A COMPARATIVE STUDY OF READING INSTRUCTION MANAGEMENT
FOR SELECTED THIRD GRADE STUDENTS IN AN
URBAN SCHOOL DISTRICT

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Kellie A. Cohen, B.S.E., M.Ed.
Denton, Texas
August, 1991
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The specific purposes of the study were (1) to determine the effectiveness of ECRI (Exemplary Center for Reading Instruction), as compared to "traditional" (basal driven) classroom instruction based on a comparative analysis of norm-referenced test data; (2) to determine if there was a significant difference between Blacks, Hispanics and Caucasians on the Vocabulary and Reading Comprehension portions of the Iowa Test of Basic Skills among the third grade ECRI students; and (3) to provide valid information for those charged with the implementation of reading instruction in the Dallas Independent School District, Dallas, Texas.

The experimental population consisted of 1989-1990 third grade students from an urban school district. Approximately half of the subjects (through random assignment) received language arts instruction from teachers who had been trained and demonstrated proficiency in the implementation of ECRI teaching/management strategies. The remaining subjects received traditional basal instruction from teachers who have likewise demonstrated teaching
expertise based on the rating achieved from the state-mandated Texas Teacher Appraisal System, which is used throughout the District.

The third-grade students who had received reading instruction from an ECRI teacher scored significantly higher on the Vocabulary portion of the ITBS assessment than third-grade students who did not receive reading instruction from an ECRI teacher. However, no statistically significant difference was found between the two groups' scores on the Reading Comprehension portion of the ITBS.

Regardless of the teaching strategies used, the third-grade Caucasian students were able to obtain higher scores than the Black and Hispanic students on both the Vocabulary and Reading Comprehension subtests.

ECRI is an effective means by which to provide students with vocabulary instruction. The use of this particular model of mastery learning would appear to warrant consideration by educators. Reid's model is one which can be implemented in conventional school settings, utilizing the district's existing reading series; however, extensive teacher training is necessary.
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CHAPTER I

INTRODUCTION

In 1985 two laws were passed by the Texas Legislature to extend educational services to students with dyslexia and related disorders. House Bill 157 requires screening and treatment for dyslexia and related disorders of students enrolled in public school. House Bill 2168 mandates inservice training on the recognition of dyslexia and related disorders in public school students and on teacher strategies for these students.

As defined in Texas Education Code Section 21.924:

1. "Dyslexia" means a disorder of constitutional origin manifested by a difficulty in learning to read, write, or spell, despite conventional instruction, adequate intelligence, and socio-cultural opportunity.

2. "Related disorders" includes disorders similar to or related to dyslexia such as developmental auditory imperception, dysgraphia, specific developmental dyslexia, developmental dysgraphia, and developmental spelling disability.
Many of the characteristics associated with dyslexia also are found in children with other specific learning disabilities or with speech/spoken language disorders. However, when these characteristics are not age-appropriate and interfere with learning, they may be symptoms of a language or learning disorder, including dyslexia, and the child may need special assistance in academic or related areas.

Dyslexia is an extremely complex issue. There is no specific definition, list of symptoms or recommended treatment that is consistently met with agreement. In spite of this lack of unanimity, the public schools must respond to the challenge of the new legislation and proceed with their programs (Turner, 1986).

The urban school district in this study has invested a great deal of time and effort into the full implementation of the Exemplary Center for Reading Instruction reading program. ECRI is on the state approved list of programs Texas school districts could choose to meet the needs of dyslexic learners and the requirements of House Bills 157 and 2168. Although there are data from schools across the country which support the effectiveness of ECRI strategies, there has not been a study conducted in any major urban school district in the state of Texas. Since this major urban district plans to continue implementing ECRI, which
has an impact on the education of thousands of students yearly, it is imperative that the program's effectiveness be closely evaluated.

There is a continuing search in school districts across the country for a better way to teach students to read. If ECRI is determined to have a positive effect on student achievement in the district in which the research is being conducted, then it seems reasonable to believe that it could have the same positive effect on student achievement in similar school districts across the country. Research conducted on this program's effectiveness is especially relative to school districts in Texas since ECRI is on a list of thirteen programs, one of which every district in this state must choose to implement.

Statement of the Problem

The problem of this study is to determine if third grade students who have received instruction from a teacher trained in, and utilizing ECRI strategies, score significantly higher on the Vocabulary and Reading Comprehension portions of the ITBS assessment than third grade students who did not receive reading instruction from an ECRI teacher.
Purpose of the Study

The purpose of this study is to determine if third grade students who have received reading instruction from a teacher trained in, and utilizing ECRI strategies score significantly higher on the Vocabulary and Reading Comprehension portions of the ITBS assessment than third grade students who did not receive reading instruction from an ECRI teacher.

The specific purposes of the study are (1) to determine the effectiveness of ECRI instruction, as compared to "traditional" (term to be defined in later section) classroom instruction based on a comparative analysis of norm-referenced test data; (2) to determine if there is a significant difference between Blacks, Hispanics and Caucasians on the Vocabulary and Reading Comprehension portions of the ITBS among the third grade ECRI students; and (3) to provide valid information for those charged with the implementation of reading instruction in the district.

Research Questions

1. Will there be a significant difference on the Vocabulary portion of the ITBS assessment between third grade students who have received reading instruction from a teacher trained in, and utilizing ECRI strategies and
third grade students who did not receive reading instruction from an ECRI teacher?

2. Will there be a significant difference on the Reading Comprehension portion of the ITBS between third grade students who have received reading instruction from a teacher trained in, and utilizing ECRI strategies and third grade students who did not receive reading instruction from an ECRI teacher?

3. Will there be a significant difference between Blacks, Hispanics, Caucasians and "Others" (i.e., Asian, Indian) on the Vocabulary portion of the ITBS, among the third grade ECRI students?

4. Will there be a significant difference between Blacks, Hispanics, Caucasians and "Others" (i.e., Asian, Indian) on the Reading Comprehension portion of the ITBS, among the third grade ECRI students?

**Definition of Terms**

**Basal Reading/Workbook** - Refers to the reading materials selected by the school district to be used in the regular education program.

**Frustrational Reading Level** - Selections in which the pupil makes ten or more word recognition errors in a hundred words (ten percent or more errors) are too difficult for a teacher to instruct the pupil in reading. These graded
selections are described as being at a frustrational level for the pupils (Reid, 1981).

**Independent Reading Level** - Selections that are read with less than five word recognition errors per hundred words (less than five percent error) indicate that those grade levels are too easy for a pupil to read while being instructed. Selections read with less than five percent error are considered to be the pupil's independent reading level (Reid, 1981).

**Instructional Grouping** - Grouping students for reading instruction, based upon the instructional reading level obtained through the administration of the ECRI Informal Reading Inventory.

**Instructional Reading Level** - An instructional oral reading level is that grade level where five to nine word recognition errors (five to nine percent) occur per hundred words. Here a teacher would be able to teach effectively word recognition skills and new words and correct for errors (Reid, 1981).

**Mastery Learning** - Learning which occurs as the result of instruction which includes clearly defined objectives, that can be easily observed and measured, with established expectations that must be achieved by the students before they progress to the next higher skill/level (Reid, 1983).
Off Grade-Level Reading Instruction - For the purpose of this study, it refers to the use of multi-level basals to provide reading/language arts instruction to groups of third grade students.

On Grade-Level Reading Instruction - For the purpose of this study, it refers to the use of third grade basals/workbooks and spelling texts to provide reading/language arts instruction to third grade students.

Traditional Classroom Instruction - For the purpose of this study, it consists of grade-level basal/basal workbook whole-group instruction for reading and the use of grade-level spelling texts. The non-ECRI teachers selected for this study do not group students for reading instruction and utilize the basal workbook for reading comprehension instruction.

Literature Review

Early in her research efforts, Dr. Ethna Reid, founder and director of ECRI (Exemplary Center for Reading Instruction), found that the amount of instructional time provided in reading was highly correlated with student achievement (Castner et al., 1986). This was true as long as the amount of time provided was "quality" time. That is, instructional time had to be spent on basic skills instruction, such as word recognition/vocabulary, comprehension and grammar. In
comparison first-grade classrooms where students actually spent more time engaged in traditional basal instructional activities, achievement levels were lower. The major implication from these initial efforts was that increasing instructional time allocations alone was not enough. A more critical facet involved what teachers and students were doing with that time.

Gersten, Woodward and Parch (1986) examined direct instruction and the use of instructional time. A key principle in the design of direct instruction programs appears to be quite simple; for all students to master the concept/skill, the materials and teacher preparation of these materials must be clear and concise. However, Gersten, et al., note that many instructional programs, particularly the common basal materials are not designed with the precision necessary for students of varying abilities to be successful.

Research on teacher effectiveness has established a clear relationship between direct instruction and student achievement (Blanton et al., 1986). The authors state that students learn skills through repeated exposure to tasks such as worksheets, commercially produced dittos and basal workbooks. These assignments often occur without relevant instruction.
A study conducted by Duffy et al., (1986) suggested that traditional basal instruction often is essentially a matter of procedural monitoring of students' responses to materials, with the teacher providing little substantive information regarding what the task is, why it would be useful, or how to do it.

Following initial teacher training in ECRI techniques, Reid conducted a comparison study of teacher behavior during skills instruction in both ECRI and non-ECRI (traditional) classes (Reid, 1986). A total of 21 classrooms in ten different schools were observed for three days per week, every other week, over a three-month period. It was found that, on the average, ECRI teachers elicited an average of 11.8 overt responses per minute as compared to only 4.1 of their non-ECRI counterparts; significant reading achievement differences favoring ECRI classrooms were also reported.

In an additional study (Reid, 1986), ECRI was effective with compensatory and special education students as well. As part of the Chapter I testing program in an Ohio school district, Stanford Early School Achievement Test (Level II) scores attained prior to and immediately following the implementation of ECRI were examined. Pretest and posttest scores after one year of ECRI implementation revealed significant mean gains (approximately 37.73 points) in student achievement.
ECRI is a total language arts instructional program. It provides instruction simultaneously in reading, oral language, spelling, comprehension, and other activities in a highly structured, teacher-directed, systematic pattern that ensures mastery. Students demonstrate mastery by successfully passing a "mastery test," with one hundred percent accuracy, with rate as an additional criterion.

ECRI teachers are provided with training in strategies that actively engage their students in learning tasks and provide them with substantially more opportunities to practice what they are being taught. ECRI teachers expect their students to display overt, rapid, and accurate responses to specific teacher directives (Reid, 1986).

Descriptive and prescriptive research at the Exemplary Center for Reading Instruction has demonstrated that most pupils can learn to read, that teachers can learn to teach pupils to read, and that teaching for mastery is most effective when the teacher's management system allows each pupil to move on to master new skills as soon as mastery of the skills presently being learned is demonstrated. In an ECRI mastery classroom pupils progress in their practice of new skills and work in materials independently of other pupils. No pupil waits for another. Pupils within a group do not move as a group. They are instructed in small groups (based upon instructional reading levels) those language skills which they will need in future work (Reid, 1977a).
ECRI teachers do not rely upon a Teacher's Guide nor upon a skills sequence provided by publishers if such suggested instruction does not correlate to skills embedded in the words in the basic reading materials. Word recognition, spelling, penmanship, comprehension, study and proofing skills should come from the text itself (Reid, 1977a).

Research indicates that almost all children can learn to read if provided with appropriate learning conditions. Mastery learning studies and field research have demonstrated high levels of mastery by pupils in various content areas (Block, 1971 and 1974; Reid, 1974 and 1976).

According to Reid (1977b), research studies of methods of teaching beginning reading indicate that the phonic/linguistic approach is slightly superior to the basal approach in word recognition, paragraphing, spelling and study skills. It was also found that adding a supplementary phonics program to the basal produces results superior to the basal alone.

Research suggests that reading teachers can be more effective by eliciting many overt responses from pupils (Reid, 1977b). This assists learners in discrimination and in sustaining attention. By soliciting oral responses from beginning readers, teachers can facilitate the recognition.
and comprehension of printed words and sentences. Without a pupil's response, a teacher cannot diagnose and prescribe for the pupil nor measure how effectively he or she has helped the pupil achieve. Some reading materials and kits specifically call for teacher-directed pupil responses, but teaching techniques to elicit accurate and efficient pupil responses can be incorporated into any set of materials (Reid, 1977b).

Teacher behavior is also important in reading instruction. Within a given method of instruction, considerable variance in pupil performance can be observed. The suggestion was made that these variances might be attributed in part to teacher differences (Bond & Dykstra, 1967; & Dykstra, 1967). Teacher behaviors that appear to be related to pupil achievement have been isolated (Reid, 1968; & Wadham et al., 1976). Teachers who motivate pupils and sustain their interest until learning becomes reinforcing increase pupils' achievement levels (Reid, 1977b).

Pupils' attention is sustained with the momentum of the teacher directives (dialogues) during instruction and the reinforcement offered during practice time. The use of overt responses and motor responses correlated with the overt help pupils to remain on-task. The structure of the scheduling, record-keeping, and instruction keeps pupils occupied so there are few behavior problems. When a teacher
spends time managing pupils' learning, less time is spent managing their behavior. Teachers in an individualized mastery classroom do not assign busy work such as exercises on the chalkboard, workbooks, or ditto sheets (Reid, 1977a). It is recommended by ECRI that teachers not use the publisher's supplementary materials or tests, just the stories or the literature. According to Reid, founder and director of ECRI, "It's what the teacher does with the learners that makes the difference (Brandt, 1990, p. 80)."

Limitations of the Study

The study is restricted by the following limitations:
1. It represents only a sample of third grade students within a specific urban school district.
2. There is a limitation concerning the number of third grade ECRI teachers which could be selected for this study.
3. The experimental treatment may only be as effective as the teacher who administers it. To attempt to control this variable, certain stipulations were established regarding what type of teachers were chosen to participate in this study. The teachers had to be third grade teachers who had been trained and certified in the use of ECRI strategies.
Design of the Study

The experimental research design was used in this study. The treatment in this design is reading instruction -- the independent variable which was manipulated. The scores on the Vocabulary and Reading Comprehension sections of the Iowa Test of Basic Skills were the dependent variables.

