MATCHING READING PROGRAMS TO STUDENTS' NEEDS: AN EXAMINATION OF ALTERNATE PROGRAMMING USING A DIRECT INSTRUCTION PROGRAM IN THE REGULAR CLASSROOM

by

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Matching Reading Programs to Students' Needs: An Examination of Alternate Programming Using a Direct Instruction Program in the Regular Classroom.

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ABSTRACT

This study examined the possibility that classroom teachers trained in a reading program specifically designed to meet the needs of students experiencing reading difficulties in grades 3, 4, 5, &6, could have a positive effect on the level of student achievement in reading. One hundred sixty-two students nominated as having reading difficulties were assigned to the experimental group and received the reading program Reading Mastery from teachers trained in that program. Ninety-nine students also nominated as having reading difficulties were assigned to the control group. They received the regular classroom reading program in place at their schools, from teachers who may or may not have had specific training in the teaching of reading.

Results of the study show that both groups were successful at improving reading performance in vocabulary, silent comprehension, decoding, and oral comprehension, over time. Specific effects of the experimental reading program, Reading Mastery were found only in grade 3 on the vocabulary subtest of the Gates McGinitie, and in grade 6 on the reading comprehension subtest of the Gates McGinitie. Neither group showed significant improvement in attitude toward reading.

Suggestions for practice in education include the consideration of: (a) selection of appropriate textual materials, learning strategies, and preferred learning styles, (b) the "best" environment for learning, (c) the effectiveness of Direct Instruction reading programs for students with reading difficulties, (d) a carefully planned model of professional development, (e) the design of an accountable battery of reading assessment tools, and (f) collaboration of university and school district to meet the needs of both institutions. Further research to expand the experiment to determine the effectiveness of other alternate reading programs is suggested.

DEDICATION

This thesis is dedicated to a young man named Freddy. Tow headed, happy, bright, and verbally articulate, Freddy was in the first Grade 1 class of my teaching career. One of the greatest joys that year was watching 6 and 7 year olds make sense of print. The phrase "I can read!" was heard off and on all year as little ones began on the great learning adventure, their eyes sparkling with delight.

However, Freddy did not learn to read that year. He did not learn to read the next year either as he repeated his Grade 1 with me. I found my lack of skills deeply frustrating and I made a personal commitment to myself and Freddy that one day I would find a way to help young children with reading difficulties learn how to read.

I know could help Freddy now.

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I also wish to thank my family, Bob, Andrew and Abby who maintained faith and patience in the face of many stacks of unwashed dishes while "Mom" was at the computer - again.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Context of the Problem

Over the years, reading programs, approaches, and methodologies have undergone significant conceptual pendulum swings. In recent years in British Columbia, we have witnessed a revolution in the notion of "emergent reading" approaches. One challenge for classroom teachers is that of choosing an effective reading program for less able readers. We see, hear, and are increasingly involved in practices of integration and mainstreaming of children as mandated by the Ministry of Education. At the school level of service delivery, this mandate translates into a number of new issues. For example; the practice of teaching all classes as a whole, collaborative consultation with the Learning Assistance teacher in the classroom working alongside the classroom teacher, and the need to address teaching/learning styles. In addition, teachers and researchers are in the midst of a major reading debate on a world basis regarding the merits of "whole language" as a basic or the "only" reading approach. The issue of how to assist children who are reading delayed has become more complex in the 1990's as debates and issues swirl around us and we try to make accountable professional judgments in determining reading programs best suited to their needs.

1.2 Background

Traditionally, in our province, youngsters with moderate learning and reading problems were part of the regular classroom (1940's - 1960's) and left (usually at the back of the room) to fend for themselves. In the mid-1960's Learning Disabilities (LD) definitions and research were becoming a part of the specialist education literature. Awareness in our community began in the 1970's with parents (of LD children) who were originally resented with a passion by the teaching profession for their superior knowledge of Learning Disabilities and for treading in "teacher territory". As awareness developed into knowledge and practice among specialist teachers during this decade, reading delayed students began to be withdrawn from the regular classroom by the newly designated (1973) Learning Assistance teachers for short periods of time during the day or week for specialized diagnosis and remediation.

This process continued through the late 1970's and the 1980's. Children were sent or brought to the Learning Assistance Centre for programming which varied in quality, length, and breadth from school to school and district to district. If Learning Assistance teachers were lucky, they were able to use an empty classroom, if not, medical rooms, and/or storage cupboards were often commandeered for this activity. Some programs and some LA teachers were remarkably effective, some were not. Success or failure hinged upon a number of factors. Did the teacher have enthusiastic ownership of the program? Did the teacher have adequate training? Did the teacher have resources, programs, and /or materials that were effective for each referred youngster?

As we move into the 1990's and wrestle with the need to comply with the Ministry of Education's policies contained in Year 2000: A Framework for Learning, the new Primary and Intermediate Programs; and our own professional needs of providing effective reading programs for all children, it seems both appropriate and timely to evaluate the merit of classroom-based programs for students with reading problems. Ysseldyke (1982) suggested that since different children learn in different ways and that these differences can be identified and considered in instructional planning, all children should spend 100% of their school day in the regular classroom. He supported the concept of total integration of learning disabled students with appropriately planned instructional interventions in the regular classroom as the optimal placement for addressing their needs. It is important to examine programs that have been designed for students experiencing reading difficulties, particularly in light of the following statement from the Year 2000 a Framework for Learning (1990) document:

> if a student has difficulty developing knowledge, skills, or attitudes in a particular area, then different learning resources and teaching approaches are usually indicated, not a repeat of the same material and activities that were unsuccessfully attempted previously. (p. 17)

One program is Reading Mastery published by SRA and developed by the Direct Instruction team from the University of Oregon (Osborne et al, 1980-1984). It is a basal reading program designed for youngsters with reading difficulties to be delivered within the regular classroom setting. Skills are taught and mastered sequentially in combination with highly structured direct instruction techniques.

1.3 Problem Statement

The purpose of this study was to compare the reading scores of two groups of students (experimental and control) in an effort to determine whether or not the program, Reading Mastery (RM) was more effective than the reading program(s) currently offered within the individual school settings. The goal was to investigate if one program/practice would be superior to another in five key reading areas (Johns, 1989) namely; vocabulary comprehension, silent reading comprehension, decoding, oral reading comprehension, and attitudes towards reading. The experimental group was instructed over a period of eight months by regular classroom teachers specifically trained in Direct Instruction techniques using the RM program. The control group was instructed by the regular classroom teachers without specific training in reading strategies using the reading program currently in use in that particular school at that time. Both groups were given the same pre (October) and post (May) assessments to measure the effects in the five areas.

1.4 Rationale and Significance of the Study

It is hoped that the information gathered during this study would provide a basis for (1) examining additional alternate reading programs or approaches with different focuses, but designed for students with reading difficulties, in order to determine their effectiveness, and (2) the Ministry of Education to determine the appropriateness of placing funding for materials and teacher training of alternate reading programs in elementary classrooms.

1.5 Hypothesis Statements and Questions

It is hypothesized that one way in which students with reading difficulties might experience success would be to provide alternate reading programming within the regular classroom setting which utilizes components we know to be effective for their particular needs. It is further hypothesized that one such program would be the Direct Instruction program, Reading Mastery.

Do students in Grades 3, 4, 5, and 6 of teachers trained in Direct Instruction reading methodology and receiving the program, Reading Mastery, specifically designed to meet the needs of students with reading difficulties (experimental group), perform better than students of teachers not so trained and receiving the regular reading program offered in that school (control group)? The following five questions were asked in this study:

1. will students in the experimental group show greater gains in reading vocabulary scores than those in the control group as measured in October and May using the Gates McGinitie Reading Test (Canadian) vocabulary subtest?
2. will students in the experimental group show greater gains in reading comprehension (multiple choice, silent reading) scores than those in the control group as measured in October and May using the Gates McGinitie Reading Test (Canadian) comprehension subtest?

3. will students in the experimental group show greater gains in reading decoding scores than those in the control group as measured in October and May using the Basic Reading Inventory word recognition subtest?

4. will students in the experimental group show greater gains in reading comprehension (oral questions) scores than those in the control group as measured in October and May using the Basic Reading Inventory comprehension subtest?

5. will students in the experimental group show greater gains in reading attitude scores than those in the control group as measured in October and May using the Student Perception of Ability Score ?

1.6 Definitions of Terms Used in This Study

assessment: (used interchangeably with: measurement, test, instrument, evaluation) the process of collecting test data information.

basal reading program: a program of teaching reading that incorporates an approach to word introduction particular to that program, (ie. a sight vocabulary approach, a tactile approach, a hear-say approach, etc.). Basal reading programs come as packages from publishers which have readers, teacher's

manuals, and a large selection of supplementary materials (eg. little books, big books, tapes, student work materials, idea books, and written language materials).

collaborative consultation: the process of discussing the implementation of best practices for teachers and students in order to negotiate treatment decisions for a targeted student. Initially, this usually involves the regular classroom teacher and the Learning Assistance teacher.

comprehension: the processing of information to make meaning. Reading involves meaning in the transaction between the reader and the author.

decoding: the act of translating print to speech through an analysis and application of sound-letter relationships.

direct instruction: refers a group of general instructional techniques including: teaching in small groups for effective monitoring, providing immediate correction procedures, and attention to academic engaged time.

Direct Instruction: refers to a group of techniques encompassing those described in direct instruction (above) but which add: specific cueing signals (usually finger/touch or voice/auditory), careful attention to the pacing of the instruction (sometimes timing with a stopwatch), and scripted lessons found in Teacher Presentation manuals.

emergent reading: the beginning stages of reading in which all words are not necessarily read or understood.

emergent readers: those who are beginning to learn to read.

integration and mainstreaming: the placement of all students regardless of disability or degree of disability in the regular classroom setting.

Learning Assistance program: an instructional setting to which a student may come for a specific period of time (less than that allotted for Resource Room programming) on a regularly scheduled basis for individualized and/or small group instruction. Learning Assistance programming may also take the form of collaborative consultation and be delivered within the classroom setting.

learning/teaching styles: cognitive, affective, and physiological learning preferences that serve as relatively stable indicators of how learners/teachers perceive, interact with, and respond to the learning/teaching environment (Gruener & ter Borg, 1982).

literature-based approach: a program of teaching reading that incorporates books written for children that are not usually a specific part of a basal reading program (sometimes called trade books). Examples would include; traditional tales (eg. Little Red Riding Hood), traditional classics (eg. Potter, B. The Tale of Peter Rabbit), repeat pattern books (eg. The House That Jack Built),

fairy tales (eg. those of Hans Christian Anderson), and contemporary classics (eg. Sendak, M. Where the Wild Things Are).

measurement: in this study it is the process of obtaining a reading score.

metacognition: refers to the awareness of the person, task, and strategy variables affecting cognitive performance, and the effective use of this information to plan, monitor, and regulate performance (adapted from Ryan et al, 1986).

prior knowledge: the body of knowledge and understanding that the learner brings to a current situation.

pull-out practices: reading delayed students are withdrawn from the regular classroom for short periods of time during the day or week for specialized diagnosis and remediation in the Learning Assistance Centre.

readability formulas: formulas which help estimate the levels of textbook difficulty. They typically involve a measure of sentence length and word difficulty to ascertain a grade level score for the examined material(s).

regular classroom teachers: those teachers who enroll and are responsible for a class of students usually heterogeneously grouped and which sometimes contain a range of ages.

regular reading program: the program which the school and teachers have decided that they will use for that particular year. In British Columbia, school districts may choose the reading program they will use. In some districts this decision is school-based. During the year that the data were being collected for this study, there were 11 different programs of reading instruction employed in School District #43 (Coquitlam), with some elementary schools having three programs in operation within their own building at the same time. The schools that participated in the study were using a variety of these programs/concepts.

resource room program: an instructional setting to which a student may come for a specific period of time (more than that allotted for Learning Assistance programming) usually on a regularly scheduled basis for individualized and/or small group instruction. Resource room programming may also take the form of collaborative consultation and be delivered within the classroom setting.

reading Scope and Sequence charts: the general plan in basal reading programs showing the introduction of skills in a sequential or vertical arrangement and with expanding or horizontally conceptualized reinforcement. Students move down through the levels and across within each level (Vacca, 1987).

students with reading difficulties: those students who have mild to moderate reading difficulties, regardless of the cause, and are so identified by the

classroom teacher in consultation with the LA teacher (other words or phrases used interchangeably in this study are: students with reading problems, reading delayed students, less able readers, students experiencing reading problems, disabled readers)

whole language: teachers practicing a whole language approach believe that skills are best learned while students are engaged in purposeful reading and writing. In reading, language is kept whole in that stories are not broken up into vocabulary words, flash cards and phonic drills, but that new vocabulary and phonic skills are learned as the student remains in constant contact with meaningful print.

1.7 Organization of the Study

Chapter One contains a context for the problem, placing the problem within a brief historical background since the 1940's, a statement of the problem along with its rationale and significance, the hypothesis statements, a series of definitions of those terms which have been placed within quotation marks throughout the text, and ends with this description of the organization of the study. The review of the literature is found in Chapter Two and highlights the findings and recommendations from research in the areas of BC curriculum and philosophy of the Year 2000 paper, teacher training/professional development, assessment of reading abilities, students with reading difficulties, direct instruction philosophy and practices and the hypothesis statement.

How the study was initiated, schools and teachers chosen, training conducted, measurement instruments chosen and administered, students chosen, program institutionalized, and the data managed is documented in Chapter Three. Chapter Four contains the reporting of the results of the data collection, and in Chapter Five are found the interpretations of the results combined with a discussion of conclusions and recommendations for future exploration.

CHAPTER 2

REVIEW OF THE LITERATURE

2.1 British Columbia Reorganizes Its Education System

2.1.1 Background of current changes.

So that the context of this study might be better understood, it is important to set the current education scene in British Columbia (all references in this section are to Ministry of Education documents). In 1988 the Sullivan Royal Commission was conducting a survey of the education system and preparing recommendations, new policy directions, and a mandate for the school system in British Columbia (Learning Through Reading, 1990e). Following input from parents, educators, vested groups, and the general public, the document Year 2000: A Curriculum and Assessment Framework for the Future was produced in September, 1989. The mission statement from this document had already been set in place the previous January and was to be repeated and emphasized many times over the ensuing months:

> The purpose of the British Columbia school system is *to enable learners to develop their individual potential* [italics added] and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy society and a prosperous sustainable economy. (p. 1)

Principles about learners and learning are presented as the basis for the design of curriculum and assessment programs in the Primary Program Foundation Document (1989) and the Intermediate Program (1990a) . They are:

Learning and the Learner

1. Learning requires the active participation of the learner.
2. People learn in a variety of ways and at different rates.
3. Learning is both an individual and a social process.

Curriculum and Assessment

1. Curriculum and assessment should be learner focused.

   - developmentally appropriate curriculum and assessment
   - continuous learning
   - self-direction
   - meeting individual needs
   - ensuring relevance

2. Curriculum should provide choices and assessment should help students make informed choices.

   - assessing learning
   - reporting learning
   - consistency in learning (Intermediate Program p. 17)

The program goals and learning outcomes for all grades/groupings and subject areas were built around the above principles ranging from Kindergarten to Graduation programs.

2.1.2 Definitions of reading and literacy.

Concurrent with the Sullivan Commission, the Ministry began the revision of the Language Arts-English Curriculum. Since the Ministry went to parents in open forums, and said "Let's Talk About Schools" in 1982/83, "reading" has not been viewed in isolation as a discrete subject area. It was and is considered to be one part of the Language Arts/Humanities strand (Year 2000: A Framework for Learning) along with writing, speaking, and listening. As a part of Language Arts, reading is defined, in the Ministry of Education's Position

Statements (1990c) document, as "essentially a dynamic thinking activity in which the reader interacts with the text, engaging personal prior experiences, expectations, and feelings to create a meaningful understanding of the writing" (p. 18), and the literate person is characterized in the first descriptor of the literacy section of the Curriculum Guide (1990b) as one who "is competent and confident in using language powerfully for a variety of personal and social purposes" (p. 15).

2.1.3 The learner.

The Year 2000: A Framework for Learning (1990g) document refers often to "The Learner" in the context of his or her needs in discussing "personalized needs", "continuous learning", and "meeting individual needs". Under the heading "People learn in a variety of ways and at different rates", the following sentence is critical when the needs of children with reading difficulties are examined:

> how each individual learns is a function not only of chronological age, but also of personal interests and abilities, preferred ways of learning and the learning opportunities and experiences which that individual has had in the past. (p. 8)

One consideration for students with difficulties would be that they would require more time to reach a set level of proficiency (Position Statements, 1990c). A second suggestion was proposed for those with difficulty in processing and generalizing written and spoken information was to structure the learning environment and presentation of content materials (Primary Program, 1990f)

to allow for the child's learning characteristics. When a reasonably fluent reader has problems reading a number of texts used in instruction, the selective use of miscue analysis to diagnose semantic, syntactic, or grapho-phonemic difficulties is recommended (Learning Through Reading, 1990e). With the original mission statement in mind, the Ministry suggests that the goal for those with reading difficulties is: "to enable each student to experience literature and to use language with satisfaction and confidence, striving for fluency, precision, clarity and independence" (Position Statements, 1990c, p. 14).

2.1.4 The curriculum.

The notion of comprehension or reading for meaning, being taught from the beginning of all language arts curriculum (Primary Program, 1990f, p. 182) was found throughout the Ministry documents and was considered to be of *primary* importance. Other components of the reading process but of secondary importance were: oral reading, independent reading, emergent literacy, reading-writing connections, reading to children, phonics, cooperative learning, and the processes of reading and writing. In the Curriculum Guide (1990b), learning outcome 2.4 the objective stated, "to develop the students' ability to recognize and apply patterns of language" (p. 47), and learning outcome 2.5 the objective stated, "to develop the students' ability to integrate the language cued systems (pragmatic, semantic, syntactic, graphites) to construct meaning" (p. 48). Reading should have an integrated focus by linking it with listening, writing and talking and should be developed concurrently. It is stressed that text should use

natural sounding language or predictable patterns for emergent readers (Primary Program, 1990f, p. 182) and that there would be an emphasis on the use of children's literature, both fiction and non-fiction to help learners develop their reading abilities (Year 2000, A Framework for Learning, 1990g). In the Kindergarten Curriculum Guide (1985) Ministry thinking on reading is summarized with the statement that " reading needs to be a natural and delightful part of a young child's experience" (p. 48).

