '*tion*' to aid visual and auditory internalization as well as to develop discrimination of analogous sound relationships between known and unfamiliar words (Tarasoff, 1990, Buchannan, 1989). As the letters were verbalized, the word was written to incorporate kinesthetic and tactile cuing. Finally the word was proofread, by self-questioning - "Does this look right?"

Because this strategy relied on memorization, its use was more limited in effectiveness and efficiency than the others presented, but was felt to be a useful methodology for remembering specific, individual "spelling demons" (Horn, 1947) or hard words.

Learning to group words by rhyming and spelling patterns is a way of organizing words to enhance memory (Tarasoff, 1990). It was applicable in generating spellings of long or difficult words, but was also transferable to new words as it focused on rhyming letter clusters. Because students were encouraged to vocalize spellings while writing the word, RAP should provide a useful mnemonic strategy that would facilitate metamemory through a multi-sensory approach. RAP was also supported by work in learning styles which found that Learning Disabled students, who are very often poor spellers, prefer to learn through the auditory mode (Young &

McIntyre, 1992). A description of the RAP strategy has been included as Appendix 8.

In conclusion, the main focus of this study was the investigation of the effects of direct instruction in a strategy based spelling program that adheres to the whole language philosophy of integration and inclusivity on the spelling achievement and use of standard spelling in pragmatic writing by intermediate students.

Specifically, the questions to be addressed were:

1. Did the instructional method have a significant effect on spelling achievement, as measured by a standardized test?
2. What was the effect of the treatment on the types of errors made (predictable or nonpredictable)?
3. Did the instructional method have a significant effect on the use of standard spelling within independent writing?
4. Did the instructional method have a significant effect on the development of metacognitive awareness?

IV Results

The results of this study on the effectiveness of a didactic, strategy based spelling program will be reported in three sections. The first section will present data pertinent to the subjects' ability to spell words in isolation and information related to success with phonetically regular and irregular words, as measured by the Test of Written Spelling (TWS). The second section will report the findings about the subjects' ability to spell within a pragmatic context, as measured by the independent writing samples collected and finally, the growth in spelling knowledge will be reported, as determined by the metacognitive questionnaire. These findings will be related to the hypotheses stated. Section 3 will also include anecdotal information derived from the questionnaire. Within each section, data collected about the observation group will also be presented for information.

Section 1: Spelling Ability Related to Dictated Words

Treatment Group: The priori prediction about the effectiveness of direct strategy instruction was that *students given direct instruction in generalizable spelling strategies would make significant gains in their ability to spell*. This prediction relates to the subjects' demonstrated performance with dictated words.

A standardized spelling test of 60 words was administered as a pre-test and repeated following the six month instructional period. Table 1 reports the raw mean scores, mean differences, and standard

deviations (SD) for the scores obtained from the pre- and post-test measures of the TWS. Since they are often used by teachers, the Grade Equivalency (GE) scores are also included. Examination of these data reveal that spelling competency with dictated words improved following the six month term of this study.

Table 1

Means, Standard Deviations (SD), and Grade Equivalencies (GE), for Total Scores on the Test of Written Spelling (TWS).
(Treatment Group[])

	Mean Score	SD	GE	Mean Difference	SD
Pre-test	34.01	12.9	4.84		
				5.53	5.37
Post-test	39.55	12.2	5.77		

To determine the growth in achievement, the pre- and post-test scores were compared. The results revealed a significant difference of 5.53 (SD - 5.37). Therefore, it is concluded that the spelling achievement reflected by this test occurred as a result of the instruction received.

The first hypothesis, that students receiving structured, formal instruction in generalizable spelling strategies would make significant gains in their ability to spell dictated words, is supported. The results show an increase of 5.53 words out of a total possible 60 words. These scores represent a G.E. increase of 0.93

years. As these gains were made over a six month period, they show achievement that is 65% greater than would normally be expected on this test, which indicates significant growth in spelling ability.

Table 2

Pre- and Post-test Mean Scores, Standard Deviations (SD), Grade Equivalencies (GE), and Differences for the Predictable and Nonpredictable Subscores of the Test of Written Spelling (TWS) (Treatment Group)

		Mean Scores	SD	GE	Mean Difference	SD
Predictable	Pre-test	23.86	7.27	3.9		
					2.69	3.64
	Post-test	26.55	6.03	5.1		
Non- Predictable	Pre-test	10.1	6.53	4.4		
					3.03	3.38
	Post-test	13.1	6.63	5.3		

To determine the *effectiveness of didactic instruction in strategic spelling related to word type*, as posed in the hypothesis, the scores of the TWS were further analyzed. The subscores of the TWS provide information as to the achievement related to word type. The first 35 words of the test are categorized as phonetically regular in their orthography and the remaining 25 are classified as

irregular. Table 2 presents the TWS mean scores, standard deviations (SD), and mean differences for the Predictable (phonetically regular) Words and Nonpredictable (irregular) words subscales. Grade Equivalencies have been included. An increase in means is evident for both types of words suggesting that the treatment was effective.

The pre- and post-test scores were compared to determine the achievement gains. The mean difference for Predictable words is 2.69 (SD= 3.64). For Nonpredictable words the mean difference is 3.03 (SD=3.38). Significant improvement is evident in both types of words, therefore the achievement gains noted over the course of the study may be attributed to the treatment received.

In relation to the priori question as to the effects of the treatment on competence with phonetically regular and irregular words, the data reveal gains were made in graphophonemic knowledge of both types of words, although slightly greater improvement was noted for Predictable or phonetically regular words, as compared to Nonpredictable or phonetically irregular words. The increase in the mean for Predictable words was 2.69 words, (SD=3.64) out of a total possible for this subscale of 35. Expressed as a grade equivalency, the increase is 1.2 years. The Nonpredictable Words subscale reveals an increase of 3.03 (SD=3.38) out of a possible 25 words. This is converted to a grade equivalency increase of 0.9 years. Direct instruction in generalizable spelling strategies is effective for both word types.

Observation Group: The same measures were used to examine the spelling achievement of the observation group who received only informal, incidental spelling instruction in conjunction with their reading and writing program. Analysis of the data gathered from this group also indicates statistically significant gains in achievement as measured by the TWS. These data are presented in Table 3.

Table 3

Means, Standard Deviations (SD), and Grade Equivalencies (GE) for Total Scores on the Test of Written Spelling (TWS).
(Observation Group)

	Mean Score	SD	GE	Mean Difference	SD
Pre-test	41.92	11.23	6.22		
				3.51	4.50
Post-test	45.43	9.97	6.58		

The scores show a mean difference of 3.51 (SD=4.50). These gains, when converted to grade equivalency scores show an increase of 0.58 years over the six month term. Therefore, this type of instruction affects average, or expected levels of growth gains in spelling achievement as measured by the TWS.

To determine the effects on word types, the subscores of the TWS were also analyzed for this group. Table 4 lists the achievement scores for the Predictable and Nonpredictable

subscales of the TWS for the observation group. A gain of 1.41 (SD = 2.43) words out of the possible 35 words is noted for Predictable words and 2.29 (SD= 3.67) of the possible 25 words for Nonpredictable words.

Table 4

Pre- and Post-test Mean Scores, Standard Deviations (SD), Grade Equivalencies (GE), and Differences for the Predictable and Nonpredictable Scores of the Test of Written Spelling (TWS) (Observation Group)

		Mean	SD	GE	Mean	SD
		Scores			Difference	
Predictable	Pre-test	28.19	5.49	5.7		
					1.41	2.43
	Post-test	29.60	4.79	6.1		
Non-Predictable	Pre-test	13.75	6.04	5.3		
					2.29	3.67
	Post-test	16.04	6.02	6.1		

The difference of 1.41 in the Predictable subscale converts to a G. E. gain of 0.4. The Nonpredictable subscore difference (2.29) converts to a G.E. increase of 0.8. As with the treatment group, increases are noted in both word categories but slightly greater increases are observed with phonetically irregular words for this

group. This could be due to the inclusion in the observation group of the grade seven students, who would show more initial competence with phonetically regular words and therefore fewer gains in post-testing. It is interesting to note that, although not statistically comparable, greater gains were observed for the treatment group for the total scores on this test, as well as in both categories of words.

Section 2 - Spelling in Context:

Treatment Group - The priori prediction made about the effectiveness of strategy based, didactic spelling instruction on achievement in pragmatic writing was that *students receiving direct, formal instruction in generalizable spelling strategies would make significant gains in their use of standard spelling in independent writing*. This prediction is based on performance in independent writing.