Approximately half of the subjects (through random assignment) received language arts instruction from teachers who had been trained and demonstrated proficiency in the implementation of ECRI teaching/management strategies. The remaining subjects received traditional basal instruction from teachers who have likewise demonstrated teaching expertise based on the rating achieved from the state-mandated Texas Teacher Appraisal System, which is used throughout the District.

Procedures

Population Sample
The experimental population consisted of 1989-1990 third grade students from an urban school district. The students in the control group received approximately eight months of traditional basal instruction and the students in the treatment group received approximately eight months of instruction from an ECRI teacher.
Data Collection

The following steps were taken to collect the necessary data for this study:

1. A list was formulated of all elementary schools which have a trained, proficient, certified ECRI third grade teacher, as well as additional third grade sections.

2. Each school's name was put on a slip of paper, the slips were mixed thoroughly and the names of fifteen schools were drawn.

3. The school's principal was contacted to obtain the section numbers (to be used when gathering data from the District's Research and Evaluation Department) of all third grade teachers who had ratings of either "Exceeds Expectations" or "Clearly Outstanding" on the Texas Teacher Appraisal System evaluation instrument.

4. If a school had more than one of the above-mentioned third grade, non-ECRI teachers, the teachers' names were put on slips of paper, the slips mixed thoroughly and one name was drawn.

5. Student identification numbers were obtained for each one of the five hundred and three students in the sample, which were used to collect test data.

6. The District's Research and Evaluation Department was contacted to obtain a copy of each of the students' scores (by I.D. number) on their third grade, 1989-1990
ITBS tests. Second grade, 1988-1989 ITBS test scores were also collected in order to determine if there was a significant difference between the control and treatment groups prior to placement in the third grade. Data was collected and compiled on approximately two hundred and fifty students in the control group and two hundred and fifty students in the treatment group.
CHAPTER II

LITERATURE REVIEW

Introduction

Over the past decades there has been an abundance of research conducted in order to help educators determine the most effective means by which to teach students to read. Numerous programs or teaching strategies grew out of these early research efforts. The Exemplary Center for Reading Instruction (ECRI) is one such program. ECRI, Reid's model of mastery learning, will be reviewed at length throughout the course of Chapter II.

The review of literature will focus on the following four areas; the Origin of Exemplary Center for Reading Instruction, Mastery Learning, Criticisms of Mastery Learning and the Reid Model of Mastery Learning. A summary of the research as well as conclusions will follow.

Origin of Exemplary Center for Reading Instruction

The Exemplary Center for Reading Instruction (ECRI) was founded in 1966, by Dr. Ethna Reid, with the assistance of funds from the United States Office of Education. During the first year the Reading Center strove to establish demonstrations of exemplary programs of diagnosis and instruction in reading; provide inservice training in
teaching reading for developmental, remedial, and clinical reading programs; collect, catalog, and disseminate information on materials and research; and maintain liaison with regional and national research and development projects and related institutions to establish cooperative ventures.

The purpose of the first summer inservice workshop, June 7 to July 15, 1966, was to give teachers some practice in informal reading diagnosis and individualizing instruction so that they could begin using these techniques in their classrooms in the fall. Participating teachers tutored children from Salt Lake City public and private elementary and junior high schools for two hours daily and then took their turn in the student's seat for another two hours. About two hundred experienced elementary teachers and principals (when possible three teachers from each school in Granite School District) participated in three three-week sessions. Realizing that workshop training does not guarantee use of new techniques in the classroom, the Center established a follow-program to encourage teachers to practice newly-learned teaching techniques. Workshop participants returned to the Reading Center once or twice a month to more fully develop and understand the methods they had learned during the summer (Reid, 1975).

Since that time, ECRI has functioned as a consulting firm and a developer-demonstrator project designed to
instruct teachers in the effective and efficient use of classroom time. The Center is built upon the belief that most, if not all, students can learn to read and write successfully if they are properly taught to do so. However, Reid's years of experience in the role of teacher, principal, reading and language arts supervisor, as well as director of a reading clinic, indicated that quite often students were not learning these basic skills. Such failures prompted ECRI to undertake an extensive research agenda designed to identify those instructional strategies that appeared to facilitate students' acquisition of basic language arts skills. These "effective" teaching procedures have subsequently been incorporated into a total language arts program that has, in turn, been taught to preservice and inservice teachers nationwide (Reid, 1986). It is estimated that in recent years (1986-1990) about 800 new schools per year have adopted the ECRI program. The ECRI-certified trainers offer inservice to approximately five to six thousand teachers a year (Brandt, 1990).

The original ECRI project was validated over a three-year period (i.e., 1971-1974) with more than 700 students enrolled in four Utah school districts (U.S. Department of Education, undated). First graders were reading at a 3.8 grade level; second graders averaged from the 95th to the 99th percentile; and Title 1 pupils averaged 1.4 to 3.2
years gain for each year of instruction, based on results obtained from the Comprehensive Test of Basic Skills. Additional support for ECRI came in a later report by Sloan (1979) in which experimental programs substantially improved the standardized reading test performance of Navajo students in three elementary schools. In fact, with the exception of one group, every class of fourth through seventh graders using ECRI met and/or exceeded expected growth levels (U.S. Department of Education, undated). Another report (Linn, 1980) describes results from a school’s Comprehensive Test of Basic Skills assessment. These findings indicated that scores for students enrolled in ECRI classrooms for five years were all one and one-half years above grade level.

ECRI is a total language arts instructional program. The program has been validated by the former Joint (National Institute of Education and U. S. Department of Education) Dissemination Review Panel and is disseminated by the National Diffusion Network of the U. S. Department of Education. Validation was achieved after a JDRP evaluator audited the data received from school districts implementing ECRI. The ECRI program provides for instruction simultaneously in reading, oral language, spelling, comprehension, and other activities in a highly structured, systematic pattern that ensures mastery (U. S. Department of Education, undated). ECRI students learn to read, write, and spell each word, understand its meaning, and use it in sentences
and stories and as they encounter it in their reading exercises. ECRI is not a substitute for existing language arts programs. Instead, it is designed to supplement current basal instruction by providing teachers with strategies that more actively engage their students in learning tasks and provide them with substantially more opportunities to practice what they are being taught (Reid, 1986).

Through a series of early research studies, ECRI found that student learning was enhanced when (a) pupils were provided with sufficient amounts of quality instructional time (Castner, Della-Piana, Hogben, & Allen, 1968); (b) teachers positively reinforced their students for increasing oral reading speed and accuracy (Milczarek, 1969); (c) students were taught to display overt, rapid, and accurate responses to specific teacher directives (Bates, 1978; Reid, 1969, 1973B; Reynolds, 1968; Winterton, 1971); (d) teachers expected and required high levels of student mastery (Reid, 1973a; Scheen, 1972; Tateoka, 1981); and (e) teachers increased their rates of particular teaching behaviors such as providing directives, checking student responses, and using praise statements (Wadham, 1972).

Early in its research efforts, ECRI found that the amount of instructional time provided in reading was highly correlated with student achievement (Castner, et al., 1968),
as long as the amount of time provided was "quality" time. That is, instructional time had to be spent on basic skill instruction, such as word recognition, comprehension, and study. In comparison, first-grade classrooms where students actually spent more time using traditional instructional activities, achievement levels were lower. The major implication from these initial efforts was that increasing instructional time allocations alone was not enough. A more critical facet involved what teachers and students were doing with that time.

Milczarek (1969) in another early investigation, examined the effects of manipulating reinforcement contingencies upon students' subsequent oral reading speed and accuracy. Milczarek found that students responded well during instruction and more rapidly if teachers assumed some responsibility for student motivation. Two additional studies reported similar facilitative effects when students were able to select either school-related activities (Alter, 1968) or a preferred curricular task (Chan, 1968) as their form of positive reinforcement. Data from these studies, as well as years of subsequent practical experience, have demonstrated the necessity of incorporating substantial amounts of positive reinforcement into ECRI instructional programs (Reid, 1986).
Early informal observations of low-performing low-achieving students indicated that these pupils rarely responded orally in class. In fact, over a three-day observation period, low-achieving students in a first-grade classroom did not respond once orally (Reid, 1969). Yet, at the same time, the classroom teacher elicited an average of 35 correct responses per minute from higher performing students. Similarly, low-achieving students produced no written products over the same time period, whereas their higher performing classmates were averaging 1.5 to 2.4 written responses per minute in their workbooks.

Teachers seemed unable to obtain overt, accurate responses from some of their students. ECRI realized that unless students responded, they would not learn. Instruction for teachers on how to elicit responses from typically nonresponding or low-responding learners commenced. Following initial teacher training in ECRI techniques, Reid conducted a comparison study of teacher behavior in both ECRI and non-ECRI classes (Reid, 1973a). A total of 21 classrooms in 10 different schools were observed for three days per week, every other week, over a three-month period. It was found that, on the average, ECRI teachers elicited an average of 11.8 overt responses per minute as compared to only 4.1 of their non-ECRI counterparts. The number of letters written incorrectly by students in the target
classrooms was also computed; ECRI students were making four to five times fewer errors per minute (i.e., 12 versus 52 errors/minute) than their fellow students enrolled in non-ECRI classes.

Bates (1973), in another comparative investigation, found that, on the average, ECRI students were receiving substantially more opportunities to respond in reading class than their non-ECRI counterparts. It was noted, for example, that ECRI students' opportunity to respond time ranged from 95 percent to 99 percent of their reading period, whereas non-ECRI pupils were given only 20 percent to 50 percent of their reading time in which to respond.

The necessity for accuracy in students' overt responses was uncovered earlier in a study by Reynolds (1968). He found that students who made fewer errors in initial learning experiences were more accurate in making fine discriminations in later learning of complex relationships. Unstable and/or inconsistent judgment on a generalization test was consistently found for pupils who had made many errors on earlier learning tasks. Students who had learned with many errors similarly displayed greater variability in their response rates. The use of errorless discrimination training and fading procedures, however, proved to be particularly effective in remediating these problems. Reynolds found that several very difficult discriminations
could be taught to these previously nonresponding students by using such techniques.

Finally, Winterton (1971) demonstrated that increases in response rate need not occur at the expense of student accuracy. A group of low-achieving and initially low-responding students were effectively taught to significantly increase their response rates. Results indicated that not only could these children accomplish this, but that there did not appear to be a limit or ceiling to their oral response rates.

Early on in their research efforts, ECRI recognized the importance of having all students attain high levels of accuracy before proceeding to more difficult subject matter. Initial efforts to determine specific levels of mastery were examined through a series of retention studies. A variety of investigations sought answers to the question: What level of mastery will yield 95 percent or better retention at a 16-week follow-up?

It was found, for example, that expecting 100 percent mastery for correctly reading a word list aloud three times consecutively yielded no greater retention than reading the list once with 100 percent accuracy. It was reported further, however, that reducing mastery expectations for reading and spelling aloud to 85 percent significantly decreased students' percentage of retention to below 50
percent. It was also determined that establishing expectations of 100 percent mastery for oral reading and spelling of new words and providing more opportunities to respond orally and in writing eliminated many of the inaccuracies found earlier in students' oral reading (Scheen, 1972).

It was reported later that ethnic origin, sex, and IQ scores were not factors in determining these student achievement outcomes (Jordan, 1977). Furthermore, very little or no decrease in student achievement were found in a subsequent follow-up assessment the next academic year.

In another study examining the effects ECRI's mastery expectations on students writing ability, Tateoka (1981) reported that the number of (a) words written, (b) independent and dependent clauses used, and (c) sentences generated were significantly greater in ECRI students' written products than in control students' writing. Similarly, ECRI students used (a) a significantly greater variety of sentence patterns, (b) increased word length, and (c) more accurate writing mechanics.

In an attempt to examine the effects of rate of specific teaching behaviors upon subsequent student achievement, teachers were observed both before and during training in the use of ECRI's teaching techniques (Wadham, 1972). Initially, it was found that teachers' rate of teaching prior to instruction ranged from a low of .08 M/m (movements per
minute) to a high of 2.5 M/m. During subsequent training in ECRI procedures, these rates increased to 1.3 and 2.9 M/m respectively. Teachers' checking of students responses showed a similar increase following ECRI training as well. Most impressive, however, were the substantial increases found in teachers' use of praise. Prior to training, amounts of praising ranged from a low of .12 M/m to a high of 1.4 M/m; during ECRI training these rates increased to a range of 4.9 to 9.0 M/m, respectively. Given the documented importance of contingent teacher attention in effectively promoting appropriate academic and social behavior, it was particularly rewarding to see that teachers could be easily taught to increase their use of this skill. Additional studies conducted by ECRI personnel were concerned with rate and efficiency of classroom instruction. Of particular interest were questions such as, Is each teaching task performed with the greatest efficiency? and Is each teaching act and pupil response as brief and effective as it can be? (Reid, 1986).

These concerns and the desire to disseminate effectively ECRI's techniques led to the development of instructional directives (dialogues or scripts) for teachers to follow as they teach. It was found that these directives provided high frequency of teacher and pupil interaction and enhanced the replication of ECRI's teaching strategies (Reid, 1986).
ECRI was particularly concerned with maximizing instructional time. A major goal involved having teachers ask questions as succinctly as possible while simultaneously minimizing student response latency. How can a question take less time to ask? One way is for students to anticipate the question before the teacher ever asks it. Students can then learn to answer the question being verbalized by the teacher. This makes teaching time much more efficient. In ECRI classrooms, teacher directives serve such a purpose. Since similar directives (e.g., "spell and read" or "write, spell, and read") are used frequently, students learn to anticipate these directives and respond as quickly as possible to them. The result is an instructional exchange in which teachers use predictable directives and students respond accurately in a few seconds.