2.1.5 The environment.

In the Ministry document Learning Through Reading (1990e) the statement that "school must be a place where reading is promoted and where student self-awareness and self-confidence in reading are fostered" (p. 3) serves to underpin the environmental issue. Education is moving toward a model of integration of children with special needs into the optimum setting. In many cases this setting was stated as being the regular classroom (Position Statements, 1990c). These children

> "can be integrated with their peers when the instructional program is adapted". (Intermediate Program, 1990a, p. 183)

The notion of heterogeneous grouping within the classroom situation as the most effective way of raising reading achievement levels was stated in both the Primary Program (1990f, p. 177) and the Intermediate Program (1990a, p. 26). It was postulated that grouping in this way (heterogeneous rather than

homogeneous) can remove the stigma of remediation (Position Statements, 1990c), accords common and equal status to all learners (Intermediate Program, 1990a), and capitalizes on cooperative learning and provides support for less able readers (Primary Program, 1989). A further component required of the environment in the new mandate, was the need for "active" learning. This concept was described as being a place where students would learn from direct experiences. Active learning was to be more than a particular activity or strategy of teaching; it was considered a necessary component of a learner-focused program (Intermediate Program, 1990a).

2.1.6 Summary.

Elements of (1) the definitions of reading, language arts, and learning, and (2) the needs of the learner in terms of environment and curriculum are contained in the Ministry documents and are mandated for the school system. Yet what does the research literature have to say in support or rejection of these same factors?

2.2 Students with Reading Difficulties

Students experiencing difficulties in reading have particular needs within the framework of any conceptual approach and/or Ministry mandate. For years educators have recognized the need for alternative instructional methods and techniques to meet the needs of various students in heterogeneously grouped

classrooms (Martin, 1985). What are some of those learner needs? What about textual materials? What strategies do these youngsters need? Do we need to look at their learning styles in terms of the presentation of instruction, least restrictive environment, and self-esteem?

2.2.1 Matching learner needs: Students with reading difficulties.

A sound reading program for all children combines skills mastery with reading for personal pleasure and information (Winograd & Greenlee, 1986; Carbo, 1987). They, and others (Groff, 1986; Chall, 1986) suggested however, that using skills listed in scope and sequence charts of basal readers as the sole criterion for a reading program is not reasonable. Over a two year period spent examining remedial and resource room programs Milligan (1986) concluded that poor readers especially need to spend time actively involved in reading observing that poor readers had far fewer opportunities to read than good readers. Many programs for these youngsters do not focus on getting the students engaged in reading (Ysseldyke et al., 1989; Milligan, 1986; Chall, 1986; Smith, 1982).

Milligan (1986) also found that too much time was spent teaching phonic decoding skills. In Becoming a Nation of Readers (Anderson et al, 1985) was found the statement that explicit phonics should be taught early, fast, and to those who need it. They defined phonics as the relationship between sounds and symbols of letters or the alphabetic principle. Phonological awareness skills are

highly correlated with later success in learning to read (Hurford, 1990). Researchers in the field of phonics advocated the alphabetic principle or phonological awareness and practice only as it leads to fluency (Nicholson, 1986; Perfetti, 1986; Groff, 1986) and meaningful language (Anderson et al., 1985; Chall, 1986). Using their phonetic knowledge, children would gain courage and skill and thus gain fluency and speed (Snider & Tarver, 1987). Developing the ability to read fluently requires the opportunity to read combined with skills that enhance the comprehension of what is reading (Perfetti, 1986).

Poor comprehenders who were assisted by comprehension strategy training were highlighted in a variety of studies as showing substantial, often striking, improvements when explicit comprehension strategies were used (Ryan et al, 1986). Training must be explicit and direct (Boehnlein, 1986; Carnine & Silbert, 1979; Pearson & Dole, 1987). Four key strategies were found to be highly effective by Brown and Palinscar (1982) in their reciprocal teaching model of explicit comprehension. They developed the following strategies as a teaching procedure to train poor readers to learn from texts: summarizing the main content; formulating potential test questions; clarifying hard parts; and predicting future content. Central to their procedure was the concept of "expert scaffolding where an expert (a teacher, a peer, a parent, or master craftsman) provides a supporting context in which students may gradually acquire skills" . They showed in their study that virtually all the strategies used in the research led to significant improvements in the targeted comprehension skills.

Poor readers were found to display increasingly global cognitive deficits as they get older which might possibly grow into behavioral and motivational problems (Stanovich, 1986). The early intervention program implemented by the Ohio Department of Education based on Marie Clay's (1985) Reading Recovery approach stressed the need to intervene before children's poor habits become difficult to change and block future learning (Boehnlein, 1987). This statement was supported by Stanovich's (1988) research where he found that the early acquisition of reading skill results in reading/academic experiences that facilitate the development of other cognitive structures laying the foundation for successful reading achievement at more advanced levels.

The learner with reading difficulties needs the opportunity to be engaged in reading far more than is presently the case, to be taught phonics as it leads to fluency, to have the opportunity to learn explicit comprehension strategies and to have all these elements presented early in his or her learning-to-read period of school experience. These learner needs are all dependent upon textual materials, whether they be storybooks, basal readers, or personal retellings told in language experience fashion.

2.2.2 Matching text with students' needs.

Many textbooks currently in use are not designed for classes of students with a wide range of abilities or diverse learning styles. Teachers reported problems that result from a discrepancy between the needs of integrated students

experiencing reading difficulties and the instructional materials used in class (Burnette, 1987). Too many textual materials were developed to fit the skills rather than as legitimate texts that students would find worth reading (Winograd & Greenlee, 1986). Baxter (1988) found two common factors among learners who make a high frequency of mistakes while attempting to learn to read. One is that they are more easily confused, especially by similar situations that are different, the other is that they are easily distracted by the irrelevant.
It is particularly important to determine adequate pupil text associations when one considers that 44% of new information in content area classes is presented through textbooks and 85% of learning disabled youngsters in these classes have great difficulty in reading (Zigmond et al., 1985).

Milligan (1986) found that teachers often made reading difficult for poor readers by choosing materials about which the readers had little background or prior knowledge. He suggested that teachers could make reading easier by choosing materials which are easy to read: that is materials about which the reader has some knowledge and/or the "will" to read.

The matching of students and texts also concerns that of "readability" or the difficulty level of the text. Readability can be measured in several ways, principally by counting the number of syllables and sentences in a designated passage. Lovitt et al (1987) cautioned against using readability formulas in isolation and suggested that teachers require their students to read passages from their texts and tell what they have read in an effort to determine suitability.

Davison and Kantor (1982) conducted a study which demonstrated that the readers' prior knowledge had a greater effect on the ease of reading than textual features as measured by readability formulas.

Basal reading programs were found to play a critical role in translating research findings into practice. These materials have changed over time reflecting political and pedagogical pressure, and they have provided on the job training for beginning teachers (McCallum, 1986). We must be very careful, particularly in the area of initial reading instruction, not to throw out the baby with the bath water when discussing the merits of basal series (McCallum, 1988). But do basals have to mean dull and ineffective instruction? It may be argued that some of our new basal series published since 1987 containing rich collections of well chosen literature-based reading within the children's anthologies have turned some children "on" to reading. Winograd (1990) feels that basal readers can provide a rich source of authentic literature for students and useful techniques, suggestions, and activities for teachers. Good teachers are good managers of both the environment and the reading lesson (Brandt, 1986). Basals provide a management system for coordinating reading instruction that releases teachers for other instructional tasks. The importance of the management function cannot be overlooked given that the majority of teachers have neither the time, energy, nor the expertise to develop fully blown, effective reading programs. It is important to carefully choose a well designed, accountable program designed to meet the needs of targeted children. Pupil editions must have well written meaningful selections which can provide

children and teachers with authentic opportunities for sharing personal responses and exploring the insights available through interactions with the written word (Winograd, 1990) and each other (Raphael & Englert, 1989). This view supports the Ministry statement that reading is both an individual and a social activity (p. 2).

In their study, Eldridge and Butterfield (1986) concluded that the use of children's literature (104 selected children's trade books - books without fixed vocabulary or sentence length but with an emphasis on patterns and predictability) to teach children to read had a significant positive effect upon students' achievement and attitude toward reading. In reading instruction utilizing a "literature-based approach" there is the notion that each child has a very unique developmental pattern, and as children use their personal backgrounds to cope with print, recognize words and understand text, they do need to have individual guidance (Green, 1986). The major question was, how would a busy teacher find the time to regularly meet with each child? Even highly skilled teachers seemed to spend long hours in organizing and reorganizing their classrooms (Brandt, 1986) in order to accommodate the array of requisite organizational tasks.

In choosing textual materials it was found important to choose materials about which children had "prior knowledge", and that readability formulas are an important consideration but they should not be used in isolation from other factors. Basal readers were found to have value for beginning teachers, as

management systems, and have selections well worth consideration. Literature-based reading programs were shown to have the advantage of allowing pupils to self-select what they read, thereby having the opportunity to read for their own pleasure as well as skill level. As youngsters approach their materials, what strategies were deemed important for accessing the information?

2.2.3 Matching reading strategies with students' needs.

Strategies include thoughts or behaviors that help students to acquire new information in such a way that the new information is integrated into existing knowledge (Weinstein, 1987). Four critical reading strategies found in surveying the literature centered first on the speed of decoding as it leads to automaticity and thereby fluency (Carnine & Silbert, 1979; Groff, 1986; Nicholson, 1986; Perfetti, 1986; Rasinski, 1989; Samuels, 1988; & Snider & Tarver, 1987). The importance of explicit teaching of comprehension strategies was a second issue of strategy training commonly found in the literature (Alley & Deshler, 1979; Carnine & Silbert, 1979; Gertsen & Carnine, 1986; Pearson, 1985 & 1987; & Winograd & Hare, 1988). A third strategy regularly addressed was metacognitive training or self-instruction training for students to organize themselves and their materials (Alley and Deshler, 1979; Schumaker et al., 1986); to monitor their reading for meaning (Griffey et al., 1988; Milligan, 1986; Paris & Meyers, 1981; Ryan et al. 1986; Wong & Jones, 1982), and to continuously evaluate themselves and their reading (Bos & Filip, 1982; Brown & Palinscar, 1982; Palinscar, 1986; Wong & Wong, 1986;

Wong, 1987). Transfer of training or generalization was the final major strategy issue for students with reading difficulties which was addressed. These students were described as needing explicit training to transfer their learning from one cognitive domain to another (math to science for example), and from one setting to another (resource room to classroom for example). For this group of disabled readers it cannot be assumed that generalization will occur without intervention (Deshler et al., 1981; Deshler & Schumaker, 1986; Ellis, 1987a; Ellis, 1987b; Gelzheiser, et al., 1986; Gerber, 1986; Locke & Abbey, 1989; Palinscar, 1986; Perfetti, 1986; Perkins, 1988; & Stokes & Baer, 1977).

A strategies framework of fluency, comprehension, organization, and generalization skills is limited in operation however, if the learners' styles or preferences are not taken into consideration. Learning strategies and learning styles must be matched if success is to be achieved.

2.2.4 Matching instruction with students' learning styles.

In their survey of the research on learning styles during the past decade Dunn et al. (1989) have found that student achievement increases when the teaching method matches student "learning styles". Learning styles comprise those biological and developmental characteristics that affect how one learns (Dunn et al., 1989; Greuner & ter Borg, 1984; Martin, 1985). An awareness of each student's style of learning is critical to that student's opportunities to develop and learn (Dunn, 1984). Carbo found that reading achievement depends

on how well the instructional program accommodates a given student's natural reading style (1987).

Learning styles have many components. Those most commonly mentioned are: 1) environmental, 2) perceptual/modality, 3) structural, and 4) sociological preferences (Dunn & Dunn, 1978, Hunt, 1987; Greuner & ter Borg; Johnson & Johnson, 1987).

2.2.4.1 Environmental Preferences.

Ken and Rita Dunn (1978) pioneered the research and practice into environmental considerations for optimal learning. They addressed the issues of the physical needs of the learner such as temperature, visual stimuli, furniture and furniture arrangement, time-of-day, finding that optimum conditions varied from learner to learner. An additional environmental factor emerging as a contentious issue in the current literature is the location of service delivery for students with learning difficulties. Ysseldyke et al. (1990) suggested that educators must pay special attention to existing instructional arrangements for students with mild handicaps in regular classrooms. The results of Ysseldyke's study indicate that general education teachers either did not see a way to alter the classroom environment or were unable to implement potential changes to meet students' needs. Wong (1989) identified specific skill competencies (diagnostic teaching, managing atypical learners, academic setting, and motivating students) needed by general educators to effectively address individual differences. Cooper

and Speece (1990) concluded that at-risk students were without opportunities for assistance and corrective feedback during their independent, reading-related practice tasks in the regular classroom. They observed no peer tutoring, other adult tutoring, or cooperative learning. In regular classes, improved academic outcomes were associated with whole group instruction that also included alternative grouping arrangements, such as reading groups (Bloom, 1984). Based on what Durkin (1990) had seen, the need to adjust classroom instruction in ways that accommodate differences in students' abilities today remains largely unfulfilled.

2.2.4.2 Modality Preferences.

For years educators have recognized the need for alternative instructional methods and techniques to meet the needs of the various students in heterogeneously grouped classrooms. Teachers are frustrated, knowing that they are failing to meet the needs of some of the students (Greuner & ter Borg, 1984) yet, making accommodation for perceptual or modality preferences is one fairly simple way in which classroom teachers can meet some students' needs. For example, Daly (1987) found that for students with poor visual discrimination, textual stimuli may exert very weak control over reading behavior during beginning reading. If these students exhibit strong intraverbal behavior (eg. telling stories), then using the language experience approach would concentrate on the students' strength to gradually develop textual behavior. Underachievers and young students learn significantly more when they are introduced to new

material through their modality preferences; and they learn significantly more when, they are reinforced through their secondary or tertiary modality (Dunn, 1990), that is if the student shows a primary visual preference, and secondarily an auditory preference, then it would be important to consider using auditory cues as well as visual ones in the instructional program..

2.2.4.3 Structural Preferences.

When examining the provision of structure into the instructional process the question was asked - just how much structure is enough? Structured learning is a psychoeducational, behavioral approach for providing instruction. It consists of 1) modeling, 2) role playing, 3) performance feedback, and 4) provision for transfer of training (McGinnis et al., 1984). Hunt's (1985) study of structural needs and academic achievement showed that the less able reader required teacher directed instruction containing activities with much structure to attain curricular goals, whereas those students requiring little structure tended to be independent learners capable of structuring their own experiences. Carbo (1987) maintained that children with reading difficulties benefitted from assistance in structuring their own learning.

2.2.4.4 Sociological factors.

Lastly, sociological factors refer to the preference for learning alone or as part of a group. In recent years educational focus has been placed on the notion

of cooperative learning or to learn and study together with the mutual goals of mastering academic information (Larson & Dansereau, 1986) and also upon the understanding that learning is a social activity (Goodman, 1986). Cooperative learning is based on a belief that students need to learn to recognize and value their dependence upon one another. Findings indicate that self-esteem is positively affected using cooperative learning methods as a result of increased academic achievement and positive inter-peer interaction (Johnson & Johnson, 1987). The way in which learning to read is experienced by the child will determine how he will view himself in general, and how he will conceive of himself as a learner and even as a person (Bettelheim & Zelan,1982). Reading failure causes children an immense loss of self-esteem during school years (Boehnlein, 1987). Bloom (1976) determined that "the major factor influencing affect (attitude) in the school was the students' perception of his competence in learning."

The literature pertaining to learning styles indicated that educators must consider the physical environment of the student with learning difficulties, the location of the delivery of service to that student, modality preferences especially for initial learning, the amount of structure necessary for optimum learning, and student grouping practices particularly as they relate to cooperative learning and self-esteem.

2.2.5 Summary.

Students experiencing difficulties in reading have particular needs. They need to use their phonics skills to develop fluency and thereby increase the opportunities for comprehending. These aspects of their learning need to be accomplished in the early school years in order to maintain self-esteem and motivation. Textbooks need to be user-friendly, that is that the content should be within the expectational realm of the student's prior knowledge, and that the passages be at an acceptable level of readability. The research has shown that textual materials may be either basal reading programs or literature-based programs. It has been shown that the ways in which a student learns to read is critical to his or her development and that effective strategies of fluency, comprehension, cognition, metacognition, and organization, must be explicitly taught and practiced. Learning strategies are in many ways dependent upon the styles of the learner and teacher. Some are more effective than others, for others - both learner and teacher. It was found to be essential to allow for environmental, locational, modality, structural and sociological preferences as they lead to perceptions of self-esteem for the learner with reading difficulties. Searching for a program/approach that would match all these needs became an impossible task. However, one program , Direct Instruction, certainly met many learner, textual, strategic and stylistic criteria mentioned in the preceding section. In addition, Direct Instruction has been comprehensively scrutinized many times by outside evaluators and has been found to have pedagogically compelling, and durable results.

2.3 Direct Instruction

The second of Bloom's (1984) solutions for improving students' learning processes was to improve the tools of instruction by selecting a curriculum, textbook, or other instructional material that had been proven to be very effective. In 1977, the Abt Associates of Cambridge, Massachusetts, completed a National Evaluation of Project Follow Through comparing nine different approaches to teaching economically disadvantaged children. The report showed that the Direct Instruction Model (University of Oregon) achieved first place on all absolute (eg. reading and math) and affective measures. This study was the first to show that compensatory education can work (Becker & Englemann, 1977; Gertsen, 1985; Gertsen &Keating, 1987). For example, the performance level data for total reading as measured on the Metropolitan Achievement Test for all models showed Direct Instruction to be the only approach to show achievement above 3.0 grade level, which was about one-half standard deviation level above the mean of all other models. In each of the four communities examined by Gertsen and Keating (1987) in their followup study, positive long term (1968-1982) effects for the students in the Direct Instruction programs were reported. The effects examined were; dropout rate, graduation rate, achievement, and college entrance rate. The positive effects were consistent in all locations and among all groups of students. What was it about this approach or model that was so successful?

