THE EFFECTS OF USING INTEGRATED TESTING AND SKILLS SOFTWARE IN READING INSTRUCTION FOR AT-RISK STUDENTS

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

Barbara J. Pitre, B.S., M.Ed., M.B.A.

Denton, Texas

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The purpose of this study was to determine the effects of using computer-managed, integrated testing and skills software with individualized homework packets on the reading achievement and attitudes of at-risk students in a low-achieving urban school. An additional purpose was to determine teacher attitudes toward using technology to deliver, measure, and manage instruction.

The population for this study consisted of all fourth, fifth, and sixth graders at a low-achieving elementary school in an urban school district in the Southwest. During a six-weeks period, all students were scheduled for 12 hours of reading instruction using Skills Bank II computer software on a computer network. This software provided diagnostic reports to the teacher and the parents. Additionally, three homework packets were produced that addressed the specific skill deficiencies of the students. Training classes on the networked software were offered to the teachers along with graduate credit from a local university.

Students' reading achievement was measured using the norm-referenced achievement test given by the district. Students' attitudes that related to academic self-concept, achievement motivation, and perceptions of
the learning environment were measured using a school climate survey designed by the district. Teachers' attitudes were measured using a researcher designed questionnaire and a personal interview.

The results indicated that there was a significant difference in the reading scores of students who completed at least one homework packet, and a significant difference in the scores of students who had parent signatures on the homework packets. Analyses of the student surveys indicated that the students perceived their teachers positively, were satisfied with their learning environment, and perceived cohesiveness among their classmates.

The results of teachers' responses to the questionnaire and interview indicated that the teachers felt positive about the computer-managed reading instruction, especially the diagnostic information, homework packets, and the effect on student motivation.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACKNOWLEDGMENTS ........................................................................... iii</td>
</tr>
<tr>
<td></td>
<td>LIST OF TABLES .............................................................................. vi</td>
</tr>
<tr>
<td></td>
<td>LIST OF ILLUSTRATIONS ..................................................................... viii</td>
</tr>
<tr>
<td></td>
<td>Chapter</td>
</tr>
<tr>
<td>1.</td>
<td>INTRODUCTION .................................................................................. 1</td>
</tr>
</tbody>
</table>
|         | Purpose of the Study  
|         | Statement of the Problem  
|         | Research Questions  
|         | Overview of Methodology  
|         | Definition of Terms  
|         | Limitations                                                          |
| 2.      | REVIEW OF LITERATURE ..................................................................... 13 |
|         | The Reading Ability and Characteristics of At-Risk Students  
|         | The Advantages of Using Computers to Teach At-Risk Students  
|         | The Role of the Teacher in Using Technology  
|         | The Effect of Parental Involvement in the Education of At-Risk Students  
|         | The Need for the Study                                               |
| 3.      | METHODS ......................................................................................... 27 |
|         | Population and Demographics  
|         | Instrumentation  
|         | Research Design  
|         | Treatment of Data                                                    |
### TABLE OF CONTENTS -- Continued

4. **PRESENTATION AND ANALYSIS OF DATA** .......................... 45  
   - Research Question 1  
   - Research Question 2  
   - Research Question 3  
   - Research Question 4  
   - Research Question 5  
   - Research Question 6  
   - Teacher Interview  

5. **CONCLUSIONS** .................................................................... 99  
   - Summary  
   - Discussion  
   - Findings  
   - Summary of Findings  
   - Conclusions  
   - Implications  
   - Recommendations  
   - Need for Future Study  

**APPENDIX**  

| A. | Background Information ......................................................... 120 |
| B. | How I Feel About Myself .......................................................... 127 |
| C. | How My Class Acts .................................................................... 130 |
| D. | Teacher Questionnaire ............................................................... 133 |
| E. | Personal Index Journal ............................................................... 136 |

**REFERENCES** ........................................................................... 152
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Student Population Characteristics</td>
<td>29</td>
</tr>
<tr>
<td>2.</td>
<td>Learner Perception Characteristics Means</td>
<td>30</td>
</tr>
<tr>
<td>4.</td>
<td>Responses To The Learning Center Teacher Survey, 1990-1991 School Year</td>
<td>32</td>
</tr>
<tr>
<td>5.</td>
<td>Test of Difference in Reading Pretest Means</td>
<td>46</td>
</tr>
<tr>
<td>6.</td>
<td>Analysis of Covariance on Reading Posttest Means with Reading Pretest As Covariate</td>
<td>47</td>
</tr>
<tr>
<td>7.</td>
<td>Test of Difference in Change of Reading Scores at the Treatment and Comparison Centers</td>
<td>47</td>
</tr>
<tr>
<td>8.</td>
<td>Correlation of Reading Achievement and Number of Completed Homework Packets</td>
<td>50</td>
</tr>
<tr>
<td>9.</td>
<td>Test of Significance on Reading Posttest Scores of Homework Group and Other Students</td>
<td>53</td>
</tr>
<tr>
<td>10.</td>
<td>Test of Significance for Reading Pre/Posttest Scores of Homework Group by Grade Level</td>
<td>55</td>
</tr>
<tr>
<td>11.</td>
<td>Number of Parent Signatures on Homework Packets by Grade Level</td>
<td>57</td>
</tr>
<tr>
<td>12.</td>
<td>Correlation of Reading Achievement and Parental Signatures on Homework</td>
<td>59</td>
</tr>
<tr>
<td>13.</td>
<td>The Relationship Between Parental Signatures and Students' Reading Achievement</td>
<td>60</td>
</tr>
<tr>
<td>Table</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>14.</td>
<td>Correlations of Parental Signatures and Completion of Homework Packets</td>
<td>61</td>
</tr>
<tr>
<td>15.</td>
<td>Parental Participation by Helping with Homework Packets by Grade Level</td>
<td>62</td>
</tr>
<tr>
<td>16.</td>
<td>Significant Differences on Individual Questions on How I Feel About Myself</td>
<td>66</td>
</tr>
<tr>
<td>17.</td>
<td>Test of Significant Differences on How My Class Acts</td>
<td>68</td>
</tr>
<tr>
<td>19.</td>
<td>Mean Responses to Each Factor on How My Class Acts by Grade Level</td>
<td>71</td>
</tr>
<tr>
<td>20.</td>
<td>Demographic Information on the Teachers at the Treatment Center</td>
<td>73</td>
</tr>
<tr>
<td>21.</td>
<td>Teacher Questionnaire, Categories of Responses</td>
<td>74</td>
</tr>
<tr>
<td>22.</td>
<td>Correlation Between Teachers' Responses to Questionnaire Categories</td>
<td>77</td>
</tr>
<tr>
<td>23.</td>
<td>Correlation Between Teachers' Total Scores and Scores on Specific Topics</td>
<td>78</td>
</tr>
<tr>
<td>24.</td>
<td>Categories of Responses to Teacher Interview</td>
<td>90</td>
</tr>
<tr>
<td>25.</td>
<td>Grade 5 T.A.A.S Results, 1992--70% Standard</td>
<td>124</td>
</tr>
<tr>
<td>26.</td>
<td>Percentile Band Gains on the ITBS Reading Subtest</td>
<td>124</td>
</tr>
<tr>
<td>27.</td>
<td>ITBS Reading Percentile Bands, Median Score</td>
<td>125</td>
</tr>
<tr>
<td>28.</td>
<td>Students' Reading Characteristics, Means</td>
<td>126</td>
</tr>
<tr>
<td>Figure</td>
<td>Illustration Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1.</td>
<td>Academic self-concept and achievement motivation survey</td>
<td>35</td>
</tr>
<tr>
<td>2.</td>
<td>Student perceptions of the learning environment survey</td>
<td>37</td>
</tr>
<tr>
<td>3.</td>
<td>Number of homework packets completed at each grade level</td>
<td>49</td>
</tr>
<tr>
<td>4.</td>
<td>Effect of the number of homework packets on reading scores</td>
<td>51</td>
</tr>
<tr>
<td>5.</td>
<td>Effect of homework on reading achievement</td>
<td>53</td>
</tr>
<tr>
<td>6.</td>
<td>Reading achievement by groups and grades</td>
<td>54</td>
</tr>
<tr>
<td>7.</td>
<td>Number of parental signatures on homework by gender and grade level</td>
<td>57</td>
</tr>
<tr>
<td>8.</td>
<td>Percentages of signatures on the homework packets by gender</td>
<td>58</td>
</tr>
<tr>
<td>9.</td>
<td>Reading pretest and posttest enrollments by grade and group</td>
<td>63</td>
</tr>
<tr>
<td>10.</td>
<td>Percentage of enrollment change between reading pretest/posttest</td>
<td>63</td>
</tr>
<tr>
<td>11.</td>
<td>Mean scores on the pretest/posttest How I Feel About Myself</td>
<td>65</td>
</tr>
<tr>
<td>12.</td>
<td>Teachers' total response scores on the Teacher Questionnaire</td>
<td>79</td>
</tr>
<tr>
<td>13.</td>
<td>Teachers' responses to teacher training/computer competency</td>
<td>80</td>
</tr>
<tr>
<td>14.</td>
<td>Teachers' responses to the questions on productivity</td>
<td>81</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>15.</td>
<td>Teachers' responses to the questions on homework packets</td>
<td>82</td>
</tr>
<tr>
<td>16.</td>
<td>Teachers' responses to the questions on effectiveness</td>
<td>83</td>
</tr>
<tr>
<td>17.</td>
<td>Teachers' responses to the questions on student attitudes</td>
<td>83</td>
</tr>
<tr>
<td>18.</td>
<td>Teachers' responses to the questions on computer lab use</td>
<td>84</td>
</tr>
<tr>
<td>19.</td>
<td>Teachers' total scores on questionnaire compared with the mean</td>
<td>85</td>
</tr>
<tr>
<td>20.</td>
<td>Teachers' scores on effectiveness compared with the mean score</td>
<td>86</td>
</tr>
<tr>
<td>21.</td>
<td>Teachers' scores on student attitudes compared with the mean</td>
<td>86</td>
</tr>
<tr>
<td>22.</td>
<td>Teachers' high and low scores compared to the mean score</td>
<td>87</td>
</tr>
<tr>
<td>23.</td>
<td>Teachers' high and low productivity scores</td>
<td>88</td>
</tr>
<tr>
<td>24.</td>
<td>Teachers' high and low effectiveness scores</td>
<td>88</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

A critical issue in the future of our educational system is developing urban schools that are able to enhance the academic performance of their students and increase their desire to learn (Cuban, 1989). President George Bush remarks in *America 2000: An Education Strategy* that we must accept responsibility for educating everyone in America, regardless of their background or disability (Alexander, 1991). On the other hand, newly released data from the U.S. Census Bureau indicate that over the past 10 years the nation's children have become poorer and more diverse and more likely to fall behind in school (Schmidt, 1992).

One of the obstacles that appears to prevent urban schools from educating everyone is the poor reading ability of the students. According to Reitzammer (1990), two out of every four inner-city students will drop out prior to graduation because they lack reading skills, and early intervention programs which promote reading success are a cornerstone in the dropout prevention plan for America's youth. Since reading is an integral part of all academic studies, early remediation of reading deficiencies may provide the impetus for disadvantaged students to continue their studies and avoid being "at-risk" of dropping out of school.
Despite the continued efforts aimed at improving reading achievement, the results have been less than satisfactory. In fact, national reading assessments conducted between 1971 and 1988 report relatively small gains in reading achievement, with especially disappointing performances by the average and low-scoring students. Furthermore, Linn and Dunbar (1990) note that the performance of 9-year-olds over this period of time indicated either a slight decline or relatively no change in the level of reading ability. Additionally, the 1990 NAEP study showed that there is a wide gap between effective reading instruction and the practices of most classrooms (Rothman, 1992).