Analysis of independent writing samples of the subjects in the treatment group provided data related to this hypothesis. Table 5 includes means, standard deviations (SD), and differences for the scores obtained from this analysis. The means are expressed as the percentage of words spelled correctly out of the total number of words in the sample. The difference of 5 percentage points from pre-test to post-test appears to indicate growth in spelling ability in this area.

Table 5

Means, Standard Deviations (SD), and Differences for the Pre- and
Post-test Independent Writing Samples
(Treatment Group)

	Percentage	SD	Difference	SD
	Means			
Pre-test	88.52	9.32		
			5.13%	2.68
Post-test	93.66	6.75		

These pre- and post-test scores were analyzed for demonstrated growth. A difference of 5.13 (SD - 6.28) was revealed which is a significant increase. Therefore the gains made in the pragmatic use of standard spelling in a contextual format are reflective of the type of treatment received.

The increase from 88% to 93% over a six month period shows substantial improvement in standard spelling use in independent writing. The subjects demonstrated that they were not only able to apply their developing knowledge of spelling on an isolated word test, but in meaningful context as well, which is the ultimate goal of any spelling program. Thus, the hypothesis that students trained in a strategy based spelling program would make significant gains in their use of standard spelling in independent writing is supported.

Observation Group: Information as to spelling achievement in pragmatic writing was gathered for this group in the same manner as for the treatment group. The means, standard deviations (SD), and differences obtained from the observation group, who received no formal spelling instruction, have been included as Table 6. The results show no increase in the use of standard spelling in pragmatic writing.

Table 6

Means, Standard Deviations (SD), and Differences for the Pre- and Post-test Independent Writing Samples
(Observation Group)

	Percentage	SD	Difference	SD
	Means			
Pre-test	93.00	7.33		
			0.0	3.75
Post-test	93.00	8.05		

The comparison of pre- and post-test scores revealed identical scores, thus indicating no ascertainable increase in the use of standard spelling in pragmatic writing. It is interesting to note that, although the gains noted in spelling ability on a dictated, standardized test were statistically significant, the same growth is not evident in ability for pragmatic usage. This would suggest that the informal spelling instruction had little effect on the subjects'

demonstrated ability in this area. Possible reasons for this could be the discrepant ages, grades and developmental levels of this group of students. It may also be attributable to the initially high scores obtained from the pre-test (mean=93%). More conclusive information would require further research.

Section 3 - Metacognitive Spelling Knowledge

Treatment Group: A priori prediction was made that *students receiving direct instruction in the use of generalizable spelling strategies would make significant gains in their metacognitive awareness and hence application of such strategies.* This prediction is related to responses to the metacognitive questionnaire.

Table 7

Means, Standard Deviations (SD), Percentages, and Differences for
the Metacognitive Questionnaire
(Treatment Group)

	Mean Score	SD	Percentage	Difference	SD
Pre-test	7.10	2.07	50.7		
				2.48	2.55
Post-test	9.59	1.86	68.5		

Student responses to questions 1, 2, 3, 4, 6, 7, and 9 on the questionnaire were scored according to the the metacognition reflected, with a total possible of 14. These scores were used to determine the growth in metacognitive knowledge. Table 7 reports the mean scores, standard deviations (SD), and differences of the results of the pre- and post-test measures. Total score means have also been reported as a percentage of the total possible score to add clarity. The results suggest an increase in the level of metacognitive awareness.

The data reveal a mean difference of 2.48 (SD = 2.55) from pre- to post-test. Significant gains are therefore attributable to the treatment received.

Following training in generalizable spelling strategies, each of which contained elements to overtly encourage students to develop awareness and applicative spelling knowledge, the metacognitive level of the subjects increased significantly. The mean of 50.7% on the pre-test rose to 68.5% on the post-test, reflecting an mean increase of 17.8%. Although this questionnaire does not reflect the appropriateness of choice, nor accuracy of use, the subjects were able to demonstrate their awareness of and ability to self-select from of a variety of effective spelling strategies. The hypothesis, that gains would be evident in metacognition, is therefore supported.

Observation Group: The observation group responded to the same questionnaire as the treatment group in order to assess their metacognitive levels. Spelling instruction for this group, although contextual in nature, was unstructured and informal. There was no

overt emphasis on metacognitive development. Table 8 presents the means, standard deviations (SD), differences, and percentages obtained from the observation group. Examination of these data suggest some growth in metacognitive awareness.

Table 8
Means, Standard Deviations (SD), Percentages, and Differences for
the Metacognitive Questionnaire
(Observation Group)

	Mean Score	SD	Percentage	Difference	SD
Pre-test	6.72	2.14	48.0		
				1.17	2.04
Post-test	7.90	2.18	56.4		

An observed mean difference of 1.17 (SD=2.04) was determined from the comparison of pre- and post-test scores. Expressed as a percentage of the total possible score the observation group achieved a mean of 48.0% on the pre-test and 56.4% on the post-test. This represents a mean increase of 8.4% in metacognitive awareness which may be attributable to the type of instruction received. The fact that instruction took place during curricular reading and writing activities may have facilitated applicative awareness. The increases noted are not as great as that of the treatment group, although statistical comparison is not possible due to the variation

in ages and grades of the subjects. Empirical research would be needed to support conclusive findings.

Anecdotal Information

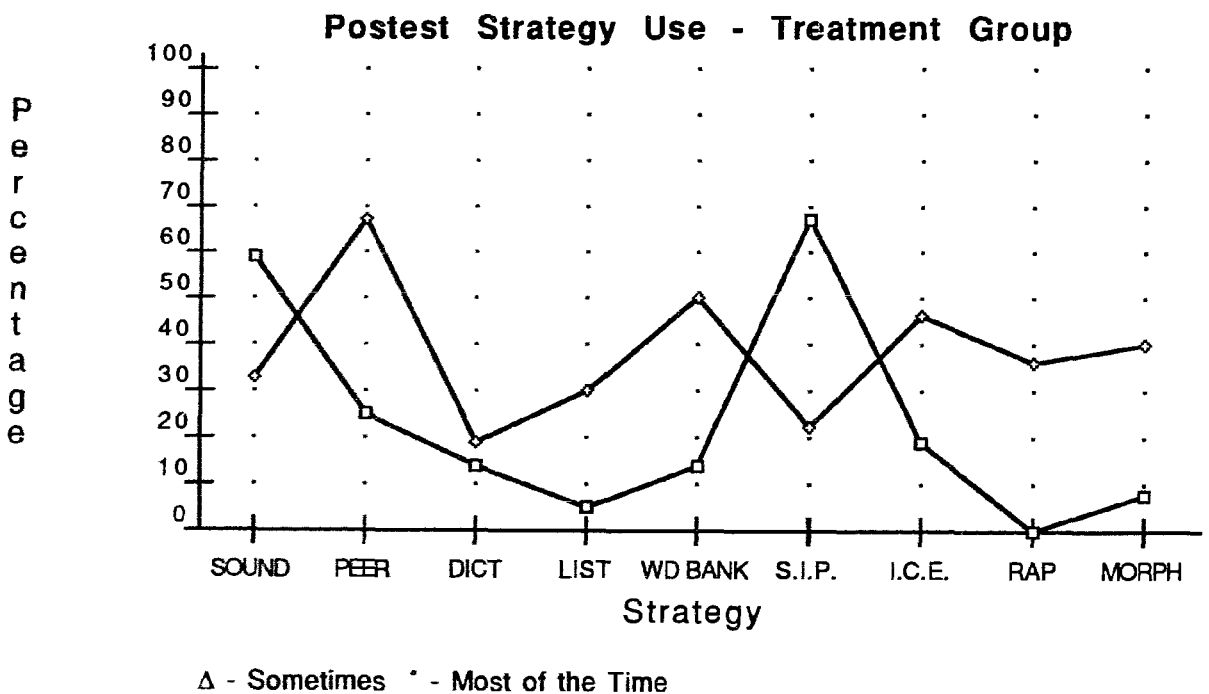
Treatment Group: The rating scale and questions 5,8 and 10 were not scored as part of the measure of metacognition. Rather, they were used to obtain anecdotal information as to the students' perceptions of the benefits of the strategies in which they had been trained. The responses to the rating scale were tabulated to produced the graph in Figure 1. The graph reports the percentage of respondents who indicated use of each strategy as "Sometimes" (moderate) or "Most of the Time" (extensive) on the post-test questionnaire.