As noted earlier, ECRI is a total language arts program designed to supplement existing basal instruction. Students learn to identify new words, spell them, understand their meanings, and use them in sentences, as well as in grammatically correct creative and expository writing exercises. In addition, pupils in ECRI classes are provided with daily penmanship instruction; they learn to "proof and correct" their own work products, and they are specifically taught how to work independently.
After having identified particular teacher behaviors that were reliably associated with improved pupil performance, ECRI personnel developed a training program that effectively taught these skills to practitioners. These training programs were designed to instruct teachers in the use of previously described teaching skills, while continuing to use the same basic reading materials, as well as existing organizational and staffing patterns. Keeping instructional content familiar for practicing teachers while altering only their instructional strategies appeared to make the transition into ECRI instruction less threatening for teachers (Reid, 1986).

ECRI can be best described as a highly structured, teacher-directed, mastery learning approach. This structure initially appears during the first three to four weeks of the school year (Reid, 1983). Teachers establish detailed clear-cut rules to direct students through the three major components of instruction (i.e., skills time, practice time, and backup skills time). Simultaneously, teachers establish detailed scheduling and record-keeping systems that are used throughout the year. Students are taught as an entire group to make quick and orderly transitions during each instructional phase through the use of specific teacher directives. Initially, instructional materials are structured so that even the lowest performing students can experience immediate
success. Appropriate transitions and work-related behaviors are then immediately reinforced through the use of teacher praise. Once students have successfully learned the "system" and are responding independent of teacher reminders, instruction within each ECRI component can occur more efficiently.

Skills time, which lasts approximately twenty to thirty minutes per day, is the instructional component of ECRI during which "new" skills (e.g., vocabulary words, sentence patterns, and comprehension strategies) are introduced. These activities are teacher-directed to ensure that all students within each small skills group respond correctly. Instruction is introduced in a three-step process (i.e., (a) demonstration, (b) prompt, and (c) practice). Students typically respond orally and in unison following initial teacher directives. The teacher teaches skills in advance of the student in each skills group who is at the highest level of mastery and reviews back to the student who is at the lowest level. This enables students to move on in their materials as rapidly as they can without waiting for any other student. ECRI teachers typically use eight methods for introducing new words: (a) sight, (b) context, (c) phonics, (d) word structure 1 (adding a word part to a base word without changing the base word), (3) word structure 2 (combining words without a change in either word),
(f) word structure 3 (changing the base word and adding a word part), (g) word structure 4 (combining words with changes occurring in the words), and (h) word structure 5 (reading the syllables) (Reid, 1978g, 1978h, 1978i).

Students learn how words differ in English and how they are structured and used. The words and sentences in which they appear dictate the method of instruction rather than a teacher deciding how they are to be taught.

Teachers also learn to teach letter names so students can spell words and talk about letters (Reid, 1978d). They teach sounds so words can be taught by the phonics and syllabication methods. Teachers follow prescribed steps as they teach new words so that a variety of activities are used to teach students about the words. For example, students are taught to discriminate between newly acquired and previously learned words.

Comprehension skills are also taught during skills time. These skills are typically divided into four levels: (a) literal, (b) interpretative, (c) critical, and (d) creative. These four levels are subsequently broken down into 90 different skills. These 90 skills are taught at each grade level with increasingly more difficult selections.

At the literal level, students are taught to recognize the author's expressed meaning (Reid, 1978c). Reference is
made specifically to the author's words. At the interpretative level, the student is taught to add meaning to the author's text. At the critical level, students are taught to become critics or judges of what has been written (Reid, 1978c). Finally, at the creative level, students learn to leave the mastery test, extend the selection, or "put themselves into" what they have read (Reid, 1978b). One of the differences between the interpretative and creative levels of comprehension is that at the interpretative level readers add the meaning the author intended for them to add, while at the creative level they incorporate their own reflections.

Students participating in ECRI are also introduced to important study skills during skills time (Reid, 1980). Study skills such as selecting a topic and main idea, evaluating the relevancy of sentences, organizing information into levels of importance, following written and verbal directions, alphabetizing, locating, and surveying books and chapters are also taught at each grade level (Reid, 1980).

The belief that teaching reading skills is a means to an end (more effective communication) and not an end in itself is emphasized in the ECRI approach. Similarly, it is stressed that expressive language skills are more important than receptive skills in communicating with others because many classroom teachers focus on receptive skills (listening
and reading) at the expense of expressive skills (speaking and writing). It is recognized, however, that effective reading skills help a learner to write and speak. Organizing classrooms so students write and discuss daily is a critical ECRI teacher behavior. The teaching of language skills in ECRI is correlated as a means of saving time, and it has been a multiplier effect on learning language. For that reason, students learn to spell and write words they have read in the basal series (Reid, 1986).

Additional language arts skills such as the correct usage of grammatical structures (Reid & Slager, 1983) and additional procedures for improving students writing skills (Reid, 1984) are also introduced throughout the school year during skills time. ECRI teachers always model the skills before students are required to use the skills themselves. The students, however, are ultimately required to demonstrate mastery of these skills. To provide sufficient opportunities for attaining such mastery, students spend approximately twice as long in practice time as they do in skills instruction.

A period during which students learn to use the skills that were introduced in skills instruction is critical to students' success. In ECRI it is recommended that practice time be twice as long (i.e., 40 to 60 minutes) as skills instruction. Typically, during practice time in ECRI class-
rooms students work independently of each other but are under constant teacher supervision and guidance.

The teacher engages in three primary activities during practice time: (a) conferencing individually with students (checking on their progress toward mastery); (b) giving mastery tests, and (c) holding small group discussions. Individual student conferences provide teachers with the opportunity to move about the classroom while simultaneously evaluating students' work products. Feedback regarding the accuracy, quantity, and neatness of individual student's work can be provided at this time. Reteaching occurs if needed. Specific recommendations for improvement can also be provided. Thus, individual conferences provide both teacher and student with information that is formative in nature.

All students must also complete specific mastery tests during practice time. Once these summative evaluations are successfully completed, students are allowed to move to the next skill level. The use of individual mastery tests allows students to progress at their own rate, while simultaneously ensuring that no one moves ahead until they are adequately prepared (Reid, 1986).

Small group discussions constitute the third major activity of practice time. Students from the same reading group usually meet at a table with the teacher to discuss
something they had previously read. This activity provides an opportunity for students to interact with one another, and also allows them to put into words what they have read. In addition, since all students are typically required to participate and discuss some facet of a particular story, a built-in accountability system exists. Specific rules (e.g., "speak one at a time" and "listen to what everyone says") are reviewed before discussion groups begin, and one student usually summarizes what was said before the group disperses (Reid, 1983).

Backup skills time is the third component of ECRI instruction. This time period, which typically lasts twenty to thirty minutes, is devoted to instruction in the following areas: (a) penmanship, (b) proofing through dictation, and (c) spelling. Backup time provides students with the opportunity to learn those skills that are prerequisite for effective reading and writing.

Penmanship instruction is an integral part of ECRI instruction (Reid, 1978f). Students are taught to discriminate between letters that are perfectly spaced, written in correct sequence, and accurate in relationship to the lines on the paper. Initially, students are taught using specific teacher directives, such as "trace," "describe," and "name," and special lined paper to precisely print or write their letters and words. Time is also provided for students to
write creatively every day, usually in their writing notebooks.

Children also learn to write and sequence information through teacher dictation (Reid, 1978a). Teachers dictate individual sentences (which increase in length, quantity, and difficulty during the school year) for each instructional group. Students are then required to write and "proof and correct" their products against the teacher's samples.

Spelling comprises the last major activity of backup time (Reid, 1978j). Daily spelling instruction occurs during this time. Students are taught to spell the words that were introduced during skills instruction.

ECRI is an eighty to one hundred twenty minute total language arts program. Using a highly structured, demonstration-prompt-practice format, students learn not only what to do, but also how to do it. By using instructional directives, easily remembered classroom routines, and systematic record-keeping procedures, teachers who practice ECRI principles can greatly reduce the amount of time it takes students to learn specific skills. Furthermore, the use of small-group unison responding formats and highly structured practice time routines provides sufficient opportunities for all students to complete work at mastery levels.
In particular, educational researchers have become increasingly concerned with determining if students are directly engaged in mastering basic academic skills and what kind of progress they are making towards the mastery of those skills. This critical examination has led to a concept known as "academic engaged time" (AET) (Rosenshine & Berliner, 1978). Essentially, AET refers to the amount of time a student spends engaged in academically relevant materials which are at a moderate difficulty level. A strong correlation has consistently been found between AET and student achievement gain. That is, in those programs where higher AET was reported, student achievement levels were higher, whereas achievement gain was negligible in programs with minimal amounts of AET (Marshall, 1976; Stallings & Kaskowitz, 1974).

The implications of these findings for educational personnel in charge of selecting alternative instructional practices for students at risk for academic failure are clear, i.e., whenever possible, programs should be chosen which maximize or lead to increased academic engaged time. ECRI is one such program which has been identified by Maheady, et al. (1983).

Since its beginning in the mid-1960s, ECRI has functioned as a Joint Dissemination Review Panel (JDRP) approved developer-demonstration project to instruct
teachers on how to use classroom time more effectively and efficiently.

ECRI focuses primarily upon the individualized instruction techniques and positive reinforcement. More specifically, teachers are taught how to: (a) elicit correct responses from nonresponding pupils, (b) establish mastery levels of responses with performance and rate as criteria, (c) provide time for supervised practice, (d) correlate language arts activities to facilitate accurate responding, (e) use effective management and monitoring systems, and (f) diagnose and intervene immediately when errors or no responses occur (JDRP Report No. 74-48, 1981).

Essentially, ECRI is a total language arts instructional program that provides instruction simultaneously in reading, oral language, spelling, comprehension, and other activities in a structured, systematic pattern that ensures mastery. ECRI students learn to read each word, spell it, write it, understand its meaning, and use it in a sentence as they encounter it in reading exercises. ECRI also shares many of the characteristics of the DISTAR programs, i.e., small-group instruction, controlled practice, group choral responding, mastery learning, and rapid student response rates. The primary difference between the two programs lies in the content covered. Whereas DISTAR provides specific
lessons in commercially packaged formats, ECRI procedures can be readily adapted to existing basal series (Maheady, et al., 1983).

Research suggests that reading teachers can be more effective by eliciting many overt responses from pupils. This assists learners in discrimination and in sustaining attention. By soliciting oral responses from beginning readers, teachers can facilitate the recognition and comprehension of printed words and sentences (Cook, Kimble, Wulff, & McGuire, et al., 1961; Gagne & Gropper, 1965; & McNeil & Keislar, 1963). Without a pupil's response, a teacher cannot diagnose and prescribe for the pupil nor measure how effectively he or she has helped the pupil achieve. Some reading materials and kits specifically call for teacher-directed pupil responses, but teaching techniques to elicit accurate and efficient pupil responses can be incorporated into any set of materials.

The basic philosophy of ECRI is that all children can learn, given quality of instruction. Robert Pace (1984) pointed out in a background paper for the National Commission on Reading ("Achievement and the Quality of Student Effort") that students who spend a lot of time on a low level of quality make less progress than students who spend fewer hours at a high level of quality. Quality of effort increases in importance at higher levels of learning.
Without early and continuous preparation in the various study skills, students will not be able to attain that quality. How one learns determines both the quantity and the quality of what one learns, regardless of time spent on the task. Quality instruction is critical if mastery learning is to take place. Proponents of mastery learning claim that an added investment of ten percent to twenty percent over present instructional efforts can result in nearly universal mastery of the school curriculum. Mastery learning is the attainment of adequate performance levels on tests measuring specific learning tasks. It also describes an instructional model whose underlying assumption is that nearly every student can learn everything in the curriculum at a specified level of competence if the learner's previous knowledge and attitudes about the subject are accounted for, if the instruction is of good quality, and if adequate time on the task is allowed to permit mastery (Horton, 1981).

Mastery Learning

The mastery model has six basic components. Concise, testable objectives clearly describe the criterion for mastery and offer specific statements of outcomes and goals expected at the completion of each learning task; they are presented at the onset of the learning process. Preassessment of the learner's present level of learning permits correct placement in the learning sequence with learning
Instruction seeks to have each learner work at his own pace, in continuous progress toward mastery of the learning objectives; it usually consists of some large-group, some small-group, and some one-to-one teaching, including peer tutoring, with various combinations of computer-assisted instruction. Diagnostic assessment during instruction determines if the learner is progressing as expected; it is used to pace the learner and to adapt instruction as needed. This is followed by prescription for further learning, which provides for progression to new learning tasks for remediation, with enrichment materials prescribed for those who finish the tasks ahead of others; prescription begins early in the instructional process and continues until nearly all learners achieve mastery. Postassessment, the sixth and last component, measures individual outcome identified in the objectives. Results can be used to refine the objectives, improve instruction, and clarify the mastery criterion (Horton, 1981).

Mastery learning differs from traditional teaching in the level of specificity and precision required in the design of mastery learning programs. Planning must be accomplished much earlier in the instructional process than in conventional teaching. Content is laid out in a logical sequential way, and emphasis is on adapting the instruction
to permit all learners to achieve mastery. The teachers must believe all children are capable of reaching mastery—and behave accordingly.

According to Horton (1981), the first task in planning for mastery learning is to examine content to be taught in order to define objectives. These must be stated in concise, behavioral terms that can be accurately measured. The component skills needed to achieve the objectives must be identified and tests developed to measure mastery of these skills. The criterion for mastery should be established at this stage of planning. Learning units lasting about two to ten hours must be planned and lesson plans developed for each element of the units. Diagnostic tests, corrective and remedial steps, and enrichment activities for each unit are an integral part of the planning. Much of the work of mastery learning occurs before instruction begins. Once the program is under way, and as teachers gain experience and share material and ideas, the work load is reduced.