According to Chall and Snow (1988), experienced teachers of low-income children report that in fourth grade their students' reading progress slows, and reading problems increase. They indicate that low-income children are able to progress as expected in the primary grades when the reading task is learning to recognize and decode words, but they start to falter when their reading materials become more complex. Vacca and Padak (1990) concur, reporting that students are at risk in reading when they have developed limited cognitive skills in handling demands inherent in the task of learning from texts. They add that at-risk readers do not see themselves as competent readers and often have limited strategies for handling reading tasks. Thus, there remains a need to develop an effective approach to teaching reading to lower achieving students who may be considered "at-risk."
At-risk students seem to have learning styles that resist traditional instruction (Keough, 1986) and that are exacerbated by a low self-concept, an anxiety and dislike for reading, and a belief that they are unable to achieve (Henderson, 1987; Reed & Sautter, 1990; Slavin, 1991). Coley and Hoffman (1990) note that these students, because of their lack of reading success, get caught in a failure cycle and develop a passive, helplessness mode as their orientation to learning. They perceive school as a threatening place and want to escape (Hamby, 1989), and in order to counteract this attitude, intervention must begin early (Greene & Uroff, 1989; Slavin, 1991). Reitzammer (1990) concurs, noting that programs addressing reading success must be initiated in the elementary school experience, and Chall and Snow (1988) report that "the seeds of poor academic achievement in high school may be sown as early as fourth or fifth grade" (p. 4). Hergert (1991) notes that schools that have proven successful with large numbers of at-risk students provide early identification and intervention for learning problems and use multiple approaches to help students master skills.

At-risk students require a flexible and integrated curriculum using individualized instruction that allows them to begin at their own level and monitor their own comprehension (Knapp & Shields, 1990). Schunk and Rice (1991) point out that these students benefit from explicit sources of information that link systematic efforts with improved performances. Moreover, providing them with feedback on their learning progress enhances their achievement
outcomes. Hence, the capabilities of computer technology could be effective in meeting the instructional needs of these students because traditional teaching strategies apparently have been unsuccessful (Bialo & Sivin, 1989; Hadley & Hadley, 1991; McCarthy, 1988).

A computer-managed instructional approach that uses integrated testing and skills software appears to be especially well suited to providing an appropriate academic program for at-risk students. Slavin and Madden (1989) indicate that effective programs for at-risk students frequently assess a student's progress and modify content to meet the individual's needs. Jones (1991) notes that one of the factors that needs to be considered when implementing a program for at-risk students is continuous progress monitoring, and Miller (1991) points out that programs that are effective with low socio-economic and low ability students provide frequent feedback. Smey-Richman (1991) cautions that without a realistic assessment of prior learning, low achievers are unlikely to develop positive attitudes toward classroom tasks, and the former Secretary of Education, Lamar Alexander, notes in America 2000: An Education Strategy that educational goals are "meaningless" without good assessment (p. 70).

A computer-managed instructional approach that uses integrated testing and skills software is capable of providing continuous progress instruction while monitoring and assessing student progress on an on-going basis. In addition, it can generate information in the form of daily reports that can be used in planning instruction or evaluating achievement. Sherry (1990) indicates that
this type of approach will become more common in the future and will have a
significant impact on the field of education.

However, one of the drawbacks to the use of computer technology is the
number of teachers who are unable to apply computers as teaching tools
(Fulton, 1988; Keough, 1986). Since many of these teachers are technophobic
(Fulton, 1988), a critical factor in their use of technology is training. Therefore,
teacher training is an important factor in the implementation of effective
computer-managed instruction for at-risk students. Sununu (1986) concurs,
pointing out that part of the reason schools have not productively used
technology in the past is the lack of training for teachers.

In addition to the use of technology with at-risk students, another area
that appears to have positive impact on their achievement is the involvement of
their parents in their schooling. Keough notes in Scenario 2000: Intercepting
the Future that the attitudes of parents and the general atmosphere of the home
significantly affect a student's school performance. On the other hand, if home
values conflict with school values and achievement goals, then expecting at-risk
students to achieve is expecting them to be different from their parents (Swap,
1990). Thus, it is critical that parents of at-risk students be given information on
how to provide appropriate educational support. Often low-income parents do
not feel competent enough to help with school work and often do not under-
stand what they can do to contribute effectively to learning (Mavrogenes, 1990).
In fact, Hamby (1989) argues that in order to get an "A" on the dropout
prevention report card, parents must be provided with information on how to help their children.

During the 1990-91 school year, none of the targeted school district's elementary schools that were identified as special needs schools met their goals in reading achievement on the norm-referenced achievement tests. The State Education Agency agreed to fund a study to determine the feasibility of using integrated testing and skills software to deliver, measure, and manage reading instruction for at-risk students.

**Purpose of the Study**

This study determined the effectiveness of using a computer-managed instructional system with integrated testing and skills software to raise the reading scores of at-risk students in a low-achieving urban school. The *Skills Bank II* software program was used to generate diagnostic reports and to provide additional instruction and assessment of reading and related language arts skills in order to create individualized homework packets to address skill deficiencies. Additionally, this study determined how at-risk students in a low-achieving urban school were personally affected by this type of instruction, because research indicates that their attitudes about themselves and their learning environment have an effect on reading ability. Also, because teachers are such an integral part of any instructional system, this study also determined how the teachers were personally affected by this instructional approach.
The study was conducted in conjunction with the efforts of the Texas Center for Educational Technology at the University of North Texas.

**Statement of the Problem**

The problem for this study was to determine the effects of using computer-managed, integrated testing and skills software with individualized homework packets on the reading achievement and attitudes of at-risk students in a low-achieving urban school. An additional problem was to determine teachers' attitudes toward using technology to deliver, measure, and manage instruction.

**Research Questions**

The following questions were identified as specifically important to this study:

1. Can at-risk students who receive systematically scheduled computer-managed reading instruction with integrated testing and skills software significantly improve their reading scores on a norm-referenced achievement test?

2. Can at-risk students who complete individualized homework packets significantly improve their reading scores on a norm-referenced achievement test?
3. What relationship exists between the amount of parental involvement, as measured by signature frequency on homework assignments, and student achievement?

4. Can at-risk students who receive systematically scheduled computer-managed reading instruction with integrated testing and skills software and individualized homework packets significantly improve their scores on the part of the School Climate Survey that relates to academic self-concept and achievement motivation?

5. Can at-risk students who receive systematically scheduled computer-managed reading instruction with individualized homework packets significantly improve their scores on the part of the School Climate Survey that relates to student perceptions of the learning environment?

6. What are the teachers' attitudes toward using the computer-managed reading instruction with integrated testing and skills software, the diagnostic reports, and the individualized homework packets?

**Overview of Methodology**

This study was conducted at two elementary schools located in lower socio-economic, or disadvantaged, neighborhoods of a large, urban school district which is located in the Southwest. The treatment school was in the south section of the district, and the comparison school was in the west section of the district.
The student population for this study included all students in grades 4 through 6 who attended the treatment and comparison schools. The teacher population for this study included the computer specialist and nine classroom teachers at the treatment school.

The reading comprehension subtest of a norm-referenced achievement test was used to measure reading achievement, and teacher records were used to determine homework packet completion rates. The School Climate Survey, an instrument developed locally by the school district, measured several aspects of the school climate, including the academic self-concept and achievement motivation of students and their satisfaction, cohesion, and cooperation in the classroom. Two tests made up the survey: How I Feel About Myself measured academic self-concept and achievement motivation, and How My Class Acts measured student satisfaction, cohesion, and cooperation in the classroom. The teachers' responses to a questionnaire and interview measured the teachers' attitudes toward the treatment.

**Definition of Terms**

For the purposes of this study, the following terms have limited definitions:

At-risk students -- minority students or students eligible for free or reduced-price lunch who attended the treatment and comparison schools in the urban school district.
Computer-managed, integrated testing and skills software -- the Skills Bank II computer software program. Through the use of a file server and networked computers, this software provides instruction, a variety of diagnostic reports to map skill deficiencies, and individualized homework packets.

Diagnostic reports -- the computer-generated reports that were based on student skill deficiencies as determined by their performance on the Skills Bank II software. The student profile detailed each lesson, quiz, and test with the date, the number of questions answered by the student, the number of correct responses and the time spent on each. The class profile summarized the class performance, listing each student's average scores and time-on-task. The parent report provided a narrative history of the student's recent work. The diagnostic report compared each student's most recent work in an area to past work. The assignment report provided an Individual Educational Plan (IEP) for each student. The learning style report described how each student used Skills Bank II, and the administrator report provided a time summary of computer lab usage.

Homework group -- a group of students in the treatment school who completed at least one homework packet.

Individualized homework packets -- the computer-generated worksheets that provided homework activities to address an individual student's diagnosed skill deficiencies. These packets were developed by the student's teacher from information presented in the diagnostic reports.
Learning center -- an elementary school established by court order to serve as an alternative to busing in order to satisfy desegregation requirements for students living in a disadvantaged, or lower socio-economic, section of a large urban school district.

Norm-referenced achievement test -- the standardized achievement test normed on a national population that was administered by the school district.

Skills Bank II -- a computer software program by Skills Bank Corporation which reviewed basic skills tested by a variety of norm-referenced achievement tests and generated a variety of diagnostic reports.

Teachers' attitudes -- the teachers' responses to a researcher-designed questionnaire and interview about the effects of the computer-managed instructional approach used in the study.

Limitations

This study provided information about the effectiveness of using a specific computer-managed, integrated testing and skills software program for reading instruction with at-risk students. However, because this was a nonrandom sample and the treatment was limited to a single school population of predominantly African-American students in fourth, fifth, and sixth grades, broad generalizations are not possible. Additionally, since the duration of the treatment was only six weeks, extrapolation of the results to studies of longer or shorter duration may not be valid. The treatment school serves children from
transient neighborhoods, children from several homeless shelters, as well as children of migratory workers; therefore, the population of the school varied as much as thirty percent over the period of the study. Moreover, there was no way to control for the effect of a financial reward on the teachers' motivation and classroom performance. Finally, there were limitations to the interpretation of self-report data related to parental signatures on the homework assignments.
CHAPTER 2

INTRODUCTION

This review of literature is divided into five sections: the reading ability and characteristics of at-risk students, the advantages of using the computer to teach at-risk students, the role of the teacher in using technology, the effect of parental involvement in the education of at-risk students, and the need for this study.

The Reading Ability and Characteristics of At-risk Students

According to Hodgkinson (1992), one third of the nation's children are at risk of school failure before they enter kindergarten because they come from a single-parent home, belong to a low-income family, or have uneducated parents. Since reading proficiency is related to a student's background and general literacy experiences, students at each grade level from historically at-risk populations are at a disadvantage and, therefore, continue to perform poorly in reading relative to the national population (Applebee, Langer, & Mullis, 1988; Knapp & Shields, 1990). Schmidt (1992) notes that a disproportionate percentage of African-Americans and Hispanics fall behind in school. Habenicht, Byoune, and Futzer (1990) attribute the poor performance in school of these groups to their right-hemispheric strengths, which seem to put
them at a greater risk for difficulties in reading and learning in school than students who show left-hemispheric strengths. Seo (1991) suggests that their cultural background is misunderstood by teachers, which impedes their reading progress. Other researchers indicate that the absence of cultural continuity also affects reading achievement (Kretovics, Farber, & Armaline, 1991).