Although not empirically conclusive, the information gained from this analysis is interesting and valuable. As indicated by the graph, 67% of the subjects reported that they used the 'S.I.P.' strategy extensively. This total is raised to 89% when the subjects who make moderate use of it are included. As the two are related, it is not surprising that 'Sound it Out' (SOUND) was the next highest ranked, with 59% using it 'most of the time'. Use of a friend or teacher (PEER) to obtain correct spelling was also indicated to be useful. Although used extensively by only 25% of subjects, moderate use was indicated by 67%. This is reflective of the emphasis on co-operative learning used in the program. The 'Word Bank' (WD BANK) also appears to have been a successful strategy as moderate or extensive use was reported by 64%. Similarly, 'I.C.E.' was used

'sometimes' by 46% and 'most of the time' by 19% of the subjects. Use of 'Morphographs' (MORPH) was less extensive with only 8% reporting they used it 'most of the time', although moderate use was shown to be 40%. As would be expected, none of the respondents used 'RAP' most of the time but moderate use was indicated by 36%. Use of external sources such as dictionaries (14%) and word lists (5%) were perceived to be the least used strategies.

Figure 1

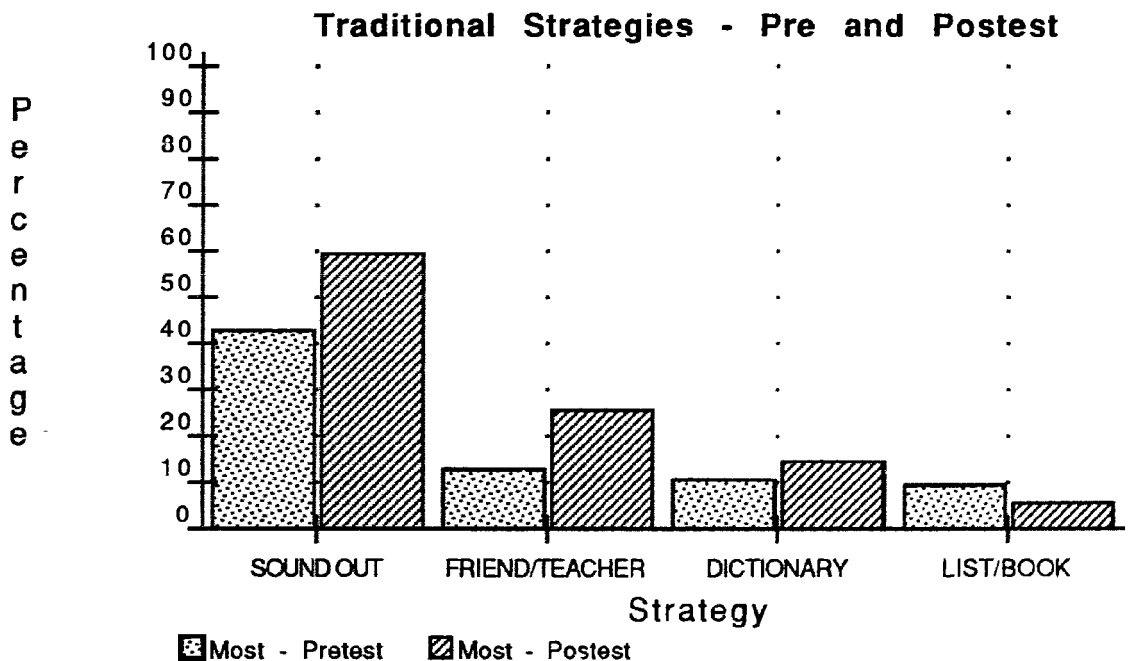
Percentage of Total Responses from the Rating Scale that Indicate Strategies Rated as Used 'Most of the Time' and Sometimes'



Comparative information is only available on the first four strategies. These have been termed 'Traditional' because of their extensive classroom use. These include the phonetic strategy of

'sound it out' (SOUND OUT), asking a peer or teacher for assistance (FRIEND/TEACHER), use of a dictionary (DICTIONARY), and use of word lists or textbooks (LIST/BOOK). Figure 2 presents changes noted in the indicated use of these strategies from pre-test to post-test.

Figure 2
Percentage of Total Pre- and Post-test Rating Scale Responses that
Ranked Traditional Strategies as Being Used 'Most of the Time'
(Treatment Group)



The graph in Figure 2 presents the percentage of responses indicating the strategy used 'most of the time'. The percentage of subjects reporting extensive use of phonics (SOUND OUT) 'most of

the time' was initially high (42%), and showed even greater use in the post-test (59%). Use of all strategies showed significant increase except that of using word lists and textbooks, thus indicating greater metacognitive awareness of a variety of effective strategies. A possible reason for the decrease in the use of word lists and textbooks could be greater independence, fostered by direct instruction in other effective strategies.

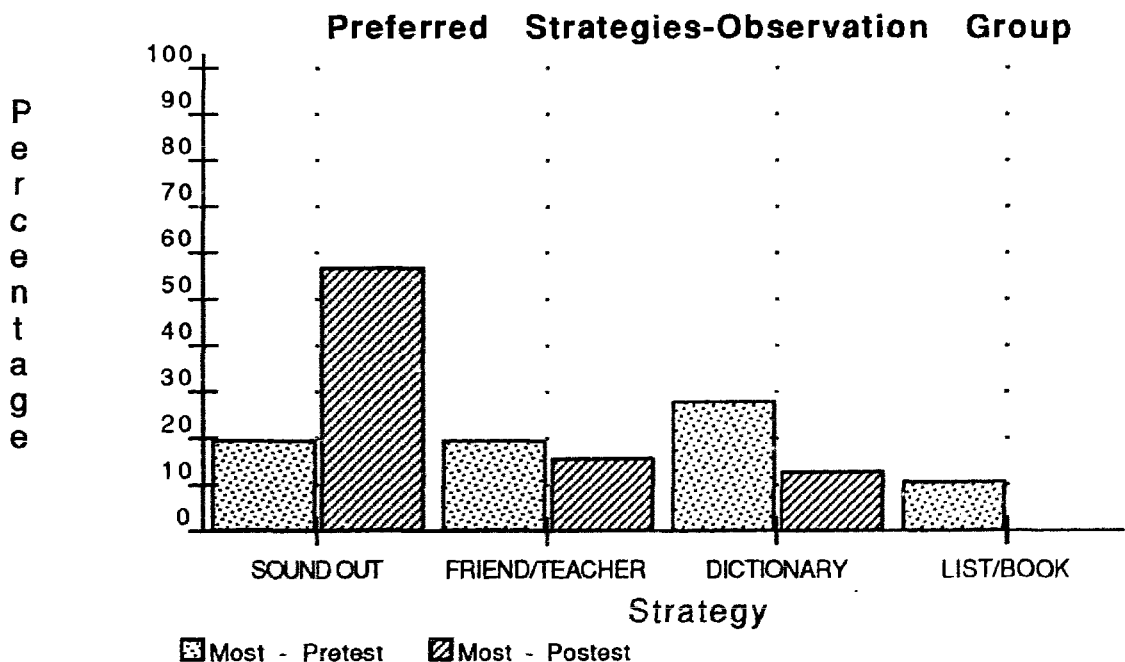
Responses from the unscored questions were compiled and analyzed for similarities. These were felt to indicate strategies that the subjects perceived as useful in learning to spell. An overview of the compiled responses has been included as Appendix 9, reporting the number of responses related to each strategy. Multiple responses were possible, therefore no standard mean is given. Responses were compiled from 64 subjects.

Responses in the pre-test revealed a large majority signifying 'sound it out' (31) as the technique most useful. The next most cited strategies were tests and traditional strategies other than 'sound it out'. 12 students reported "I don't know" in relation to the questions posed. Responses on the post-test changed dramatically. Following the instructional period of this study, 36 students reported one or more of the strategies in which they had received training as successful and beneficial. Tests were again referred to in 13 responses and 'sound out' by 12. Ten students felt that reading contributed to spelling success. Only 2 responses indicated "I don't know", again indicating a general increase in metacognitive levels. The anecdotal implications support the priori hypothesis made as to gains in metacognition.

Observation Group: Information as to the strategy use reported by the observation group is presented in Figure 3. Comparative values for the pre- and post-test rating scale of the metacognitive questionnaire represent the percentage of the total responses which indicated the use of the strategy to 'most of the time'.