Since most students will be unfamiliar with mastery learning, a thorough orientation for parents may also be helpful. In teaching the elements of the learning units, teachers should (1) allow students adequate time to practice each new skill; (2) provide frequent, regular, and direct reinforcement; (3) give students cues to help them select
the appropriate responses; (4) see that all students participate actively in the learning tasks; (5) furnish direct instruction in the learning task; and (6) monitor each student's work carefully and often (Reid, 1983).

Many schools in the United States experience a high rate of educational failure. Teachers expect a handful of bright students to learn the material they are exposed to and earn A's. The rest, it is assumed, will learn less and receive grades from B to F.

Fiske (1976) asks, Is there any reason why most students should not get A's? A growing number of educators argue that, through an approach called "mastery teaching," virtually every student can be brought to levels now thought within the reach of only a few.

The term "mastery teaching" was coined by Benjamin Bloom, a University of Chicago professor who in the early 1960s began to study why children learned at different rates. Mastery teaching assumes that, given enough time and the right learning exercises, nearly all students can learn whatever a teacher offers. The trick is to organize the class to give each student the time and the teaching needed without slowing down the class as a whole. The usual classroom method of giving all students the same amount of exposure to the teaching of a given amount of material and then assuming they will learn it with varying degrees of
thoroughness is reversed. Instead the amount of material to be thoroughly learned is held constant, and time becomes the variable (Fisk, 1976).

Studies Bloom and his students have conducted over the past decade challenge the traditional, world-wide notion that some students are inherently and permanently better, faster, and more highly motivated learners than others. Instead, he finds that, under favorable conditions of learning, most students become very similar in their ability to learn in school (Chance, 1987).

Bloom (1974, p.6) finds that the conventional system of group instruction is "likely to be very effective for some learners and ineffective for others. Teachers unconsciously direct their teaching to some students and ignore others; they give positive reinforcement to some, but not to others; they encourage overt participation from some students, but not from others. Typically, in the U.S., the top fourth of students in a class are given the greatest attention by teachers and the bottom half are given the least attention. This system of group instruction produces errors in learning at each stage of a course or term, which are compounded with later errors. The errors in this system of school instruction determine the learning of each student and only rarely is he able to fully recover from them."
According to Chance (1987), Bloom thinks, for example, that there is too much drill, too much rote learning, too little active participation by students, too much emphasis on lower-level "basic" skills, too much attention to "minimum" standards, too much competition and, most of all, too much failure in today's schools.

The present educational system rests on the assumption that wide variability in achievement is largely the result of wide variability in innate learning ability. Many people find little to quarrel with in this common-sense assumption. A recent survey revealed, for instance, that mothers in the United States believe that the principal ingredient in school success is the inborn talent of the youngster. Wide variability in student achievement is therefore natural and inevitable (Chance, 1987).

Bloom (1974) disputes these claims. The work he and his colleagues have done over the past 40 years has convinced him that much of the variability seen in student performance is neither natural nor inevitable but the product of our educational system. Bloom admits that there are innate differences in learning ability, but he believes that these differences are much smaller than most of us imagine and do not account for the wide differences in student achievement. What might be called Bloom's dictum states: What one student can learn, nearly all students can learn.
One reason students differ in achievement is past learning. What a student knows at the beginning of a lesson affects what the student gets out of that lesson. Bloom (1976) notes that variability in student achievement is not due solely to what takes place in school.

Bloom (1976) believes that the most important learning that takes place in school may have to do with feelings. Students who do well on a task feel good about the task, the school, the teacher and themselves. In discovering that they are good students, they learn that they have value in the eyes of teachers, parents and even other students. Students who do poorly on a task feel unhappy about the task and everything associated with it, including themselves. Bad students learn that they are bad people. Teachers inevitably convey these judgments; they cannot do otherwise in a system that focuses on class rank instead of mastery of course content. Bloom also complains that traditional education not only undermines the self-esteem of students who do poorly, it "infects" these students with emotional problems. Bloom emphasizes that this outcome is not a rare event attributable to an occasional insensitive teacher. Rather, it is the inevitable result of a system of education that assumes that large numbers of students must fail or just get by.

Measured mastery is not typically found in conventional reading instruction, which Levine (1985) contends uses a
scattered and random skill approach. For example, the
skills of recalling story detail may be emphasized in four
stories out of twenty-five in a reading text. The teacher
assumes over the course of a year that students have
acquired the skill of recalling story detail. Mastery
learning teachers make no such assumption.

Common to all mastery learning definitions is the basic
principle: Students must display a particular level of
expertise on a skill before proceeding to the next skill.
These skills are organized in a sequential manner, with
mastery proceeding from simple skills to complex skills.
This is analogous to what is known about mathematics: A
student cannot learn to divide until he can first add,
subtract, and multiply (Levine, 1985).

This learning hierarchy suggests that a task cannot be
fully mastered unless its less complex component skills are
thoroughly learned. Learning becomes more efficient because
the knowledge of less complex skills reduces the amount of
time necessary to learn more complex tasks. Although this
concept is basic to all mastery learning programs, there are
variations in the types of instructional strategies thought
to be most efficient.

Mastery learning strategies strive to enable 75 percent
to 95 percent of the students to achieve as much as the top
25 percent when the latter learn under typical group-based
instructional methods. According to Block (1974), three-fourths of the students in forty studies learning under mastery learning conditions have achieved at the same high standards as the top one-fourth learning under conventional, group-based instructional conditions.

Mastery learning is both a philosophy about schooling and an associated set of instructional strategies whereby the philosophy can be implemented in the classroom. With mastery, pupils develop confidence that actually shows in their faces. Every child has their own timetable of practices to mastery. The initial learning is the hardest. After the first mastery test and after pupils have "learned how to learn," the pupil requires fewer and fewer practices to master the tests that follow. This phenomenon of learning to learn produces an acceleration effect, in which pupils demonstrate surprising skills in areas that teachers had not thought pupils could function (Reid, 1985).

Criticisms of Mastery Learning

Mastery learning is one of the plans proposed by educationists who believe in behaviorist psychology. The proponents of mastery learning base their plan for revising teacher behavior on the notion that under the classroom conditions they prescribe, virtually all students will learn so well they will "master" any subject. Advocates claim that almost all students will learn to the level of "A" if
teachers are willing to give them all the help they need—enough time to learn, smaller learning units, biweekly prescriptive tests, and alternative learning materials (with which to relearn the parts of the prescriptive tests they fail) (Groff, 1975).

Second, proponents of mastery learning interpret equality as meaning that students attain mastery of the same competencies. Opponents argue that equality is the opportunity to develop in different directions according to one's abilities and interests, but not necessarily to achieve the same results. Opponents are concerned that emphasis on achieving specific instructional goals may be at the expense of other curriculum areas (Horton, 1981).

The conventional view that some students show more aptitude than others for certain subjects is therefore wrong, mastery learning charges. In explaining Benjamin Bloom's strategy, Block (1973, p. 31) states that if the conditions of mastery learning are established, "there should be little or no relationship between student aptitude and achievement" regardless of the difficulty of a course of study.

Groff (1975) contends that mastery learning has not presented the empirical evidence necessary to convince teachers that all students have the same aptitude for learning every subject. This basic tenet of mastery
learning defies the classroom experience of most teachers and contradicts the readings they have done in the scientific literature. Groff believes it will take more than out-of-hand assurances to change teachers' beliefs that students' past grades, their measured intelligence, and their attitudes toward teachers and school are all beside the point—which is supposedly the situation that exists when mastery learning rules pertain.

Groff (1975) notes apparent contradictions expressed by advocates of mastery learning in regard to the voice students should have in matters of curriculum. Mastery learning demands, on one hand, that teachers determine in rigorous detail and in objective and measurable terms precisely what performance they will demand if students are to earn an "A." Block (1972) claims, on the other hand, that in spite of these strict teacher controls, students can be involved in a great deal of two-way communication about what they should study. These appear to be conflicting statements.

The manner in which behaviorists who favor mastery learning contend subject matter should be taught is also in question. Mastery learning advocates say subjects must be broken up into closely defined bits of information rewritten as behavioral objectives. These objectives, set into a pre-determined order of teaching, must be written so that no
misinterpretation of them is possible. When students learn enough of these pieces of static information, they are said to have achieved mastery. In this process, students disregard any information that does not directly apply to the behavioral objective in question. The teacher regulates this by telling students in advance exactly what they will be tested on (Groff, 1975).

There is no demonstrable evidence, however, that behavioral objectives are better than the traditional goals of education. According to Simons (1973), the degree to which they specify behavior is not a valid determiner of student learning. Further, there is doubt that behavioral objectives have greater potential for fostering retained learning than does ordinary methodology. In sum, the extra effort it takes to write behavioral objectives may indeed be futile.

Groff (1975) believes that a danger inherent in mastery learning is one that threatens the mental health of students. He notes the bait mastery learning offers students who fail: Try one more time and you will master it. For students truly unable to cope with a certain subject (there are such students, mastery learning notwithstanding), this encouragement is just one more signal of their inferiority.

According to Groff (1975), mastery learning aims to impose yet another behavioristic doctrine on the schools.
As with previous such doctrines, which have come and gone, it announces a simple set of rules that will overcome low school achievement and its attendant problems. As with all such doctrines, Groff contends mastery learning underestimates the complex nature of the teaching act. He believes that it is highly doubtful that the special kind of applied classroom mechanics offered by mastery learning is the final solution for teachers and teaching. According to Groff, teachers are likely to continue to believe that teaching is as much an act of personal fulfillment and artistic endeavor as it is the peculiar code of behavior demanded by mastery learning.

"The quiet resistance of teachers to the formulas of teaching doctrines has always resulted in the downfall of the doctrines and mastery learning is doomed to suffer the same fate" (Groff, 1975, p. 28).

In the most common form of mastery learning, learning is held constant and time is allowed to vary. This reverses the conventional procedures of schooling, which hold time constant (e.g., 48-minute periods) and allow achievement to vary. But Slavin (1987) asks, What if the total amount of instructional time is fixed? Then, in order to give those who have not mastered the material the time to catch up, those who have mastered it must be stopped from learning for a while. Researchers have dubbed this the "Robin Hood" effect of mastery learning.
To prevent this stealing from the rich and giving to the poor, some researchers have suggested that the extra time for those who need it not be taken from the time allotted for instruction. One study reviewed by Slavin (1987) did find that mastery-learning students learned more than non-mastery-learning students as measured by daily chapter tests. However, they took twice as long to learn the material, and, on a retention test given only four days after the end of instruction, they were found to retain more—but much less than expected considering the amount retained for each hour of instruction. These results seem consistent with the rich-get-richer effect found in many reading studies, in which quick learners increase the distance between themselves and their slower counterparts throughout the grades (Bracey, 1987).

"Mastery learning is an optimistic and generous theory of school learning based on the notion of managing learning rather than managing learners" (Horton, 1979, p. 154). The theory suggests that schools can provide not only equality of educational opportunity but also equality of educational outcome (Bloom, 1976). The research from mastery learning indicates that approximately ninety-five percent of our students can learn everything the schools have to teach and that they can learn it at a mastery level with little additional expenditure of instructional effort (Block, 1971).
Research suggests and the advocates state that a ninety-five percent mastery rate can be achieved with as little as a ten to twenty percent increase in instructional effort. Research also suggests that even though some students require more time for mastery than others, the time difference will not be great. However, many teachers perceive themselves to be working at full capacity now. The effects of an increase of only ten to twenty percent time and effort are overwhelming. In addition, the ten to twenty percent increased effort is required on top of the initial effort needed to write specific goals, design or discover appropriate evaluative tools, and plan the instructional strategy. Unless a teacher is completely dedicated to the concept of mastery learning, the enormity of the task is likely to hinder widespread adoption of mastery learning into classrooms (Horton, 1979).

For mastery learning to succeed, Horton (1981) believes that more and better scientific instruments for diagnosing student academic problems and assessing gains must be readily available to teachers who are trained in their use and interpretation. This is not the case at present. Where more sophisticated evaluative tools are available, they are used by psychologists and researchers, not by classroom teachers who would be required to use them largely independent of help from specialized personnel.
The theory on which mastery learning is based has its merits. Particularly in such hierarchically organized subjects as mathematics, reading, and foreign languages, failure to learn prerequisite skills is likely to interfere with students' learning of later skills. For example, if a student fails to learn to subtract, he or she is sure to fail in learning long division. If instruction is directed toward ensuring that nearly all students learn each skill in a hierarchical sequence, the students will have the prerequisite skills necessary to enable them to learn the later skills. Rather than accepting the idea that differences in student aptitudes will lead to corresponding differences in student achievement, mastery learning theory holds that instructional time and resources should be used to bring all students up to an acceptable level of achievement. Mastery learning theorists suggest that rather than holding instructional time constant and allowing achievement to vary (as in traditional instruction), achievement level should be held constant and time allowed to vary (Bloom, 1968; Carroll, 1963).

While this idea may be appealing in terms of what is known about human learning, there is not yet any practical means for implementing this concept in the real world of day-to-day school planning. Until the barrier of fixed time-variable content is overcome, mastery learning cannot be used to the extent its advocates suggest (Horton, 1979).
In an extreme form, the central contentions of mastery learning theory are almost always true. If we establish a reasonable set of learning objectives and demand that every student achieve them at a high level regardless of how long that takes, then it is virtually certain that all students will ultimately achieve that criterion (Slavin, 1987).