O'Neil (1991) notes that there is a conflict between the increasing economic needs for an educated populace and the increasing proportions of children whose background characteristics make them statistically less likely to succeed in school. In fact, he warns that third graders who are reading a year or more below grade level, who are poor, and who are attending a school serving many other poor children have very little chance of graduating from high school. This is especially true of African-American and Hispanic students (Applebee, Langer, & Mullis, 1988). Slavin (1991) concurs, noting that on the 1988 National Assessment of Educational Progress, only 39% of African-American 9-year-olds could read at the basic level (p. 587). He further adds that retentions and special education referrals are usually based on early reading deficiencies, which are more prevalent in schools serving large numbers of disadvantaged students. These students are often labeled as learning disabled and are often treated differently in the classroom. Boutte (1992) concurs, noting that teachers' expectations for the achievement of poor and minority students are low, and a disproportionate number of African-American children are placed in low ability groups. Hornbeck (1992) suggests that low expectations become self-fulfilling
prophecies and are the "single greatest obstacle" faced by poor and minority students (p. 32).

As a result of their reading deficiencies, at-risk students tend to have a poor self-concept, which in turn affects their ability to achieve in school. In fact, Henderson (1987) points out that at-risk students lose a sense of control over their environment, which is highly related to their lack of achievement in school. Minority students seem to be especially affected by this loss of power because academic ability and identity-related factors appear to be inseparable (Cummins, 1989). Reed and Sautter (1990) indicate that many youngsters lack self-esteem and the belief that they can achieve, which Slavin (1991) notes makes them anxious about school, especially reading.

Beers and Beers (1980) indicate that intensive remedial reading instruction confines minority students to a passive role and induces a form of helplessness and instructional dependence. This often is mistaken for a learning disability. Reed and Sautter (1990) point out that the number of children diagnosed as learning disabled has increased 140% over the last 10 years, and teachers are reporting an increase in the number of children with problems in reading comprehension and basic literacy skills.

According to Firestone (1989), these problems contribute to the alienation that the at-risk student feels from school. Hamby (1989) agrees, noting that these students perceive school as a threatening place, and they want to escape the aversion they feel there. Greene and Uroff (1989) suggest
that we begin to focus on the students themselves by meeting their basic needs, and Slavin (1991) cautions that trying to remediate failure later on is very difficult because by then the students are unmotivated. Grolnick, Ryan, and Deci (1991) report that the concepts of control understanding, perceived competence, and relative autonomy are critical motivational resources. Boutte (1992) indicates that the message of lower expectations is a factor in unmotivated African-American children, and Bracey (1992) reports that a student's achievement motivation is an important factor in school success.

Consequently, a new approach to academic instruction is needed for these students. Knapp and Shields (1990) suggest that it is important to maximize time-on-task, maintain rapid pacing, and provide frequent feedback to students. In addition, they indicate that at-risk students need repeated opportunities for practice and review without criticism, and they need the opportunity to have a full range of cues to help in constructing meaning. They need explicit teaching that emphasizes modeling, demonstrations, and explanations, and they also need supplemental instructional arrangements that are flexible and integrated into the regular classroom instruction (Knapp & Shields, 1990). Keough (1986) concurs, noting that in order to keep at-risk students in school, a nontraditional curricula is needed with teachers who use an individualized approach that allows students to start at their own level.
The Advantages of Using the Computer to Teach At-risk Students

It would appear that computer technology has the potential to restructure instruction for at-risk students. The President of the United States, George Bush, in *America 2000: An Education Strategy*, indicates that nations that stick to old notions and ideologies will falter and fail until they begin to move toward educational innovation. Computer technology is an educational innovation that has yet to be exploited, especially in urban schools.

According to Boyer (1986), a totally different urban educational experience is needed, one that offers a low-threat, high-quality instructional delivery system that will reduce the anxiety of at-risk students. Since the effects of preschool and extended-day kindergarten tend to wash out by second or third grade, instructional methods are needed that maintain and accelerate student achievement (Slavin & Madden, 1989). Continuous progress models, such as computer-assisted instruction that is intensive and uses one-to-one tutoring with frequent assessments of student progress, appear to work with students at risk (Slavin & Madden, 1989). Stout (1991) suggests that there should be a strong national focus on using technological solutions to facilitate curriculum integration and monitor achievement for all students in order to reduce the numbers of at-risk students who drop out of school. On the other hand, Olson (1992) notes that technology is less available to minority students and students from poor communities.
Bialo and Sivin (1989) note that the computer's capabilities make it especially well suited to the needs of at-risk students. The multisensory approach to learning is an alternative to the traditional instruction that has failed in the past. The computer is patient and nonjudgmental and provides an instructional sequence that is tailored to the needs of the individual student. In addition, the computer provides students who are embarrassed by low level work with a sense of academic privacy and, thus, gives them a sense of empowerment. Consequently, it can change the way they feel about themselves and school, and it can change the role of teacher from judge to coach (Bialo & Sivin, 1989). Sturla (1992) points out that the computer gives the students a sense of personal responsibility and control over their learning and improves their self-esteem.

McCarthy (1988) suggests that computers should be integrated in areas where traditional teaching strategies are not working, and Goodspeed (1988) notes that they have an impact on self-efficacy and empower students because they are neutral and patient. The computer is a great equalizer for racial and ethnic minorities who do not fare as well in schools as Caucasian children (Eitzen, 1992). Gross (1989) cites some students' revealing remarks: ""The machine doesn't know I'm African-American,"" ""It doesn't hate me,"" ""It gives me a second chance,"" ""I can do it!"" (p. 50). Keough (1986) adds ""Computers have no biases. They have infinite patience, and they provide support without any
judgment; thus they offer face-saving salvation to those students who need more trials than normal to master their materials* (p. 28).

At-risk students need extra time in order to prosper, and computers can expand the focus of their education beyond basic skills and boost their self-image. Jones (1991) recommends that an instructional program for at-risk students should allow students to feel in control of their learning and should include active student involvement, direct instruction adjusted to the students' varied learning styles, continuous progress monitoring, and computer-assisted instruction. Research indicates that students gain much more from a visual presentation if they are somehow involved in what is taking place. The computer lets them choose specific skills that are strengthened according to individual needs, and it follows up with immediate and strong feedback (Small, 1989). Research for Better Schools (1989) indicates that computers are a viable, worthwhile way to meet the needs of at-risk students.

On the other hand, Bialo and Sivin (1989) note that a 1987 Congressional Office of Technology Assessment (OTA) study found that in schools with a large percentage of students eligible for free or reduced price lunches, teachers were less likely to use computers. Moreover, they found that most urban programs had less access to computers than did suburban programs (p. 39). Urbanski (1991) states that urban school districts could be labeled as "educational intensive-care units" (p. 29). Sununu (1986) emphasizes that states need to make technology more readily available to
students from low-income families, and Rood (1988) warns that future prosperity depends on a populace that can master complex technologies. Disadvantaged children, by being able to work with computers, can increase their range of accomplishments at the same time they are developing skills with modern technological applications valued by society (Ross, Smith, Morrison, & O'Dell, 1989). Fitzpatrick (1991) concludes that integrating microcomputers with the reading program has several advantages: the software interacts with the student; the student has control over the instruction, which increases motivation; academic learning time is increased, which leads to academic gains; and the software is able to meet the needs of students at various levels of reading ability.

Computers can also help with the education of at-risk students by providing up-to-date information for the teacher to use in instructional planning. A good job of assessment is critical because it defines what students need to know, determines whether they know it, and makes sure the measurements are accurate, comparable, appropriate, and constructive (Alexander, 1991). Computer-managed instruction has the capability to do a good job of assessment by providing frequent and systematic monitoring of students' progress so that intervention can occur in a timely fashion and teachers can spend more time teaching (Stapleton, 1987). A computer-managed instructional system uses networked microcomputers or terminals. It includes a software management system that collects and records the results of student
performance, has options for generating a variety of printed reports, and often has a diagnostic/prescriptive program that assigns lessons to students based on their individual progress. Additionally, it includes courseware that spans several grade levels and covers a major portion of the math, reading, and language arts curricula (Sherry, 1990).

However, the information generated by a computer-managed instructional system must be integrated into the curriculum and used to plan classroom instruction, and Ognibene and Skeele (1990) note that there is a general consensus that computers are poorly integrated into the curriculum. Sherry (1990) adds that in most schools few attempts are made to coordinate the students' computer-managed lessons with the rest of their instruction, and hardly any attempt is made to make it easy for the teacher to coordinate the regular instruction with the computer lessons.

The Role of the Teacher in the Use of Technology

Part of the difficulty of implementing computers in schools occurs because many teachers do not know how to use the technology. Even though the teacher is central to the full development of technology in education, few have found ways to exploit its full potential. A nationwide survey of education majors found that fewer than 29% perceived themselves to be prepared to teach with computers, and only about one third of all K-12 teachers had participated in at least 10 hours of computer training (Fulton, 1988, p. 34).
Keough (1986) states that only 27% of high school teachers, 21% of middle school teachers, and 10% of elementary teachers were highly proficient in the use of computers (p. 27). West (1992) indicates that the investment in hardware and software for educational restructuring and reform initiatives has not been matched by a coordinated effort to train teachers to use the equipment effectively.

Teachers must be trained in order to feel comfortable using computers. Schools have generally not become more productive through the use of technology because not enough high quality training has been provided for teachers (Goodspeed, 1988; Sununu, 1986). Fulton (1988) concurs, pointing out that many teachers admit to being technophobic; therefore, training is a critical factor in the use of technology. Sherry (1990) warns that data show that teacher training has been grossly neglected and poorly trained teachers may communicate negative attitudes which affect their students' motivation to learn. Teachers share a number of concerns about computers in the classroom because of the lack of adequate training programs to build teachers' confidence and abilities to use the technology to its fullest potential (Dupagne & Krendl, 1992). Consequently, if we view change as a three-stage evolutionary process of entry, adoption, and adaptation, then in the early stages of implementation, technical training is a key ingredient to successful adoption. However, to evolve to adaptation, teachers increasingly need opportunities to think about instruction and learning (Dwyer, Ringstaff, & Sandholtz, 1991).
The Effect of Parental Involvement in the Education of At-Risk Students

The attitudes and atmosphere of the home contribute significantly to a student's success or failure in school (Henderson, 1987; Keough, 1986; Knapp & Shields, 1990; Rood, 1988). Lakshmanan (1992) points out that success in school is almost always predetermined by parental support and the community in which a child lives. Rich (1987) concurs, noting that the active involvement of the family is critical to a child's school success and results in better academic achievement, more positive attitudes toward school, and more regular homework habits. In order to ensure a successful school experience for children, it is extremely important that their parents be involved as soon as possible in their education (Hamby, 1989).