2.3.1 Definition and description.

Success of the program is attributed to the technological details, highly specific teacher training, and careful monitoring of student progress (Becker & Engelmann, 1977). Direct Instruction is an approach that combines a belief in the utility of structured curricular materials, a concern with reinforcement of appropriate responses, the modelling and shaping of correct responses, the use of task analysis, and the continuous assessment of student performance (Gertsen, 1985). Gertsen distinguishes the following features of Direct Instruction from other behavioral approaches to teaching:

> (a) the explicit step-by-step teaching of "general use" problem-solving strategies whenever possible;
> (b) an emphasis on small group instruction as opposed to students working alone;
> (c) a systematic technology of correction procedures;
> (d) principles for cumulative review of previously learned material;
> (e) insistence on mastery for each step in the learning process.(p. 42)

The purpose in articulating and demonstrating a step-by-step strategy within a carefully sequenced hierarchy of continuous skills (Carnine, 1983) is to show students how a thinking process can lead to accurate solutions. Research findings support training students in precise, step-by-step strategies to improve their understanding of what they read (Gertsen & Carnine, 1986). Direct instruction in comprehension for example, means explaining the steps in a thought process that gives birth to comprehending. The instruction includes information on why and when to use the information which may mean the teacher

models a strategy by thinking aloud about how he or she is going to go about understanding a passage (Anderson et al, 1985). The Direct Instruction model emphasizes small-group, face to face instruction by teachers and aides. The search for methods of group instruction as effective as one-to-one or small group instruction has been reported by Bloom (1984). Throughout the study, it was found that conventional whole group instruction (usually 30 subjects) was less effective than small group instruction. Some of the percentage equivalents ranged from 50% achievement levels for the conventional instructional groups to 84%+ achievement levels for the smaller direct instruction learning groups. Bloom's (1984) suggestion, that the school system might improve student processing of instruction by using the mastery learning feedback-corrective process as a way of improving students' learning processes is an integral component of Direct Instruction. The correction procedure used in small group instruction consists of as many as six steps: praise, model, lead, test, alternate, and delayed test (Carnine & Silbert, 1979). These steps provide a systematic framework of correction procedures. Gertsen (1985) reported that Close & Taylor observed that learning was more efficient if the instructor used a correction procedure that provided the learner with an explicit strategy and immediate practice of the strategy. A plan for designing appropriate practice procedures as principles for cumulative review is described by Carnine (1989):

1. avoid memory overload by introducing new information cumulatively.
2. build retention with delayed review and discriminated practice,
3. reduce interference effects,
4. make new learning meaningful by emphasizing relationships,
5. reduce processing demands by introducing components before the strategy and by introducing easier information first,
6. require quicker responses to foster automaticity.

Using a set of carefully sequenced lessons to teach all skills to mastery is another critical feature of direct instruction. It is effective for students with learning difficulties when performance skills are taught sequentially in manageable, bite-sized pieces to the mastery level. The insistence on complete (rather than partial) mastery in each stage of the learning process, may be quite important for special education students (Gertsen, 1985).

2.3.2 Reading Mastery(RM)

One Direct Instruction program, Reading Mastery(RM) is a basal reading series consisting of six separate sequential programs intended for grades one through six (Osborne, 1984). Students learn how to decode, comprehend, and study. The content of the program features a wide range of narrative and expository prose, daily written activities, and supplementary exercises. Direct Instruction methods and detailed lesson plans are used so every student has an opportunity to learn how to read.

The focus of RM is on teaching all reading skills to mastery. The skills are taught through direct instruction techniques as they apply to a variety of contexts. Decoding, comprehension, literary appreciation and interpretation, and study skills strategies are explicitly taught in this program, providing students with a framework for learning (Osborne, 1984). The intent of the strategies is that the students will be able to generalize from what they have been learning to have a basis for evaluating unfamiliar material.

2.3.4 Summary

Stated concisely, Direct Instruction techniques are a way of explaining to students what they will be doing, why they will be doing it, how to do it, and when they can apply it (Anderson et al., 1985). This is followed by teacher modelling, teacher guided application, and the teacher's gradual release of responsibility to the students (Gaskins, 1988). These components are not lightly stated or practiced. A requisite of the Direct Instruction model is that the teacher contemplating this set of practices must engage in specific personal training in order to understand the conceptual framework and teacher technologies required for its implementation.

2.4 Professional Development

Handing an average classroom teacher a manual or a text and suggesting that he or she will be ready to implement that particular program even though it might have been carefully selected to meet those students particular needs, presumes that the teacher will implement effectively. Joyce and Showers (1986), present strong arguments to the contrary suggesting that student learning benefits are so great that the failure to create a strong staff development system is a tragic dereliction. The quality of education provided to students with special needs, further depends upon the availability of well prepared educators with specialized training (Bachor et al., 1990). All staff development programs need to have two related goals; namely, the development of competent performance and the development of conceptual understanding (Gertsen &

Woodward, 1990). The craft of teaching requires a thorough knowledge of the theory of the approach, and how to use it and adapt it in the context of an educational environment. Because specific, discrete and integrative behaviors are necessary to implement various models, extensive training and practice are required (Joyce & Showers, 1988). The issues of change, the process of change, effective staff development processes, and some notions of the teaching of "reading" for the purposes of this study will be investigated in this section.

2.4.1 The change process.

Teaching is a dynamic profession in which individuals need to be constantly changing what they do and how they do it (Clarke, 1989). The challenge of nurturing educational innovation is a tough number (Carroll, 1986). Changing what we do, even slightly, can unbalance the rest of our "game" (Joyce & Showers, 1982). Teachers do not resist change, they resist being changed (Clinton, 1988). Other behaviors must adjust to the presence of a new skill, while the discomfort of the new awkwardness is often enough to undermine our security and drive us back to our former comfort of a well practiced skill or strategy regardless of its current suitablility (Clinton, 1988). Designing strategies to promote growth involves the careful identification of obstacles, and then choosing or inventing clusters of discrete actions likely to be successful in assisting us to acquire the knowledge or skill. Why is change important? How do we initiate change? How do we prevent the return to former behaviors?

Change is at once simple and complex, the search for effective strategies for bringing about school improvements is a tantalizing affair (Fullan, 1985). Change in education, in its most common form, is pupil growth associated with the learning process itself. Coping with change is fundamental to the successful conduct of an educator's workday life and for some, the key to survival (Carroll, 1986; Clinton, 1988). Change is a process, not an event. It is made by individuals first, then institutions. For individuals it is a highly personal experience fostering developmental growth in feelings and skills (Clinton, 1989). Most fundamental goals for change are valued student outcomes, states or dispositions. Fundamental givens are the outcomes presently being achieved by students . Planned change, then, is the process of reducing the gap between the givens and goals(Leithwood, 1986). Two levels or stages of change are described by Clinton (1988) as; (1) awareness or the mental processes required to seek cognitive congruence including interest and evaluation, and (2) adoption of a physical process required to seek experiential congruence including trial and nurturing. Sparks (1983) expanded these stages into the following six steps: (1) awareness, (2) readiness, and commitment among staff; (3) planning; (4) implementation; (5) evaluation; and (6) reassessment and continuation. Innovations contribute to change when they lead to improved achievement of those curricular objectives considered valuable by those with a stake in the change. (Leithwood, 1986; Joyce & Showers, 1986).

2.4.2. Implementation: the process of change.

Several studies show that change is a clearly identified process (Leithwood, 1986; Fullan, 1985; Joyce and Showers, 1986; Sparks, 1983) and that implementation is the putting into practice of an idea, program, or set of activities which are new to the individual or organization using it (Clinton, 1988). The implementation-change strategy is one whereby the main approach to school improvement is through the identification, adoption, or development of specific proven or promising new programs. Fullan (1983) developed the following eight guidelines which would support such a strategy:

1. develop a plan
2. clarify and develop the role of central staff
3. select innovations and schools
4. clarify and develop the role of principals and the criteria for school-based processes
5. stress staff development and technical assistance
6. ensure information gathering and use
7. plan for continuation and spread
8. review capacity for future change (Fullan, 1985)

To begin the process, the National Joint Committee on Learning Disabilities (NJCLD), following careful consideration of issues related to effectiveness of in-service programs, advocated one critical stage prior to those listed above. They recommended that a needs assessment be conducted to ensure appropriate planning and implementation based on the needs of students and professional personnel (1988). Following the planning and definition of roles, Fullan (1985) suggested inviting volunteers making it clear that participation by all was eventually expected and making the invitation as attractive as possible by stressing the resources for assistance and collaboration among users (1985).

It seems reasonable to assume that, for most new programs, extended training spread over time would be prerequisite for change and that on-site cultural adaptation assistance would be required to solve the specific problems that occur during implementation (Parish & Arends, 1983). The demands of each innovation along with particular school settings were likely to be different (Miles, 1983). Implementation was found to occur to the extent that *each* and *every* teacher had the opportunity to work out the meaning of the implementation in practice and the opportunity to change behaviors, skills, and beliefs (Parish & Arends, 1983). The importance of supportive informal networks, full communications, coordination, and technical support as researched by Howes and cited by Miles(1983) were important predictors of successful implementation. Successful implementation - attaining strong technical mastery of and commitment to a new practice - was not judged to be the end of process. In the absence of deliberate tactics to build in continuation and innovation measures, the natural forces of attrition would result in the disappearance of the new technique or approach (Fullan, 1988). In explaining institutional or the durable continuation of a program or strategy, Miles (1988) stated that the successful models contain administrative decisiveness, accompanied by enough assistance to increase user skill, ownership, and stable use in the context of a stable system. In order to assess the degree(s) of institutionalization, it is necessary to determine if instructional practice did, in fact, change and the factors which exhibited or facilitated change in practice (Clinton, 1988). Monitoring at various points in time the extent to which progress is being made toward achieving the goals for change is recommended by Leithwood (1986).

2.4.3 Staff development.

Most teachers use a very narrow range of practices and expand only when substantial and carefully designed training is provided (Joyce & Showers, 1986). What then are the components of effective staff development practice?

In addressing teacher characteristics and attitudes towards change, Oja (1980) makes a strong case for staff development that strives to help teachers develop maturity on both the personal and cognitive levels. Sparks(1983), in her review of literature of research on staff development for effective teaching, found that the two major factors affecting successful efforts in staff development were (1) the support by administrators, and (2) the existence, within the school ecology, of collegiality and experimentation. With these conditions of change in place, collaborative staff models would have an opportunity to be effective. Joyce and Showers (1982,1986) in recommending the development of a "coaching environment" see the model of the process of acquisition of new elements-of-repertoire as:

- Provision of companionship
- Giving of technical feedback
- Analysis of application: extending executive control
- Adaptation of a model to the needs of the students
- Personal facilitation (support) during the practice period

They define the coaching as "hands-on, in-classroom assistance with the transfer of skills and strategies to the classroom"(Joyce & Showers, 1981).

Potential staff development activities found to be effective by Sparks (1983) included: diagnosing and prescribing (based on classroom observations of teaching behavior), giving information and clear demonstrations of recommended practice (including live modelling, videotapes, detailed narrative descriptions, and vividly described examples), discussing application (opportunities for discussion and reflection), practicing and giving feedback, microteaching, role-playing, and peer observation, and coaching (see Joyce & Showers model above).

Staff development consisting of a single session has been found to be largely ineffective. Most staff programs that have an impact on teachers were found to be spaced over time (Sparks, 1986). Even more significant is the need for long-term, ongoing in-service. It seems to be presumed that once teachers get there, they know how (Strickland in Aaron et al., 1990). Teachers' early concerns about how the program will affect them personally may later develop into concerns about how the program will affect students. Often teacher attitudes toward new instructional procedures shift when they see the impact the new strategies have on their students, particularly their "hard-to-reach" students (Gertsen & Woodward, 1990). Long-term staff development should deal with changing concerns in an adaptive, sensitive manner (Sparks, 1986).

Learning to be proficient at something new involves initial anxiety, a variety of assistance, small experiences of success, incremental skill development, and eventually conceptual clarity and ownership (Fullan, 1988).

2.4.4. The teaching of reading.

Bettelheim & Zader (1982) state that how reading is taught is critical because if the child did not know it before, it will soon be impressed on him that of all school learning, nothing compares in importance with reading, "it is of unparalleled significance."

It is critical to address the issue of teacher Professional Development in the field of reading as reading instruction as possibly the most important activity in elementary grade classrooms (Carnine & Silbert, 1979) . Reading instruction *per se* is not a required course within some teacher training institutions, yet it seems ludicrous that we place new teaching recruits into the school system without instructional tools(Bachor et al., 1990). Many teachers do not seem to know as much about how to teach reading as they need to know (Chall in Aaron et al., 1990). Current research fails to rule out the possibility that, for a considerable portion of children, reading disabilities represent an instructional function rather than a constitutional disability (Felton & Wood, 1989). Gaskins relates the story of how little she knew about learning to read when she first began teaching. She describes being perplexed by students who made minimal progress and who were usually poor readers. She says, "As I searched, I began to suspect that the answer lay not with what was wrong with these students, but in what was not right with my teaching" (1988). As she pondered these ideas, it became clear to her that the way she defined reading determined the way she taught reading.

Reading is a complex process: complex to learn and complex to teach (Carnine & Silbert, 1979). Learning to read is a developmental task closely akin to the acquisition of spoken language (Holdoway,1984). Reading is a process in which an active and strategic reader gains meaning through an interaction between background knowledge and information in a text (Gaskins, 1988). Anderson and Pearson (1984) hold the view that people make sense of new information by relating it to their prior knowledge and beliefs. Reading seems to be broken down by practitioners and researchers alike into two activities; word recognition and comprehension. Within and across each is a broad array of interactive developmental and transitional skills and strategies (Mann, Suiter & McClung, 1987). Word recognition or *decoding* is translating printed words into representation similar to oral language. Understanding that representation is *comprehension* (Carnine & Silbert, 1979).

Beginning reading instruction should have as its central focus, systematic instruction, review, and practice of sound-letter correspondence. This is not to suggest that decoding (sound-letter correspondence or phonics) encompasses the reading process, but without decoding, there is no reading. The goal of phonics is not that children be able to state the "rule" governing letter-sound relationships (Anderson et al., 1985) but that they be able to use the alphabetic principle as a tool to unlock text for understanding. Phonics ought to be conceived as a technique for getting children off to a fast start in mapping the relationships between sounds and letters (Anderson et al., 1985). If it were possible to ameliorate the deficient phonological processing of children early in their

attempts to learn to read, it might be possible to reduce or eliminate the debilitating effect this deficient process has on learning to read (Hurford, 1990). The maxims for phonics are: "Do it early. Keep it simple". Except in cases of diagnosed individual need, phonics instruction should have been completed by the end of second grade (Anderson et al., 1985). Poor readers should not be encouraged or expected to guess at words based on context, beginning letter, configuration or anything else (Standal, 1988). The irony is that poor readers, not the good, are the ones most likely to guess, simply because they are less able to decode, and have to rely on context clues to help them (Nicholson, 1986). Those who cannot decode cannot hope to comprehend.

Emphasis on the speed of decoding or "Fast Decoding Theory" is articulated as an intermediate step between decoding and comprehension strategies by Nicholson (1986). He calls it the "bottleneck problem" and suggests three facets: (1) that slow decoders are just not fast enough to process sentences efficiently; that is, that there is a bottleneck problem just getting words into short term memory so that comprehension can take place, (2) they read fewer words of context, hence they do not have an opportunity to learn as many new words, and (3) they are usually inaccurate decoders as well. Fast decoding will have a great impact on comprehension so that sentences can be quickly processed and larger meanings constructed.

The implication for early reading instruction is that neither decoding of print instruction nor instruction in extracting meaning from sentence context

should be ignored (Patterson, 1988). There is a reciprocal relationship between word identification and comprehension. Each encounter with a reading selection should serve the dual goals of advancing children's skill at understanding that reading is not simply a process of word identification, but one of bringing ideas to the mind.

Teachers need precise guidance in how to teach comprehension to low-performing students. The research demonstrates that the type of questions (Raphael, 1984), the detailed step-by-step breakdowns (Deshler et al, 1986), and extensive practice with a range of examples will significantly benefit students' comprehension (Gertsen & Carnine, 1986). For example, teachers were often encouraged to "think aloud" explaining to students how they reached a conclusion (Gertsen & Woodward, 1990). Gertsen and Carnine (1986) found that the students with the greatest gains in their study had the benefit of: direct, step-by-step instruction; guided practice; and a teacher who modeled the steps, asked questions and provided immediate feedback (Perkins, V., 1988). They concluded that a major advantage of explicit step-by-step procedures is that they allow teachers to provide specific feedback when errors are made. In examining the direct instruction model in reading comprehension, Winograd & Hare (1988) found that such an approach seems to yield consistently positive results. Pearson (1988) and Balnton et al (1990) have found that the most important comprehension questions are those asked before reading as they provide the scaffolding for motivation and the framework for reading. The goal of precise instruction in comprehension strategies is for students to be capable of

independent, intelligent analysis (Gertsen & Carnine, 1986) and to be able to relate the ideas that are inherent in groups of written words (Alley & Deshler, 1979).

2.4.5 Summary.

Over the past decade Joyce and Showers have clearly demonstrated that improvements in student achievement are a direct result of effective staff development. It was concluded from the readings of other researchers and practitioners that the presentation or implementation of a new program required those involved to specifically address the issues and process of change as they directly affect the new behaviors being presented in order to institutionalize them into the teachers' repertoire. Effective staff development would have the components of the change process integrated as part of any implementation program. In approaching a new reading program it would be important to assess the needs of the individual schools and choose programs that would best suit those needs. In the next stage it would be necessary to elicit cooperation of the administrators, accountably and persuasively present the program(s), provide opportunities for coaching and mentoring, provide resources, and finally provide for thorough evaluation. Sparks (1983) would caution us, in addition, to consider the following three criteria influencing teachers' decisions regarding implementation:

1. the extent to which the new approach/strategy is articulated
2. how well the new practice fits in with the teacher's philosophy of teaching.
3. the cost or effort required vs the payoff of the new technique. (p 70)

2.5 Assessment of Reading Abilities

One component of evaluation of program effectiveness is the evaluation of students' reading abilities. What are the key factors that tell us "how" the student is performing within the reading process? How critical are the skills of decoding, and comprehension? How important is the students' attitude towards learning and by inference, towards him or herself? How can we adequately assess these and other elements? To begin, a prerequisite to the selection of appropriate assessment tools for the purposes of comparative measurement would be an understanding of the behaviors that constitute the reading process (Ysseldyke & Marston, 1982).