However, Slavin (1987) believes this begs several critical questions. If some students take much longer than others to learn a particular objective, then one of two things must happen. Either corrective instruction must be given outside of regular class time, or students who achieve mastery early on will have to spend considerable amounts of time waiting for their classmates to catch up. The first option, extra time, is expensive and difficult to arrange, as it requires that teachers be available outside of class time to work with the nonmasters and that some students spend a great deal more time on any particular subject than they do ordinarily. The other option, giving enrichment or lateral extension activities to early masters while corrective instruction is given, may or may not be beneficial for these students. For all students mastery learning poses a dilemma, a choice between content coverage and content mastery (Arlin, 1984a; Mueller, 1976; Resnick, 1977). It may often be the case that even for low achievers, spending time to master each objective may be less productive than covering more objectives (Cooley & Leinhardt, 1980).
One claim that proponents of mastery learning make is that mastery learning is more effective than traditional instruction even when instructional time is held constant and achievement measures register coverage as well as mastery. This might be called the "strong claim" for the achievement effects of learning mastery. It is clear, at least in theory, that if mastery learning procedures greatly increase allocated time for instruction by providing enough additional time for corrective instruction to bring all students to a high level of mastery, then mastery learning students will achieve more than traditionally taught control students. But it is less obviously true that the additional time for corrective instruction is more productive in terms of student achievement than it would be simply to increase allocated time for the control students. The "strong claim" asserts that time used for corrective instruction (along with the other elements of mastery learning) is indeed more productive than time used for additional instruction to the class as a whole. It is important to note that this "strong claim" might not be endorsed by all mastery learning proponents. For example, Bloom (1976, p. 5) notes that the "time costs [necessary to enable four fifths of students to reach a level of achievement that less than one fifth attain in nonmastery conditions] are typically of the order of ten to twenty percent additional time over the classroom
scheduled time." However, Block and Anderson (1975) describe a form of mastery learning that can be implemented within usual time constraints, and in practice corrective instruction is rarely given during additional time.

It is certainly true that under mastery learning some students spend a great deal more time on any particular subject than they do ordinarily. Without this additional time spent, little improvement would be expected beyond that gained simply through frequent testing with feedback (Nungester & Duchastel, 1982). But there is ample evidence to suggest that this time can come from increasing students' engaged time (Anderson, 1976), the efficiency with which class time is used (Fitzpatrick, 1985), and students' involvement in learning activities outside of class, particularly through homework (Block & Tierney, 1974). Furthermore, it has long been shown that the need for this additional time diminishes over a series of instructional units (Block, 1974, 1983; Guskey & Gates, 1985).

Mastery learning is an effective means of ensuring that teachers adhere to a particular curriculum and students learn a specific set of objectives (the "curricular focus" claim). A "weak claim" for the effectiveness of mastery learning would be that these methods focus teachers on a particular set of objectives held to be superior to those that might have been pursued by teachers on their own. This might be called the "curricular focus" claim (Slavin, 1987).
Mastery learning grew out of the behavioral objectives/criterion-referenced testing movement (Bloom, Hastings, & Madaus, 1971); one of the central precepts of mastery learning is that once critical objectives are identified for a given course, students should be required to master those and only those objectives. In recent years the mastery learning movement has often allied itself with the "curriculum alignment" movement, which seeks to focus teachers on objectives that happen to be contained in district- and/or state-level criterion-referenced minimum competency tests as well as norm-referenced standardized tests (Levine, 1985).

The "curricular focus" claim, that mastery learning may help focus teachers and students on certain objectives, is characterized as a "weak claim" because it requires a belief that any objectives other than those pursued by the mastery learning program are of little value (Slavin, 1987). Critics (e.g., Resnick, 1977) point out that a focus on a well-defined set of minimum objectives may place a restriction on the maximum that students might have achieved. However, in certain circumstances it may well be justifiable to hold certain objectives to be essential to a course of study, and mastery learning may represent an effective means of ensuring that nearly all students have attained these objectives.
Mastery learning proponents claim that it is an effective use of additional time and instructional resources to bring almost all students to an acceptable level of achievement. A second "weak claim" noted by Slavin (1987) would be that given the availability of additional teacher and student time for corrective instruction, mastery learning is an effective means of ensuring a minimal level of achievement for all students. As noted earlier, in an extreme form this "extra time" claim is almost always true. Leaving aside cases of serious learning disabilities, it should certainly be possible to ensure that virtually all students can achieve a minimal set of objectives in a new course if an indefinite amount of one-to-one tutoring is available to students who initially fail to pass formative tests. However, it may be that, even within the context of the practicable, providing students with additional instruction if they need it will bring almost all to a reasonable level of achievement. The reason that this is characterized by Slavin as a "weak claim" is that it begs the question of whether the additional time used for corrective instruction is the best use of additional time. What could the control classes do if they also had more instructional time? However, the "extra time" issue is not a trivial one, as it is not impossible to routinely provide corrective instruction to students who need it outside of regular class time.
For example, this might be an effective use of compensatory (Chapter I) or special education resource pullouts.

Slavin (1987) has indicated that the findings of his review should not necessarily be interpreted as justifying an abandonment of mastery learning, either as an instructional practice or as a focus of research. Several widely publicized school improvement programs based on mastery learning principles have apparently been successful (e.g., Abrams, 1983; Levine & Stark, 1982; Menahem, & Weisman, 1985; Robb, 1985), and many effective nonmastery learning instructional strategies incorporate certain elements of mastery learning—in particular, frequent assessment of student learning of well-specified objectives and basing teaching decisions on the results of these assessments. Further, the idea that students' specific learning deficits should be remediated immediately instead of being allowed to accumulate into large and general deficiencies would find agreement with most educators. It may be that more positive results are obtained in continuous-progress forms of mastery learning, in which students work at their own levels and rates. Use of remedial (e.g., Chapter I), special education, or other resources to provide substantial amounts of instructional time to help lower achieving students keep up with their classmates in critical basic skills may also increase student achievement (Slavin & Madden, 1987).
Slavin (1987) does not think that mastery learning is harmful, that school districts should stop using it, or that researchers should stop studying it. "I find the theory compelling, and research on mastery learning has added a great deal to our understanding of teaching and learning. However, to move forward it is important to be clear on what we have and have not learned so far" (p. 234).

Mastery learning is built on the assumption that the majority of children can become equal in their ability to learn standard school tasks. As Bloom (1976, p. 208) has written, "To put it more strongly, each student may be helped to learn a particular subject to the same degree, level of competence, and even in approximately the same amount of time."

Bloom's analysis has merged the notion of respecting and teaching to individual differences with discriminating unfairly against children because they are different. Glickman (1979) feels that to perceive a child as having unique learning abilities is not the same as categorizing and therefore limiting a child's potential. The advocates of basic or traditional education have always treated the subject to be learned as of primary importance. All students are taught the same. Everyone turns to page fifty-five of the workbook, hears the teacher's explanation, and then does the workbook pages. This happens even though
some students are already beyond and bored with the
material, some can't understand the work at all, and others
are able to work competently through the material. What
mastery learning does do is replace "page fifty-five" with
"criterion-referenced materials" or "learning modules"
(Glickman, 1979). As Bloom (1976) describes it, the more
advanced students who finish the work quickly are kept busy
with enrichment materials; the middle third use the full
forty minutes to do the work; and the other third need extra
time for reinforcing work, peer tutoring, and individual
teacher consultations. Ideally, mastery learning works so
that the previously faster, average, and slower students
eventually reach the same levels of proficiency, and from
that point on students can be taught together as a group,
mastering the same materials at the same time.

Glickman takes issue with Bloom's assumption of same
ability and same treatment, asking the question, "What does
research indicate about the hypothesis that students are the
same?" (Glickman, 1979, p. 101). Much of the developmental
research by Piaget (1977) and Bruner (1966) provides
evidence that students progress through stages of cognitive,
language, social, moral, artistic, and physical stages at
different rates. It is important for the reader to keep in
mind that a child's progression is not the same in each
area. For example, a child who might be in stage two of
cognitive development may be in stage four of motor develop-
ment. Additionally, the research in children's abilities to learn being done by interdisciplinary teams of brain researchers seems to support student individuality rather than sameness. Children's learning varies in terms of development, lateralization, and functional interaction between the two hemispheres of the brain. Moreover, it may be that these developmental brain differences parallel and provide the neurological substrates for Piagetian cognitive stages (Piaget, 1977). Additionally, anthropologists have long claimed that a child's culture screens and influences certain types of learning over others (Arewa, 1977). How a child perceives what is relevant and of interest to learn is derived from his/her cultural history, which is not only different from group to group but from individual to individual. Therefore, according to Glickman (1979), there is much research that would refute Bloom's assertion that ninety-five percent of children have nearly the same potentiality for learning.

While society and the schools will have a difficult time accepting these notions about the basic equality of most learners, Bloom (1976) believes, "it may be even more difficult for each individual and his family to accept. Superiority and inferiority in learning ability between siblings within a family . . . have been widely accepted. This has become a powerful rationalization in accounting for learning variation within and between families and, in turn,
this rationalization has been effective in determining the effort and motivation students put into school learning and aspirations for school-related careers" (p.176).

Educators are generally humanistically-oriented people who look askance at any model for teaching that is grounded in a behavioristic model for teaching and learning. While it is argued that mastery learning is not completely or purely rooted in behavioristic psychology, the connections are well-founded enough to raise concern and distrust on the part of many teachers. For mastery learning to succeed, teachers will have to be convinced that it can contribute divergent and creative learning styles. If mastery learning is perceived to be at variance with most teacher's experiences of what constitutes a good learning environment, it cannot succeed despite sound theory and ample research (Horton, 1979).

**Exemplary Center For Reading Instruction's Model of Mastery Learning**

The Exemplary Center for Reading Instruction (ECRI) offers an approach to mastery learning different from Bloom's group approach and Keller's personalized system. An ECRI mastery learning teacher instructs small groups of students, but the students are not working toward mastery at the same level or with the same tasks.

Reid dislikes, as does Glickman, the idea of keeping a group of students working together until all master. She
also dislikes self-instructional learning that deemphasizes the need for teacher involvement during instruction or practice toward mastery (Reid, 1980).

The ECRI approach has several elements, one of which is a carefully planned system using group responses in unison and other procedures that dramatically increase each student's active participation in learning. Students speak aloud during small group work in spelling, penmanship, and word recognition skills, and even when they are working individually at their own rate on comprehension, study, and creative writing instruction.

It is true that teaching for mastery in language instruction takes more teacher and pupil time than that usually spent in conventional classrooms, but greater proficiency in students' use of oral and written language creates opportunities for more, not less, participation in other activities.

Glickman (1979) describes a mastery classroom as a place where a few "slower" students spend more time or require more practices to learn than other "faster" students do. According to Reid (1980), this is not a mastery classroom. Learning takes less and less time for every student once mastery occurs. Mastery eliminates the stereotype of "slower" students. Although one group of students could be reading on a lower reading grade level, students
within that group read with the same fluency, expression, understanding, and enthusiasm as students reading from a book at a higher reading grade level. They also spell and write as well.

Glickman's description of a student spending an inordinate amount of time to master is a description of a conventional classroom in which the teacher, unable to reach effectively and lacking necessary management techniques and materials, tries to keep students on a task until they learn it on their own (Reid, 1980).

Mastery in an ECRI classroom is a natural product of efficient instruction and prescribed activities for achieving mastery. No student struggles or suffers to master. No one is in doubt or undecided about teacher expectations.

ECRI teachers require responses from every member of the group because it makes students more secure who would otherwise not respond, and because it gives continuous feedback to the teacher, not to show that students have learned, but only that they have done what was requested. Mastery isn't expected to occur during group instruction; that usually occurs as each individual works toward mastery.

Reid used observational recorders that yielded rate and sequential data of teacher and pupil behavior to understand why some students "learn" more effectively (score better on tests, talk more readily about what they have done or read)
than others. The "high ability" student doesn't have as many lapses in responses or as much null time between responses as does the "low ability" student. The "high ability" student's response is of shorter duration than the "low ability" student's response. "Lows" don't respond as frequently as "highs," and often they don't respond at all. Some students under observation did not make a response that could be observed and recorded in fifteen days of reading instruction. They were allowed by their teachers to procrastinate doing what other students do. They were allowed to procrastinate learning (Reid, 1980).

Reid (1980, p. 171) notes, "I was unable to understand this problem as a former secondary and elementary teacher, principal, and supervisor. I knew that some students didn't get their work done, but I too thought it was because they needed more practice or took a longer time to learn. Instead, they only needed to use time in the same way as the students who were learning."

Research at ECRI (Winterton, 1971, pp. 42-43) demonstrated in experimental studies that obtaining high rates of response from "low ability" students produced students who learned more quickly than former "high ability" pupils who had lower rates expected of them. The positions of the "high" and "low" ability students changed places because of differences in teacher expectations.
One study at ECRI (Bates, 1971) investigated the amount of time in which pupils were not given an opportunity to respond. It ranged from zero to five percent in an ECRI reading class compared to fifty to eighty percent in conventional classrooms.

In yet another study in which ECRI and non-ECRI teachers were observed (Wadham, Young, & Rencher, 1976), the ECRI-taught groups had less off-task behavior for a shorter duration of time; pupils in the ECRI group had a greater frequency of correct responses and their responses took less time; ECRI teachers reinforced more consistently and for a longer period of time; they checked their pupils' responses more frequently using less time per check; they asked more questions, provided more instruction, explained, prompted, modeled, and directed more frequently.

Glickman (1979) accused mastery classrooms of teaching students what they cannot possibly learn and depriving them of the experiences (concrete manipulation) that are essential to learn abstractions.

If this is true of some mastery classrooms, it is not true of others (see Appendix A). These same accusations could be leveled at conventional classroom teachers. These problems are not peculiar to mastery classrooms.

The stimulation of higher mental processes is important in an ECRI classroom, and teachers teach skills so students can infer, analyze, apply, and evaluate. Expecting mastery
doesn't limit what is taught. For example, in an ECRI classroom, divergent thinking is a product of creative comprehension and creative writing instruction. Mastery is expected in this, also.