Rich (1987) suggests that the area of parental involvement that is most directly linked to improved academic achievement is helping with home learning activities, stating that "if teachers had to choose only one policy to stress, the most payoff will come from teachers involving parents in helping their children in learning activities at home" (p. 17). Additionally, Epstein (1984) reports that parents who learn about their children's instructional program can positively influence their reading achievement. Rothman (1992) adds that the more homework students do, the better they tend to perform in reading.

Homework has positive effects on immediate achievement and learning; long-term academic effects on willingness to learn during leisure time, improved attitude toward school, better study habits and skills; and nonacademic effects
on greater self-direction, self-discipline, and greater parental appreciation of
and involvement in schooling (Cooper, 1989).

An effort must be made early in a child’s schooling to involve the parents in reading instruction. On the other hand, low-income parents may not feel competent to deal with school work and may not understand how they can contribute to the learning environment. Research indicates that although most parents are willing to help their children with their education, they do not know how to go about it and are afraid of interfering (Mavrogenes, 1990). Thus, any attempt to involve parents needs to incorporate some parent education.

Teachers can help by making specific homework assignments. Henderson (1987) suggests that in order to help their children at home the parents need information and materials which complement and reinforce what is being taught at school. Foyle and Bailey (1986) concur, noting that clearly stated homework assignment sheets give parents a positive image of the educational process and allow parents to help students with homework.

The Need for the Study

Research indicates that reading achievement is still a problem with minority, disadvantaged children because their learning styles do not seem to match traditional teaching methods. Because these students require a tactile, experiential learning mode with a great deal of positive reinforcement, the computer could be successfully used to deliver instruction. Moreover, a
computer-managed instructional system that uses integrated testing and skills software with a computer network could deliver individualized instruction at the student's pace and provide frequent assessments to monitor progress. Deficiencies could be remediated before they worsen. On the other hand, this type of system is often too expensive for schools that serve large numbers of at-risk students; therefore, it would be beneficial to determine the effectiveness of a relatively inexpensive system.

Parental involvement appears to be a critical factor in improving reading achievement. Although it is important that parents help their children at home, without specific information they are often unable to help. Rich (1985) suggests that parents need to be linked directly to the learning of their own children by sending home learning activities as "recipes" for parents and children to do together (p. 89). The individually tailored homework packets would provide parents with specific information.

Research indicates that teachers are the key to any instructional program. If teachers are anxious about using a computer-managed system that incorporates integrated testing and skills software, or if they perceive it as too time-consuming, they may not use it and may even sabotage it. Consequently, teachers need training in how to use such a system and how to integrate the variety of information provided by that system.

Mann (1986) indicates that the programs that work with at-risk students seem to involve cash, care, computers, and coalitions. An effective program
would combine these four components. The present study, funded by the State Education Agency, involved a coalition of an independent school district in a large urban community and the Texas Center for Educational Technology at the University of North Texas. It involved using a computer network and relatively inexpensive, integrated testing and skills software to deliver, measure, and manage reading instruction and produce individualized homework packets for the students. It also included a training program for the teachers to help the teachers feel comfortable using the system and to help them effectively integrate the information from the diagnostic reports. The combination of these elements was intended to increase the level of reading achievement of at-risk students.
CHAPTER 3

METHODS

Population and Demographics

Student Population

The treatment group for this study consisted of all students in grades 4 through 6 who attended one of the learning centers of the school district. The population included 222 students with an ethnic make-up of approximately 92% African-American, 7% Hispanic, and less than 1% Caucasian. Approximately 30% of the students were transported by bus to the campus; approximately 3% were from shelters for the homeless; approximately 16% were Limited English Proficiency (LEP) students; approximately 88% were on free or reduced lunch; and approximately 60% were below the 41st national percentile on the reading subtest of the norm-referenced achievement test. Additionally, only 59 out of 105 fifth graders passed all of the administered subtests on the 1989-90 Texas Assessment of Minimum Skills (TEAMS), and fewer than 30% passed all of the tests on the 1990-91 Texas Assessment of Academic Skills (TAAS).

The comparison group for this study consisted of all students in grades 4 through 6 who attended another learning center in the district. The population included 219 students with an ethnic make-up of approximately 90% African-American, 9% Hispanic, and less than 1% Caucasian. An average of 95% of
the students received free lunch, and approximately 66% of the students were
below the 50th national percentile on the reading subtest of the norm-
referenced achievement test (Dryden, Johnson, & Bouldin, 1991). Sixty-seven
out of approximately 160 fifth graders passed all of the administered subtests on
the 1989-90 Texas Assessment of Minimum Skills (TEAMS), and fewer than
40% passed all of the tests on the 1990-91 Texas Assessment of Academic
Skills (TAAS).

Both of these learning centers are among the district's top 10 schools
with the largest number of economically deprived students (DISD, 1989). Table
1 shows the Deprivation Index for each school and the total number of students
at each campus participating in the free or reduced-price lunch program during
the 1990-91 school year. Although the schools are located in economically
deprived areas and serve economically deprived students, the Average Daily
Attendance (ADA) at both schools is relatively high. With fewer than 40% of
their students passing all tests on the 1990 TAAS, the treatment learning center
and the comparison learning center were the only learning centers in the district
that were deemed "low achieving" schools by the State Education Agency. In
addition, neither school met the school district's 1990-1991 reading goals
based on the norm-referenced achievement testing.

The students at both schools are considered at risk academically and
economically, yet they appear to have a relatively high self-concept. On the
District's Student Climate Survey that measured academic self-concept and
TABLE 1

Student Population Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Comparison center</th>
<th>Treatment center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students on</td>
<td>195</td>
<td>197</td>
</tr>
<tr>
<td>free or reduced-price lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deprivation index</td>
<td>98.0%</td>
<td>91.0%</td>
</tr>
<tr>
<td>Average daily attendance</td>
<td>94.0%</td>
<td>92.9%</td>
</tr>
</tbody>
</table>

Note. From Evaluation of the 1990-91 south and west Dallas learning centers (p. 19) by Dryden, Johnson, & Bouldin, 1991, Dallas, TX: DISD.

achievement motivation, the students at the comparison learning center averaged 2.55 out of 3.00. The students at the treatment learning center averaged 2.62 out of 3.00. However, the surveys did indicate that the students at both schools had lower school-based academic self-concepts than home-based academic self-concepts (see Table 2).

Teacher Population

The teacher populations at the treatment school and the comparison school were similar. As shown in Table 3, during the 1991-92 school year, the 40 teachers at the treatment learning center had an average of nine years of experience; 92% of them were female, approximately 48% of them were Caucasian, approximately 50% were African-American, and less than 2% were
TABLE 2

Learner Perception Characteristics. Means

<table>
<thead>
<tr>
<th></th>
<th>Comparison center</th>
<th>Treatment center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic self-concept</td>
<td>2.72</td>
<td>2.74</td>
</tr>
<tr>
<td>(Home-based)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic self-concept</td>
<td>2.37</td>
<td>2.44</td>
</tr>
<tr>
<td>(School-based)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement motivation</td>
<td>2.56</td>
<td>2.68</td>
</tr>
<tr>
<td>(Effort)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. From Evaluation of the 1990-91 south and west Dallas learning centers (p. 36) by Dryden, Johnson, & Bouldin, 1991, Dallas, TX: DISD.

Hispanic. The 43 teachers at the comparison learning center had an average of 11 years of experience; 86% of them were female, approximately 44% of them were Caucasian, approximately 53% were African-American, and less than 3% percent were Hispanic.

As shown in Table 4, teachers at both schools responded in an overall positive manner to the Learning Center Teacher Survey. The teachers at the comparison center had less favorable responses to the questions that related to the center's facilities, whereas the teachers at the treatment center had less favorable responses to the questions that related to the materials available for instruction.
TABLE 3

Teacher Characteristics, 1991-1992 School Year

<table>
<thead>
<tr>
<th></th>
<th>Comparison center</th>
<th>Treatment center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of teachers</td>
<td>43</td>
<td>40</td>
</tr>
<tr>
<td>Mean years experience</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Percent female</td>
<td>86%</td>
<td>92%</td>
</tr>
<tr>
<td>Percent male</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>Percent Caucasian</td>
<td>44%</td>
<td>48%</td>
</tr>
<tr>
<td>Percent African-American</td>
<td>53%</td>
<td>50%</td>
</tr>
<tr>
<td>Percent Hispanic</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Note. From Evaluation of the 1990-91 south and west Dallas learning centers (p. 21) by Dryden, Johnson, & Bouldin, 1991, Dallas, TX: DISD.

The Staff Development Schedule for the 1991-92 school year did not include any staff development or computer training at the comparison center, but included five computer training classes in September, October, November, March, and April at the treatment center (Lawrence, McGill, & Howard, 1991).

The teacher population at the treatment center that participated in this study included nine classroom teachers and a computer specialist. Seven of the teachers were African-American, and three of them were Caucasian. Only one teacher was male. Each teacher received an incentive bonus to contract
TABLE 4

Responses To The Learning Center Teacher Survey, 1990-91 School Year

<table>
<thead>
<tr>
<th></th>
<th>Comparison center</th>
<th>Treatment center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>69.6</td>
<td>75.0</td>
</tr>
<tr>
<td>Equipment</td>
<td>91.3</td>
<td>87.5</td>
</tr>
<tr>
<td>Staff Development</td>
<td>73.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Materials</td>
<td>82.6</td>
<td>50.0</td>
</tr>
</tbody>
</table>

Note. From Evaluation of the 1990-91 south and west Dallas learning centers (p. 15) by Dryden, Johnson, & Bouldin, 1991, Dallas, TX: DISD.

for a mandatory three-year period at the school and was eligible to receive yearly financial incentives for each academic area in which the students in the school meet the established performance goals on the norm-referenced achievement test (see Appendix A).

The teachers who participated in the study were offered training on how to use the information generated by the computer program to plan, implement, and evaluate the classroom instruction. In addition, each teacher had the flexibility to personally tailor the program to fit the classroom needs. Teachers A, B, C, and G taught mixed grade levels; teacher F taught fourth grade; teachers E and H taught fifth grade; and teachers D and I taught sixth grade.
Instrumentation

Reading Achievement

The reading comprehension subtest on the norm-referenced achievement test administered annually by the target school district was used to measure reading achievement. This instrument, a nationally normed achievement test, was administered by the school district at both the treatment center and the comparison center in April, 1991, and again in April, 1992. This achievement test was normed on approximately 235,000 students in kindergarten through ninth grade. The standardization sample was stratified and randomly selected by size of enrollment, geographic region, socio-economic status, demographic data on the individual school, and indexes of achievement in the selected individual schools. The within-grade Kuder-Richardson 20 reliabilities are high, ranging from .75 to .96 at the kindergarten and first grade level and from .74 to .96 at the first and second grade level. Reliabilities for other grade levels exceed .87. Validity coefficients range from .45 to .67. This test was concurrently standardized with the Test of Achievement and Proficiency (TAP) and the Cognitive Abilities Test (Hieronymus & Hoover, 1986; Salvia & Ysseldyke, 1985).

Homework Packets

Teachers' records were used to determine the completion rate on the
individualized homework packets and the frequency of parental help with them.

Each packet had a cover sheet to identify the student, the grade level, a
signature line for parent or guardian, the date, the teacher, and the teacher's
assessment. In addition, the student was asked to mark one of three
statements: "I did the work myself"; "I had help"; "I need help."