2.5.1 What are the critical components of reading needed for consideration in the assessment process?

Carnine and Silbert's (1979) model of reading instruction would consist of decoding and comprehension as the two basic components/behaviors of the reading process. They describe *decoding* as translating printed words into representation similar to oral language. This would include recognition of letter features, letters, letter combinations, syllables, words, and phrases. They describe *comprehension* as the understanding of the decoded representation where hierarchical skills crucial to successful comprehension begin with responding to literal and inferential questions. This model of reading is often referred to as a "bottom-up" model or one that begins with the smallest units of words and systematically builds upon learned skills. "Top-down" models of the

reading process, on the other hand, emphasize the combination of the readers' prior knowledge with the writers' message (Vacca et al., 1987). Proponents believe that students learn to read by beginning with the message of the whole passage (Goodman, 1986) and working down through paragraphs, sentences, phrases and finally, words. A third reading model is often referred to and is described by Pearson (1988) as the process of reading that is initiated by formulating hypotheses about meaning *and* by simultaneously decoding letters and words. A further important consideration in the assessment of reading is the extent to which children choose to involve themselves in reading behavior (Johnson, 1986). The reading program should be set up so that children will enjoy reading, choose to read over other activities, and naturally get practice at real reading (Vacca et al., 1987).

Critical reading factors as identified in the described models and comments are: decoding, comprehension and attitude towards reading. The question then becomes, what assessment instruments shall we use to evaluate students' reading skills in these areas for the purposes of this study? Salvia and Ysseldyke (1985) note three limitations in the assessment of reading. The first is that of curriculum match. The second problem is the selection of tests that are appropriate for making educational decisions. The third problem concerns the overall lack of technical adequacy of tests. It also appears that the tests most often chosen by special education teachers tended to be those which are attractive and easy to administer, but which do not possess the psychometric rigor in order to make appropriate instructional decisions (Connelly, 1985).

In addressing the issues of curriculum match and appropriateness for making educational decisions, consideration must be given to the purposes for which we are testing in this experiment, ie. that of comparative scores before and after treatment. We are neither seeking a curriculum match nor placement within the program. The curriculum would be set by the use of a specific pilot program and students would be placed in the program by teacher collaboration and nomination. Although cognitive style affects test results, students of various cognitive styles are expected to perform equally well on standardized tests (Scales, 1987). Informal tests seem to be better for both impulsive and reflective style students. A combination of standardized and informal testing then seems appropriate for making educational decisions about students.

2.5.2 Summary.

Current assessment practices in reading are guilty, in many ways, of fragmenting the process which they are to assess (Johnson, 1986). The intention in this study was to view the assessment component of reading behavior as an integrated whole by combining standardized testing, an informal reading inventory, and a measurement of the affective domain. It was found that the attributes of a carefully assembled assessment package should reflect a sound model of the reading process (Valencia & Pearson, 1987). We felt that given both the positive and the cautionary elements of the literature for each of the instruments, we had indeed put together a reading assessment battery that would meet the needs of the study.

2.6 Summary of the Review of the Literature

As a research field, "reading" has long had a history of argument on many sides of many issues. Great debates have occurred over the years (Chall, 1986; Nicholson, 1986; Goodman, 1986) centering in past decades on whether or not to teach phonics (auditory emphasis) as opposed to word configuration (visual emphasis), and currently on the opposing conceptual frameworks of bottom-up beliefs that students must decode letters and words before they are able to derive meaning from sentences and whole passages, versus top-down beliefs that students should begin with the whole passage and gain meaning from an array of activities including writing, speaking and listening in order to understand textual materials (Vacca et al., 1987).

2.6.1. Summary of findings.

New British Columbia Ministry of Education publications such as the Year 2000 (1989) and the Primary Program Foundation Document (1990) responded to the debate by suggesting that aspects of both sides are appropriate and that we must consider reading to be a global experience rather than a discrete set of subskills. The documents contain (1) definitions of reading, language arts, and learning, and (2) needs of the learner in terms of the environment and curriculum and assessment as they are mandated for the school system in British Columbia. It was stated that the learner with learning/reading difficulties must have the opportunity to have alternate approaches and or materials that best

accommodate his or her learning abilities or needs presented within the regular classroom setting.

The literature on reading, and specifically, reading as it applies to those students who are experiencing difficulty would also support both sides of the current debate. The application of phonics training seems to be shifting away from the endless recitations of meaningless sounds to the explicit early teaching of the alphabetic principle as it leads directly to fluency and comprehension. The research in comprehension strategies indicates the need for explicit step-by-step procedures in order to provide immediate corrective feedback for the less able student. These tactics along with the encouragement and opportunity for students with reading difficulties to significantly engage in reading as they have not done before seem to be showing positive results in reading achievement.

In choosing textual materials to support the needs of the learner, it was observed that it was more valuable to select those materials about which children had prior knowledge rather than relying on readability formulas of the materials in isolation from other factors. Basal readers were found to have selections well worth consideration and to be of value for beginning teachers and as management systems. Literature-based reading programs were shown to have the advantage of allowing pupils to self-select what they read, thereby having the opportunity to read for their own pleasure as well as skill level.

Learning strategies and learning styles must go hand in hand if we hope to achieve success with our less able students. A strategies framework that includes

the skills of fluency, comprehension, cognition and metacognition, and generalization as each applies to the needs of the specific learner was perceived to be an effective place to start. The learning styles literature showed that educators must consider the physical environment of the student with learning difficulties, the location of the delivery of service to that student, modality preferences for initial learning, student grouping practices particularly as they relate to cooperative learning, the structure of the instructional program and most importantly, notions of self-esteem as they underpin the concept of how the student perceives of himself as a "reader".

Direct Instruction is a set of techniques explaining to students what they will be doing, why they will be doing it, how to do it, and when they can apply it using a set of carefully sequenced lessons to teach all skills to mastery thereby leading to a sense of self confidence. It was found to be effective for students with learning difficulties when performance skills were taught sequentially in manageable, bite-sized pieces to the mastery level. Three critical stages of this approach were described and included teacher modelling, teacher guided application, and the teachers' gradual release of responsibility to the students. Success of the program is attributed to the technological details, highly specific teacher training, and careful monitoring of student progress.

That the direct result of effective staff development is improvement in student achievement has been thoroughly documented by Joyce and Showers (1986, 1987, 1989). However, it was found that learning to be proficient at

something new involved initial anxiety, a variety of assistance, small experiences of success, incremental skill development, and eventually conceptual clarity and ownership. It would seem to be important, that when introducing of a "new" reading program, to approach all parties with a sense of caution, eliciting teacher need and ownership, developing administrative support, providing effective in-service training, making allowance for specific coaching opportunities, and delivering district support, monitoring, and commitment.

An alarming finding in the professional development literature was the widespread lack of teacher preservice in the reading process at the college and university levels, especially, when one believes that reading is quite possibly the most important skill a young child will learn in all of his or her schooling years. In addition to understanding and implementing the reading process, the teacher of students experiencing difficulties with reading must address the literature which targets that population and defines the reading process in ways in which those students can best learn. Teachers need precise guidance in some of the substantial reading disability issues such as: sequential learning as it leads to mastery, the teaching of the alphabetic principle, comprehension training, the nature of the relationship between the alphabetic principle and comprehension, strategies training, and cognition and metacognition, as all are related to the process of reading.

In examining the evaluation of the reading process it became clear from the literature that first one needs to have an understanding of the process, and second proceed to develop a reading assessment package or process based upon

that understanding. When one views reading behavior as an integrated whole it is reasonable that one might combine a standardized test, an informal reading inventory, and a measurement of the affective domain as a means of designing an accountable reading assessment package.

2.6.2 Ministry mandate(s): Support or rejection.

At the outset of this chapter the question was asked: Does the research support the Ministry mandates as they apply to the teaching of reading? The notions that learning requires the active participation of the learner, that students learn in a variety of ways and at different rates, and that learning is both an individual and a social process are all amply supported by the literature. Within the context of reading, the placement of phonics as an aspect of decidedly secondary importance is at odds with research on the demonstrated needs for students with reading difficulties. It was clearly stated that this group of students required explicit phonics training as it would to lead to fluency and comprehension. A second area of disagreement with the Ministry mandate was the location of service delivery. Statements were found throughout the literature, particularly that published within the last three years, regarding the wisdom of regular classroom placement for the students experiencing difficulties without accommodations for their needs having been made (Ysseldyke, 1990). For example, there is concern about the lack provision of assistance and corrective feedback for reading delayed students in the regular classroom. On one hand, the Ministry conveys the message that the optimal setting would be regular

classroom, while on the other hand, the research findings indicate misgivings about the effectiveness of this location without the provision for alternate groupings and or programs. A third concern involves the accordance of equal and common status to all learners. If the purpose of the British Columbia school system is to enable all learners to develop to their individual potential then surely we must meet individual needs by accepting that students learn in a variety of ways that require effective implementation and monitoring of alternate materials, styles and strategies.

This study attempted to analyze one reading program which was specifically designed to address not only the needs of students with reading problems but which was provided within the regular classroom and solidly based in affirmative research.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Representatives of publishing companies often approach school board personnel regarding the possibility of piloting materials and/or programs in school districts. Some school boards are open to joint proposals from their District Staff members in conjunction with the representatives of the publishing houses and have a process whereby "pilot proposals" are evaluated and accepted or discarded. One such pilot proposal was presented to the Director of Instruction: Curriculum, in School District #43 (Coquitlam) by the Consultant for Learning Assistance and the Scientific Research Associates, Inc. (SRA) publications representative in February of 1986 and was subsequently accepted in March of that year. The project title was as follows:

> READING PILOT FOR LOW ACHIEVERS: A Comparison of Basal Reading Programs Grades 1-7 Specifically Designed to Meet the Needs of Low Achieving Students.

3.2 The Pilot Proposal

A number of elements must be present when proposing a pilot project for S.D. #43 (Coquitlam). They are: the rationale for the project, a "needs assessment", materials list(s) and costs, responsibilities of the various groups, commitments, and provision for monitoring/evaluation processes. These components will be discussed in the methodology section at various stages.

The stated rationale presented to the Director of Curriculum and the selected schools was; 1) that students experiencing reading difficulties can be effectively taught the skills of reading when the materials and strategies are specifically designed with their needs in mind, 2) that the primary setting for these skills to be most effectively presented and learned is in the regular classroom, and (3) that the primary vehicle for assisting those children with further deficits is - the Learning Assistance program which would provide materials and support for the student and the classroom teacher. Specifically, the intent of the pilot study over a one year period was (1) to measure actual reading gain of those students in the experimental groups compared to those of the control groups, and (2) to measure attitude change in the experimental groups compared to the control group.

3.3 Site Selection

3.3.1 The district.

Coquitlam is a large suburban municipality adjacent to the metropolitan city of Vancouver, British Columbia, Canada. The area is considered "mixed" in terms of the socio-economic diversity and cultural backgrounds of the general population. School District #43 itself covers an area of approximately 80 square miles with an estimated population of pupils enrolled in all of its 55 public schools in 1986-1987 of 20,850 of which 14,856 were elementary

school age (Grades Kindergarten to 7). Within the School District's boundaries are the Municipality of Coquitlam, the cities of Port Moody and Port Coquitlam, and the Villages of Belcarra and Anmore (Info 43, 1986 - 1987).

The District Staff includes one Superintendent, three Assistant Superintendents, and three Directors of Instruction (one of whom is the Director of Student Support Services AKA Special Education) at the executive level. They are supported by various coordinators and consultants, one of whom was the Consultant for Learning Assistance and who was responsible for developing, coordinating, and evaluating this pilot study.

The district staff was, and is, known as one that is willing to try effective implementation of innovative practices as well as having some expertise in the Direct Instruction approach and philosophy. Consequently, the Scientific Research Associates (SRA) publications representative felt he would have a positive reception for the Direct Instruction reading program, Reading Mastery (RM) in that the coordinating consultant had specific Direct Instruction training, a decade of experience teaching various Direct Instruction programs, and an enthusiastic commitment to a pilot proposal of this nature.

The district philosophy statement includes the belief that in carrying out its statutory responsibilities to establish, maintain, monitor, and develop the district school system, the district must encourage administrative and instructional practices that are both flexible and adaptive in fostering individual

school and educational efforts. Further, the board believes that all its pupils have equal rights to be offered through the school system, within the limits of the resources available to it, a wide variety of educational opportunities that will develop in the least restrictive environment, their potentials as individuals and members of society (Info 43, 1986-1987).

One of the aims of the district that is most relevant to this study, states that the board aims to provide programs that meet educational needs of all pupils at each stage of their development. The board supports the concept of meeting these needs through comprehensive school-based programs, but recognizes that there is also a place for special district services (Info 43, 1986-1987).

School District #43 Learning Assistance Guidelines resulting from a major district review of Learning Assistance Services were being developed during the 1986-1988 period. They included reference to the notions of supporting the student in the regular classroom and the promotion of the Learning Assistance Teacher as resource consultant for school based needs.

3.3.2 The schools.

The experimental sites themselves were chosen using similar criteria to that of choice of district, that is, (1) a willingness to try an innovative program, and (2) some expertise in Direct Instruction philosophy, approach and techniques. Three further elements were looked at in choosing individual

schools, they were: (1) a supportive philosophic and financial commitment by the school Principal; (2) the possibility of a trained (Direct Instruction), knowledgeable, and committed in-house coordinator currently serving as the Learning Assistance Teacher; and (3) a similarity in socioeconomic backgrounds of students based on relative housing values in each neighbourhood. Six elementary schools were considered, of which three: Burquitlam, Seaview, and Viscount Alexander, were selected in April of 1986 as the experimental sites.

The other three elementary schools: Eagleridge, Hazel Trembath, and Lord Baden Powell were chosen as the control sites using criteria that included: a knowledgeable Learning Assistance Teacher to serve as an assessment coordinator, effective Learning Assistance programming which had been in place over a period of time, and a socio-economic similarity with the experimental schools.

The on-site coordinators, the Learning Assistance Teachers, were expected of have a number of competencies including: a belief that there are many ways in which children learn to read, good communications skills with their colleagues and administrators as well as with the district consultant, good organizational skills, and the ability to work with the "change" process. In addition, school-based coordinators were expected to have a thorough knowledge of the reading process, and training and experience in reading assessment.

3.4 Professional Development

3.4.1 Experimental schools.

Staff development for the experimental schools consisted of: conducting an informal needs assessment, orientation/overview of the RM program, specific training in Direct Instruction techniques using RM, followup resource meetings at school and district levels, demonstration lessons, weekly monitoring of staff needs, and evaluation of students and program.

The three on-site coordinators and the district staff consultant met in early May to assess professional development needs and collaboratively plan in-service for all participating teachers. Needs of each of the schools were discussed and planning was adapted to meet the specific requirements of each site as training and expertise varied widely on staffs. One teacher, for example, had her Master's Degree in Education (Reading) from the University of Oregon where she had worked extensively with proponents of Direct Instruction while others on her staff had never heard the term "Direct Instruction".

To meet the breadth of diverse professional development needs, school-based and district plans were formulated. Several staff members of one school planned to attend the annual Direct Instruction Summer Institute in Eugene, Oregon that summer and were interested in bringing a recognized trainer from the Institute to work with their staff. The idea was thought to be of merit to all

and the trainer (Dr. Kathy Madigan) was brought in before school started in early September to work with all of the participants of the three pilot sites for two and a half days. Another staff requested district professional development funds to bring in a trainer (Terry Dodds) from Sannich School District, Vancouver Island, for on-site training with a followup session in her school in Sannich in November to observe and discuss the program with practicing teachers. The third staff decided to hold weekly morning breakfast/resource meetings to enhance training.

In late May and early June of 1986, orientation sessions were conducted with each of the staffs of the three schools. Information was presented by the district consultant in a discussion format at each school. The information was designed to acquaint staff members with:

1. the rationale for the study and the program,
2. the materials for use,
3. the assessment devices to be used, and
4. a proposed timeline.

Each session was concluded with a shared school and district commitment statement regarding:

1. enthusiastic ownership of study,
2. willingness to try an innovative project,
3. willingness to devote extra time and energy to the project,
4. agreement to assist with assessment, and
5. agreement to secure additional training in Reading Mastery.

3.4.1.1 Pre-study training.

During the summer, several teachers from the staffs of the three experimental schools attended the Direct Instruction Summer Institute in Oregon while others immersed themselves in their new presentation manuals for Reading Mastery.

On Thursday, September 4 and Friday September 5, Dr. Kathy Madigan of California State University, presented a training clinic for those involved with the pilot study. She addressed the following general questions: What is Reading? What does research tell us about reading disabilities? What is decoding? What is comprehension? What is Direct Instruction? She also interactively demonstrated the specific techniques of RM using live subjects both at the primary and the intermediate level. The sessions with Kathy were taped for later reference and followup refresher purposes.

All of the teacher participants were again assembled later in September at the teacher centre for refreshment of techniques using the Dr. Madigan's video, a warmup for heading into the program, and general encouragement.

3.4.1.2 Within study training.

In the following weeks and months, scheduled weekly visits were made by the district consultant to each school for the following purposes: encouragement, troubleshooting, resource provision, demonstration lessons of specific techniques, and observation. In addition, the on-site coordinators and the district consultant met every six weeks at the teacher centre to evaluate progress, share information and needs, and provide encouragement for each other.

The one teaching staff that had made plans to visit Sannichton Elementary did go in mid-November. They observed in the Grade 2/3 classroom for 90 minutes and in the Grade 5 classroom for 90 minutes, after which they had an opportunity to meet with the teachers delivering the RM program for discussion and networking.

3.4.2 Control schools.

As no treatment was to be delivered, the primary responsibility of the coordinators of the control schools during the study was to administer the instruments and manage the collection of assessment data. One of the criterion for selecting the three schools as control sites was, in fact, that the on-site Learning Assistance teacher would have had training and experience in test administration. Finally, communication with the district consultant was facilitated regarding the importance of clarifying and using standardized management of data for this study.

The district consultant formally met with the team from each control school at three stages of the project. The control team consisted of regular classroom and Learning Assistance teachers, and the administrator. The times and purposes of the meetings were as follows: once at the beginning to set up the control site, during the collection of data in October, and subsequent to the collection of data in May to discuss the final collation.