Concepts are developed first with concrete, sensory experiences; second, with vicarious or laboratory experiences; third, with audio and visual devices; and, lastly, through words, both spoken and read. Conventional classrooms are as guilty of dealing first with abstractions and later with first-hand experiences as are mastery classrooms. A wise teacher, however, doesn't wait to instruct and expect mastery in language acquisition until experiences are amassed. Reading, writing, and speaking enhance experiences. They serve to connect the learner with an experience. Words, both written and spoken, stimulate the person's involvement in and utilization of experiences. ECRI mastery classroom teachers provide an environment for learning and activities students need to learn, since all students are expected to master whatever is taught (Reid, 1980).

In conventional classrooms educators have been led to expect poor work from some pupils and mediocre work from all the others. Then they defend the student's right to fail. The time has come to prevent pupils from failing. "Why should some students be taught to believe they are inade-
quate—that they can't learn—when, in another teacher's room, they would have been successful?" (Reid, 1980, p. 173).

ECRI recognizes the effect of eliciting overt responses to maximize retention, accuracy, and comprehension, and maintain attention. Pupils are reminded of what skills they have been taught, what skills they mastered, and what skills they will be expected to master through the review, which is part of every skills instructional period (Reid, 1983). The teacher teaches new skills in each of his skills groups at least one mastery test in advance of the pupil who is passing the tests most rapidly, and reviews back to the pupil who is at the lowest mastery test—reviewing everything in between. Teaching skills in advance of the pupil at the highest mastery test, reviewing, timing practices, providing incentives to pupils to pass mastery tests, and reinforcing pupils' on-task behavior do not allow the pupils to procrastinate beginning to learn. Much lapsed time is eliminated.

Pupils' attention is sustained with the momentum of the teacher directives during instruction and the reinforcement offered during practice time. The use of overt responses and motor responses correlated with the overt help pupils to remain on-task (Reid, 1983). The structure of the scheduling, record-keeping, and instruction keeps pupils occupied so there are few behavior problems. When a teacher spends
time managing his pupils' learning, he spends less time managing their behavior.

Brandt (1990) pointed out in an interview with Reid that advocates of the whole-language approach say language must not be fragmented into a lot of little skills. When asked her position, Reid noted that she also sees reading as a process of constructing meaning rather than as an accumulation of little skills. "We think drills found in workbooks are meaningless, because they don't teach anything. We think rules are of no use. But we think you have to help children become conscious that symbols in written language represent sounds" (p. 81).

The ECRI program provides correlation and integration of the language arts. For example, students are taught to evaluate what they read. If it isn't a fact, it could be fiction. So they are taught to recognize three types of fiction: fiction about famous people and events, realistic fiction, and fantasy. Fantasy can be a fairy tale, a tall tale, a fable, and so on. Students learn to recognize writing that is fantasy. They learn that "fiction is writing the author invented or made up." The teacher models the process of reading a selection and deciding if it could be fiction. He or she tells why a particular passage is fiction and why it could not possibly happen. Students do the same. The teacher reads a fairy tale to the students,
and the students read one or more tales. Then the teacher writes a fairy tale, and the students write one, too, so their readers can decide if it is fantasy (Brandt, 1990).

Reid (Brandt, 1990) agrees with advocates of the whole-language approach that language instruction—reading and writing—should be integrated. "We care greatly about providing good literature for children to read. We believe that the outcomes of an effective reading program should include effective speaking, listening, and writing as well as reading. But we also agree with the proponents of direct instruction that children should be taught. We believe that teachers are capable of leading children to greater knowledge" (p. 81).

The goal of ECRI is simple. The program seeks to improve students' reading ability—that is, their ability to pronounce words correctly, understand what is read, and put to use the understandings they receive. They learn to communicate more effectively, use time more wisely, and feel better about their ability to learn.

Summary and Conclusions

The Exemplary Center for Reading Instruction (ECRI) was founded in 1966, by Dr. Ethna Reid. Since that time, ECRI has functioned as a consulting firm and a developer-demonstrator project designed to instruct teachers in the effective and efficient use of classroom time. The Center
is built upon the belief that most, if not all, students can learn to read and write successfully if they are properly taught to do so. However, Reid's years of experience in the role of teacher, principal, reading and language arts supervisor, as well as director of a reading clinic, indicated that quite often students were not learning these basic skills. Such failures prompted ECRI to undertake an extensive research agenda designed to identify those instructional strategies that appeared to facilitate students' acquisition of basic language arts skills. These "effective" teaching procedures have subsequently been incorporated into a total language arts program that has, in turn, been taught to preservice and inservice teachers nationwide (Reid, 1986).

ECRI can best be described as a highly structured, teacher-directed, mastery learning teaching approach. The term "mastery teaching" was coined by Benjamin Bloom, a University of Chicago professor who in the early 1960s began to study why children learned at different rates. Mastery teaching assumes that, given enough time and the right learning exercises, nearly all students can learn whatever a teacher offers. The trick is to organize the class to give each student the time and the teaching needed without slowing down the class as a whole. The usual classroom method of giving all students the same amount of exposure to the
teaching of a given amount of material and then assuming they will learn it with varying degrees of thoroughness is reversed. Instead the amount of material to be thoroughly learned is held constant, and time becomes the variable (Fisk, 1976).

Common to all mastery learning definitions is the basic principle: Students must display a particular level of expertise on a skill before proceeding in the next skill. These skills are organized in a sequential manner, with mastery proceeding from simple skills to complex skills. This learning hierarchy suggests that a task cannot be fully mastered unless its less complex component skills are thoroughly learned. Learning becomes more efficient because the knowledge of less complex skills reduces the amount of time necessary to learn more complex tasks. Although this concept is basic to all mastery learning programs, there are variations in the types of instructional strategies thought to be most efficient.

The proponents of mastery learning interpret equality as meaning that students attain mastery of the same competencies. Opponents argue that equality is the opportunity to develop in different directions according to one's abilities and interests, but not necessarily to achieve the same results. Opponents are concerned that emphasis on achieving specific instructional goals may be at the expense of other curriculum areas (Horton, 1981).
Glickman takes issue with Bloom's assumption of same ability and same treatment, asking the question, "What does research indicate about the hypothesis that students are the same?" (Glickman, 1979, p. 101). Much of the developmental research by Piaget (1977) and Bruner (1966) provides evidence that students progress through stages of cognitive, language, social, moral, artistic, and physical stages at different rates.

According to Groff (1975), mastery learning aims to impose yet another behavioristic doctrine on the schools. As with previous such doctrines, which have come and gone, it announces a simple set of rules that will overcome low school achievement and its attendant problems. As with all such doctrines, Groff contends mastery learning underestimates the complex nature of the teaching act. He believes that it is highly doubtful that the special kind of applied classroom mechanics offered by mastery learning is the final solution for teachers and teaching. According to Groff, teachers are likely to continue to believe that teaching is as much an act of personal fulfillment and artistic endeavor as it is the peculiar code of behavior demanded by mastery learning.

The Exemplary Center for Reading Instruction (ECRI) offers an approach to mastery learning different from Bloom's group approach and Keller's personalized system. An ECRI mastery learning teacher instructs small groups of
students, but the students are not working toward mastery at the same level or with the same tasks.

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Mastery learning is both a philosophy about schooling and an associated set of instructional strategies whereby the philosophy can be implemented in the classroom. Several widely publicized school improvement programs based on mastery learning principles have apparently been successful (e.g., Abrams, 1983; Levine & Stark, 1982; Menahem & Weisman, 1985; Robb, 1985), and many effective nonmastery learning instructional strategies incorporate certain elements of mastery learning—in particular, frequent assessment of student learning of well-specified objectives and basing teaching decisions on the results of these assessments. However, there appears to be considerable
disagreement among educators as to whether or not mastery learning is a viable means for providing classroom instruction in our present educational structure.
CHAPTER III
PROCEDURES

Introduction

The procedures used to collect and analyze the data are the focus of Chapter III. The population sample is outlined and the measurement instrument discussed in terms of validity and reliability. The steps taken to collect the necessary data as well as the procedures used for data analysis follow.

Population Sample

The experimental population consisted of 1989-1990 third grade students from an urban school district. The students in the control group received approximately eight months of traditional basal instruction and the students in the treatment group received approximately eight months of instruction from an ECRI teacher. Demographic characteristics are presented in Tables 1 and 2.

Instrumentation

The instrument used in this study is the Iowa Test of Basic Skills, Forms 7 and 8. The ITBS is a widely used test battery intended to provide comprehensive and continuous measurement of growth in the fundamental skills: vocabulary, reading, the mechanics of writing, methods of study,
Table 1
Demographic characteristics of the population sample for the Vocabulary portion of the ITBS

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Table 2
Demographic characteristics of the population sample for the Reading Comprehension portion of the ITBS

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<td>Other</td>
<td>6</td>
<td>2.8</td>
<td>.53</td>
</tr>
</tbody>
</table>
and mathematics. The multilevel battery contains eleven subtests and is designed for use in grades two to nine. Among the new features of Forms 7 and 8 of the battery are the addition of a mathematics computation subtest and reduction in the amount of testing time required to complete the battery (Mitchell, 1983).

All eleven subtests of the ITBS utilize multiple choice items, such as:

Identify which sentence has an error in punctuation.

(a) The girls went to the store.
(b) Run, the building is on fire!
(c) Where do you think the boy is hiding.
(d) Do you know who has the paint?

Which of the following is correct?

(a) $18 + 164 + 3 = 185$
(b) $701 + 96 + 16 = 803$
(c) $14 + 824 + 5 = 943$
(d) $2 + 998 + 7 = 907$

Identify the setting of the following selection.

Tommy slid on the freshly waxed floor. He was in a hurry to get the milk from the refrigerator. He did not see his mother standing at the sink washing dishes.

(a) the garage
(b) the school
(c) the bathroom
(d) the kitchen
The basic purposes for which the battery is designed are to facilitate (a) within classroom decisions such as diagnosing strengths and weaknesses, and individualizing instruction; and (b) decisions external to the classroom such as identifying strengths and weaknesses of a group (grade level, building, or school system), and ascertaining the effectiveness of curricular or instructional innovations (Mitchell, 1983).

The within-grade Kuder-Richardson 20 reliabilities for the eleven subtests and total scores are high, generally greater than .85, with many exceeding .90. The K-R 20 reliability of the composite score for each level of the test is .98. The standard errors of measurement for each subtest and level are reported in the Technical Summary, an interpretive guide for the user (Mitchell, 1983). While the content validity of an achievement battery rests ultimately upon the judgment of the user regarding the match between local curriculum and the test content, there is little question that the ITBS contains content that is generally representative of school curricula in grades two to nine.

The battery has criterion-related validity with other achievement and ability measures. However, according to Mitchell (1983), one of the test's reviewers, criterion-related validity is not construct validity and the issue of what construct or constructs the ITBS assess is not answered satisfactorily in the interpretive materials available.
The tests were normed in the Fall of 1977 on 12,000 to 18,000 pupils per grades two to nine. School districts were stratified by size, region, and community socioeconomic status. A total of 165 school districts were sampled. Subsamples of about 3,000 students per grade were retested to provide spring norms. The norming sample was sufficiently large and representative of both majority and minority pupils. Special percentile rank norms were also available for region of the country, Catholic schools, large urban schools, and school districts of high and low socioeconomic status. Raw scores on the ITBS are converted to either developmental scores (grade equivalent scores, age equivalent scores, standard scores) or status scores (percentile ranks, normal curve equivalents, stanines) (Mitchell, 1983).

As previously stated, the norming sample is representative of both majority and minority pupils and includes large urban schools and districts of high and low socioeconomic status. Both the sample and experimental population are from a large urban school district, which includes majority and minority pupils of mixed socioeconomic status. Therefore, the pupilation used in this study does not differ significantly from the norming sample.

The Reading Instruction Management Strategy Questionnaire (see Appendix B) was given to each of the third grade non-ECRI teachers in this study. The questionnaire was
designed by the researcher and used to help determine the extent to which the non-ECRI teachers were alike in their delivery of reading instruction (i.e., teaching methods, materials used). A summary of the questionnaire responses (see Appendix C) will be discussed in Chapter IV. There is very little variance in the methods used by the ECRI teachers since instruction is delivered via directives or teacher scripts.

Data Collection

The following steps were taken to collect the necessary data for this study:

1. A list was formulated of all elementary schools who have a trained, proficient, certified ECRI third grade teacher, as well as additional third grade sections.

2. Each school's name was written on a slip of paper, the slips were mixed thoroughly and fifteen names were drawn.

3. Each school's principal was contacted to obtain the section numbers (used when gathering data from the District's Research and Evaluation Department) of all third grade teachers who have ratings of either "Exceeds Expectations" or "Clearly Outstanding" on the Texas Teacher Appraisal System evaluation instrument.
4. For schools that had more than one of the above-mentioned third grade, non-ECRI teachers, the teachers' names were put on slips of paper, the slips mixed thoroughly and one name drawn.

5. The Reading Instruction Management Strategy Questionnaire (see Appendix B) was completed and obtained from each of the third grade non-ECRI teachers.

6. Student identification numbers were obtained for each one of the five hundred and three students in the sample, which were used to collect test data.

7. The District's Research and Evaluation Department was contacted to obtain a copy of each of the students' scores (by I.D. number) on their third grade, 1989-1990 ITBS tests. Second grade, 1988-1989 ITBS test scores were also collected in order to determine if there was a significant difference between the control and treatment groups prior to placement in the third grade. Data was collected and compiled on approximately two hundred and fifty students in the control group and two hundred and fifty students in the treatment group.

Data Analysis

The statistical model used in this study was the t-Test for Independent Samples. This statistical model was chosen because the data is interval/ratio and there will be a comparison of the mean scores of two independent groups.
The t-Test is a statistical test designed to determine if the mean scores of two groups are significantly different. A two-tailed test was chosen based on the following research hypothesis:

There will be a significant difference between scores obtained on the Vocabulary and Reading Comprehension portions of the Iowa Test of Basic Skills, when comparing third grade students who have and have not received ECRI instruction.