**Academic Self-Concept and Achievement Motivation**

The School Climate Survey, How I Feel About Myself, was administered
in November, 1991, and in April, 1992, and was used to assess student
attitudes about academic self-concept and achievement motivation. This survey
was developed and validated internally by the school district over a six-year
period and has an overall internal consistency of .76 (Cronbach’s Alpha). The
survey measured three learner perception characteristics: home-based
academic self-concept (Cronbach’s Alpha = 0.77), school-based academic self-
concept (Cronbach’s Alpha = 0.74), and achievement motivation (Cronbach’s
Alpha = 0.74). The survey contained 18 questions to which the students
responded using a scale never (1), sometimes (2), and often (3). Five questions
assessed the students' home-based academic self-concept, five questions
assessed the students' school-based academic self-concept, and five questions
assessed the students' achievement motivation (effort). Figure 1 provides a
detailed listing of the questions.
HOW I FEEL ABOUT MYSELF: LEARNER PERCEPTION CHARACTERISTICS THAT RELATE TO ACADEMIC SELF-CONCEPT AND ACHIEVEMENT MOTIVATION

Home-based academic self-concept:
- My family thinks I can learn in school.
- My family thinks I can make good grades.
- I try to get good grades.
- I believe that good grades will help me later in life.
- I enjoy learning new things.

School-based academic self-concept:
- My teachers think I am smart.
- Other children think I am smart.
- I am as smart as others in my class.
- My teachers like my schoolwork.
- I am smarter than my teacher thinks I am.

Achievement motivation:
- I listen in class.
- I pay attention in class.
- I try my best in school.
- I do my homework.
- I continue with schoolwork even if it is hard.

Figure 1. Academic self-concept and achievement motivation survey.

Satisfaction With the Learning Environment

The School Climate Survey, How My Class Acts, was administered in April, 1992, and was used to assess student attitudes about the learning environment. This survey was developed and validated internally by the school district over a six-year period and has an overall internal consistency of .74.
(Cronbach's Alpha). The survey measures four climate characteristics: satisfaction with learning (Cronbach's Alpha = 0.81), friction among students (Cronbach's Alpha = 0.70), cooperation among students (Cronbach's Alpha = 0.67), and cohesiveness among students (Cronbach's Alpha = 0.75). The survey contained 27 questions to which the students responded using a scale never (1), sometimes (2), and often (3). Eight questions assessed the students' satisfaction with learning, four questions assessed friction among the students, five questions assessed cooperation among the students, and five questions assessed the degree of cohesiveness among the students. Figure 2 provides a detailed listing of the questions.

Teachers' Attitudes

The teachers' responses to a questionnaire and interview by the researcher at the end of the study provided information on the attitudes of the teachers toward the treatment. The questionnaire was developed by the researcher and contained 38 questions with Yes or No responses which served as a basis for the interview. The questions were designed to determine the teachers' attitudes about the training, teacher productivity, the homework packets, the effectiveness of the software, student attitudes, and use of the computer lab. Additionally, the questionnaire provided demographic
HOW MY CLASS ACTS: LEARNER PERCEPTION CHARACTERISTICS THAT RELATE TO THE CLASSROOM CLIMATE

Satisfaction with learning:
- In my class, the students think that learning is fun.
- In my class, the students like to learn new things.
- In my class, the students learn a lot.
- In my class, the students try even if it is hard.
- In my class, the students enjoy the class.
- In my class, the students want to please the teacher.
- In my class, the students would like to be elsewhere.
- In my class, the students are bored.

Friction among students:
- In my class, the students blame each other.
- In my class, the students pick on each other.
- In my class, the students disrupt the class.
- In my class, the students try to finish first.

Cooperation among students:
- In my class, the students help each other learn.
- In my class, the students explain work to each other.
- In my class, the students share ideas.
- In my class, the students compare each others work.
- In my class, the students take up for each other.

Cohesiveness among the students:
- In my class, the students are friendly.
- In my class, the students like each other.
- In my class, the students trust each other.
- In my class, the students agree with each other.
- In my class, the students listen to each other.

Figure 2. Students' perceptions of the learning environment survey.
information on the teachers, including their grade level, total years of teaching experience, years of teaching experience at the treatment center, and earned academic degrees. The interview was open-ended and nonstructured. It involved a brief overview of the study followed by a solicitation of the teachers' opinions and reactions to what had occurred.

**Research Design**

This study incorporated a pretest/posttest design with a nonrandomized treatment group of students in one school and a nonrandomized comparison group of students in another school. Both the treatment school and comparison school are school district learning centers of similar size, ethnic distribution, resources, educational philosophies, and TAAS and norm-referenced achievement test distributions. Additionally, the student populations of both schools are from similar socio-economic backgrounds and reside in disadvantaged neighborhoods in the district.

During the 1991-1992 school year, students from both schools received computer-assisted reading instruction with a variety of instructional software designed for reading comprehension, vocabulary building, word knowledge, reference information, consumer information, and graphic information. Both schools scheduled the fourth, fifth, and sixth graders in the computer labs for weekly instruction using stand-alone computers.
From the middle of February through the middle of April, 1992, all students in grades 4 through 6 at the treatment center participated in approximately 12, one-hour sessions of reading instruction using Skills Bank II, an integrated testing and skills software on a computer network. This software was able to generate a variety of diagnostic reports and information based on the individual student's performance. The software ran on a network with a file server to manage the instruction. The students received frequent feedback on their performance in each skill area and their overall performance in reading comprehension; the teachers were able to receive diagnostic reports summarizing each student's performance and their classes' performance on each skill area; and the parents were able to receive diagnostic reports summarizing their child's performance in reading.

The classroom teachers provided the introduction to the lesson in the reading class and monitored the instructional sessions in the computer lab. The computer specialist generated the diagnostic reports available through Skills Bank II. Based on the individual student's performance each session, the teachers developed individualized homework packets that addressed the diagnosed skill deficiencies of the students. Each packet had a cover sheet that could be removed for the researcher. The parents of each student were asked to sign the cover sheet. Students were asked to mark whether or not they had help completing the packet. The teachers were asked to remove the cover sheets for the researcher and record on each student's packet whether or not
the packet was completed. In order to preserve the integrity and individuality of each teacher's professional decision making, each teacher was allowed to define completion of the homework packets in accordance with the classroom policies and procedures.

The teachers at both schools had access to a computer-generated reading styles inventory on each student that included behavior-specific recommendations for the individual student's reading instruction. Teachers in the treatment group additionally had access to the variety of diagnostic reports generated by the Skills Bank II networked software and approximately 20 hours of training on using the network and the diagnostic reports.

During the summer prior to the study, a week of training was offered by the computer specialist at the building site. Beginning in January, 1992, the computer specialist offered additional on-site training for the teachers during their planning period. Additionally, the University of North Texas offered a graduate class which included on-site training at night and on Saturday by university and school district personnel. This training involved an introduction to the study, an overview of the student population characteristics, and several hours of "hands-on" experience using the integrated testing and skills software on the network. Additionally, the teachers were offered the opportunity to receive graduate credit by attending the training sessions, attending the National Educational Computer Conference (which was being held in the area), and by completing the writing requirements for the course.
Treatment of Data

To determine the effect of the treatment on reading achievement, several statistical analyses were used with SPSS and STATISTICA/Mac. The raw scores on the reading comprehension subtest administered in spring 1991, and spring 1992 were analyzed using descriptive statistics and linear correlation (Pearson) to determine the degree of relationship between the two tests. The similarities in the achievement levels of the treatment group and the comparison group on the pretest scores were verified using a test of difference of means. A t test for independent samples was used at the ninety-five percent probability level ($p < .05$). To determine the main effect of the treatment, an analysis of covariance was used at the ninety-five percent probability level ($p < .05$) on the posttest scores, using the pretest scores as the covariate. Moreover, the change in mean scores from the pretest to the posttest was analyzed using a t test for independent samples at the ninety-five percent probability level ($p < .05$). In order to determine if there was a significant main effect due to grade level, an analysis of variance on the posttest raw scores was used at the ninety-five percent probability level ($p < .05$). Finally, an analysis of variance on the difference in raw scores between the pretest and posttest was used to determine if there was any interaction between school and grade level.

The effect on reading achievement of completing individualized homework packets was determined in several ways. Descriptive statistics were used to analyze the level of response. The completion rate (number of packets
completed) was correlated with the posttest scores using both parametric (Pearson) and nonparametric (Kendall Tau and Spearman) statistics. The different levels of student response to the homework packets (the number of packets completed) were categorized, and an analysis of variance at the ninety-five percent probability level ($p < .05$) was used to determine if there was a relationship between the number of homework packets completed and the change in raw score on the reading comprehension subtest of the norm-referenced achievement test. In addition, an analysis of covariance on the posttest scores and the number of completed packets with the pretest scores as a covariate was used to determine the relationship between the homework packets and achievement. An analysis of variance at the ninety-five percent probability level ($p < .05$) was used to determine the effect of the homework packets and the grade level on the change in scores for the treatment and comparison groups and to determine the specific effect of grade level on the homework group. The difference in means between the homework group and other students was tested using a $t$ test for independent samples at the ninety-five percent probability level ($p < .05$). This test was also used to determine if there was a significant difference in the homework group at different grade levels.

The cover sheets to the homework packets were examined to determine the frequency of parental signatures and the number of times the student received help with the packets. The results were analyzed using descriptive
statistics. The frequency of signatures was correlated with achievement using Kendall Tau and Gamma Correlations. A t test for independent samples at the ninety-five percent probability level ($p < .05$) was used to determine if there was a significant difference in the posttest scores of those students whose parents signed the packets. An analysis of variance at the ninety-five percent probability level ($p < .05$) was used to determine if there was a relationship between the frequency of the parental signatures and the students' reading achievement.

Both parametric and nonparametric statistics were used to correlate parent signatures and completion rates (Pearson, Gamma, Kendall Tau, and Spearman). The homework completion rates and frequencies of parent signatures were correlated with achievement using Spearman Rank Order Correlations. Descriptive statistics were used to determine the effect of the homework packets on the degree of parental involvement as indicated by the frequency that students marked the "I had help" statement. Descriptive statistics were also used to determine the relationship between membership in the homework group and attendance.

Descriptive statistics were used to analyze pretest and posttest scores from the treatment and comparison groups on the School Climate Survey, How I Feel About Myself, and a t test for dependent samples at the ninety-five percent probability level ($p < .05$) was used to determine if there was a significant difference on each of the three factors. A t test for independent samples at the ninety-five percent probability level ($p < .05$) was used to analyze each question.
on the posttest to determine if students at the two schools answered specific questions differently.

In order to analyze students' scores on the School Climate Survey, How My Class Acts, a *t* test for independent samples at the ninety-five percent probability level (*p* < .05) was used to analyze each factor to determine if there was a significant difference in the way the students at the two schools perceived their learning environment. Additionally, a *t* test for independent samples at the ninety-five percent probability level (*p* < .05) was used to analyze each question to determine if the students at the two schools answered specific questions differently. Moreover, an analysis of variance at the ninety-five percent probability level (*p* < .05) was used to determine if there was a significant improvement in the students' perceptions of the learning environment by grade level at the treatment school.