3.5 Selection of Assessment Instruments

The second agenda item at the early May meeting of on-site Coordinators, dealt with how to measure progress in reading for the purposes of this study. Various assessment tools and techniques were discussed and as a result of a review of the literature and in consultation with university mentors (Dr. Leone Prock, SFU; and Dr. Jerry Johns, University of Northern Illinois), the Director of Curriculum for School District #43 (Dr. Alan Taylor), the SRA representative, and the six coordinators themselves. Descriptions of the instruments which were selected follows.

3.5.1 The assessment tools chosen.

As no single test can sample all reading behaviors (Ysseldyke & Marston, 1982) three different types of reading instruments were chosen for assessment. They were a standardized reading test, The Gates McGinitie Reading Tests, Canadian Edition (to be referred to as GM); an informal reading inventory; The

Basic Reading Inventory (to be referred to as BRI); and an attitudinal survey, The Student's Perception of Ability Scale (to be referred to as SPAS).

3.5.2 A standardized group assessment.

The GM is a group administered multiple choice test, described in the Ninth Mental Measurements Yearbook (Mitchell, 1985) as a worthwhile test of reading progress. Two reading behaviors are targeted for measurement by the author; vocabulary, which is primarily a test of word knowledge, and comprehension, containing both literal and inferential questions (McGinitie).The Kuder-Richardson Formula 20 reliability coefficients range from .85 to .94. (Mitchell, 1985). Content analysis of the items shows the test adequately samples both decoding reading and comprehension skills (Salvia & Ysseldyke, 1985; Ysseldyke & Marston, 1986). The various levels of the tests (Grades 1-12) were normed on a representative sample of 46,000 Canadian students. As with all group reading tests, it serves as only one part of a carefully considered assessment package (Cooter, 1989).

3.5.3 An individual informal reading inventory (IRI) assessment.

The GM relies on multiple-choice responses and may encourage impulsive guessing (Compton's work cited in Ysseldyke & Marston, 1986) which might possibly lead to comparing accuracy in the assessment of reading skills being

compromised. Bristow et al. (1983) suggest that an IRI provides a rich opportunity to observe a range of "ecologically valid reading behaviors" that simply cannot be observed when a students take a group silent reading test. The IRI chosen for this study was the BRI and was administered to individual students to by the school Learning Assistance teacher in October and by trained examiners in May. It consists of two parts. The first requires students to read from a series of graded lists of words derived from the EDL Core Vocabularies in Reading, Mathematics, Science and Social Studies, based on basal and frequency lists, and the Basic Skills Word list: Grades 1-12, also based on basal and frequency factors, but adds a third category of students demonstrated familiarity with particular words (Johns, 1985). In the second part of the BRI, students are instructed to read aloud from a series of graded passages and answer ten oral comprehension questions about each passage. The passages have been developed over the years by Johns and his associates at the University of Northern Illinois Reading Clinic as well as by practitioners all over North America providing feedback to Johns with each new edition. The trained examiners from the experiment described in this study, in fact, provided specific passage suggestions for revision of the 4th and 5th editions of the BRI. In previous editions, passages were graded on a "readability" basis. That is, they were subjected to a number of readability measures in order to determine the reading level of the content typically based on of sentence lengths and word difficulty (Vacca et al, 1987). The 3rd edition included data and input from a wider variety of sources which included; practitioners feedback, reviews of IRI's and particularly the BRI, critiques from university students, letters to the author,

and the author's continued use in the clinical situation (Johns, 1985). It was decided in consultation with Dr. Johns (personal communication, April 10, 1986) to administer the same form (A) of each test (test-retest) in October and later again in May. He stated at the time that the performance consistency within the BRI between forms (ie. forms A, B, and C) had not been sufficiently assessed. In other words, Form A does not necessarily equal Form B or Form C etc. In their article on "alternate-form reliability" the findings of Helgren-Lempesis and Mangrum (1986)agreed with Johns suggesting that authors of IRI's need to address the equivalency of alternate forms.

The Ninth Mental Measurements Yearbook (1985) regards the BRI as a useful tool to assess reading performances, especially among children who have reading disabilities. Bristow et al (1983) chose to include the BRI in their study as representative of a commercial IRI, based on high frequency of use, careful construction, and recent revisions. They found that the BRI may be a good alternative to teacher prepared IRI's and can be a useful alternative when several basals are used. The reading assessment literature contains much cautionary language about the subjective interpretations if IRI results. It is perhaps best summed up by Helgren-Lempesis and Mangrum (1986) when they say "Many questions remain to be answered before IRI's are examined and esteem assigned to them by teachers and diagnosticians. Though acceptable, the reliabilities of the published IRI's suggest the need for cautious interpretation.

3.5.4 An attitude assessment.

Reading tests themselves only provide information about selected aspects of reading performance, consequently, we need to make decisions based on multiple indicators (Vacca et al., 1987). With this caution in mind we head into an even grayer area of student assessment, that of exploring and quantifying students' perceptions of themselves as "learners" and "learning". As this project was being planned and the coordinators worried over the choice of assessment tools, it was suggested by one of the group that we examine some instruments in the affective domain to create a more dynamic assessment combination in light of current thinking about reading. It was decided that it was not enough to assess a student's current level of academic performance since those who assess must also investigate what shaped the performance (Salvia & Ysseldyke, 1985). One of the most durable beliefs in education is that self-concept influences behavior in all major areas of a student's life. Gorrell found a wealth of studies that showed positive correlations between self-concepts and school achievements. In some cases, learning-disabled childrens' feelings of competence or acceptance may have an impact on their behavior (Pearl et al, 1986). Troubled readers almost always see themselves as poor readers. They show fear and anxiety or reject reading altogether as not worth the effort (Phinney, 1988). Bandura (1986) suggested that an individual's beliefs about his or her ability to perform certain specific actions or to attain certain goals, operated as a mediating influence on behavior particularly affecting whether or not the student would attempt a certain behavior and the amount of persistence he or she would expend in that

attempt. Consequently we chose an instrument that attempted to reflect these ideas of self esteem. The Student Perception of Ability Scale (SPAS) (1983) was described but not reviewed in the Ninth Mental Measurements Yearbook (1985). In the SPAS, the student is asked his or her opinion about 70 self-concept and learning issues on a yes/no basis, such as: "I like to answer questions; My friends read better than I do; I usually finish my schoolwork; When school gets tough, I give up; etc. " School systems might find the SPAS a useful instrument for evaluating affective components of special programs such as those involving remedial instruction" (Chapman et al, 1981).

3.6 The Subjects

Students in both the experimental and the control schools were chosen using two criteria. Firstly, classroom teachers (Grades 1-7) were asked to nominate those students experiencing difficulties with reading in their own classrooms based on observational and informal assessment data. Following the early September in-service with Dr. Madigan, the teachers met with their new classes and did not "group" their youngsters for the first two weeks of the school year. During that time, however, they did conduct observations on work habits and participation as well as informal assessments in areas such as paragraph writing, story discussion, spelling tests, and oral reading in order to evaluate their students' abilities with a view to possible and/or appropriate placement in the RM pilot study.

Secondly, teachers were asked to nominate those students who would likely be non-transient for a one year period so that we might conduct pre and post assessment. The experimental schools were asked to nominate students using one additional factor, namely that the student would respond well to the Direct Instruction format of highly structured presentations in an audio and visual, interactive format. Lists of nominated children were collated and cooperatively evaluated based on the criteria by the Learning Assistance teacher and the classroom teacher for suitability, particularly in the experimental schools.

The participants in the study were selected by September 19, 1986 and numbered 261. Table 1 shows the distribution of subjects by experimental and control groups as well as by grade level.

TABLE 1

Distribution of Pilot Study Subjects by Group and Grade

N = EXPERIMENTAL/TREATMENT GROUP

SCHOOL/GRADE	GR. 1	GR. 2	GR. 3	GR. 4	GR. 5	GR. 6	GR.7	TOTAL
A	7	10	12	5	7	11		52
B	10	7	9	7	7	10		50
C	5	8	8	10	8	10	11	60
SUB-TOTALS	22	25	29	22	22	31	11	162

N = CONTROL/NON TREATMENT GROUP

SCHOOL/GRADE	GR. 1	GR. 2	GR. 3	GR. 4	GR. 5	GR. 6	GR. 7	TOTAL
D		5	4	7	4	6	4	30
E	5	5	6	5	3	5	5	34
F	9	5	4	3	8	2	4	35
SUB-TOTALS	14	15	14	15	15	13	13	99

TOTAL SUBJECTS **261**

3.7 Direct Instruction Reading Program, "Reading Mastery" (RM)

RM is a basal reading series intended for students in grades 1 through 6. For students at each grade level it consists of basal readers (anthologies), workbooks, skillbooks for students in grades 4 through 6, and test booklets at all levels. Teacher materials include presentation books (scripts), teacher guides, take-home and spelling books for grades 1 and 2, and testing and management handbooks at all levels. The goals of the program are that students will learn to decode, comprehend, and use study skills. The focus of the series is on teaching all reading skills to mastery.

3.7.1 Program delivery.

All skills were taught using Direct Instruction techniques as they applied to a variety of contexts. Skills were continually reviewed and monitored. This cycle of thorough instructional management was intended to provide the less able reader in particular, with appropriate kinds and amounts of practice in order to master critical reading skills.

To ensure accurate placement of students, each level (corresponding to grade) of the series includes a placement test that was administered to individual students by the Learning Assistance teachers as part of the initial planning and informal assessment period.

Individual lessons usually lasted 30 to 45 minutes daily and were taught by the classroom teacher. Each formal lesson consisted of group instruction, independent work and a daily checkout of student work.

3.7.2 Monitoring strategies and informal assessment of student progress.

Students were informally monitored and assessed on a diagnostic - prescriptive basis using the program materials(a form of curriculum based assessment) as they progressed through each level of the series. Decoding skills were periodically measured through rate-and-accuracy checkouts which were part of each day's lesson. Comprehension and study skills were measured through daily independent work serving as a continuous assessment of each student's skill mastery. In addition, those teachers who chose to use the publisher's levels tests, had an opportunity to do so. Progress charts showing decoding and comprehension measures were a major reinforcement technique used throughout the program.

3.8 Data Collection

3.8.1 Formal assessment.

Pre and post testing, occurred in October of 1986 and May 1987 respectively. At each testing period, students in both the experimental and the

control groups, completed a battery of three tests: a standardized reading test, the Gates McGinitie Reading Test (Form A in October and Form B in May) measuring vocabulary and silent reading comprehension; an informal reading inventory, the Basic Reading Inventory (Form A in October and May) measuring decoding and oral comprehension; and an affective measure, Students' Perception of Ability Test (SPAS)(there is only one form of this test) measuring student self-concept.

In October the battery was administered by the regular classroom teacher and the Learning Assistance Teacher. Assessment time per child amounted to approximately 120 minutes or 2 hours. With an average pilot study participation of 43 students per school this amounted to approximately 86 hours of testing for the teachers in the schools. At their resource meeting in November, the district and site coordinators felt that the amount of time required for testing was too great and that a solution needed to be found.

3.8.2 Examiner Training

For the October assessment period, District Learning Assistance teachers were trained in the Basic Reading Inventory procedures the previous May in order to provide sufficient reflection and practice time. They were already familiar with the administration of the Gates McGinitie and the Student Perception of Ability Scale.

Because the administration of the battery of chosen assessment tools required more time (1 1/2 hours/student) than had been either anticipated or found acceptable for the Learning Assistance teacher case load at the end of the year, it became clear that another avenue for post testing needed to be explored. Dr. Leone Prock, Professor, Education Faculty, Simon Fraser University, presented a proposal to the then Undergraduate Faculty Chairman , Dr. Mike Manley-Casimir, and his committee to offer a course titled "Reading Assessment: A Field Experience" for credit at SFU during intersession (May and June,1987) in conjunction with School District #43(Coquitlam). As Dr. Prock stated in her presentation to the committee, here was a unique opportunity to work cooperatively with a local school board to help solve their needs while at the same time providing a viable university course for education students at SFU. The undergraduate committee agreed, and the "Coquitlam Experiment" representing an important bridge between efforts of a school district and the university (Prock, 1987) was born.

Hence, the " Coquitlam Experiment" became EDUC 385 and was offered as requested to begin in May, 1987 with 12 students registered. The course outline included the following topics: (1) the field experience, (2) reading assessment, (3) characteristics of measurement, (4) the "Coquitlam Experiment", and (5) school based research. The students were taught how to administer the various parts of the test battery and they had an opportunity to practice in role playing sessions with each other. The visit of Dr. Jerry Johns, University of Northern Illinois, the author of the Basic Reading Inventory, to one of the class sessions,

provided an outstanding opportunity for the EDUC 385 students to hear and interact first hand with a leader in the field of informal reading inventories.

In May, the assessment battery (post test) was administered to all subjects by twelve EDUC 385 students. Two students were assigned to each of the six school sites. Their experience and performance was carefully monitored by twice weekly visits of the district consultant, the on-site learning Assistance teachers, and the school principals.

3.8.3 Informal program assessment.

Mid-study feedback for purposes of evaluating the program was facilitated by the district consultant in collaboration with the individual school principals. These meetings were held in each school in February to bring each staff together as a whole to address common concerns. Teachers and administrators were asked to examine program expectations, outstanding features, and difficulties encountered.

A final anecdotal evaluation of the program and/or the study was conducted in June of 1987. The questions were; What did you like about the Reading Mastery program? What would you like more information on? and What would you suggest for future programs?

3.9 Data Management.

3.9.1 Summary sheets.

The students' raw scores on each of the three tests were collected and entered on a summary sheet, specifically designed for purposes of the pilot study, in October by the Learning Assistance teachers and in May by the SFU EDUC 385 students.

3.9.2 Confidentiality.

Subjects' names were specifically deleted in order to provide confidentiality to the study. They were not included, as requested by the district consultant, on the summary sheets that were submitted for collation in June.

The anecdotal feedback sheets from the participating teachers were kept as submitted to the on-site coordinators and transcribed for analysis. Names were also deleted from these forms for confidentiality purposes.

3.9.3 Independent variable.

The experimental group received the treatment of an alternate reading program, RM by classroom teachers so trained in that program for a period of

eight months in the regular classroom setting. The control group received no treatment and were taught by classroom teachers who might or might not have had any training in the teaching of reading.

3.9.4 Dependent variables.

Dependent measures were related to vocabulary, silent comprehension, decoding, oral comprehension, and attitude towards reading. The same dependent measures were used for students in both the experimental and control conditions.

3.10 Experimental Design

The experimental design is a 2 (Groups: Treatment vs. Control) X 2 (Tests: Pre and Post) factorial.

CHAPTER 4

RESULTS

4.1 Introduction

The results of this study will be reported in five sections as each pertains to the dependent variables. In analyzing pre and post test scores, the decision was made to report only raw scores rather than include grade equivalency and percentile scores for each measure to assure maximum reliability in the dependent variables. The use of test scores based on percentile and grade equivalency are highly susceptible to over interpretation as they are not equal interval units (Tindal and Marston, 1986). Consequently raw scores were used exclusively in the present data analyses. Each section begins with means and standard deviations (Descriptive Results) as they are presented for each variable showing the pre and post test results. The second part of each section contains results of a repeated measures Analysis of Variance (ANOVA Results). The SPSS:X (Nie, 1983), ANOVAR computer software program was run on the SFU mainframe to investigate (A) the possible differences between groups (B) the degree of significance between pre and post testing and (AB) the interactions between the two. This information is followed by an accompanying graph comparing the mean gains of the experimental and control groups by grade and by variable.

The experimental hypothesis was presented in directional form in Chapter 1. It states that the subjects receiving treatment from teachers trained in the Direct Instruction Program, Reading Mastery would show a significant increase between pre and post testing over the control group who were receiving the "regular" classroom reading program. The dependent variables are discussed in alternate form in this chapter for statistical testing. Because of the practical context of this research, the criterion for statistical significance was set at alpha level of .05.

4.2 Gates McGinitie Vocabulary (GMV) Subtest

The first dependent variable stated that the subjects receiving treatment would show a significant increase from pre to post test scores on the Gates McGinitie Vocabulary (GMV) subtest.

4.2.1 Descriptive Results

The mean raw scores and standard deviations across pre and post testing are presented in Table 2. Results are shown for the experimental and control groups for Grades 3 to 6.

TABLE 2

Mean Raw Scores and Standard Deviations Across Pre and Post Testing:

Gates McGinitie Vocabulary Subtest

GRADE	GROUP	PRETEST MEAN	POSTTEST MEAN	MEAN GAIN	DIFF (E-C)	PRETEST STD DEV	POSTTEST STD DEV
3	EXPER	15.200	23.800	8.600	4.300	7.341	7.457
	CONTROL	15.700	20.000	4.300		6.977	6.289
	GR MEANS	15.400	22.280				
4	EXPER	12.571	19.429	6.858	1.929	5.003	5.034
	CONTROL	14.500	19.429	4.929		3.798	4.292
	GR MEANS	13.536	19.429				
5	EXPER	16.944	23.056	6.112	0.969	4.709	3.262
	CONTROL	18.286	23.429	5.143		6.317	4.504
	GR MEANS	17.320	23.160				
6	EXPER	23.667	28.111	4.444	0.171	8.643	7.267
	CONTROL	25.000	29.273	4.273		6.261	5.159
	GR MEANS	24.172	28.552				

GR MEANS: Grand Means of Tests. (eg. The mean of all Grade 3 subjects at pre test.)

All groups showed mean gains ranging from 4.237 (Grade 6 control) to 8.600 (Grade 3, experimental) for the period of treatment (October to May). Differences in mean gain scores (experimental mean gain score minus control mean gain score) ranged from a low of 0.171 (Grade 6) to a high of 4.300 (Grade 3). Differences in Standard Deviations were minimal from pre to post test ranging from -1.813 (Grade 5, control) to .494 (Grade 4, control).