Figure 3

Percentage of Total Pre- and Post-test Rating Scale Responses that Rated Traditional Responses as Being Used 'Most of the Time'
(Observation Group)



The observation group reported comparable use of all strategies in the pre-test, with dictionary use being ranked the

highest at 27%. The strategies reported in the post-test evidenced less even distribution and showed a decrease in use for all strategies except phonics (SOUND OUT). Use of phonics showed a significant increase from 19% to 56%. None of the observation indicated use of word lists and textbooks in the post-test, and use of a dictionary decreased from 27% to 12% indicating less use of independent strategies. Reliable conclusions as to reasons for the differences noted cannot be drawn from the information presented as the researcher was not present during instruction times and therefore any conclusions would be speculative in nature. .

Responses to the unscored items on the pre- and post-test questionnaire were compiled and analyzed. An overview of these are presented in Appendix 10. The total number of respondents was 40, although multiple responses were possible.

Pre-test responses cited tests (17 responses) to be the most successful perceived methodology followed by 'sound it out' with 14 responses. Simply supplying the needed spelling was cited 8 times. Memorizing and dictionary use were mentioned 4 times each. 17 students responded "I don't know" to the questions. Post-test results varied little, in that 'sound it out' (17) and tests (11) again were cited most often. Memorizing words, which is related to tests, was cited a further 5 times. Learning 'little words' first and progressing to longer ones was indicated by 10 students as a successful methodology, but no suggestions were evident as to effective strategies for learning the 'little words'. These results, in conjunction with the 12 "I don't know" responses do not suggest

significant growth in metacognitive knowledge of a variety of spelling strategies. .

Conclusion

The results of this study support the hypothesis that "Within a whole language framework, children will make significant gains in spelling achievement and in their use of standard spelling in written communication when given direct, formal instruction in generalizable spelling strategies without the use of predetermined word lists, as contrasted to self-directed, informal instruction."

The measures used to assess achievement showed educationally significant growth following the instruction period. In relation to the specific research questions, the following conclusions are drawn:

1. A gain of 5.54 (GE-0.9) in total score on the TWS reveals that the treatment did have significant effect on spelling achievement as measured by a standardized test.
2. The treatment effected similar gains in both phonetically regular and irregular words. The increase for Predictable words (regular) was 2.69 (GE 1.2) and for Nonpredictable words (irregular) was 3.03 (GE 0.9).
3. The instructional method had significant effect on the use of standard spelling within independent writing as evidenced by an increase of 5.13% usage as measured by writing sample analysis.

4. The instructional method had significant effect on the development of metacognitive awareness as indicated by an increase of 2.48 (17.8%) from pre-test to post-test on the metacognitive questionnaire. This evidence was supported by anecdotal comments.

Data analysis verified attribution of the differences to the treatment received, thus suggesting that direct instruction in generalizable spelling strategies is effective in facilitating achievement.

V Discussion

The research reported in this paper investigated the viability of incorporating direct instruction in generalizable spelling strategies within a whole language framework. The hypothesis was that "within a whole language framework, children will make significant gains in spelling achievement and in their use of standard spelling in written communication when given direct, formal instruction in generalizable spelling strategies without the use of predetermined word lists, as contrasted to self-directed, informal instruction". It attempted to merge the diverse research findings in the fields of cognitive and developmental psychology, linguistics, and neuroscience to determine effective instructional methodologies within the regular classroom. The classroom focus was chosen to be consistent with the Year 2000 emphasis on inclusion. Specifically, the questions researched were the effects of the above stated instructional method on 1) spelling achievement as demonstrated on a standardized test, 2) the achievement as related to phonetically regular and irregular words, 3) achievement as demonstrated in independent writing, and 4) growth in metacognitive awareness of spelling knowledge and strategic application.

The hypothesis was tested in four intermediate classrooms, involving a total of one hundred and six subjects, with training occurring as a part of the regular Language Arts curriculum to ensure practical applicability. For this reason, a representational rather than random sample was chosen. Three classes (sixty-five

subjects) comprised the 'treatment' group, who received direct, formal instruction in generalizable spelling strategies and two classes (forty-one subjects) who received only informal, self-directed instruction. **This group was designated as an 'observation' group, as the data collected were not statistically comparable due to diverse age and grade levels.**

The study spanned a six month period, during which students in the treatment group received direct instruction, averaging sixty to seventy-five minutes per week, in cognitive-based spelling strategies, rather than in studying predetermined word lists. Orthographic knowledge was fostered through lessons that were structured to enhance observation and awareness of lexical patterns within context. **Four strategies were presented in a structured format that included demonstration and modelling of the strategy, guided practice in a pragmatic context, followed by reflection on personal understanding and application. The goal was to both increase orthographic knowledge and awareness and to provide a variety of effective strategies that could be employed in pragmatic use. Assessment measures, therefore, involved not only a standardized test (Test of Written Spelling), but also analysis of independent writing samples and a metacognitive interview. Data collected reflected comparison of scores from pre and post tests. The results of the data analysis will be discussed in relation to the above stated questions.**

Demonstrated Achievement on a Standardized Spelling Test

Subjects in this study made statistically and educationally significant gains in their achievement as measured by the Test of Written Spelling (TWS) (Larsen & Hammill, 1976). Demonstrated orthographic competence with dictated words revealed significant achievement gains related to increased grapho-phonemic knowledge, awareness of structural analysis, and application of semantic knowledge. The gains noted in spelling achievement support the efficacy of the direct, cognitive-based instruction. Direct instruction has been proven in past studies (Allen & Alger, 1965; Horn, 1969; Simon & Simon, 1973), as in this study, to be an effective instructional practice. It is felt that direct instruction in generalizable strategies provides a framework and motivation for attending to and internalizing spelling knowledge. To employ the strategies, students are required to consciously activate their prior lexical knowledge. Personal motivation is facilitated by directed discussions and applicative emphasis, rather than in isolated word study.

Cognitive processes used to activate and apply knowledge can be identified and therefore, become an instructional focus (Wong, 1992). Research by Radebaugh (1985) provided important information about strategies used by efficient spellers which was incorporated into this study. As poor spellers often 'sound out' words letter by letter, direct instruction was given in the use of syllabication and common letter clusters with the strategy entitled Sound In Parts (SIP). SIP directly cues students in auditory discrimination and phonemic awareness through segmentation, although not necessarily traditional syllabication. Phonetic,

semantic and syntactic knowledge can then be effectively applied to the smaller, more manageable word parts. The demonstrated effectiveness of this strategy also supports the work of Ball and Blackman (1991) which concluded that phonemic awareness could be enhanced through training. Visualization, as a spelling strategy, is often not used nor valued by students prior to direct instruction, as evidenced by responses to the metacognitive pretest interview used in this study and the interview used by Radebaugh (1985). Block and Peskowitz (1990) found that achievement could be facilitated by cuing visual attention in monitoring accuracy. Tarasoff (1990) suggested visual attention as a focus for instruction and the present study confirms its effectiveness. The Image Copy Examine (ICE) strategy cues students to create a visual image of the word before spelling and then to check for accuracy ("Does it look right?"). The Morphograph strategy which encourages semantic word analysis and guided the applicative process through self-questioning ("Is there a part of this word I know?"), also appears to be an effective method to develop orthography and metacognition. This finding is consistent with a study by Wong, (1986) in which the efficacy of developing domain specific knowledge in conjunction with a metacognitive strategy, that of self-questioning, was investigated. Paris, Lipson and Wixson (1983) suggested that children must have both 'skill and will' to be effective spellers. These variables of word analysis to develop orthographic knowledge and applicative information would seem to be valuable elements of a successful spelling strategy. The results indicate that direct instruction in generalizable spelling strategies not only facilitates the knowledge base (skill) but also an

effortful attitude (will) which enables children to apply their increasing orthographic awareness

The results of the TWS indicate that students receiving instruction without reliance upon predetermined word lists, made significant gains in spelling achievement. Although no previous research was found that investigated formal spelling instruction not based on word lists, this project is supportive of theories posited by such 'whole language' researchers as Beers, Beers and Grant (1977), Buchannan (1989) and Gentry (1982, 1987) who claimed that children gain competency and knowledge more effectively through many opportunities to study words and language in context than by studying and memorizing isolated word lists. The results of the present study indicate that lessons can be effectively structured that retain a contextual link, yet encourage children to form their own set of 'rules' and generalizations. In the present study, lessons involved opportunities overtly structured to facilitate observation, analysis and discussion of spelling and language in context. For example, frequent 'cloze' activities (Buchannan, 1989), utilizing thematic or pragmatic text, focused attention on grapho-phonemic structures. Variations and adaptations of Palincsar's (1988) Reciprocal Teaching strategy encouraged verbalization, and thus internalization, of generalizations and cognitive processes. Recurrent group and peer proofreading activities provided guidance and practice in monitoring and revision. The results demonstrate that such methodologies can be effective.