The hypothesis states that there will be a significant difference, but it does not indicate in which direction. Therefore, a two-tailed test will be used. Alpha level was set at .05 to determine if a significant difference exists between the two groups' mean scores.

The results of the t-Tests (one comparing Vocabulary scores and one comparing Comprehension scores) will be reported in the following form:

Table 3
Results of the t-Test (p < .05)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-ECRI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
An analysis of the variance (ANOVA) will be conducted within the ECRI treatment group to determine if a significant difference exists between Blacks, Hispanics, Caucasians, and "Others" (i.e., Asian, Indian) on the Vocabulary and Reading Comprehension sections of the ITBS.

The ANOVA results will be reported in the following form:

Table 4
Analysis of Variance Summary Table

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>$F^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$F^a = .05$

A detailed analysis of the data is presented in Chapter IV, noting findings as well as interpretations relating to each research question. Conclusions based upon this study's findings are discussed in Chapter V and recommendations are suggested for further related research.
CHAPTER IV

ANALYSIS OF THE DATA

Introduction

The data collected for this study will be analyzed in relation to each of the research questions; statistical findings will be presented with interpretations to follow. A discussion section will further explore possible explanations for the research findings.

The t-Test for Independent Samples was the statistical model used in this study. A two-tailed test was chosen based on the research hypothesis which states that there will be a significant difference, but it does not indicate in which direction.

Research Question

1. Will there be a significant difference on the Vocabulary portion of the ITBS assessment between third grade students who received reading instruction from a teacher trained in and utilizing ECRI strategies and third grade students who did not receive reading instruction from an ECRI teacher?

Findings

The third grade students who had received reading instruction from a teacher trained in, and utilizing ECRI
strategies scored significantly higher on the Vocabulary portion of the ITBS assessment than third grade students who did not receive reading instruction from an ECRI teacher. These findings are supported in Table 5.

Table 5
Comparison of third grade ITBS Vocabulary Scores for ECRI and Non-ECRI groups

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI</td>
<td>242</td>
<td>3.75</td>
<td>1.07</td>
<td>2.68*</td>
</tr>
<tr>
<td>Non-ECRI</td>
<td>231</td>
<td>3.49</td>
<td>1.05</td>
<td></td>
</tr>
</tbody>
</table>

*P < .05

Second grade, 1988-1989 ITBS Vocabulary test scores collected for the same two groups of students in this study indicated that there was not a significant difference between the control and treatment groups prior to placement in the third grade (see Table 6).

Table 6
Comparison of second grade ITBS Vocabulary Scores for ECRI and Non-ECRI groups prior to treatment (placement in the third grade)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI</td>
<td>215</td>
<td>2.80</td>
<td>1.34</td>
<td>0.39 (No significant difference at the .05 level)</td>
</tr>
<tr>
<td>Non-ECRI</td>
<td>209</td>
<td>2.76</td>
<td>1.06</td>
<td></td>
</tr>
</tbody>
</table>
Interpretations

The teachers who attend an Exemplary Center for Reading Instruction seminar receive specific training in how to teach vocabulary. Participants are taught that there are eight different methods by which new words could be introduced; these methods include: Teaching New Words Through the Sight and Context Methods, Teaching New Words Through the Phonics Method, and Teaching New Words Through the Word Structure Methods (five). The trainees complete a series of exercises which allow them to test their skills at determining which of the eight methods learned is the appropriate way to teach each vocabulary word.

During the course of the five-day Initial Reading seminar the participants are required to memorize directives, teacher scripts used to provide more effective instruction, and to teach two vocabulary words. These words are taught to the trainer, under a time criteria. They are also taught to small groups of students on the last day of the seminar.

The teachers are also required to memorize additional directives such as comprehension, sounds and spelling. However, it has been this researcher's experience, that the directives that most teachers memorize first are the ones used to teach vocabulary. Therefore, the vocabulary introduction component of ECRI is typically what the teachers feel most comfortable with implementing in their classrooms.
Vocabulary instruction for ECRI students is very integrated. The students are taught to decode written language and then to use these newly learned words in sentences. The ability to read and spell these new vocabulary words with one hundred percent accuracy and in a specified time criteria (one second per word) are skills addressed on every Mastery Test. Students may not go on to the next skill level until the preceding Mastery Test has been passed.

The non-ECRI teachers in this study also introduced vocabulary to their students; however, the students were not required to learn to spell these words, nor were they required to read each word with one hundred percent accuracy. The words the non-ECRI students were to spell came from the spelling basal rather than the reading basal. These students were learning to read words from one source, while learning to spell words from another.

It is understandable that the importance placed upon vocabulary instruction in both the ECRI seminars and in the teachers' classrooms would be reflected in the students' test scores.

Research Question

2. Will there be a significant difference on the Reading Comprehension portion of the ITBS assessment between third grade students who received reading instruction
from a teacher trained in and utilizing ECRI strategies and third grade students who did not receive reading instruction from an ECRI teacher?

Findings

There was no significant difference between third grade students who had received reading instruction from a teacher trained in and utilizing ECRI strategies and third grade students who had not received reading instruction from an ECRI teacher, on the Reading Comprehension portion of the ITBS assessment. Results of the t-Test are reported in Table 7.

Table 7

Comparison of third grade ITBS Reading Comprehension Scores for ECRI and Non-ECRI groups

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI</td>
<td>242</td>
<td>3.61</td>
<td>1.2</td>
<td>1.21</td>
</tr>
<tr>
<td>Non-ECRI</td>
<td>231</td>
<td>3.48</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

Second grade, 1988-1989 ITBS Reading Comprehension test scores collected for the same two groups of students in this study indicated that there was not a significant difference between the control and treatment groups prior to placement in the third grade (see Table 8).
Table 8
Comparison of second grade ITBS Reading Comprehension Scores for ECRI and Non-ECRI groups prior to treatment (placement in the third grade)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI</td>
<td>215</td>
<td>2.73</td>
<td>1.2</td>
<td>0.50</td>
</tr>
<tr>
<td>Non-ECRI</td>
<td>209</td>
<td>2.68</td>
<td>1.0</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Interpretations

The teachers who attend an Exemplary Center for Reading Instruction seminar are taught to teach Comprehension at four different levels: literal, inferential, critical and creative. The trainees are required to memorize directives to teach a literal comprehension lesson. They must demonstrate their proficiency individually, with the trainer, and again with a group of students on the last day of the seminar.

ECRI teachers typically teach one comprehension skill during the same block of time that vocabulary words are introduced. The students are routinely tested on their acquisition of comprehension skills during individual conferences and on every three to four Mastery Tests.

The non-ECRI teachers in this study teach the same comprehension skills using various methods and materials, such as the grade-level basal workbook, and teacher-made, as
well as commercially produced, worksheets. However, there are no directives used to guide the instruction or the introduction of the comprehension skill.

The ECRI teachers use directives to guide their presentation of the lesson. The students read out loud, in unison, comprehension paragraphs written at the groups' instructional level and are taught strategies to use to find the main idea, character, infer the setting, etc. . .

Although the students who had received reading instruction from an ECRI trained teacher scored higher than their non-ECRI peers, the difference between the two groups' scores was not statistically significant (the calculated t, 1.21 was not greater than the critical value for significance at the .05 level, 1.96). The strategies and materials being used by both the ECRI and non-ECRI teachers to teach reading comprehension appear to be producing essentially the same results in terms of student performance on a standardized test.

**Research Question**

3. Will there be a significant difference between Blacks, Hispanics, Caucasians and "Others" (i.e., Asian, Indian) on the Vocabulary portion of the ITBS, among the third grade ECRI students?
Findings

The Caucasian ECRI students scored significantly higher than the Hispanic ECRI students on the Vocabulary portion of the ITBS. There were no other groups whose scores differed significantly.

Since the various groups did not contain the same number of subjects, the Cochran's C test was performed, which indicated homogeneity among group variances. A one-way analysis of variance was used in analyzing the data (see Table 9).

Table 9

Analysis of Variance of ITBS Vocabulary scores for Caucasian, Black, Hispanic and "Other" (i.e., Asian, Indian) ECRI students

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ss</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>14.67</td>
<td>4.89</td>
<td>4.37*</td>
</tr>
<tr>
<td>Within groups</td>
<td>238</td>
<td>266.14</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>280.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S < .05

Scheffé's post hoc analysis procedure was used to determine the means between which significant differences existed; the results are summarized in Table 10.
Table 10

Results of Scheffé's post hoc analysis procedure for ECRI students on the Vocabulary portion of the ITBS

<table>
<thead>
<tr>
<th>Mean</th>
<th>Group</th>
<th>3</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>Hispanic (Grp. 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>Other (Grp. 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6</td>
<td>Black (Grp. 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>Caucasian (Grp. 1)</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Denotes pairs of groups significantly different at the .05 level.

A one-way analysis of variance was also used to analyze the data for the non-ECRI students in order to determine if differences in test scores existed among these groups as well (see Table 11).

Table 11

Analysis of Variance of ITBS Vocabulary scores for Caucasian, Black, Hispanic and "Other" (i.e., Asian, Indian) non-ECRI students

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ss</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>42.67</td>
<td>14.22</td>
<td>15.05*</td>
</tr>
<tr>
<td>Within groups</td>
<td>227</td>
<td>214.47</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>257.14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05

The Caucasian non-ECRI students scored significantly higher than all other groups of non-ECRI students on the Vocabulary portion of the ITBS. Scheffé's post hoc analysis procedure was used to determine the means between which significant difference existed; the results are summarized in Table 12.
Table 12

Results of Scheffé's post hoc analysis procedure for non-ECRI students on the Vocabulary portion of the ITBS

<table>
<thead>
<tr>
<th>Mean</th>
<th>Group</th>
<th>3</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.7</td>
<td>Other (Grp. 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>Hispanic (Grp. 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Black (Grp. 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Caucasian (Grp. 1)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

* Denotes pairs of groups significantly different at the .05 level.

Interpretations

The strategies used by ECRI teachers to teach new vocabulary words were significantly more effective with the Caucasian students than the Hispanic students in terms of producing higher scores on the vocabulary portion of the ITBS. One possible contributing factor for this difference could be the varied vocabulary backgrounds that may have existed between these two groups prior to the instruction, or even prior to initially beginning school. In addition, the language spoken at home may differ for these two groups of students, providing the Caucasian students additional vocabulary reinforcement.

The strategies used by the non-ECRI teachers to teach new vocabulary words were significantly more effective with the Caucasian students than with any other group in terms of
producing higher scores on the Vocabulary portion of the ITBS. The Caucasian students (ECRI and non-ECRI) were able to achieve the higher vocabulary scores regardless of the method of instruction. Although the difference was not statistically significant, the Black, Hispanic, and Other ECRI students scored higher than their non-ECRI counterparts on this particular subtest.

**Research Question**

4. Will there be a significant difference between Blacks, Hispanics, Caucasians and "Others" (i.e., Asian, Indian) on the Reading Comprehension portion of the ITBS, among the third grade ECRI students?

**Findings**

The Caucasian ECRI students scored significantly higher than the Black and Hispanic ECRI students on the Reading Comprehension portion of the ITBS. There were no other groups whose scores differed significantly.

Since the various groups did not contain the same number of subjects, the Cochran's C test was performed which indicated homogeneity among group variances. A one-way analysis of variance was used in analyzing the data (see Table 13).
Table 13

Analysis of Variance of ITBS Comprehension scores for Caucasians, Blacks, Hispanics and "Other" (i.e., Asian, Indian) ECRI students

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ss</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>22.47</td>
<td>7.49</td>
<td>5.48*</td>
</tr>
<tr>
<td>Within groups</td>
<td>238</td>
<td>325.05</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>347.53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*S < .05

Scheffé's post hoc analysis procedure was used to determine the means between which significant differences existed; the results are summarized in Table 14.

Table 14

Results of Scheffé's post hoc analysis procedure for ECRI students on the Reading Comprehension portion of the ITBS

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Hispanic (Grp. 3)</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Other (Grp. 4)</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Black (Grp. 2)</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Caucasian (Grp. 1)</td>
<td>4.0</td>
<td>*</td>
</tr>
</tbody>
</table>

* Denotes pairs of groups significantly different at the .05 level.
A one-way analysis of variance was also used to analyze the data for the non-ECRI students in order to determine if differences in test scores existed among these groups as well (see Table 15).

Table 15
Analysis of Variance of ITBS Reading Comprehension scores for Caucasian, Black, Hispanic and "Other" (i.e., Asian, Indian) non-ECRI students

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ss</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3</td>
<td>44.56</td>
<td>14.85</td>
<td>14.27*</td>
</tr>
<tr>
<td>Within groups</td>
<td>227</td>
<td>236.25</td>
<td>1.04</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>280.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P < .05

The Caucasian non-ECRI students scored significantly higher than all other groups of non-ECRI students on the Reading Comprehension portion of the ITBS. Scheffé's post hoc analysis procedure was used to determine the means between which significant differences existed; the results are summarized in Table 16.
Table 16

Results of Scheffé's post hoc analysis procedure for non-ECRI students on the Reading Comprehension portion of the ITBS

<table>
<thead>
<tr>
<th>Mean</th>
<th>Group</th>
<th>3</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8</td>
<td>Other (Grp. 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Black (Grp. 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Hispanic (Grp. 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Caucasian (Grp. 1)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

* Denotes pairs of groups significantly different at the .05 level.