4.2.2 ANOVA Results

As indicated in Table 3, the results showed no significant Group differences. However, there was a consistent main effect of Tests across all grade

levels, suggesting that both treatment and control groups improved in the vocabulary subtest of the Gates McGinitie Reading Test. Excepting for the grade 3 children, the interactions between Groups and Tests (AB) at grades 4, 5, and 6

TABLE 3

Analysis of Variance Summary Table: Gates McGinitie Vocabulary Subtest

SOURCE OF VARIANCE	SS	df	MS	f	p
GRADE 3 (N=25)					
A	32.669	1	32.669	0.369	0.549
B	499.228	1	499.228	39.478	0.001*
AB	55.474	1	55.474	4.387	0.047*
GRADE 4 (N=28)					
A	13.019	1	13.019	0.428	0.519
B	486.162	1	486.162	43.538	0.001*
AB	13.016	1	13.016	1.166	0.290
GRADE 5 (N=25)					
A	7.407	1	7.407	0.236	0.632
B	319.164	1	319.164	37.392	0.001*
AB	2.360	1	2.360	0.276	0.604
GRADE 6 (N=29)					
A	21.250	1	21.250	0.219	0.644
B	259.412	1	259.412	34.966	0.001*
AB	0.100	1	0.100	0.013	0.908

*values were significant at alpha = .05

A - Groups (Experimental vs Control) effect
B - Tests (pre and post) effect
AB - Interactions between the two

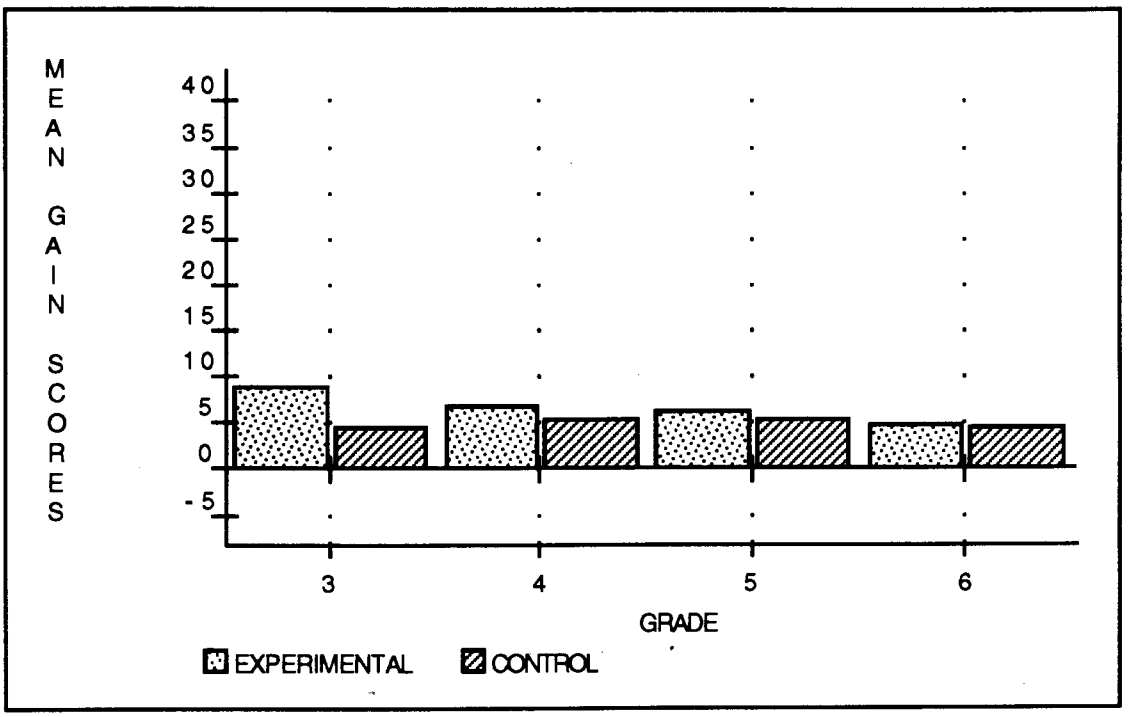
were non-significant. The significant interaction between group and tests at grade 3 indicates that at the pretest, treatment, and control groups did not differ from each other. But at post test, the treatment group surpassed the control group.

The differences between the mean gains in group scores ("Diffs" column in Table 1) across pre and post testing for the experimental and control groups are shown graphically in Figure 1.

FIGURE 1

Mean Gain Differences Scores (Posttest Minus Pretest) for Experimental and Control Groups by Grade:

Gates McGinitie Vocabulary Subtest



4.3 Gates McGinitie Comprehension (GMC) Subtest

The second dependent variable stated that the subjects receiving treatment would show a significant increase from pre to post test scores on the Gates McGinitie Comprehension (GMC) subtest.

4.3.1 Descriptive Results

The mean raw scores and standard deviations across pre and post testing are presented in Table 4. Results are shown for the experimental and control groups for Grades 3 to 6.

TABLE 4

Mean Raw Scores and Standard Deviations Across Pre and Post Testing:

Gates McGinitie Comprehension Subtest

GRADE	GROUP	PRETEST MEAN	POSTTEST MEAN	MEAN GAIN	DIFF (1-2)	PRETEST STD DEV	POSTTEST STD DEV
3	EXPER	16.000	27.667	11.667	3.667	5.305	6.114
	CONTROL	15.000	23.000	8.000		4.028	8.340
	GR MEANS	15.600	25.800				
4	EXPER	11.643	17.571	5.928	3.143	4.236	4.380
	CONTROL	13.929	16.714	2.785		4.411	3.384
	GR MEANS	12.786	17.143				
5	EXPER	17.056	21.778	4.722	2.150	6.159	5.887
	CONTROL	15.571	18.143	2.572		7.502	6.466
	GR MEANS	16.640	20.760				
6	EXPER	20.778	26.722	5.944	2.035	5.786	6.452
	CONTROL	16.818	20.727	3.909		4.215	7.001
	GR MEANS	19.276	24.448				

GR MEANS: Grand Means of Tests (eg. The mean of all Grade 3 subjects at pre test.)

The groups showed mean gains ranging from 2.572 (grade 5, control) to 11.667 (grade 3, experimental) for the period of treatment (October to May). Differences in mean gain scores (experimental minus control) ranged from a low of 2.035 (Grade 6) to a high of 3.667 (Grade 3). Differences in Standard Deviations were minimal from pre to post test ranging from -1.036 (grade 5, control) to 2.786 (grade 6 control). There was a notable increase in standard deviation for the grade 3 control group, however. Mean scores at that level increased from 15.000 to 23.000 and the consequent standard deviations increased from 4.028 to 8.340 for a difference of 4.312 or double the pretest standard deviation signifying the possibility that as the mean scores increased and the standard deviation doubled, some students may have benefited considerably and some not nearly as much from the regular reading program as indicated in the post test results.

4.3.2 ANOVA Results

Except for grade 6, Table 5 shows that there was no significant main effect of Groups. At the grade 6 level, the treatment group surpassed the control group. Like the results of the Vocabulary subtest, there was a consistent main effect of Tests indicating that both treatment and control groups improved in reading comprehension on the Gates. The only significant interaction between Groups and Tests occurred at grade 6 where the treatment group surpassed the control group substantially at posttest but did not differ from the latter at pretest.

TABLE 5

Analysis of Variance Summary Table: Gates McGinitie Comprehension Subtest

SOURCE OF VARIANCE	SS	df	MS	f	p
GRADE 3 (N=25)					
A	96.331	1	96.331	1.774	0.196
B	1160.332	1	1160.332	60.562	0.001*
AB	40.336	1	40.336	2.105	0.160
GRADE 4 (N=28)					
A	7.144	1	7.144	0.315	0.579
B	265.785	1	265.785	23.453	0.001*
AB	34.573	1	34.573	3.051	0.093
GRADE 5 (N=25)					
A	66.037	1	66.037	1.171	0.290
B	134.057	1	134.057	5.866	0.024*
AB	11.657	1	11.657	0.510	0.482
GRADE 6 (N=29)					
A	338.286	1	338.286	5.956	0.022*
B	331.455	1	331.455	21.778	0.001*
AB	14.139	1	14.139	0.929	0.344

*values were significant at alpha = .05

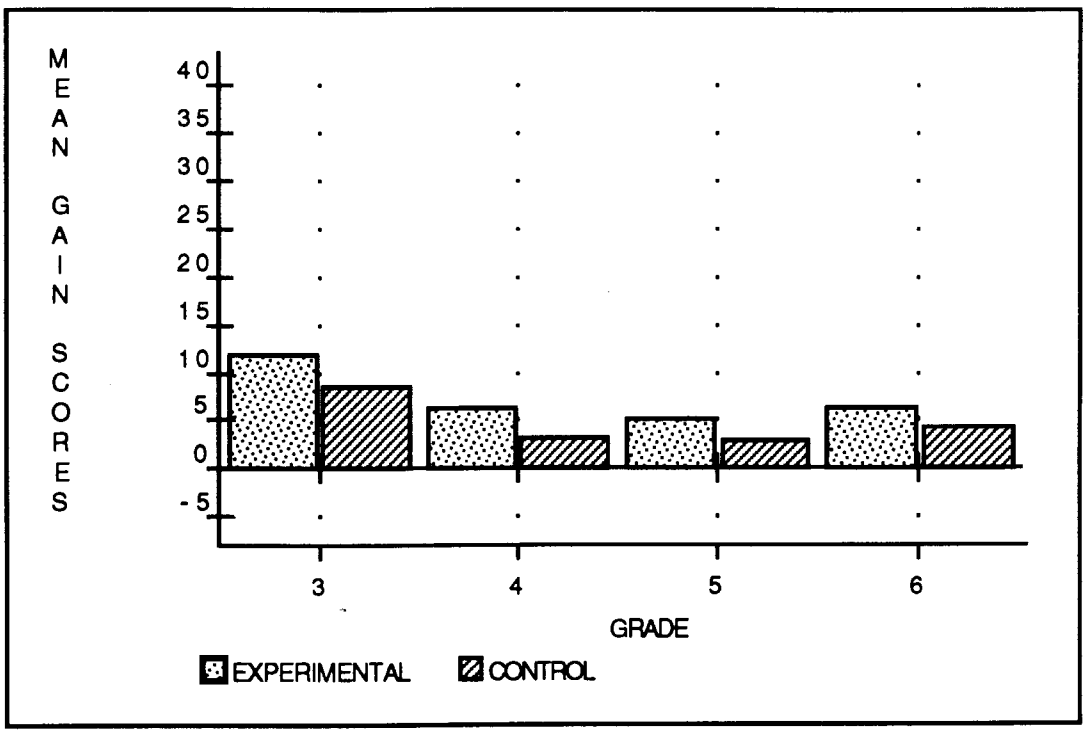
A - Groups (Experimental vs Control) effect
B - Tests (pre and post) effect
AB - Interactions between the two

The differences between the mean gains in group scores ("Diffs" column in Table 3) across pre and post testing of the experimental and control groups are shown graphically in Figure 2.

FIGURE 2

Mean Gain Scores Differences (Posttest Minus Pretest) for Experimental and Control Groups by Grade:

Gates McGinitie Comprehension Subtest



4.4 Basic Reading Inventory Decoding (BRID) Subtest

The third dependent variable stated that the subjects receiving treatment would show a significant increase from pre to post test scores on the Basic Reading Inventory Decoding (BRID) subtest.

4.4.1 Descriptive Results

The mean raw scores and standard deviations across pre and post testing are presented in Table 6. Results are shown for the experimental and control groups for Grades 3 to 6.

TABLE 6

Mean Raw Scores and Standard Deviations Across Pre and Post Testing:

Basic Reading Inventory Decoding Subtest

GRADE	GROUP	PRETEST MEAN	POSTTEST MEAN	MEAN GAIN	DIFF (1-2)	PRETEST STD DEV	POSTTEST STD DEV
3	EXPER	83.600	114.933	31.333	2.533	32.980	30.120
	CONTROL	85.000	113.800	28.800		12.824	21.596
	GR MEANS	84.160	114.480				
4	EXPER	128.857	151.857	23.000	-14.643	24.554	15.531
	CONTROL	119.786	157.429	37.643		19.264	21.785
	GR MEANS	124.321	154.643				
5	EXPER	151.333	166.500	15.167	-0.261	29.396	30.446
	CONTROL	154.286	169.714	15.428		26.638	29.438
	GR MEANS	152.160	167.400				
6	EXPER	153.722	173.000	19.278	2.824	20.372	19.537
	CONTROL	167.273	183.727	16.454		8.889	10.919
	GR MEANS	158.862	177.069				

GR MEANS: Grand Means of Tests. (eg. The mean of all Grade 3 subjects at pre test.)

All groups showed mean gains ranging from a low of 15.167 (Grade 5, experimental) to a high of 37.643 (Grade 4, control) for the period of treatment (October to May). Differences in mean gain scores (experimental mean gain score minus control mean gain score) ranged from a low of -14.643 (Grade 4) to a high of 2.824 (Grade 6).

Differences in standard deviations were minimal from pre to posttest for grades 5 and 6. The standard deviation differences for grades 3 and 4 are worth noting. At grade 3 the standard deviation level decreased by -2.860 for the experimental group on an increase of mean scores from 83.600 to 114.933 and increased by 8.772 for the control group on mean scores of 85.000 to 113.800. This would seem to indicate a greater spread in upper and lower scores for the control group on the post test. The reverse occurred at grade 4 where the standard deviation for the experimental group decreased by -9.023 on an increase of mean scores from 128.857 to 151.857 indicating that as the mean score increased, more students achieved scores closer to the mean.

4.4.2 ANOVA Results

Table 7 showed clearly that there was no significant main effect of Groups at grades 3, 4, and 5. A difference may or may not have been found at the grade 6 level as the $p = .05$. However, consistent with the data above, there was a significant main effect of Tests suggesting that both treatment and control groups improved across time. Unexpectedly, the control groups improved significantly

more than the treatment groups at posttest in grades 4 and 6. However, only at grade 4 was the interaction between Groups and Tests significant.

TABLE 7

Analysis of Variance Summary Table: Basic Reading Inventory Decoding Subtest

SOURCE OF VARIANCE	SS	df	MS	f	p
GRADE 3 (N=25)					
A	0.234	1	0.234	0.000	0.989
B	10848.047	1	10848.047	67.939	0.001*
AB	19.266	1	19.266	0.121	0.731
GRADE 4 (N=28)					
A	42.875	1	42.875	0.060	0.809
B	12871.254	1	12871.254	101.195	0.001*
AB	750.750	1	750.750	5.902	0.022*
GRADE 5 (N=25)					
A	95.760	1	95.760	0.058	0.812
B	2358.720	1	2358.720	32.602	0.001*
AB	0.000	1	0.000	0.000	0.999
GRADE 6 (N=29)					
A	2012.432	1	2012.432	4.219	0.050*
B	4358.559	1	4358.559	46.514	0.001*
AB	27.310	1	27.310	0.291	0.594

* values were significant at alpha = .05

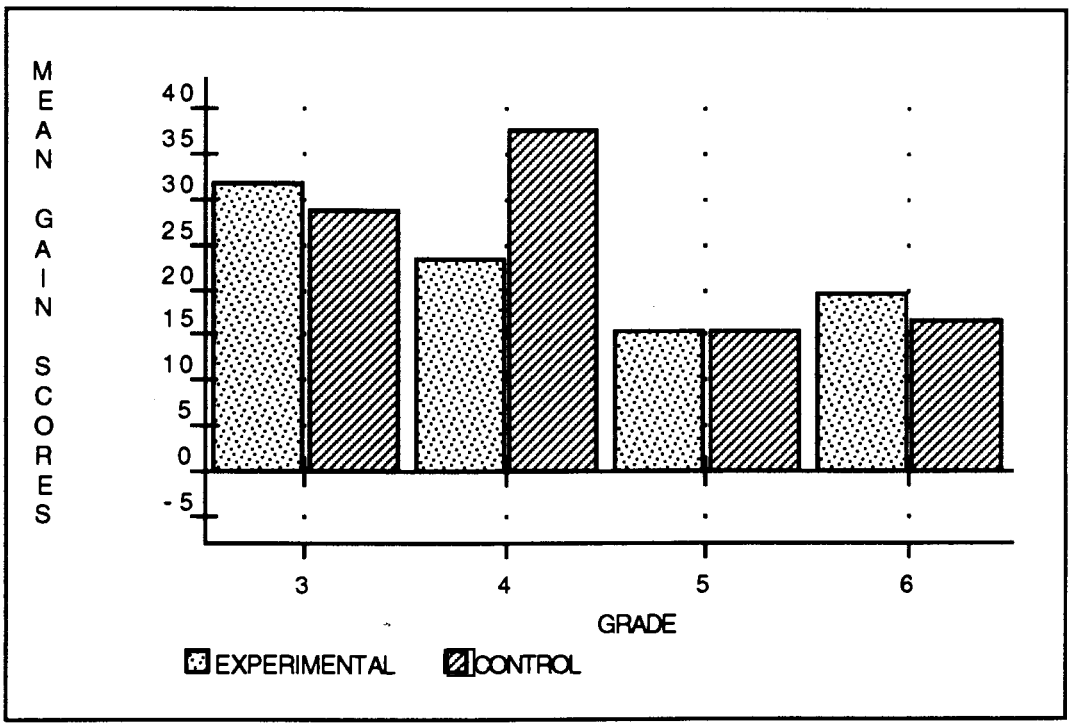
A - Groups (Experimental vs Control) effect
B - Tests (pre and post) effect
AB - Interactions between the two

The differences between the mean gains in group scores ("Diffs" column in Table 5) across pre and post testing for the experimental and control groups are shown graphically in Figure 3.

FIGURE 3

Mean Gain Scores Differences (Posttest Minus Pretest) for Experimental and Control Groups by Grade:

Basic Reading Inventory Decoding Subtest



4.5 Basic Reading Inventory Comprehension (BRIC) Subtest

The fourth dependent variable stated that the subjects receiving treatment would show a significant increase level from pre to post test scores on the Basic Reading Inventory Comprehension (BRIC) subtest.

4.5.1 Descriptive Results

The mean raw scores and standard deviations across pre and post testing are presented in Table 8 Results are shown for the experimental and control groups for Grades 3 to 6.

TABLE 8

Mean Raw Scores and Standard Deviations Across Pre and Post Testing:

Basic Reading Inventory Comprehension Subtest

GRADE	GROUP	PRETEST MEAN	POSTTEST MEAN	MEAN GAIN	DIFF (1-2)	PRETEST STD DEV	POSTTEST STD DEV
3	EXPER	34.100	49.467	15.367	5.017	19.409	11.330
	CONTROL	40.650	51.000	10.350		8.638	7.842
	GR MEANS	36.720	50.080				
4	EXPER	54.071	65.321	11.250	1.893	11.860	17.845
	CONTROL	51.143	60.500	9.357		2.453	6.158
	GR MEANS	52.607	62.911				
5	EXPER	62.778	73.222	10.444	-0.556	15.175	17.932
	CONTROL	61.714	72.714	11.000		12.510	10.303
	GR MEANS	62.480	73.080				
6	EXPER	63.556	77.111	13.555	8.509	7.604	9.208
	CONTROL	75.045	80.091	5.046		5.479	6.553
	GR MEANS	67.914	78.241				

GR MEANS: Grand Means of Tests. (eg. The mean of all Grade 3 subjects at pre test.)