In order to determine the teachers' attitudes about the computer-managed reading instruction with diagnostic reports and individualized homework packets, the teachers' responses to a questionnaire and follow-up interview conducted by the researcher at the completion of the study were analyzed and categorized using descriptive statistics. Additionally, scores for each category were correlated using linear correlation (Pearson) to determine the relationship between the categories.
CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to determine the effects of using computer-managed, integrated testing and skills software with individualized homework packets on the reading achievement and attitudes of at-risk students in a low-achieving urban school. An additional problem was to determine teachers' attitudes toward using technology to deliver, measure, and manage instruction. The results of the study are presented in six sections to answer each research question.

Research Question 1

The first research question asks whether at-risk students who receive systematically scheduled computer-managed reading instruction with integrated testing and skills software can significantly improve their reading scores on a norm-referenced achievement test.

An analysis of the raw scores from the spring 1991, norm-referenced achievement test (pretest) and the spring 1992, norm-referenced achievement test (posttest) indicated that the mean raw score on the reading comprehension subtest of the pretest was 22.30, and the mean raw score of the posttest was 23.69. Scores ranged from 6.00 to 48.00 on the pretest and from 7.00 to 46.00
on the posttest. The results of a linear correlation (Pearson) indicated that there was a relationship between the two tests ($r = .829$). The similarities in the achievement levels of the treatment group and the comparison group on the pretest scores were verified using a test of difference of means. A $t$ test for independent samples was used at the ninety-five percent probability level ($p < .05$). The results (shown in Table 5) indicated that there was no significant difference between the two populations ($t = -.005; df = 439; p = .996$).

Table 5

Test of Difference in Reading Pretest Means

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>Mean</th>
<th>$t$ Value</th>
<th>$df$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment center</td>
<td>219</td>
<td>22.306</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison center</td>
<td>222</td>
<td>22.302</td>
<td>-.005</td>
<td>439</td>
<td>.996</td>
</tr>
</tbody>
</table>

To determine the main effect of the treatment, an analysis of covariance was used at the ninety-five percent probability level ($p < .05$) on the posttest scores, using the pretest scores as the covariate. The results indicated that there was a significant main effect ($F = 4.103; p = .044$) with the comparison center (see Table 6).
Table 6

Analysis of Covariance on Reading Posttest Means with Reading Pretest as Covariate

<table>
<thead>
<tr>
<th>Treatment center</th>
<th>Posttest Mean</th>
<th>Pretest Mean</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23.053</td>
<td>23.682</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison center</td>
<td>24.245</td>
<td>23.464</td>
<td>4.103</td>
<td>.044</td>
</tr>
</tbody>
</table>

The change in mean scores from the pretest to the posttest was analyzed using a t test for independent samples at the ninety-five percent probability level (p < .05). As shown in Table 7, results indicated that there was not a significant difference (t = 1.95; df = 281; p = .052).

Table 7

Test of Difference in Change of Reading Scores at the Treatment and Comparison Centers

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>t Value</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment center</td>
<td>132</td>
<td>-.629</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison center</td>
<td>151</td>
<td>.782</td>
<td>1.95</td>
<td>281</td>
<td>.052</td>
</tr>
</tbody>
</table>
In order to determine if there was a significant interaction between schools and grade levels, an analysis of variance on the posttest raw scores was used at the ninety-five percent probability level ($p < .05$). The results indicated that there was a significant effect due to grade level ($F = 5.389; p = .005$), but there was no significant difference between the treatment and comparison schools at that grade level ($F = .276; p = .759$). An analysis of variance on the change in raw scores between the pretest and posttest was used to further determine if there was any interaction between school and grade level. The results indicated a significant main effect for both school ($F = 4.986; p = .026$) and grade level ($F = 4.643; p = .010$), but no significant interaction ($F = 2.774; p = .064$).

**Research Question 2**

The second research question asks whether at-risk students who complete individualized homework packets can significantly improve their reading scores on a norm-referenced achievement test.

During the study, three homework packets were issued to the students. One hundred sixty-nine packets were completed and returned to the teachers. As shown in Figure 3, the fourth grade students completed a total of 52 packets; the fifth grade students completed a total of 54 packets; and the sixth grade students completed a total of 63 packets.
When the total number of packets in each grade was compared to the average number of packets completed, the results indicated that only the sixth grade students completed an above average number of packets (see Figure 3). A total of 63 students (56.8%) in the study completed only one homework packet, 38 students (34.2%) completed two homework packets, and 10 students (9.0%) completed all three packets. Considerably more fifth graders than fourth or sixth graders completed the first packet; approximately the same number of students from each grade level completed the second packet; and very few students in fourth and sixth grade (no fifth graders) completed the third packet. Twelve students in sixth grade completed one packet, compared to 17 students in fourth and 34 students in fifth. Fifteen students in sixth grade completed 2

![Bar chart showing mean and total completed packets by grade level]

Figure 3. Number of homework packets completed at each grade level.
packets, compared to 13 students in fourth and 10 students in fifth. Seven students in sixth grade completed 3 packets, compared to 3 in fourth grade and none in fifth grade.

The completion rate (number of packets completed) was correlated with the posttest scores using both parametric (Pearson) and nonparametric (Kendall Tau and Spearman) statistics. As shown in Table 8, there was no correlation between the completion rate and achievement.

Table 8

**Correlation of Reading Achievement and Number of Completed Homework**

<table>
<thead>
<tr>
<th>Packets</th>
<th>Linear correlation (Pearson) $r = .07449$</th>
<th>Kendall Tau correlation $r = .08539$</th>
<th>Spearman Rank Order correlation $r = .10703$</th>
</tr>
</thead>
</table>

In order to determine if there was a relationship between the number of packets completed and the change in raw score on the reading comprehension subtest of the norm-referenced achievement test, the different levels of student responses to the homework packets (the number of packets completed) were
categorized, and an analysis of variance at the ninety-five percent probability level ($p < .05$) was used to determine the relationship. The results indicated that there was a significant main effect of change in scores ($F = 3.327; p = .040$).

As shown in Figure 4, the mean reading score on the posttest for students at each grade level who completed one homework packet ($n = 63$) increased from the pretest score, but the mean reading score on the posttest of students who completed two packets ($n = 38$) decreased from the pretest score or remained the same. The mean reading score on the posttest of students who completed three homework packets ($n = 10$) increased.

![Figure 4. Effect of the number of homework packets on reading scores.](image-url)
An analysis of covariance at the ninety-five percent probability level ($p < .05$) using the pretest scores as a covariate was used to further determine the relationship between the homework packets and achievement. Results indicated that there was no significant difference in the posttest means when the pretest was used as a covariate ($F = .576; p = .564$).

To determine the interaction of the homework packets and the grade level on the change in scores for the treatment and comparison groups, an analysis of variance at the ninety-five percent probability level ($p < .05$) was used. The results indicated that there was no significant main effect for grade level ($F = 1.657; p = .196$). Additionally, an analysis of variance at the ninety-five percent probability level ($p < .05$) on the difference in scores, number of completed packets, and grade level of the homework group indicated that there was no significant main effect ($F = 2.291; p = .065$), no significant special effect of completion rate and change in scores ($F = 2.894; p = .060$), no significant special effect of grade level and change in scores ($F = 1.298; p = .278$), and no significant two-way interaction ($F = .369; p = .775$).

A $t$ test for independent samples at the ninety-five percent probability level ($p < .05$) was used to compare the posttest scores of the homework group and the posttest scores of the other students in both the treatment and comparison groups. The results shown in Table 9 indicated a significant difference between the students in the homework group and the other students ($t = 1.98; df = 327; p = .048$).
Table 9

Test of Significance on Reading Posttest Scores of Homework Group and Other Students

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>t Value</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework group</td>
<td>71</td>
<td>23.9767</td>
<td>1.98</td>
<td>327</td>
<td>.048</td>
</tr>
<tr>
<td>Other students</td>
<td>258</td>
<td>21.9014</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5 shows the difference between the mean pretest and posttest reading scores for the fourth, fifth, and sixth graders in the homework group. The mean reading scores on the posttest increased for each grade level.

![Figure 5. Effect of homework on reading achievement.](image-url)
Figure 6 shows the difference between the mean reading score on the pretest and posttest for students at the comparison center, at the treatment center, and in the homework group. Both the fourth graders at the comparison center and fourth graders in the homework group increased their mean reading score on the posttest. Fifth graders in each of the groups increased their mean reading score on the posttest. Both the sixth graders at the treatment center and sixth graders in the homework group increased their mean reading score on the posttest. Sixth graders at the comparison center showed no change in their mean reading score.

Figure 6. Reading achievement by groups and grades.

The difference in means in the pretest scores and posttest scores of the homework group at different grade levels was tested using a t-test for
independent samples at the ninety-five percent probability level ($p < .05$). As shown in Table 10, there was no significant difference between fourth and fifth grade on either the pretest or the posttest (pretest: $p = .610$; posttest: $p = .610$).

Table 10

Test of Significance for Reading Pre/Posttest Scores of Homework Group by Grade Level

<table>
<thead>
<tr>
<th></th>
<th>Fourth</th>
<th></th>
<th>Fifth</th>
<th></th>
<th>Sixth</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>n</td>
<td>32</td>
<td>32</td>
<td>42</td>
<td>42</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>t Value</td>
<td>.512</td>
<td>.512</td>
<td>.512</td>
<td>.512</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t Value</td>
<td>-2.799</td>
<td>-1.964</td>
<td></td>
<td></td>
<td>-2.799</td>
<td>-1.964</td>
</tr>
<tr>
<td>t Value</td>
<td>-3.560</td>
<td>-2.625</td>
<td>-3.560</td>
<td>-2.625</td>
<td></td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>72</td>
<td>72</td>
<td>72</td>
<td>72</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>df</td>
<td>61</td>
<td>64</td>
<td></td>
<td></td>
<td>71</td>
<td>74</td>
</tr>
<tr>
<td>df</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>.610</td>
<td>.610</td>
<td>.610</td>
<td>.610</td>
<td>.610</td>
<td>.610</td>
</tr>
<tr>
<td>p</td>
<td>.007</td>
<td>.054</td>
<td>.007</td>
<td>.054</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>.001</td>
<td>.011</td>
<td>.001</td>
<td>.011</td>
<td>.001</td>
<td>.011</td>
</tr>
</tbody>
</table>
However, there was a significant difference between fourth and sixth grade (pretest: $p = .007$; posttest: $p = .054$) and between fifth and sixth grade (pretest: $p = .001$; posttest: $p = .011$).

**Research Question 3**

The third research question asks what relationship exists between the amount of parental involvement, as measured by signature frequency on homework assignments, and student achievement.

One of the purposes of issuing the homework packets was to increase parental involvement. The homework packets provided two levels at which the parents could become involved: the awareness level and the participation level. The cover sheets to the homework packets were examined to determine the frequency of parental signatures (awareness) and the number of times the student received help with the packets (participation).

To verify that the parents were aware of the homework, they were asked to sign the homework packets. Tabulation of the total number of parent signatures indicated that 24 (21%) of the signatures were from parents of fourth graders, 44 (38%) of the signatures were from parents of fifth graders, and 47 (41%) of the signatures were from parents of sixth graders (see Table 11).

Figure 7 shows the gender of the parents who signed the homework packets. At the fourth grade level 20 signatures were from females and 4 were from males; at the fifth grade level 35 signatures were from females and 9 were
Table 11

Number of Parent Signatures on Homework Packets by Grade Level

<table>
<thead>
<tr>
<th>Number of parent signatures</th>
<th>percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fourth grade</td>
<td>24</td>
</tr>
<tr>
<td>Fifth grade</td>
<td>44</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>47</td>
</tr>
</tbody>
</table>

from males; and at the sixth grade level 38 signatures were from females and 9 were from males.