Interpretations

The strategies used by ECRI teachers to teach comprehension skills were significantly more effective with the Caucasian students than the Hispanic and Black students in terms of producing higher scores on the Reading Comprehension portion of the ITBS. However, the Caucasian non-ECRI students performed equally as well, registering significantly higher scores on the Reading Comprehension subtest than any other group. The teaching strategies employed do not appear to have an impact on the third grade Caucasian students' ability to obtain higher scores than the Black and Hispanic students on this particular measure of reading comprehension.
Discussion

The Reading Instruction Management Strategy Questionnaire was obtained from each of the third grade non-ECRI teachers to help determine the extent to which they were alike in their teaching practices. A summary of their responses (see Appendix C) reveals almost identical instructional practices. All of the teachers indicated that the third-grade basal was the primary text used to provide reading instruction and that the third-grade spelling basals were used for spelling instruction. Three of the fifteen non-ECRI teachers reported administering a reading inventory to determine each student's reading level, but none of the teachers grouped students according to their instructional reading level for reading instruction.

All but one teacher used the basal reading text and workbook teacher guides as the primary (four out of five lessons) sources for the reading lessons.

The third-grade basal readers and accompanying workbooks were reported to be the primary materials used to provide vocabulary instruction for fourteen of the fifteen teachers; however, these materials do not contain specific strategies for teachers to use to provide such instruction, just a list of key vocabulary for each story and some accompanying workbook pages. Since the ECRI teachers were trained to use specific strategies to teach new vocabulary words, this would help to account for their students scoring
significantly higher than the non-ECRI students on the Vocabulary portion of the ITBS.

The only significant difference in the teachers' responses was in regard to the use of supplemental materials to teach comprehension skills. Six teachers indicated that the grade-level basal reader and accompanying workbooks were not the primary materials used to teach comprehension. There appears to be a greater variety of supplemental comprehension materials used by the non-ECRI teachers, with almost no deviation from the basal reader in order to provide vocabulary instruction.

As noted previously, it is understandable that due to the importance placed upon vocabulary development in both the Exemplary Center for Reading Instruction seminars and by the ECRI teachers in their daily schedules, their students test performance in this area would be enhanced. The directives used to teach new vocabulary words are usually the first ones learned by ECRI trainees and, therefore, the first ones used in the classrooms. The students typically respond positively to the teacher's directives, encouraging the teacher to continue using the teaching strategies. The researcher is speculating that whichever new skill is mastered first, rewarded first, and used daily is most likely to be a skill the teacher implements successfully.

There appears to be numerous materials and sources of comprehension paragraphs available to many of the non-ECRI
teachers. The comprehension skills to be taught during each six-week grading period are clearly outlined and are the same for each grade level. Perhaps non-ECRI teachers are better equipped to teach comprehension than to provide specific, intensive vocabulary instruction—not that they couldn't, just that it does not appear to be treated with the same level of intensity. This could be one possible explanation for the lack of variance between groups on the Reading Comprehension subtest and the significant difference that existed between the same two groups on the Vocabulary portion of the ITBS.
CHAPTER V
FINDINGS, CONCLUSIONS, AND SUGGESTED
FURTHER RELATED RESEARCH

Introduction
The research findings will be summarized and outlined in this chapter and conclusions will be presented based upon these findings. Educational implications will be discussed as well as suggestions for further related research.

Findings
1. The third-grade students who had received reading instruction from a teacher trained in, and utilizing ECRI strategies scored significantly higher on the Vocabulary portion of the ITBS assessment than third-grade students who did not receive reading instruction from an ECRI teacher.

2. There was no significant difference between third-grade students who had received reading instruction from a teacher trained in, and utilizing ECRI strategies and third-grade students who had not received reading instruction from an ECRI teacher, on the Reading Comprehension portion of the ITBS assessment.

3. The Caucasian ECRI students scored significantly higher than the Hispanic ECRI students on the Vocabulary portion of the ITBS. There were no other groups whose scores differed significantly.
4. The Caucasian non-ECRI students scored significantly higher than all other groups of non-ECRI students on the Vocabulary portion of the ITBS.

5. The Caucasian ECRI students scored significantly higher than the Black and Hispanic ECRI students on the Reading Comprehension portion of the ITBS. There were no other groups whose scores differed significantly.

6. The Caucasian non-ECRI students scored significantly higher than all other groups of non-ECRI students on the Reading Comprehension portion of the ITBS.

Conclusions

1. The strategies used by ECRI trained teachers to develop vocabulary are more effective than those used by the non-ECRI teachers in this study, as measured by student scores on the Vocabulary portion of the ITBS.

2. The strategies used by ECRI trained teachers to teach comprehension skills were no more effective than those used by the non-ECRI teachers in this study, as measured by student scores on the Reading Comprehension portion of the ITBS.

3. Regardless of the teaching strategies used, the third grade Caucasian students achieved higher scores than the Black and Hispanic students on both the Vocabulary and Reading Comprehension portions of the ITBS. A highly structured management approach such as ECRI is not more...
effective with Black and Hispanic students in attaining grade level equivalency, in the areas of Vocabulary and Comprehension, than the traditional basal reader/workbook approach.

4. Although the ECRI program has proven its effectiveness in numerous other studies, the small statistical difference found between the ECRI and non-ECRI students in this study raises a question as to whether or not the additional economic outlay needed to implement this program is cost effective.

5. All of the teachers chosen to participate in this study have demonstrated a high level of teaching proficiency as noted by prior formal teacher evaluations. Perhaps very little difference was observed in test scores due in part to the teachers' high level of skill, regardless of specific methodology being implemented in their classrooms.

**Educational Implications**

ECRI is an effective means by which to provide students with vocabulary instruction. The use of this particular model of mastery learning would appear to warrant consideration by educators.

The methods used by the ECRI teachers to teach reading comprehension were considered at least comparable to the traditional basal reader/workbook approach.
The various models of mastery learning each utilize their own sets of instructional strategies. Reid's model is one which can be implemented in conventional school settings, utilizing existing reading series; however, extensive teacher training is necessary.

The review of the literature presented the views of both the proponents and opponents of mastery learning; each group having research to support their positions. Educators should carefully consider the issues raised by both camps and bear in mind the potential that exists when various instructional methodologies are used in our schools.

**Suggested Further Related Research and Recommendations**

A longitudinal study could also be conducted in which a group of ECRI students was followed through several grades. Since the ECRI program could be used in kindergarten through the twelfth grade, a study of student performance could be conducted at several different grade levels. The effectiveness of ECRI could be measured against that of other instructional methodologies, such as whole language, alphabetic phonics as well as various other models of mastery learning. The Iowa Test of Basic Skills is but one measure of student achievement. It would be beneficial to know if the results found in this study were also found using other means of assessment. Researchers could isolate the specific teaching strategies used by ECRI teachers and
determine to what extent these same strategies are used by their non-ECRI peers and their impact on student learning.

It might also be beneficial to explore the relationship between the expectations inherent in mastery learning programs and the students' self-esteem. Considering the additional costs necessary to fully implement ECRI, it is recommended that school districts closely evaluate all research studies utilizing ECRI before choosing to implement this approach.
APPENDIX A

CHARACTERISTICS OF MASTERY CLASSROOMS AND

UNIQUE FEATURES OF REID MODEL
<table>
<thead>
<tr>
<th>CHARACTERISTICS OF MASTERY CLASSROOMS</th>
<th>UNIQUE FEATURES OF REID MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Instructional objectives are determined</td>
<td>1. Objectives and skills sequence—what should be taught—come from the basic reading materials each teacher has available in classroom. Skills that are lacking are taught by the teacher.</td>
</tr>
<tr>
<td>2. Content is broken into small steps or learning units.</td>
<td>2. Teacher behavior is relied upon rather than materials to assist all students to achieve mastery.</td>
</tr>
<tr>
<td>3. Units are sequenced.</td>
<td>3. Teachers memorize directives or scripts to follow as they teach (and reteach) so they can model each skill first and, then, teach the memory for the skill before expecting students to practice it under supervision. The directives allow teachers to teach more in less time.</td>
</tr>
</tbody>
</table>

Teachers recognize importance of observing pupil behavior if they are to know whether they have taught effectively. They, therefore, elicit overt responses if possible. Instruction develops visual, auditory and motor skills. Overt responding assists attention and increases retention.

Teachers enhance reading, writing, speaking, and listening skills by correlating instruction in language skills. Students spell and write words they are learning to read. Primary grade students are taught to write words they can speak and not yet spell.
<table>
<thead>
<tr>
<th>CHARACTERISTICS OF MASTERY CLASSROOMS</th>
<th>UNIQUE FEATURES OF REID MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers recognize that &quot;academi-cally-engaged&quot; time might not be the most efficient use of time and that &quot;maximally used&quot; time is more productive.</td>
<td>Teachers are concerned with their rate of teaching and pupils' rate of responding.</td>
</tr>
<tr>
<td>4. Each unit is written to ensure mastery.</td>
<td>4. The teacher ensures mastery rather than relying on materials. Teachers use ECRI instructional materials to teach reading (word recognition, comprehension, and study skills), penmanship, spelling, proofing, grammar and creative writing skills.</td>
</tr>
<tr>
<td>5. The unit is taught.</td>
<td>5. The teacher instructs small groups of students. The students have been tested with an informal reading inventory and placed in small groups on their instructional reading levels. All students in the group respond to the teacher's requests. The teacher teaches more language skills than are recommended in the reading and language programs.</td>
</tr>
<tr>
<td>6. Mastery time is provided.</td>
<td>6. Mastery time is twice as long as reading, grammar and creative writing instructional time but equivalent to all language skills instructional time. It is supervised. Students are taught steps to take to achieve mastery. They are provided a checklist to record the dates of completion of each step.</td>
</tr>
<tr>
<td>7. Formative tests are administered.</td>
<td>7. Teachers use individual conferences, small group discussions and writing experiences rather than a paper-pencil formative test to check on students' progress toward</td>
</tr>
<tr>
<td>CHARACTERISTICS OF MASTERY CLASSROOMS</td>
<td>UNIQUE FEATURES OF REID MODEL</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Feedback/correction components are used.</td>
<td>Teachers use instant error diagnosis and prescription techniques to reteach when incorrect or no responses are given by students. These reteaching techniques are used in lieu of paper-pencil correctional components. Pupils are taught to diagnose and prescribe for errors they make. They are taught to identify when they are ready to take the test and strategies to follow for specific skills deficiencies.</td>
</tr>
<tr>
<td>Student's progress is certified with a mastery test.</td>
<td>Mastery tests are teacher-administered, individual oral tests that are performance based. They test students' abilities to read their basic reading materials and understand what they have read.</td>
</tr>
<tr>
<td>Students are graded on the basis of proficiency on the mastery test.</td>
<td>All students pass the mastery tests. Reid's model relies not only on a &quot;philosophy&quot; that all students learn well what is taught. Teachers learn to use an instructional and management system whereby all students master.</td>
</tr>
</tbody>
</table>

mastery. The conferences, discussions and written materials check on behavior that is being taught: accuracy and rate of reading words in isolation and in context, comprehension and study skills, penmanship, spelling, creative and expository writing, and pupils' management and diagnostic skills.
Teachers also learn to use only those techniques that demonstrate through words, tone of voice, posture, touch, eye contact, etc., that every student is capable of learning and is a worthwhile individual.
APPENDIX B

QUESTIONNAIRE
READING INSTRUCTION MANAGEMENT STRATEGY QUESTIONNAIRE

1. Is the third grade basal the primary text used to provide reading instruction?  YES  NO

2. Are students regularly assigned (4 out of 5 follow-up assignments) basal workbook exercises?  YES  NO

3. Prior to instruction, was any type of reading inventory administered to determine each student's instructional reading level?  YES  NO

4. Are students grouped according to their instructional reading level for reading instruction?  YES  NO

5. Are third grade spelling basals used to provide spelling instruction?  YES  NO

6. Are the grade-level basal readers and accompanying workbooks the primary materials used to teach comprehension skills?  YES  NO

7. Are the third grade basal readers and accompanying workbooks the primary materials used for vocabulary (i.e., word attack skills, structural analysis) development/instruction?  YES  NO

8. Is there a District instructional timeline which you follow regardless of each student's individual skill acquisition?  YES  NO

9. Are the basal reading text and workbook teacher guides the primary (4 out of 5 lessons) sources for reading lessons?  YES  NO

10. Are the responses to the above-mentioned questions the same as they would have been last (1989-1990) school year?  YES  *NO*

* If answer is NO, please indicate which practices would have been different: __________________________________________

Please list additional materials (if any) and the publisher's name, that are used during reading instruction: __________________________________________

__________________________________________

__________________________________________
APPENDIX C

QUESTIONNAIRE SUMMARY FORM
## READING INSTRUCTION MANAGEMENT STRATEGY QUESTIONNAIRE

**SUMMARY FORM**

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the third grade basal the primary text used to provide reading instruction?</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>2. Are students regularly assigned (4 out of 5 follow-up assignments) basal workbook exercises?</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>3. Prior to instruction, was any type of reading inventory administered to determine each student's instructional reading level?</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4. Are students grouped according to their instructional reading level for reading instruction?</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>5. Are third grade spelling basals used to provide spelling instruction?</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>6. Are the grade-level basal readers and accompanying workbooks the primary materials used to teach comprehension skills?</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>7. Are the third grade basal readers and accompanying workbooks the primary materials used for vocabulary (i.e., word attack skills, structural analysis) development/instruction?</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>8. Is there a District instructional timeline which you follow regardless of each student's individual skill acquisition?</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>9. Are the basal reading text and workbook teacher guides the primary (4 out of 5 lessons) sources for reading lessons?</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>10. Are the responses to the above-mentioned questions the same as they would have been last (1989-1990) school year?</td>
<td>14</td>
<td>1*</td>
</tr>
</tbody>
</table>

* If answer is NO, please indicate which practices would have been different: 

"We don't use workbooks this year and we did last year."

Please list additional materials (if any) and the publisher's name, that are used during reading instruction:

- Odyssey HBJ
- Supplemental materials for basal reading series
- Focus
- Frank Schaffer Comprehension Publications
REFERENCES


Bayman, B. (1979). Oregon ECRI students gain in all areas. ECRI Newsletter, 1.