All groups showed mean gains ranging from a low of 5.046 (Grade 6 control) to a high of 15.367 (Grade 3 experimental) for the period of treatment (October to May). Differences in mean gain scores (experimental mean gain score minus control mean gain score) ranged from a low of -0.556 (Grade 5) to a high of 8.509 (Grade 6). Differences in standard deviations were minimal from pre to post test for grades 5 and 6 ranging from -2.207 to 2.757 on mean scores of 61.714 to 80.091. The standard deviation differences for grades 3 and 4 are worth noting. At grade 3, the standard deviation decreased by -8.079 on an increase of mean scores from 34.100 to 49.467 for the experimental group. For the grade 4 group, the standard deviation for the experimental group increased by 5.985 on an increase in mean scores from 54.071 to 65.321 and for the control group by 3.705 on an increase of mean scores from 51.143 to 60.500, more than doubling the pre test standard deviation.

4.5.2 ANOVA Results

Table 9 again showed a significant main effect of Tests at all grade levels, suggesting that both treatment and control groups improved across time in the BRI comprehension subtest. Of pertinence is the significant pretest difference between treatment and control groups at grade 6 where the control group had a higher pretest mean than the treatment group. Similarly, the single significant interaction between Groups and Tests at grade 6 indicated that the difference between the two groups decreased substantially at posttest. Although the treatment group did not surpass the control group at post test, the treatment

group clearly improved more than the control group across time. The control group did not demonstrate a ceiling effect as shown by the maximum score of the control group on the Means and Ranges Table (Appendix A).

TABLE 9

Analysis of Variance Summary Table:

Basic Reading Inventory Comprehension Subtest

SOURCE OF VARIANCE	SS	df	MS	f	p
GRADE 3 (N=25)					
A	196.031	1	196.031	0.665	0.423
B	1984.031	1	1984.031	30.014	0.001*
AB	75.516	1	75.516	1.142	0.296
GRADE 4 (N=28)					
A	210.219	1	210.219	0.932	0.343
B	1486.243	1	1486.243	57.248	0.001*
AB	12.578	1	12.578	0.484	0.493
GRADE 5 (N=25)					
A	6.221	1	6.221	0.014	0.907
B	1158.846	1	1158.846	35.256	0.001*
AB	0.788	1	0.788	0.024	0.878
GRADE 6 (N=29)					
A	714.763	1	714.763	10.147	0.004*
B	1181.173	1	1181.173	25.470	0.001*
AB	247.233	1	247.233	5.331	0.029*

*values were significant at alpha = .05

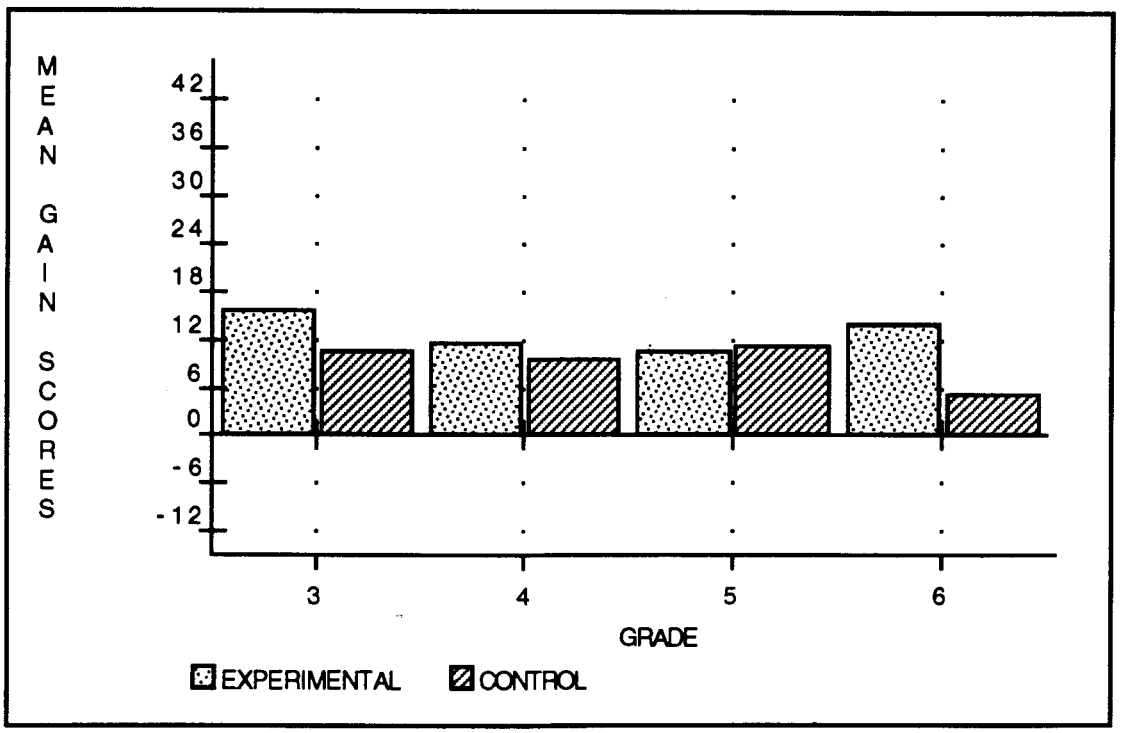
A - Groups (Experimental vs Control) effect
B - Tests (pre and post) effect
AB - Interactions between the two

The differences between the mean gains in group scores ("Diffs" column in Table 7) across pre and post testing of the experimental and control groups are shown graphically in Figure 4.

FIGURE 4

Mean Gain Scores Differences (Posttest Minus Pretest) for Experimental and Control Groups by Grade:

Basic Reading Inventory Comprehension Subtest



4.6 Student Perception of Ability Scale (SPAS).

The fifth dependent variable stated that the subjects receiving treatment would show a significant increase from pre to post test scores on the Student Perception of Ability Scale (SPAS).

4.6.1 Descriptive Results

The mean raw scores and standard deviations across pre and post testing are presented in Table 10. Results are shown for the experimental and control groups for Grades 3 to 6.

TABLE 10

Mean Raw Scores and Standard Deviations Across Pre and Post Testing:

Student Perception of Ability Scale

GRADE	GROUP	PRETEST MEAN	POSTTEST MEAN	MEAN GAIN	DIFF (1-2)	PRETEST STD DEV	POSTTEST STD DEV
3	EXPER	42.400	45.933	3.533	7.233	15.277	16.692
	CONTROL	46.200	42.500	-3.700		5.978	6.381
	GR MEANS	43.920	44.560				
4	EXPER	37.857	43.786	5.929	4.214	11.681	12.103
	CONTROL	39.071	40.786	1.715		11.512	12.632
	GR MEANS	38.464	42.286				
5	EXPER	39.500	41.389	1.889	-0.826	17.161	12.626
	CONTROL	39.714	42.429	2.715		14.477	8.364
	GR MEANS	39.560	41.680				
6	EXPER	37.722	38.222	0.500	6.409	13.715	11.379
	CONTROL	41.000	35.091	-5.909		12.712	12.810
	GR MEANS	38.966	37.064				

GR MEANS: Grand Means of Tests. (eg. The mean of all Grade 3 subjects at pre test.)

Both experimental and control groups in grades 4 and 5 showed mean gains ranging from a low of 1.715 (Grade 4, control) to a high of 5.929 (Grade 4, experimental) for the period of treatment (October to May). For the first time in this study, two groups (grade 3 control and grade 6 control) showed negative mean gain scores, that is their post test mean was lower than their pre test mean. Differences in mean gain scores (experimental mean gain score minus control mean gain score) ranged from a low of -0.826 (Grade 5) to a high of 7.233 (Grade 3). Differences in standard deviations were minimal from pre to post test for grades 3, 4, and 6 ranging from a low of -2.336 to a high of 1.415 on mean scores ranging from 37.722 to 45.933. The standard deviation differences for grade 5 are worth noting. For the experimental group the standard deviation level decreased by -4.535 on an increase of mean scores from 39.000 to 41.389 which was an increase of 26.5% on the pre test standard deviation and for the control group the standard deviation level decreased by -6.113 on an increase in mean from 39.714 to 42.429 for a decrease in standard deviation by 43%.

4.6.2 ANOVA Results

The results on the SPAS indicated only one significant finding as shown in Table 11, namely, the interaction between Groups and Tests at grade 3. This interaction indicated that at the pretest, the control group surpassed the treatment group while at posttest, the reverse was observed. In short, there was a crossover in the performance of the two groups of students between pre and posttests.

TABLE 11

Analysis of Variance Summary Table: Student Perception of Ability Scale

SOURCE OF VARIANCE	SS	df	MS	f	p
GRADE 3 (N=25)					
A	0.375	1	0.375	0.001	0.973
B	0.094	1	0.094	0.003	0.957
AB	156.984	1	156.984	5.043	0.035*
GRADE 4 (N=28)					
A	11.211	1	11.211	0.055	0.817
B	204.477	1	204.477	2.474	0.126
AB	62.125	1	62.125	0.752	0.394
GRADE 5 (N=25)					
A	3.977	1	3.977	O.012	0.913
B	53.393	1	53.393	0.629	0.436
AB	1.693	1	1.693	0.020	0.899
GRADE 6 (N=29)					
A	0.107	1	0.107	0.000	0.984
B	99.907	1	99.907	1.450	0.239
AB	140.179	1	140.179	2.034	0.165

*value was significant at alpha = .05

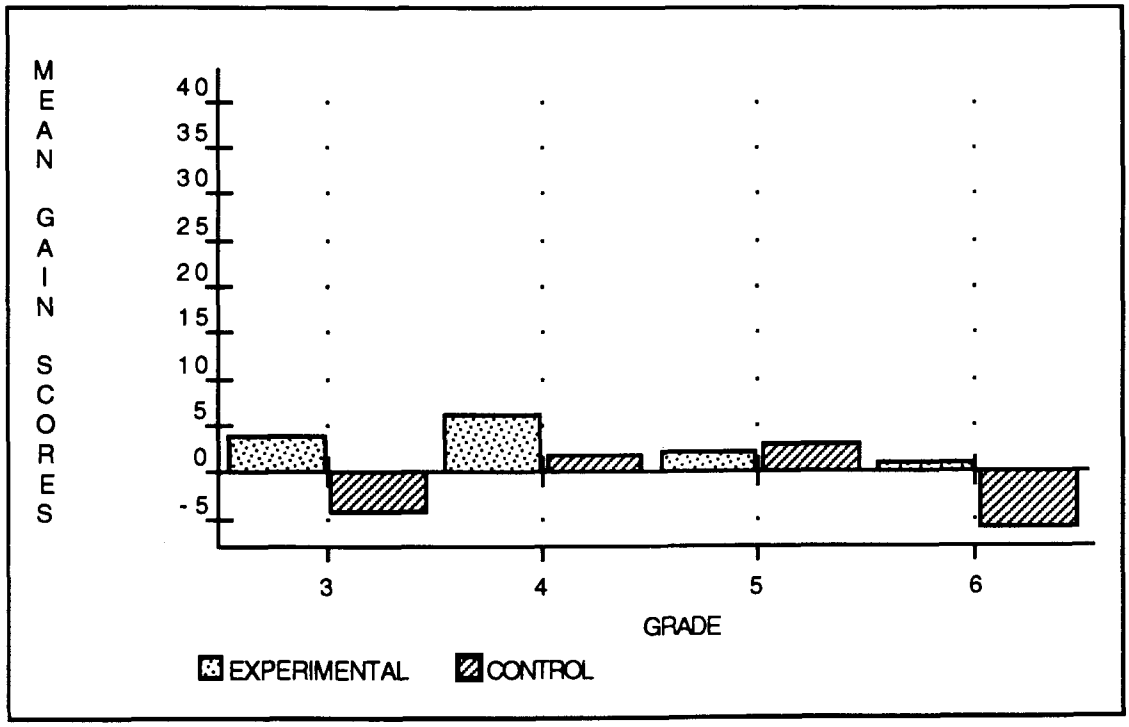
A - Groups (Experimental vs Control) effect
B - Tests (pre and post) effect
AB - Interactions between the two

The differences between the mean gains in group scores ("Diffs" column in Table 9) across pre and post testing of the experimental and control groups are shown graphically in Figure 5.

FIGURE 5

Mean Gain Scores Differences (Posttest Minus Pretest) for Experimental and Control Groups by Grade:

Student Perception of Ability Scale



4.7 Summary

The descriptive data supported all five of the hypothesis statements showing that subjects receiving treatment from teachers trained in Direct

Instruction methodology and delivering a program specifically designed to meet their reading needs showed an increase from pre-to-post test scores. The ANOVA results consistently showed over time, that both treatment and control groups improved in vocabulary, decoding and reading comprehension on the measurement tests given. However, significant effects of treatment were found in grade 3 on the vocabulary subtest of the Gates McGinitie, and in grade 6 on the reading comprehension subtest of the Gates. The control groups showed improvement over the treatment groups in grades 4 and 6 on the decoding subtest of the BRI. This unexpected reverse trend resulted from the control groups making greater gains than the treatment groups at posttest.

The specificity of treatment effects may have been due to the variability of treatment delivery, or to the particular combinations of student and treatment. Replications with appropriate modifications of variables of interest is clearly called for.

CHAPTER 5

DISCUSSION

5.1 Introduction

The purpose of this study was to examine the effect of providing an alternate reading program to experimental groups within regular classrooms by teachers trained in that program versus providing the regular reading program to control groups within the regular classroom by teachers who may or may not have had training in the teaching of reading. In this final chapter, the findings of the experiment are presented, evaluated, and examined in relation to the research literature considered in earlier chapters. Strengths and limitations of the study will be discussed followed by suggestions for practice in education and implications for future research.

5.2 Evaluation and Interpretation of the Findings

The first dependent variable of this study was that students in the experimental group would show greater gains in reading vocabulary scores than those in the control group as measured in October and May using the Gates McGinitie Reading Test (Canadian) vocabulary subtest (GMV). The experimental groups made gains over the control groups at grades 4, 5, and 6 with the difference being greater at grade 4 and minimal at grade 6. The gain, however, was greatest at the grade 3 level, and met the alpha significance level of .05 for

the interactive factor between groups and tests indicating that for this variable and at this grade RM was an effective reading program.

The second dependent variable of this study was that students in the experimental group would show greater gains in reading comprehension scores than those in the control group as measured in October and May using the Gates McGinitie Reading Test (Canadian) comprehension subtest (GMC). The results for grades 3, 4, and 5 show that the RM program was more effective than the regular reading program but were rejected due to the lack of significance. In these grades the experimental group achieved higher results. The doubling of the standard deviation from 4.028 to 8.340 for the control group in grade 3 was attributed to a greater spread in scores at post test. The results for grade 6, which also showed a greater gain of the experimental group over the control group, were considered significant at alpha .05.

The third dependent variable of this study was that students in the experimental group would show greater gains in reading decoding scores than those in the control group as measured in October and May using the Basic Reading Inventory decoding subtest (BRID). All groups and all grades made large gains relative to the other four variables (see Figures 1, 2, 4, and 5). The results unexpectedly, show nowhere near the gains of the experimental over the control groups given the explicit nature of the decoding component of the RM program. One of the beliefs of any Direct Instruction program is that skills will be learned sequentially to mastery, yet the grade 3 gain is minimal compared to

the control group (2.5 points), the grade 5 results are nearly identical for both groups, and the grade 4 gain was actually much lower for the experimental group with the interaction between groups and tests considered significant ($p = <.05$). These results are consistent with the findings of McFaul (1986) when she states that Direct Instruction is not necessarily effective with all students for all purposes. The inference may be drawn here that the regular program is as or more effective for the decoding component than the RM program at the grade 4 level. Although the grade 6 scores do show a significant difference of experimental over control scores they are not included in this discussion as the groups might have been ($p = .05$) significantly different. The largest overall gains by all groups of the study were made in this variable. Increases in mean gains in decoding scores ranged from an increase of 16 points to 38 points, indicating that students' abilities at recognizing words out of context improved for both groups.

The fourth dependent variable of this study was, that students in the experimental group would show greater gains in reading comprehension scores than those in the control group as measured in October and May using the Basic Reading Inventory comprehension subtest (BRIC). The results from this measure indicate that while both groups made gains in comprehension across time, some slight comprehension gains of experimental over control are recorded for grades 3 and 4, and a slight drop of experimental over control is noted for grade 5. Although the mean gain for the experimental group over the control group at the grade 6 level is far greater for this variable than the other grades

(14 point gain compared to 5 point gain for grade 3), the group and interaction effects are noted in favor of the control group at significance levels of .004 and .029 ($p = <.05$) respectively.

The fifth dependent variable of this study was that students in the experimental group would show greater gains in reading attitude scores than those in the control group as measured in October and May using the Student Perception of Ability Scale (SPAS). Although this is, perhaps, the most interesting set of results of the experiment, the analysis of variance showed that the differences between groups, tests, and interactions were not significantly different. This is consistent with the findings of Phinney (1988). The positive mean gain scores ranged from an increase of .500 or 1/2 a point to 5.929 or 6 points suggesting that this might not have been enough of a gain to evaluate differences compared to the differences in scores of the other four variables . A contributing factor may have been that the teachers of both groups did not focus on the affective component of the reading process, ie. they did not encourage the students to view their reading progress, however small, as an important factor in their overall progress.

Two other scores of note on the SPAS were the post test negative means at the Grade 3 and 6 levels for the control groups as these were the only negative results reported in this study possibly indicating that student attitude did decline over the testing period for the two grades. The correlation between difficulties with reading and low self esteem are well documented (Carbo, 1987)

particularly when little if any modification is being made in the reading program within the regular classroom. The provision of an alternate program that better meets some degree of self esteem in reading needs might have been reflected in the positive gain scores for the experimental groups on the SPAS.