That the development of spelling knowledge could be facilitated without relying on isolated drills and exercises

addresses the concern expressed by Graves (1976) that teaching spelling in isolation inadvertently gives children the message that learning spelling is for use in exercises, not in writing. This concern was echoed by Radebaugh (1985), who suggested that less able spellers viewed the objective as 'passing the spelling test on Friday'. Responses to the pretest of the metacognitive interview used in the present study revealed similar opinions expressed by many students. Although current spelling programs, such as the Canadian Spelling Program, (Thomas; 1979) acknowledge the issue of transfer, the very fact of isolating spelling instruction within the language program is a negation of such a goal.

Spelling Achievement Related to Word Type

The results of the TWS provide subscores related to Predictable (phonetically regular) and Non-predictable (irregular) words. Data analysis revealed significant gains related to both word types. This suggests that the intervention was successful in developing orthographic and grapho-phonemic knowledge, as well as in developing strategies for application.

The instructional method used in the present study addresses the controversy surrounding the inclusion of instruction in phonics. Many theorists (Groff 1979, 1986; Cramer 1969; Graham and Miller, 1979; Ball & Blackman, 1991; Hanna, Hanna & Hodges, 1971), have extolled the efficacy of the inclusion of phonics instruction within a spelling program, while whole language theorists such as Gentry (1982, 1987) posit that direct instruction in phonics restricts written language fluency and encourages dependency on

memorization. As evident in this study, children can acquire and apply significant grapho-phonemic knowledge without studying isolated phonics 'rules'. This is concordant with research by Rule (1982) and Wong (1986) as to the efficacy of providing strategies for application of phonics generalizations. The knowledge and application gains noted in this study are felt to be attributable to context-based word study which fosters observation, as well as the emphasis on discussion and reflection. Children are able to develop phonemic skills and awareness, and as well, appreciate the logic of our orthographic system by analyzing words in the context of both expository and narrative writing. Teaching strategies such as 'cloze' and 'group editing' were found to be of particular use in structuring observation. The efficacy of the individual strategies, as they relate to grapho-phonemic knowledge, has been discussed. This project suggests that the dichotomous phonics research can be amalgamated by revising the focus of the controversy from **whether** to include phonics to **how** to include it.

Although the subjects in this study evidenced significant gains in spelling phonetically regular words, greater gains in competence with phonetically irregular words were noted. This may be explained by the developmental theories proposed by Gentry (1982) and Buchannan (1989). In their investigations, spelling competence was analyzed and categorized, showing a progression from a pre-phonetic through a phonetic and finally to a semantic stage, in which children exhibit greater reliance on meaning and structural analysis than on phonics to achieve standard spelling. They suggested that children reach the semantic stage during late primary or early

intermediate years. The finding that a semantic focus of instruction correlated with accretive scores on the Non-predictable (irregular) subscores of the TWS would support this theory. The subjects were intermediate students, thus presumably, at the semantic stage in their development. The pretest results of the TWS revealed comparatively high levels of initial competence with phonetically regular words, thereby suggesting instructional needs at the semantic level. This finding, though, should present a caution to practitioners, in that the developmental level of the students should be ascertained prior to instruction. Semantically focused instruction would not meet the needs of children who are still at a phonetic stage of development. As there are no absolute norms, it should not be presumed based upon age. Further research into the correlation between developmental stage and instructional focus is required.

Morphophonological analysis is the systematic way in which grapho-phonemic representations preserve basic units of meaning, or morphemes, in transcription, (Mann, 1991) The efficacy of direct instruction in such analysis is also supported by the gains noted in irregular words. As postulated by Templeton (1986), and endorsed by several others, (Simon & Simon, 1973; Graham & Miller, 1979; Henderson & Templeton, 1986), orthography is the basis for logical analysis of word level phonology and the application of appropriate phonetic rules is dependent on semantic and syntactic knowledge. The tutelage used in this study provides students with opportunities to become aware of, discuss and reflect upon the connection between meaning and grapho-phonemic structure. It facilitates the

development of a mental lexicon, thus encouraging application of semantic and syntactic extensions of known words. The results suggest that presentation of material within a meaningful context is a procedural advantage, as it further strengthens the morphophonological connection. That such increases in the orthographic knowledge base could be facilitated without the use of isolated exercises or word lists is again supportive of whole language theorists such as Beers, Beers and Grant (1977), Gentry (1987) and Goodman (1986).

Demonstrated Achievement in Independent Writing

The primary goal of any spelling program is to facilitate the use of standard spelling in independent, pragmatic writing, therefore the analysis of standard spelling within independent writing samples is considered to be of major consequence. The results obtained revealed a mean increase of more than 5% in independent, unedited writing for the treatment group, although, interestingly, no increase was noted for the observation group.

The most probable reason for these results is the overt emphasis on application that was incorporated in presentation and practice of the strategies used. Introduction to strategy use was prefaced with discussion as to the personal efficacy of standard spelling use. To address Graves' (1976) concern as to the spelling goal being "passing the test on Friday" (p.90), the students identified when, where and why correct orthography was essential, thus creating a motivational attitude towards application. The findings give further credence to Young and McIntyre's (1992) conclusions

that instruction must be relevant and address real problems. As well, these data are corroborative of Simon and Simon's (1973) contention that intrinsic motivation is more effective than extrinsic, teacher directed, motivation.

The contextual nature of the instruction, as discussed earlier in relation to competence with dictated words, is felt to have had similar significant effect on pragmatic application for analogical reasons. Beers, Beers, and Grant (1977) found in their research that, although children developed phonetic and structural knowledge through isolated instruction, the knowledge was not applied consistently in independent writing, and that strategies were not used to generate the spelling of new words. The increased percentage of standard spelling noted in the writing sample analysis used in this project negates such concerns. The lessons were structured to lead students in the observation and awareness of orthographic generalizations within meaningful literature, and practice was guided through curricular writing experiences. The results indicate that pragmatic use is effectively facilitated through direct instruction that maintains ambient relevance. As the observation group, having received only incidental, self-directed instruction, evidenced no gains in pragmatic application, one may speculate that the direct instruction component has important ramifications in effecting the gains noted with the treatment group. However, as the two groups were not statistically comparable, further research would be needed to substantiate such a hypothesis.

Achievement as Related to Metacognitive Awareness

Scores on the pre and post test metacognitive interviews revealed significant growth in thoughtful, strategic orientation to spelling. Treatment group responses indicated an increase of almost 18% in awareness of the purpose, pragmatic utility and personal motivation for correct spelling, a variety of strategies to achieve correct spelling, as well as in monitoring or revision strategies. These increases reflect studies by Radebaugh (1985) and Rule (1982) that illustrate the reciprocity between metacognition and skill development. Illustrative of responses prior to training were comments such as 'spelling' was important to 'pass a test'. A singular strategic response (most commonly 'sound it out') was significantly common and few children were able to provide alternative strategies if this proved ineffective. Subsequent to instructional methods that directly addressed metacognitive development, subjects in this study were able to cite at least two possible solutions to achieving orthographically correct spelling, were able to document techniques to locate and revise errors in proofreading and to express personal relevance of correct spelling. Fifteen percent of the subjects referred to 'reading' as a way to develop spelling ability. As research (Gentry, 1987) suggests that this is indeed true, this finding supports the integration of spelling instruction within the Language Arts curriculum. In this study, increases in metacognitive awareness are observed to be accompanied by, and seem to affect, increases in demonstrated spelling ability.

The observation group also made increases in metacognitive awareness, although not as significant as noted with the treatment

group (8%). As well, this group showed no appreciable growth in their demonstrated ability to spell within independent writing. Spelling instruction for this group was contextually based, in that it occurred informally during reading and writing activities, but did not directly address metacognition. These findings would appear to further support the efficacy of contextually-based instruction as an effective means of enhancing grapho-phonemic knowledge, but also suggests that direct instruction in metacognition was a significant factor in the degree of application and regulation. It is important to again note that these observations are speculative, as the data collected were not empirically comparable, but these preliminary findings should be substantial enough to prompt further investigation.