Figure 7: Number of parental signatures on homework by gender and grade.
As indicated in Figure 8, 81% of the total signatures were from females, and 19% of the total signatures were from males. At the fourth grade level, 83% of the signatures were from females, and 17% were from males; at the fifth grade level, 79.5% of the signatures were from females, and 19.5% were from males; and at the sixth grade level, 81% of the signatures were from females, and 19% were from males.

![Figure 8. Percentages of signatures on the homework packets by gender.](image)

The frequency of parental signatures on the homework packets was correlated with the reading posttest scores using Kendall Tau and Gamma Correlations. Results indicated that there was a significant relationship between parents signing the homework and student achievement (see Table 12).
Table 12

Correlation of Reading Achievement and Parental Signatures on Homework

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kendall Tau</td>
<td>108</td>
<td>2.01</td>
<td>.045</td>
</tr>
<tr>
<td>Gamma</td>
<td>108</td>
<td>2.01</td>
<td>.045</td>
</tr>
</tbody>
</table>

Additionally, a $t$ test for independent samples at the ninety-five percent probability level ($p < .05$) was used to determine if there was a significant difference in the posttest scores of those students whose parents signed the packets. The frequency of signatures was compared to the posttest scores, and the results indicated that while mean scores increased for students whose parents signed, there was no significant difference between the posttest scores of students whose parents signed the packets and the students whose parents did not sign the packets (see Table 13).

An analysis of variance at the ninety-five percent probability level ($p < .05$) was used to further determine if there was a relationship between the frequency of the parental signatures and the students' reading achievement. The results indicated that there was no main effect between the number of parent signatures and the change in reading score from the pretest to the posttest ($F = 1.004; p = .3944$).
Table 13

The Relationship Between Parental Signatures and Students' Reading Achievement

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>No signatures</td>
<td>27</td>
<td>21.222</td>
<td>-1.525</td>
<td>78</td>
<td>.131</td>
</tr>
<tr>
<td>One signature</td>
<td>53</td>
<td>23.868</td>
<td>-1.716</td>
<td>47</td>
<td>.093</td>
</tr>
<tr>
<td>Two signatures</td>
<td>22</td>
<td>24.773</td>
<td>-1.357</td>
<td>31</td>
<td>.185</td>
</tr>
<tr>
<td>Three signatures</td>
<td>6</td>
<td>24.500</td>
<td>-1.357</td>
<td>31</td>
<td>.185</td>
</tr>
</tbody>
</table>

Both parametric and nonparametric statistics were used to correlate parent signatures with completion rates to determine if there was a significant relationship between the number of parent signatures and the number of packets completed. The four statistical tests that were used (Pearson, Gamma, Kendal Tau, and Spearman) indicated that there was a relationship between the number of parent signatures and the number of homework packets that were completed. Table 14 presents the findings.

The Spearman Rank Order Correlations test was used to correlate the homework completion rates, frequencies of parental signatures, and achievement. The results indicated that there was not a significant relationship between the number of homework packets completed and a student's reading
Table 14

Correlations of Parental Signatures and Completion of Homework Packets

<table>
<thead>
<tr>
<th>Correlations test</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>.626</td>
</tr>
<tr>
<td>Gamma</td>
<td>.745</td>
</tr>
<tr>
<td>Kendall Tau</td>
<td>.535</td>
</tr>
<tr>
<td>Spearman Rank Order</td>
<td>.569</td>
</tr>
</tbody>
</table>

posttest score \( (p = .270) \), nor was there a significant relationship between the number of parental signatures and the student's reading posttest score \( (p = .076) \).

To determine whether the homework packets provided an opportunity for active participation, the students were asked to indicate on each packet whether or not they had help completing it. Six (25%) of the fourth graders indicated that they had help with the packets, 7 (16%) of the fifth graders indicated that they had help, and 21 (45%) of the sixth graders indicated that they had help (see Table 15).

Because the treatment center serves several homeless shelters and has about a 30% turnover in the student body during the school year, an analysis was made of the number of students present for both the pretest and the
Table 15

Parental Participation by Helping with Homework Packets by Grade Level

<table>
<thead>
<tr>
<th></th>
<th>Fourth</th>
<th>Fifth</th>
<th>Sixth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed packets</td>
<td>52</td>
<td>54</td>
<td>63</td>
</tr>
<tr>
<td>Signed packets</td>
<td>24</td>
<td>44</td>
<td>47</td>
</tr>
<tr>
<td>Percent involvement</td>
<td>46%</td>
<td>82%</td>
<td>75%</td>
</tr>
<tr>
<td>Parental help</td>
<td>6</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Percent participation</td>
<td>25%</td>
<td>16%</td>
<td>45%</td>
</tr>
</tbody>
</table>

The results are summarized in Figure 9. Both the comparison school (C) and the treatment school (T) had fewer students at all three grade levels present for the posttest than were present for the pretest. On the other hand, for both the pretest and posttest, the homework group (HW) had the same number of students present in the fourth and fifth grades and more students present in the sixth grade. The percentage change in testing enrollment for all three grade levels in the comparison school, the treatment school, and the homework group is shown in Figure 10. The comparison center had a larger negative percentage of change in enrollment at the fourth grade level than did the treatment center; however, the treatment center had a larger negative percentage of change in enrollment at both the fifth and sixth grade levels. The
homework group had no percentage of change in enrollment at the fourth or fifth grade levels and a positive percentage of change in enrollment at the sixth grade level.

Figure 9. Reading pretest and posttest enrollments by grade and group.

Figure 10. Percentage of enrollment change between reading pretest/posttest.
Research Question 4

The fourth research question asks whether at-risk students who receive systematically scheduled computer-managed reading instruction with integrated testing and skills software and individualized homework packets can significantly improve their scores on the part of the School Climate Survey related to academic self-concept and achievement motivation.

The mean student responses to the climate survey How I Feel About Myself were analyzed for the two schools. Each positive statement was weighted three points for often, two points for sometimes, and one point for never. Each negative statement was weighted three points for never, two points for sometimes, and one point for often. The descriptive results are displayed in Figure 11. On the pretest, the mean score for Factor 1 (home-based academic self-concept) was higher for the treatment school (Mean = 2.78) than for the comparison school (Mean = 2.71). On the posttest, the mean score for Factor 1 was the same for both schools (Mean = 2.76). On both the pretest and the posttest, the mean score for Factor 2 (school-based academic self-concept) was higher for the treatment school (pretest mean = 2.27; posttest mean = 2.36) than for the comparison school (pretest mean = 2.23; posttest mean = 2.26). On both the pretest and the posttest, the mean score for Factor 3 (achievement motivation) was higher for the treatment school (pretest mean = 2.55; posttest mean = 2.45) than for the comparison school (pretest mean = 2.47; posttest
mean = 2.43). However, as shown in Figure 11, the posttest means for both schools were lower than the pretest means.

![Bar chart showing pretest and posttest scores for different factors.]

**Figure 11.** Mean scores on the pretest/posttest How I Feel About Myself.

A *t* test for dependent samples at the ninety-five percent probability level (*p* < .05) was used to compare the mean responses on the pretest and posttest for each of the three factors: home-based self-concept, school-based self-concept, and achievement motivation. No significant difference was found for any of the factors (Factor 1: *p* = .894; Factor 2: *p* = .100; Factor 3: *p* = .673). However, a *t* test for independent samples (*p* < .05) comparing the mean scores on each question on the posttest indicated some significant differences on individual questions. The results are displayed in Table 16.
Table 16

Significant Differences on Individual Questions on How I Feel About Myself

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teachers think I am smart.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison center</td>
<td>184</td>
<td>2.41</td>
<td>2.54</td>
<td>.01</td>
</tr>
<tr>
<td>Treatment center</td>
<td>89</td>
<td>2.61</td>
<td>2.61</td>
<td>.01</td>
</tr>
<tr>
<td>Question 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teachers like my school work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison center</td>
<td>184</td>
<td>2.24</td>
<td>2.61</td>
<td>.01</td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>2.43</td>
<td>2.61</td>
<td>.01</td>
</tr>
</tbody>
</table>

Research Question 5

The fifth research question asks whether at-risk students who receive systematically scheduled computer-managed reading instruction with individualized homework packets can significantly improve their scores on the part of the School Climate Survey related to the students' perceptions of their learning environment.
The student responses to the climate survey How My Class Acts were analyzed for the two schools. Each positive statement was scored three points for often, two points for sometimes, and one point for never. Each negative statement was scored three points for never, two points for sometimes, and one point for often. A $t$ test for independent samples at the ninety-five percent probability level ($p < .05$) was used to compare the mean responses on each of the four factors: satisfaction with learning, friction among students, cooperation among students, and cohesiveness among students. No significant difference was found for any of the factors. The results are displayed in Table 17.

On the first factor, satisfaction with learning, the treatment school students appeared to be more satisfied with their learning environment (mean = 2.18) than were students at the comparison school (mean = 2.13). Additionally, on the second factor, friction among students, the treatment school students appeared to perceive less friction among the students in the school (mean = 1.89) than did the students at the comparison school (mean = 1.91). However, on the third factor, cooperation among students, the comparison school students (mean = 2.16) appeared to view their peers as more cooperative than did the treatment school students (mean = 2.12); but on the fourth factor, cohesiveness among students, the treatment school students (mean = 2.08) appeared to feel a higher degree of cohesiveness than did the comparison school students (mean = 2.06).
### Table 17

**Test of Significant Differences on How My Class Acts**

<table>
<thead>
<tr>
<th>Factor 1: Satisfaction with Learning</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>2.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>2.18</td>
<td>-1.15</td>
<td>272</td>
<td>.250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 2: Friction Among Students</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>1.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>1.89</td>
<td>.36</td>
<td>272</td>
<td>.721</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 3: Cooperation Among Students</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>2.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>2.12</td>
<td>.91</td>
<td>272</td>
<td>.365</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 4: Cohesiveness Among Students</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>2.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>2.08</td>
<td>-.47</td>
<td>272</td>
<td>.636</td>
</tr>
</tbody>
</table>
A t test for independent samples at the ninety-five percent probability level (p < .05) was used to determine if there were significant differences in the way students answered specific questions. The results are displayed in Table 18. The treatment group (mean = 2.01) rated question 4, "In my class, the

Table 18

**Significant Differences on Individual Questions on How My Class Acts**

<table>
<thead>
<tr>
<th>Question 4: In my class, the students take up for each other.</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>1.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>2.01</td>
<td>1.97</td>
<td>272</td>
<td>.050</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 11: In my class, the students try even if it is hard.</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>183</td>
<td>1.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>1.64</td>
<td>-1.93</td>
<td>272</td>
<td>.054</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 18: In my class, the students would like to be elsewhere.</th>
<th>n</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison center</td>
<td>184</td>
<td>1.74</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment center</td>
<td>91</td>
<td>1.96</td>
<td>2.41</td>
<td>270</td>
<td>.017</td>
</tr>
</tbody>
</table>
students take up for each other," significantly higher than did the students in the comparison group (mean = 1.85). On the other hand, the treatment group (mean = 1.64) rated question 11, "In my class, the students try even if it is hard," significantly lower than did the students in the comparison group (mean = 1.78). Significantly fewer students in the treatment group responded **often** (3) or **sometimes** (2) to the statement. The treatment group (mean = 1.96) rated question 18, "In my class, the students would like to be elsewhere," significantly more positively than the comparison group (mean = 1.74). Significantly more students in the treatment group answered **never** (3) to the statement than did the students in the comparison group.