5.3 Conclusions

Gertsen (1985) described the following conditions for providing a credible design for evaluation of a program: random assignment to one of two programs with mean performance on a battery of valid, reliable, and sensitive academic measures compared to determine whether one performs significantly better than the other. He also emphasized the importance of careful monitoring of the new program for effectiveness of implementation of the control classes to ensure that these classes are not using the experimental teaching method. He suggested that if the sample is large enough and all these conditions are met "one can be reasonably sure that differences between the samples on the post tests are due to the educational program.

It may be concluded from the results, that over time, both treatment and control groups improved in vocabulary, decoding and comprehension. Specific effects of the experimental reading program, Reading Mastery (RM) were found only in grade 3 on the vocabulary subtest of the Gates McGinitie, and in grade 6 on the reading comprehension subtest of the Gates McGinitie supporting the hypotheses for these two variables at these two grade levels. An obvious conclusion to be drawn from these results is that with the exception of the above

cited treatment effects, the reading program, RM, was only marginally more effective than the regular classroom program. The gains for the academic variables do not replicate the degree of improvement reported in some of the prior research on Direct Instruction reading programs (Becker & Englemann, 1977; Polloway et al., 1986; Gertsen & Keating, 1987).

5.4 Strengths, Limitations and Implications of the Study

Cooperation from teachers and administrators in the experimental schools was outstanding, perhaps due to the provision of an effective reading program for students with reading difficulties based on the literature (Gertsen & Keating, 1987) and on the four coordinators' (district and the three experimental schools) personal experiences. Based on the informal feedback sheets from the teachers and administrators, it was certainly perceived as a desirable addition to the school and classroom program. In addition the opportunity to present Reading Mastery in the subjects' natural environment provided a practical way to apply such a curriculum.

The degree of expected gain of the experimental group over the control group did not materialize. Student identification for program placement might have been one factor. Classroom teachers in consultation with learning assistance teachers were asked to nominate low performing students for the study by predicting their progress based on observations during the first six weeks of school rather than place children in a program based on achievement and/or

reading test scores. The pre test battery was administered to the nominated group after placement. It might have been possible that teacher prediction was not accurate in pinpointing candidates for whom this particular program might have been effective.

Of concern for this study was the use of different examiners for the pre and post testing. In October, the Learning Assistance teachers administered and marked all tests. In May, the tests were administered and marked by twelve trained examiners who were assigned to specific schools in pairs (nine of whom were teachers) with the supervision of the Learning Assistance teachers and University personnel. Helgen-Lempsis (1986) would caution that further research is needed to determine the error variance components due to the examiner factor. The question also arises over the reliability of test-retest versus the use of alternate forms of the same test for pre and post testing. The same forms were used in this study for pre and post testing and might be viewed with caution.

Given the highly structured, time-on-task nature of this particular reading program it might have been wise to add a learning styles assessment to the testing battery (Dunn et al., 1989; McFaul, 1983). It would have been interesting to view the correlations between preferred styles and achievement scores in order to assess the effectiveness of RM in relation to how children learn to read.

Two major components of the suggested effective change process/staff development process were not as well dealt with as they might have been. Both address the issue of ongoing collegial support. The first component, group resource meetings designed to share concerns, strengths, and successes of the program were not successfully implemented based on the lack of teacher attendance at the first two after-school sessions. Teacher attendance was a discouraging 20 - 25% at each school in relation to the effort and time spent on providing these sessions. The second component, coaching, was simply not present in the formal sense. It was neither built into the process nor was it explicitly observed at any of the three sites. This is not to say that teachers worked in isolation, they did not. They often discussed the program on an informal basis. The intention of this observation is, that resource time and coaching must be an explicit part of the process in order for the process of change to work (Clinton, 1988; Joyce & Showers, 1986; Miles, 1988).

At the beginning of the study, 261 subjects from grades 1 to 6 in six schools were participating. When it was time to collate the data eight months later, it was found that only four of the six schools provided complete data for all grades; two experimental schools and two control schools. One school had no pretest data available, the other had complete pre and post test data available only for grades 5 and 6. Available data were also sparse across all schools for grades 1 and 2. Examiners felt that at this early reading level most children were non-readers and that pre test information on this testing battery was not only very limited but of somewhat questionable value. However, limiting the

grades to 3 to 6 has the advantage of measurement of reading well above and well below reading grade levels (Salvia & Ysseldyke, 1985). The total number of subjects was reduced overall by 154 for a total of 107 subjects (see Table 1). The implication is clear that submission of data must be checked and double checked for completeness even when a system for assurance of accurate and complete collection is in place.

5.5 Suggestions for practice in education.

While the main objective of the thesis was to study the effects of the provision of one alternate reading program, RM, such a program should not be considered as the only alternate program that might be attempted for students with reading difficulties. Any one of a dozen reading programs is "best" if it enables a child to learn to read with facility and enjoyment (Carbo, 1987). Training and encouragement to try other reading programs must be nurtured amongst regular classroom teachers if effective programs are to be found for every child.

A number of suggestions and some subjective observations are offered for those contemplating use of this (RM) or other reading programs for those students with reading difficulties:

1. When making placement and program decisions for students with reading difficulties teachers must take into consideration some of

the following : whether or not a student would be better served using a basal reader or literature based reading materials; what strategies he or she needs at his or her point of reading development; and what are his or her preferred learning styles.

2. The educational setting for the provision of alternate reading programs must be carefully investigated. For example, is it more effective to have students with reading difficulties receive their reading instruction in the regular classroom from the regular classroom teacher or is it better that they be given instruction by a reading specialist in a resource room setting? An analogy could ee made here to the doctor who is a general practitioner providing diagnosis and prescription for a neurological disorder in his or her own setting not having had the training or possessing the appropriate diagnostic instruments. It would seem important to assess the needs of the student in relation to the degree of difficulty and his or her perception of "best" environment for learning.

3. Direct Instruction Reading is an effective approach (Gertsen & Carnine, 1986) based on the powerful results of the Follow Through project, the study of Polloway et al. (1986), this study, and personal experience. When the teachers of the experimental group were asked to give their comments on the program, they said:

"I liked the constant repetition, vocabulary development, and word attack skills, these kids actually learned to read." (Classroom Teacher, grade 4)

"These kids have learned to read when they have failed to do so before." (Classroom Teacher, grade 3)

"In 25 years of teaching, this is the first time I've enjoyed teaching reading." (Classroom Teacher, grade 6)

"Skills are taught in a progression which is not only sensible but is crucial to slow children being able to learn. They cannot miss steps in learning this way!" (Learning Assistance Teacher)

"The kids liked the repetitiveness. They learned the structure by themselves." (Classroom Teacher, grade 5)

"Because of the practice of time-on-task, the kids have to pay attention. They attend better and enjoy the stories." (Classroom Teacher, grade 4)

Students not only learn to read and practice fluent reading daily, the skill endures over time. It would be wise to consider the provision of this program as one alternative available to students in a school.

4. The inclusion of a carefully planned model of professional development into the implementation process is a critical factor of the success or failure of any new program or approach. However, successful implementation - attaining strong technical mastery of and commitment to a new practice - was not judged to be the end of process. In the absence of deliberate tactics to build in continuation and innovation measures, the natural forces of attrition would result in the disappearance of the new technique or approach (Fullan, 1988).

5. When designing a battery of assessment tools to examine a student's reading ability it would be of value to consider: (a) the definition of reading, (b) the critical factors to assess, (c) the affective domain, and (d) the inclusion of a learning styles inventory for the purposes of program placement.

6. A strength of this study is that it enabled the university and the community to come together for each other's mutual benefit. The offering of a Diagnostic Reading course within the Faculty of Education that was designed to teach university students to view the reading process and to use an informal reading inventory to assess certain aspects of the reading process, was of direct value and goodwill to the school district needing that assessment. The university students and the district were most appreciative of the opportunity for learning and the work accomplished.

5.6 Implications for future research

The incorporation of program materials designated for students with reading difficulties into the regular classroom setting and program offers many avenues for research. With regard to the present study, a number of suggestions are made to improve the current design of this project for similar studies undertaken in the future.

1. Preselect students based on screening procedures which would include an assessment battery as well as observation procedures. It might be important to redo the experiment using a selected population based on the same measures used to identify those students who might benefit from the program. Based on personal experience with this program, it was indeed effective over time for an assessment-based preselected population. Based upon the assessment from the Follow Through program, that population which had been preselected, also made greater gains than are shown in this study.

2. This study might be changed to compare RM to another alternate program (Paris' strategies. Project Read, etc) rather than the regular classroom reading program. The design might also be changed to compare RM delivered within the classroom setting to delivered as a pull-out program in a resource room.

3. The inclusion of a learning styles inventory (eg. Dunn & Dunn, 1978) for students as part of the assessment battery would be useful in screening out those students for whom a particular program bias is inappropriate, such as one with an appreciable emphasis on structure for an independent learner, or one with a heavy emphasis on global visual thinking when one is an assessed linear thinker.

4. Having teachers comment on and rate the program using a teacher survey instrument, during delivery and at the conclusion of a school year using the same survey pre and post might yield valuable information as to teacher satisfaction with the program. Two comment sheets were used in this study, one in January and one in June. Because they were different in format, the comments did not become part of the data collection in quantitative form. Yet the comments themselves were enlightening regarding predictions, satisfaction and concerns of the program and changes were able to be implemented subsequent to the January articulation.

5. More attention to the provision for coaching opportunities for teachers would be beneficial. Several teachers in the project requested time to observe others, and the response seemed artificial at best on the part of administrators and district staff. A followup study might specifically address the achievement gains made by students in this program based on the amount of coaching strategies and time built into the program for coaching for their teachers.

6. The question must be asked whether or not the observed gains are of great enough magnitude to justify the expenditure of time, money and effort on the part of teachers, administrators and

district personnel. The answer might then be that it would be important to test over a longer period of time, three years for example, in order to have further comparisons within the parameters of this experiment.

5.7 Concluding Statement

Although the data in this study did not reveal the expected degree of positive differences in means of the experimental group over the control group, the fact that 82% of the significant items did show a net increase, argues in favor of the provision of alternate programming for youngsters with reading difficulties. The positive attitudes of the teachers involved in this project speaks well for the use of direct instruction programs for many students experiencing difficulties with reading. Reading materials and techniques have changed as our understanding of the reading process has changed. In the best of all possible worlds, reading materials and techniques would incorporate current knowledge of the reading process as it best suits each youngster's reading needs (McCallum, 1988). The school system must enable learners to develop to their individual potential and to acquire the knowledge, skills and attitudes needed to contribute to a healthy society. It is critical that teachers, administrators, district personnel, and the Ministry of Education reflect upon the notion of searching for and providing funding for training and materials of alternate reading programs that may have potential for a positive, long-term impact on the lives of children who have reading difficulties.

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APPENDIX A: MEANS AND RANGES TABLE

GRADE/GROUP		GM VOCABULARY		GM COMPREHENSION	
		PRE TEST	POST TEST	PRE TEST	POST TEST
3 EXPER	MEAN	15.20	23.80	16.00	27.67
(N = 15)	MINIMUM	7.00	10.00	7.00	16.00
	MAXIMUM	27.00	38.00	26.00	38.00
	STAND. DEV	7.34	7.46	5.31	6.11
	TOTAL POSS	45.00	45.00	44.00	44.00
3 CONTROL	MEAN	15.70	20.00	15.00	23.00
(N = 10)	MINIMUM	7.00	10.00	8.00	9.00
	MAXIMUM	28.00	28.00	20.00	38.00
	STAND. DEV	6.98	6.29	4.03	8.34
	TOTAL POSS	45.00	45.00	44.00	44.00
4 EXPER	MEAN	12.57	19.43	11.64	17.57
(N = 14)	MINIMUM	4.00	11.00	3.00	12.00
	MAXIMUM	24.00	28.00	20.00	26.00
	STAND. DEV	5.00	5.03	4.24	4.38
	TOTAL POSS	45.00	45.00	43.00	43.00
4 CONTROL	MEAN	14.50	19.43	13.93	16.71
(N = 14)	MINIMUM	9.00	12.00	8.00	11.00
	MAXIMUM	21.00	29.00	22.00	25.00
	STAND. DEV	3.80	4.29	4.41	3.38
	TOTAL POSS	45.00	45.00	43.00	43.00
5 EXPER	MEAN	16.94	23.06	17.06	21.78
(N = 18)	MINIMUM	3.00	16.00	5.00	8.00
	MAXIMUM	27.00	28.00	29.00	32.00
	STAND. DEV	4.71	3.26	6.16	5.89
	TOTAL POSS	45.00	45.00	43.00	43.00
5 CONTROL	MEAN	18.29	23.43	15.57	18.14
(N = 7)	MINIMUM	6.00	16.00	8.00	8.00
	MAXIMUM	26.00	29.00	29.00	26.00
	STAND. DEV	6.32	4.50	7.50	6.47
	TOTAL POSS	45.00	45.00	43.00	43.00
6 EXPER	MEAN	23.67	28.11	20.78	26.72
(N = 18)	MINIMUM	13.00	17.00	13.00	12.00
	MAXIMUM	39.00	40.00	30.00	37.00
	STAND. DEV	8.64	7.27	5.79	6.45
	TOTAL POSS	45.00	45.00	43.00	43.00
6 CONTROL	MEAN	25.00	29.27	16.82	20.73
(N = 11)	MINIMUM	15.00	20.00	10.00	8.00
	MAXIMUM	33.00	39.00	21.00	28.00
	STAND. DEV	6.26	5.16	4.22	7.00
	TOTAL POSS	45.00	45.00	43.00	43.00

APPENDIX A: MEANS AND RANGES TABLE (Cont'd)

		BRI DECODING		BRI COMPREHENSION	
GRADE/GROUP		**PRE TEST**	**POST TEST**	**PRE TEST**	**POST TEST**
3 EXPER	MEAN	83.60	114.93	34.10	49.47
(N = 15)	MINIMUM	13.00	70.00	0.00	27.50
	MAXIMUM	121.00	166.00	56.00	63.00
	STAND. DEV	32.98	30.12	19.41	11.33
	TOTAL POSS	200.00	200.00	95.00	95.00
3 CONTROL	MEAN	85.00	113.80	40.65	51.00
(N = 10)	MINIMUM	67.00	81.00	28.50	43.00
	MAXIMUM	111.00	143.00	50.00	65.50
	STAND. DEV	12.82	21.59	8.64	7.84
	TOTAL POSS	200.00	200.00	95.00	95.00
4 EXPER	MEAN	128.86	151.86	54.07	65.32
(N = 14)	MINIMUM	89.00	131.00	39.00	39.50
	MAXIMUM	153.00	182.00	73.00	90.00
	STAND. DEV	24.55	15.53	11.86	17.84
	TOTAL POSS	200.00	200.00	95.00	95.00
4 CONTROL	MEAN	119.79	157.42	51.14	60.50
(N = 14)	MINIMUM	80.00	107.00	45.50	47.00
	MAXIMUM	158.00	190.00	54.50	70.50
	STAND. DEV	19.26	21.78	2.45	6.16
	TOTAL POSS	200.00	200.00	95.00	95.00
5 EXPER	MEAN	151.33	166.50	62.78	73.22
(N = 18)	MINIMUM	88.00	79.00	25.00	22.00
	MAXIMUM	191.00	196.00	89.50	90.00
	STAND. DEV	29.40	30.45	15.18	17.93
	TOTAL POSS	200.00	200.00	95.00	95.00
5 CONTROL	MEAN	154.29	169.71	61.71	72.71
(N = 7)	MINIMUM	103.00	106.00	39.50	57.00
	MAXIMUM	191.00	193.00	78.00	90.00
	STAND. DEV	26.64	29.44	12.51	10.30
	TOTAL POSS	200.00	200.00	95.00	95.00
6 EXPER	MEAN	153.72	173.00	63.56	77.11
(N = 18)	MINIMUM	110.00	137.00	47.50	64.50
	MAXIMUM	185.00	195.00	73.50	93.50
	STAND. DEV	20.37	19.54	7.60	9.21
	TOTAL POSS	200.00	200.00	95.00	95.00
6 CONTROL	MEAN	167.27	183.73	75.05	80.09
(N = 11)	MINIMUM	154.00	170.00	65.50	75.00
	MAXIMUM	183.00	195.00	86.50	93.50
	STAND. DEV	8.89	10.92	5.48	6.55
	TOTAL POSS	200.00	200.00	95.00	95.00

APPENDIX A: MEANS AND RANGES TABLE (Cont'd)

		SPAS	
GRADE/GROUP		**PRE TEST**	**POST TEST**
3 EXPER	MEAN	42.04	45.93
(N = 15)	MINIMUM	21.00	18.00
	MAXIMUM	65.00	66.00
	STAND. DEV	15.28	16.69
	TOTAL POSS	70.00	70.00
3 CONTROL	MEAN	46.20	42.50
(N = 10)	MINIMUM	34.00	33.00
	MAXIMUM	54.00	55.00
	STAND. DEV	5.98	6.38
	TOTAL POSS	70.00	70.00
4 EXPER	MEAN	37.86	43.79
(N = 14)	MINIMUM	12.00	24.00
	MAXIMUM	57.00	69.00
	STAND. DEV	11.68	12.10
	TOTAL POSS	70.00	70.00
4 CONTROL	MEAN	39.07	40.79
(N = 14)	MINIMUM	16.00	17.00
	MAXIMUM	63.00	62.00
	STAND. DEV	11.51	12.63
	TOTAL POSS	70.00	70.00
5 EXPER	MEAN	39.50	41.39
(N = 18)	MINIMUM	2.00	18.00
	MAXIMUM	68.00	55.00
	STAND. DEV	17.16	12.63
	TOTAL POSS	70.00	70.00
5 CONTROL	MEAN	39.71	42.43
(N = 7)	MINIMUM	12.00	27.00
	MAXIMUM	56.00	52.00
	STAND. DEV	14.48	8.36
	TOTAL POSS	70.00	70.00
6 EXPER	MEAN	37.72	38.22
(N = 18)	MINIMUM	11.00	14.00
	MAXIMUM	56.00	57.00
	STAND. DEV	13.72	11.38
	TOTAL POSS	70.00	70.00
6 CONTROL	MEAN	41.00	35.09
(N = 11)	MINIMUM	27.00	8.00
	MAXIMUM	55.00	56.00
	STAND. DEV	12.71	12.81
	TOTAL POSS	70.00	70.00