The metacognitive interview provided valuable and interesting anecdotal information as to the students' perceptions of the utility of various spelling strategies in relation to the instruction received. Prior to the intervention, the pretest interviews for both groups revealed an almost exclusive use of 'sound it out' to spell unfamiliar words. Minimal references were noted in use of other traditional strategies such as dictionary use, or ask a teacher. As the results of the treatment group changed dramatically in the post test, reflecting significant utilization of strategies included in the training period, it would appear that the strategies presented are of benefit in achieving standard spelling. It is possible that this finding is at least partially attributable to the fact that 'children learn what they are taught'. Of the strategies identified, SIP was reported by the majority to be of most benefit. This is explicable in

that it enhances a strategy already perceived as successful ('sound it out'). Beers, Beers and Grant (1977) found that phonics was the initial strategy used to attempt an unfamiliar word. Children first rely on their grapho-phonemic perceptions to generate spellings and subsequently apply semantic and syntactic generalizations. The SIP strategy augments this process by emphasizing auditory awareness of the segments of larger words, thus making the 'sound it out' strategy more efficient. Application of phonetic, semantic and syntactical knowledge is facilitated by more manageable parts. The tendency of poor spellers to spell letter by letter (Radebaugh, 1985) is also addressed by the use of SIP.

Metacognitive awareness implies self-regulation and independence (Swanson, 1989) - that the learner assume control of cognitive processing. Block and Peskowitz (1990) refer to this as developing a 'spelling conscience'. In this study, several factors, as assessed by this interview, would seem to indicate that the interventions effect greater independence. The responses from the treatment group indicated an increase in general strategy awareness and use. More reference was made to the utilization of strategies such as 'word banks' or word list and of visual analysis of words to locate errors. There was a significant decrease in "I don't know" responses (from 12 to 2) to questions about how to spell or how to help someone else spell. The students were apparently more able to rely on internal resources to be successful as their metacognition increased. This is in direct contrast to the observation group, where instruction was given through directed student/teacher writing conferences and some phonics instruction. This group evidenced

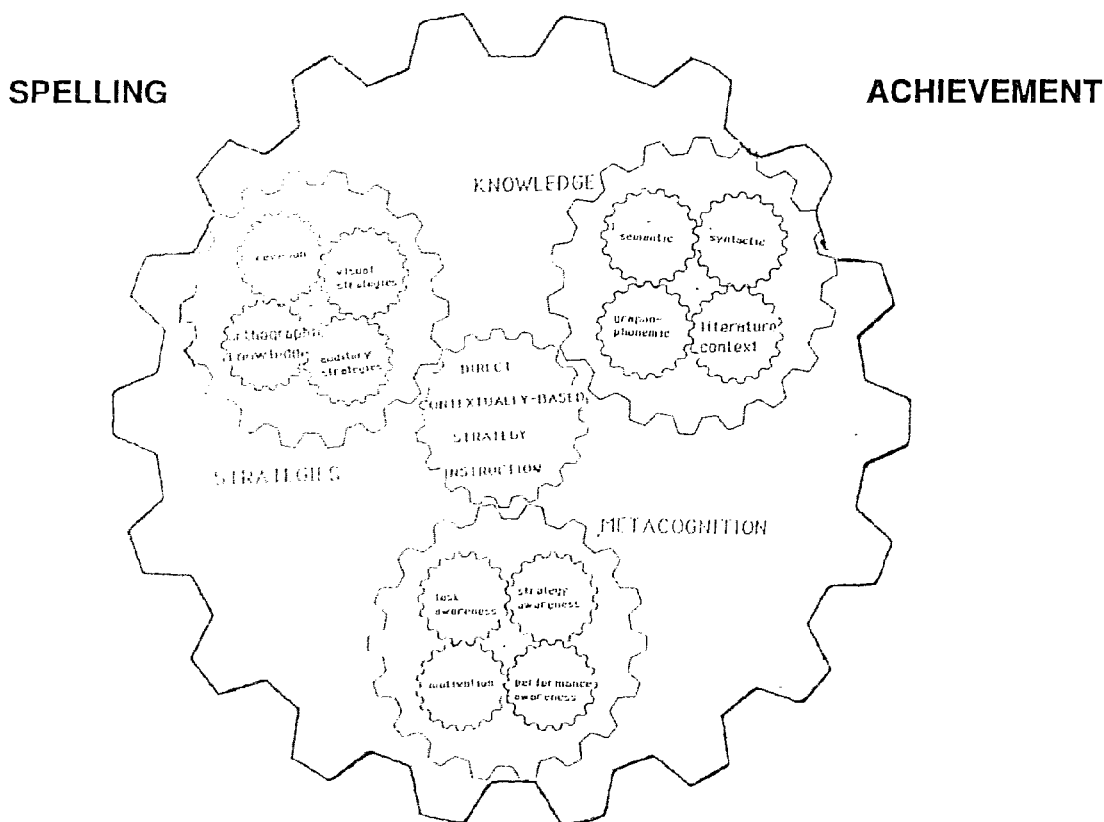
little change in strategy use. Increased mention was made to 'sound it out' but little mention was noted of other independent strategies such as dictionaries or word lists. A significant number of responses on the post test continued to indicate "I don't know" in relation to effective cognitive strategies. The many references to 'remembering the rules' and memorization do not signify growth in either awareness of a variety of strategies nor in the ability to self-monitor and regulate use. A possible explanation for the differences noted between the two groups is the different instructional emphasis. The intervention methodologies used with the treatment group overtly address awareness and generalization of cognitive processes as well as development of orthographic knowledge. Informal methods may support the development of lexicography but, as the application is teacher directed during writing conferences, attributional issues and self-efficacy are not fostered to the same degree.

The results of this study have been conceptualized by the author as depicted in Figure 4. Cogs of a gear have been used to represent the interconnective correlations that seemed apparent from the results of this study. Direct strategy instruction which maintains a contextual link appears to be a significant facilitator, or main 'cog', which 'drives' achievement in content knowledge, strategy awareness and metacognition. The intervention method investigated in this project effected gains in all three components, rather than being focused on one isolated area. The demonstrated gains in overall competence suggest that these constructs have equal importance in 'turning' the spelling achievement wheel. The

smaller cogs inside the component wheels represent the specific instructional foci, which are also seen as interdependent.

Figure 4

The three integral 'cogs' of an effective spelling program are seen as knowledge, strategies and metacognition. Each component is 'driven' by direct, contextually-based instruction.



Implications

This report will conclude with implications for practical application of the findings as well as proposals for future research. The most important implication of the current study stems from the bifaceted instructional premise - direct instruction incorporated within a contextual framework. The study has confirmed the

efficacy of direct instruction, but with a metamorphic difference. Instruction diverged from traditional programs by focusing on generalizable spelling strategies rather than metamemory strategies for learning pre-determined word lists. Orthographic knowledge can be fostered through directed word study, but with words taken from thematic or student generated text. Guided practice in strategic application of this knowledge can be incorporated into pragmatic writing activities. The results indicate that such intervention methods enhance students' competence with both dictated words and independent writing and may provide a more efficacious approach than either traditional basal programs or incidental whole language methods. Four generalizable strategies were highlighted in this investigation, but it is recommended that future research explore further effective strategies. Additionally, more specific, empirical information is needed as to the significant dependent variables of contextually-based instruction to identify effective pedagogical practices. A major limitation of this research is the incomparability of the treatment and observation groups for statistical analysis. Several interesting observations were identified, but further research is needed to empirically compare the efficacy of direct versus indirect, incidental instruction.

Another implication, although in no way separable from the first, is that instructional strategies must address the three interrelated components of successful spelling: domain specific knowledge, strategies and metacognition, as depicted in Figure 1. Development of an adequate orthographic knowledge base is a precursor to successful spelling. Many and varied opportunities

must be structured to afford children the probability of observing and analyzing words in context to develop an internalized set of lexical generalizations and 'rules'. These must include phonetic knowledge, as well as semantic and syntactic structures. Simon and Simon (1973) called for research designed to investigate "how to introduce phonemic information" (p.136) and Templeton (1986) suggested the need to further examine the relationship between orthographic knowledge and exposure to written language. This study suggests that structured exploration of written language, incorporating guided word study is an effective regimen to develop a productive knowledge of phonology and orthographic structure.

A further implication of this study is that cultivation of cognitive strategies to enable successful application of increasing lexical comprehension is equally essential. Classroom and remedial instruction that addresses this issue will enhance the chances of success for students. The strategies selected for attention should accommodate diverse learning style preferences as well as the complex cognitive demands of spelling. Block and Peskowitz (1990) called for research to develop appropriate, effective strategies. This investigation documents four such strategies that concurrently develop cognizance and orthographic knowledge, accommodate a variety of spelling tasks, and address such issues as phonemic awareness (Lie, 1991), as well as visualization and auditory cuing (Tarasoff, 1990). Although simplistic in nature, these strategies provide an effective focus to guide and direct the application of spelling knowledge within pragmatic writing.

Metacognition is the third component of successful intervention. This study suggests that attention to developing self-regulatory and reflective attitudes in students will support and enhance achievement. Swanson (1989) identified three elements of metacognition as task-awareness, strategy-awareness and performance-awareness. In this study, task demands were successfully delineated through demonstration and discussion that occurred during contextually-based, curricular writing activities. The students appeared to gain insight as to the differentiated cognition applicable to a variety of words and writing tasks. For example, writing a research report usually requires more use of text reference strategies than does a journal entry, for which phonological and/or morphological processing may suffice. Task-awareness should also address attitudinal and motivational concerns as stressed by Borkowski (1992). The time spent in discussing the efficacy of learning to spell and the contexts in which standard spelling is advantageous is thought to have been beneficial in developing a positive attitude and motivation to apply the strategies presented. Strategy demands appear to be best facilitated through direct instruction, which includes attention to task application and self-monitoring. Successful performance-awareness was evident in increased independent behaviors accompanying the demonstrated achievement gains. Wong (1987) challenged research to document successful intervention methods to address these issues. The present investigation implicates direct instruction in generalizable spelling strategies within a contextual framework as one such intervention.

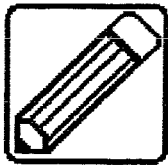
The findings of this study also have implications for assessment methods. The cognitive and metacognitive processes that have been found to impact on achievement are not readily assessed through traditional, standardized measures and challenge the professional to incorporate a broader, more thorough range of diagnostic tools. Prior to pedagogical decisions, current strategic perceptions and their degree of success must be determined. Developmental levels of spelling must also be ascertained (Gentry, 1982). It would be inefficacious to focus instruction on higher level orthographic word study if the students were still at a phonetic processing stage. The goal of a spelling program is competence in written communication, therefore evaluation must reflect independent writing analysis. A comprehensive assessment should be conducted over time and include a variety of measures. Misspelling Analysis of student writing, both edited and unedited, as suggested by Buchannan (1989) can provide a valuable information source to determine spelling cognizance and pragmatic competence, including the ability to locate and revise errors. The interview used in the present study proved to be invaluable in appraising strategic and metacognitive awareness with an additional benefit of the interview being the facility of large group administration. Assessment should not be restricted to these informal measures, however (Scott, 1990). Dictated, standardized tests may identify children for whom encouragement is needed to make the transition to a more sophisticated stage of development. Some children may use only those words in their writing that they are certain of spelling correctly. These error-free drafts would seem to indicate

little need for intervention, and yet there may be spelling principles that need to be grasped. As Scott (1990) suggests, a thorough, child-centred approach to spelling assessment may provide the "missing link" between current research and instructional practices. Researchers are challenged to address the need for empirically tested cognitive-based assessment measures.

The findings of this investigation have direct generalization to instruction in other areas of Language Arts. The orthographic and phonemic knowledge development facilitated through the described intervention have equal application to decoding skills. This would suggest that other specific reading skills, receiving similar direct, contextually-based instruction would evidence comparable gains.

A final implication stems from the generalization of the findings to classroom use. The current educational trend of Inclusive or Neighborhood Schools has increased the diversity of students within the regular classroom, many of whom find spelling a struggle. The demonstrated success of the pedagogical strategies investigated in this study attest to the feasibility of successful intervention through an integrated Language Arts curriculum, delivered within the classroom environment. The generalized achievement gains noted suggest the efficacy of the intervention for the diverse ability levels, but poses questions that should be addressed by future research. Are certain strategies more or less appropriate for students of predetermined ability levels? In relation to ability level, what effect does the intervention have on orthographic skill development? on pragmatic use? on metacognitive awareness? Does the intervention have

differentiated achievement effects related to ability level? It is hoped that answers to these questions will enhance the applicability of this type of programming to meet the challenges of today's classrooms.



SPELLING INTERVIEW A

NAME _____
DATE _____

1. Is it important to learn how to spell? Why?

2. When you are writing a story draft or writing in your journal, how do you spell the words?

3. What do you do when you come to a word you're not sure how to spell?

Do you ever do anything else?

4. What is the most important thing to remember about spelling?

5. Who helped you the most to learn to spell?

How did they help?

6. What is the hardest part of spelling?

7. How do you find the spelling mistakes in a draft?

What do you do to change them to the correct spelling?

8. How would you teach a young person how to spell?

9. What would you like to learn or do better in spelling this year?

10. Are you a good speller? Why or why not?

Rate the following spelling strategies as to how often you use them to spell words when you are writing a story, a report or your journal:

	not very often	sometimes	most of the time
Sound the word out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Ask a friend or teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Dictionary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Find the word in a list or book	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



SPELLING INTERVIEW B

NAME _____
DATE _____

1. Spelling is important because...

2. When I'm writing a story draft or writing in my journal, I spell words by...

3. When I come to a word I'm not sure how to spell, I...

Sometimes I also...

4. The most important thing to remember about spelling is...

5. _____ helped me the most to learn to spell because they...

6. The hardest thing about spelling is

7. When I'm writing a good copy of a story or report, I find the spelling mistakes in the draft by...

I change them to the correct spelling by...

8. I would teach a young person how to spell by...

9. The most important thing I learned in spelling this year was...

10. I am/am not a good speller. Why?

Rate the following spelling strategies as to how often you use them to spell words when you are writing a story, a report or your journal:

	not very often	sometimes	most of the time
Sound the word out--	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ask a friend or----- teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dictionary-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Find the word in a list or book-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Look the word up bank in my word bank-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.I.P-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I.C.E-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RAP-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Morphographs-----	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



SPELLING INTERVIEW A

NAME _____

DATE _____

Scoring Key**Total Possible: 14 points**

1. Is it important to learn how to spell? Why?
 - 0 - no reasons given (its important, you need to know it)*
 - 1 - superficial reasoning (it will help you)*
 - 2 - useful as a lifelong skill (get job, writing letters, school success)*

2. When you are writing a story draft or writing in your journal, how do you spell the words?
 - 0 - don't know, no strategy stated*
 - 1 - 1 strategy reported*
 - 2 - variety of strategies reported*

3. What do you do when you come to a word you're not sure how to spell?
 - 0 - don't know, no strategy stated*
 - 1 - 1 strategy reported*
 - 2 - variety of strategies reported*

Do you ever do anything else?

4. What is the most important thing to remember about spelling?
 - 0 - don't know, no strategy stated*
 - 1 - 1 strategy reported*
 - 2 - variety of strategies reported*

5. Who helped you the most to learn to spell?

How did they help?

anecdotal information

6. What is the hardest part of spelling?
 - 0 - memorize words for tests*
 - 1 - spell/remember harder/longer words*
 - 2 - use in real/pragmatic writing*

7. How do you find the spelling mistakes in a draft?

What do you do to change them to the correct spelling?

 - 0 - no strategies reported*
 - 1 - look carefully, 1 strategy for change reported*
 - 2 - strategies to find and make changes*

8. How would you teach a young person how to spell?

anecdotal information

9. What would you like to learn or do better in spelling this year?

0 - memorize words for tests

1 - spell/remember harder/longer words

2 - use in real/pragmatic writing

10. Are you a good speller? Why or why not?

anecdotal information

Rate the following spelling strategies as to how often you use them to spell words when you are writing a story, a report or your journal:

	not very often	sometimes	most of the time
Sound the word out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Ask a friend or teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Dictionary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not very often	sometimes	most of the time
Find the word in a list or book	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Cloze Encounters (of a spelling kind)

What It Is: a cloze activity in which groups of letters are blanked out of the text and the correct spelling filled in by the student. It is best done in a group or supported situation as the child is encouraged to verbalize and explain his/her thinking.

Why Do It:

- it encourages the child to activate his own thoughts and verbalize his/her spelling strategies
- it helps the child to gain insight into the spelling process
- it is an effective means of teaching skills such as phonics and structural analysis within a meaningful text
- it promotes risk-taking

How To Do It:

- The text should be a complete literary unit. It could be a letter, message, short story, informational material or poem.
- Words or parts of words are blanked out or covered up
- Letters or clusters may be left in or blanked out to focus on specific phonics rules or generalizations.
- In a classroom, the text may be presented on an overhead or chart paper and read together.
- Individuals should be called upon to supply the missing words/letters and give reasons to support their choices
- As a group or partner activity, children are encouraged to "think aloud" as they fill in the blanks
- Observations and/or generalizations should be shared at the end of the activity
 - There is **no** right answer. Any word is acceptable as long as it 'sounds right', 'makes sense' and fits with the letters that have been left in.

Appendix 4

Flower PowerGoals:

- teach/reinforce affixes
- reinforce concept of creating new words from known roots
- discovery/awareness of possible affixes
- discovery/awareness of rules for adding suffixes
- reinforce spelling of common root words
- provide opportunity for discussion and verbalization of rationale for spellings and generalizations
- provide opportunity to practise word analysis as a spelling strategy

Teaching Strategies Brainstorm, Carousel Brainstorm, Peer Proofreading

Method:

- as a whole group discuss, brainstorm and record possible affixes
- model the process as a large group using an o/h transparency of the plant diagram. Select a root word and print it over the roots of the plant. Brainstorm new words created by adding one or more of the affixes. The new words are printed on the leaves and petals of the plant.
- arrange the children into groups of 5-6
- assign one (or more) root words to each group. (each word may not be used more than once)
- the root words are recorded with a large marker over the "roots" of the plant diagram
- the groups are timed and given 2 minutes to brainstorm and record on the leaves and petals, **all** new words they can think of by adding affixes
- at the end of 2 minutes, the groups' "flowers" are passed to the next group and the process is repeated. The new group must read the words that are already there before adding any (none should be repeated)
- the carousel process is repeated until **all** the groups have had a chance to brainstorm about **all** the root words
- when the groups receive their original papers back, they are directed to "edit" them and eliminate any words they don't agree with. (Dictionaries, or other external sources are encouraged at this point.)
- they are then given a chance to color, print etc to create a pleasing visual.

- the "Word Gardens" are shared with the whole group and rationale for eliminations is explained.

I.C.E.

I.C.E. is an acronym for a spelling strategy that encourages the use of visual imagery and self-checking. It stands for *Image Copy Examine*

Rationale: for many children, the 'sound it out' strategy does not fit their learning style. For them, a much more useful strategy is creating a visual picture of the word and the self-checking question "Does it **look** right?"

Method: Before this strategy is to be used for spelling, the children should have many experiences with creating visual images of concrete objects.

- the children are encouraged to imagine a computer screen (or any other screen or board on which to place their word) in their mind
- they are then directed to think of the word in question and it 'type' it onto the computer, creating the visual *image*
- for extra practice, they can try to imagine the word in different sizes, different type styles etc.
- the next step is to *copy* the word from the screen onto paper and finally to *examine* the word to see if it looks correct.
- the students should be encouraged to verbalize to the group or a partner how they used this strategy and how well it worked thus fostering metacognition
- this strategy works equally well whether spelling in independent writing or writing tests

Appendix 6

S.I.P.

S.I.P. is an acronym for a strategy that encourages children to break words into their component parts to facilitate spelling. It is applicable to both auditory or visual emphasis. It stands for *Sound In Parts*.

Rationale:

- it provides direct instruction in breaking words into parts, as many children do not do this naturally.
- it provides opportunities to focus on common letter clusters and make generalizations.
- it encourages metacognitive awareness that small parts are easier to spell and effective ways to use this.

Method:

- as a class, share/discuss difficulties, frustrations and successes in spelling longer words.
- through clapping, intonation, etc., introduce the concept of beats or sounds in words.
- focus on or introduce the concept of syllables as a useful strategy.
- introduce the acronym - S.I.P. - as a way to remember the strategy.
- share examples of how difficult words might be said in parts.
- model how to use the strategy - say and spell each individual part of the word.
- provide many opportunities for the students to practice (such as 'Student Teacher') and encourage reflection in learning logs.

Appendix 7

MORPHOGRAPHS

MORPHOGRAPHS are letter clusters that convey meaning, such as prefixes and suffixes or Greek and Latin roots. This strategy develops motivation and interest through semantic word analysis while it fosters the awareness that our orthographic system does, indeed, make sense. This understanding helps children apply reasoning, not just memory, to spelling.

- RATIONALE**:- develops a mental lexicon or dictionary
- facilitates word analysis based on meaning
 - strengthens the connection between meaning and spelling
 - emphasizes the predictability of written language
 - facilitates segmentation of longer words into manageable parts
 - facilitates self-regulation
 - encourages an effective combination of modalities - visual and reasoning

- METHOD**:
- A. opportunities are structured to facilitate observation of morphographs in meaningful text
 - cloze activities in which affixes have been blanked out are useful
 - prompts such as "*how did you know to double the t?*"; "*why would you only add 'd' instead of 'ed'?*" may be used
 - opportunities to discover the meaning related to the morphographs should also be structured. (Carousel Brainstorming can generate a list that can be later analyzed by co-operative groups)
 - B. following this knowledge building, application of the generalization is modelled with other suggested words.
 - application is guided by self-questioning:
 - "*Is there a part of this word I know?*"
 - "*What do I need to add?*"
 - (after writing) "*Does it look right?*"
 - personal understanding of the orthographic knowledge and application should be recorded in spelling logs
 - practice and review is facilitated through group activities such as the cloze described, personal writing, sharing, group proofreading and in writing conferences.

Appendix 8

RAP

RAP: Although not the most useful strategy for most spellers, the auditory channel can provide a useful method for some words, particularly unusual or 'trouble' words. The RAP strategy makes use of the currently popular musical genre of Rap music, which relies heavily on beat and rhythm. It also encourages verbalization of letter sequence, thus adding further sensory input.

RATIONALE:- encourages verbalization of letter sequences

- provides a mnemonic strategy for long or hard words
- provides a self-checking system

METHOD:

- to introduce this strategy, the children are invited to share their favorite Rap songs and music. The ensuing discussion focuses on the beat and rhythm, which makes the 'songs' memorable.
- students, in groups of 2-3, are asked to prepare a Rap show for the class
- each group selects a word they have decided is hard to spell and creates a song or 'RAP', in which the **letters** are presented in a rhythmic, rememberable form
- each group performs their RAP for the class
- this activity facilitates an awareness of the usefulness of audition to remember spellings

Strategy Awareness and Application

- students are encouraged to verbalize letters as they are writing words (particularly in word banks, where the *correct* letter sequence is being written)
- the value of looking at the word and 'reading' the letters (aloud) is discussed
- when attempting to spell or check the accuracy of a troublesome word, this auditory memory can prove a valuable mnemonic prompt
- students are cued to self-question "Does that sound right?" to reinforce self-monitoring
- personal understanding and reflections as to usefulness of this and all strategies should be recorded in spelling logs.

Appendix 9

**Outline of Responses to Unscored Questions on the
Metacognitive Questionnaire Indicating Subjects'
Perception of Successful Spelling Strategies**

Items 5, 8 and 10 required reflection on spelling strategies and/or instructional methodologies with which the subjects had experienced success or would be of benefit to others. Responses to these questions were compiled and categorized by strategy. The number of responses were tabulated and are listed below. No standard mean is given, as multiple responses were noted.

(Pre and Posttest Comparisons - Treatment Group)

<u>Indicated Strategy</u>	<u>No. of Responses Pretest</u>	<u>No. of Responses Posttest</u>
Strategy Used During Instruction		36
Sound Out	31	12
Test	13	13
Strategy (Other Than Sound Out)	13	
Supply the Word	13	6
Learn 'Little Words'	5	
Memorize	4	
Dictionary	1	4
"I Don't Know"	12	2
Read		10

Appendix 10

**Outline of Responses to Unscored Questions on the
Metacognitive Questionnaire Indicating Subjects'
Perception of Successful Spelling Strategies**

Pre and Posttest Comparisons - Observation Group

<u>Indicated Strategy</u>	<u>No. of Responses Pretest</u>	<u>No. of Responses Posttest</u>
Strategy Presented During Training	N/A	N/A
Sound Out	14	17
Test	17	11
Strategy (Other Than Sound Out)		
Supply the Word	8	6
Learn 'Little Words'	2	10
Memorize	4	5
Dictionary	4	4
"I Don't Know"	17	12
Read		

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