An analysis of variance at the ninety-five percent probability level was used to determine if grade level had an effect on the way students in the treatment group perceived the learning environment. Table 19 displays the means for each factor by grade level. On the second factor, friction among students, there was a significant main effect difference between the sixth grade and fourth grade students at the treatment center ($F = 3.6449; df = 2; p = .027$). The sixth grade students (mean = 1.82) perceived significantly less friction among their classmates than did the fourth grade students (mean = 1.67). The fifth grade students (mean = 1.74) perceived less friction among their classmates than did the fourth graders, but perceived more friction among their classmates than did the sixth graders.
Table 19

**Mean Responses to Each Factor on How My Class Acts by Grade Level**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Satisfaction With Learning</strong></td>
<td></td>
</tr>
<tr>
<td>Fourth grade</td>
<td>1.83</td>
</tr>
<tr>
<td>Fifth grade</td>
<td>1.80</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>1.84</td>
</tr>
<tr>
<td><strong>Factor 2: Friction Among Students</strong></td>
<td></td>
</tr>
<tr>
<td>Fourth grade</td>
<td>1.67</td>
</tr>
<tr>
<td>Fifth grade</td>
<td>1.74</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>1.82</td>
</tr>
<tr>
<td><strong>Factor 3: Cooperation Among Students</strong></td>
<td></td>
</tr>
<tr>
<td>Fourth grade</td>
<td>1.86</td>
</tr>
<tr>
<td>Fifth grade</td>
<td>1.87</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>1.85</td>
</tr>
<tr>
<td><strong>Factor 4: Cohesiveness Among Students</strong></td>
<td></td>
</tr>
<tr>
<td>Fourth grade</td>
<td>1.95</td>
</tr>
<tr>
<td>Fifth grade</td>
<td>1.92</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>1.93</td>
</tr>
</tbody>
</table>
Research Question 6

The sixth research question asks what are the teachers' attitudes toward using the computer-managed reading instruction with integrated testing and skills software, the diagnostic reports, and the individualized homework packets.

Nine classroom teachers from the treatment school, along with the computer specialist, were asked to complete a questionnaire and to respond to an interview by the researcher in order to determine their general attitudes toward the implementation of the computer-managed instruction and the use of the testing and skills software.

Teacher Questionnaire

The Teacher Questionnaire (see Appendix D) that was administered to the nine classroom teachers at the treatment school contained requests for demographic information and 38 questions designed to elicit the teachers' perceptions and attitudes about the different aspects of this study.

The demographic information related to total years of teaching experience, years of experience at the treatment center, and academic degrees. One teacher refused to provide any demographic information and another refused to indicate how long she had been at the center. Of the remaining teachers, the median for years of total experience was 16.5, the mean for years of total experience was 15.5, and the mode for years of total
experience was 17. The years of total experience ranged from 3 to 23. The median for years of experience at the treatment center site was 3, the mean for years of experience at the treatment center site was 5.7, and the mode for years of experience at the treatment center site was 2. Sixty-three percent of the teachers had advanced degrees at the master's level (see Table 20).

Table 20

Demographic Information on the Teachers at the Treatment Center

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Total experience</th>
<th>Treatment center experience</th>
<th>Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>2</td>
<td>BA</td>
</tr>
<tr>
<td>B</td>
<td>22</td>
<td>10</td>
<td>BS</td>
</tr>
<tr>
<td>C</td>
<td>12</td>
<td></td>
<td>MSE</td>
</tr>
<tr>
<td>D</td>
<td>16</td>
<td>2</td>
<td>MS+</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>14</td>
<td>14</td>
<td>ME</td>
</tr>
<tr>
<td>G</td>
<td>23</td>
<td>3</td>
<td>MA+</td>
</tr>
<tr>
<td>H</td>
<td>17</td>
<td>7</td>
<td>BS</td>
</tr>
<tr>
<td>I</td>
<td>17</td>
<td>2</td>
<td>ME</td>
</tr>
</tbody>
</table>
The 38 questions on the Teacher Questionnaire were related to six topics: teacher training/computer competency, student attitudes about the instructional mode, computer lab use, the effectiveness of the program, teacher productivity, and the benefits of the homework packets (see Table 21).

Table 21

Teacher Questionnaire, Categories of Responses

Questions related to teacher training/computer competency:

- Do you think the training was adequate?
- Do you have a computer at home?
- Do you feel uncomfortable about using the computer network?
- Have you had any computer courses or workshops?

Questions related to student attitudes:

- Did the students like it?
- Did the students like the computer-managed instruction?
- Did student motivation improve because of the new system?
- Did the new system affect student attitudes about school?

Questions related to computer lab usage:

- Were you looking forward to using the system this year?
- Did you use the computer lab before participating in this program?
- Did you use the computer lab this year more often than last year?
Table 21--Continued

Questions related to the program's effectiveness:

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the computer-managed reading instruction effective?</td>
</tr>
<tr>
<td>Do you think this program should be implemented at other centers?</td>
</tr>
<tr>
<td>Do you think this is the best way to correct reading deficiencies?</td>
</tr>
<tr>
<td>Would you like to continue to use this program?</td>
</tr>
<tr>
<td>Will your students improve their score on the achievement test this year?</td>
</tr>
<tr>
<td>Was the computer-managed instruction an improvement?</td>
</tr>
<tr>
<td>Do you think that the money spent on the system was well spent?</td>
</tr>
</tbody>
</table>

Questions related to teacher productivity:

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did using the system reduce your planning time?</td>
</tr>
<tr>
<td>Did the student profiles help you in any way?</td>
</tr>
<tr>
<td>Were the class profiles useful?</td>
</tr>
<tr>
<td>Was the system easy to use?</td>
</tr>
<tr>
<td>Did using the system take too much time?</td>
</tr>
<tr>
<td>Did using this system increase your work load?</td>
</tr>
<tr>
<td>Did your time spent with individual students increase?</td>
</tr>
<tr>
<td>Did you use the system for planning instruction?</td>
</tr>
<tr>
<td>Were the diagnostic reports helpful?</td>
</tr>
<tr>
<td>Did you use the diagnostic information regularly to plan?</td>
</tr>
<tr>
<td>Could you have been as effective without the diagnostic information?</td>
</tr>
<tr>
<td>Do you think this new system made you more efficient?</td>
</tr>
</tbody>
</table>

Questions related to homework packets:

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were the homework packets beneficial to your students?</td>
</tr>
<tr>
<td>Did you send homework packets home each session?</td>
</tr>
<tr>
<td>Did the students like the homework packets?</td>
</tr>
<tr>
<td>Were the homework packets effective?</td>
</tr>
<tr>
<td>Did the parents respond to the homework packets?</td>
</tr>
<tr>
<td>Did the students' attitude about homework change?</td>
</tr>
<tr>
<td>Did homework response increase with the homework packets?</td>
</tr>
<tr>
<td>Did the homework packets increase parent involvement?</td>
</tr>
</tbody>
</table>
The responses to the Teacher Questionnaire were totaled, assigning two points to every positive response to a question and one point to every negative response. A total response score was obtained, as well as a score for each category.

A linear correlation (Pearson) was used to determine if there was any relationship between the way teachers responded to each category. The results are presented in Table 22. The teachers' responses to the questions related to teacher training/computer competency were not positively correlated to their responses that related to any of the other topics, but they were negatively correlated to their responses that related to the homework packets ($r = -.548$) and productivity ($r = - .657$). The teachers' responses to the questions related to student attitudes were positively correlated with their responses related to productivity ($r = .680$) and effectiveness ($r = .787$). The teachers' responses to the questions related to productivity were positively correlated with their responses related to student attitudes ($r = .680$) and effectiveness ($r = .765$), and they were negatively correlated to their responses on teacher training/computer competency ($r = -.657$). The teachers' responses to the questions related to effectiveness were positively correlated with their responses related to productivity ($r = .765$) and student attitudes ($r = .787$). The teachers' responses to the questions related to computer lab use were positively correlated with their responses related to homework packets ($r = .507$). The teachers' responses to the questions related to homework packets
were positively correlated with their responses related to computer lab use \((r = .507)\) but negatively correlated with their responses related to teacher training/computer competency \((r = -.548)\).

Table 22

<table>
<thead>
<tr>
<th>Homework packets</th>
<th>Productivity</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training/computer competency</td>
<td>-.548</td>
<td>-.657</td>
</tr>
<tr>
<td>Student attitudes</td>
<td>.680</td>
<td>.787</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>.765</td>
<td></td>
</tr>
<tr>
<td>Computer lab use</td>
<td>.507</td>
<td></td>
</tr>
</tbody>
</table>

A linear correlation (Pearson) was used to determine if there was any relationship between the teachers' total scores on the questionnaire and the scores on each topic. The results are presented in Table 23. On four of the topics there was a high correlation with the total scores. The teachers' total scores were correlated with their responses related to homework packets \((r = .655)\), effectiveness \((r = .745)\), student attitudes \((r = .714)\), and productivity \((r = .805)\). The total scores and the teachers' responses to the questions related to
teacher training/computer competency ($r = -.470$) and computer lab use ($r = .354$) were not correlated.

Table 23

**Correlation Between Teachers' Total Scores and Scores on Specific Topics**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework packets</td>
<td>$r = .655$</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>$r = .745$</td>
</tr>
<tr>
<td>Student attitudes</td>
<td>$r = .714$</td>
</tr>
<tr>
<td>Productivity</td>
<td>$r = .805$</td>
</tr>
<tr>
<td>Training/computer competency</td>
<td>$r = -.470$</td>
</tr>
<tr>
<td>Computer lab use</td>
<td>$r = .354$</td>
</tr>
</tbody>
</table>

Figure 12 shows the total maximum positive score, the mean positive score, and the total positive response score for each teacher on the Teacher Questionnaire. Teacher D had the highest positive total score, and Teacher E had the lowest positive total score.

The questions that related to the topic of teacher training/computer competency included questions about prior computer training as well as personal computer ownership. Only two of the teachers indicated that the on-
site training was adequate. However, both of these teachers indicated that they had taken computer courses or workshops, but neither had a computer at home.

![Bar Chart](image)

**Figure 12.** Teachers' total response scores on the Teacher Questionnaire.

Five of the nine teachers noted that they had a computer at home, and seven of the teachers indicated that they had taken computer courses or workshops.

The results of the teachers' responses to the questions on teacher training/computer competency are presented in Figure 13.

The questions that related to the topic of teacher productivity addressed the efficiency of the program in planning, time, and workload and the
effectiveness of the program for providing diagnostic information on the
students. Eight of the nine teachers noted that the system was easy to use, did

![Bar Chart](image)

Figure 13. Teachers' responses to teacher training/computer competency.

not take too much time, and did not increase their work load. However,
responses to the questions related to planning were mixed. Only two out of the
nine teachers noted that using the system reduced their planning time, although
five of the nine teachers indicated that they used the system for planning
instruction. Five teachers noted that the system made them more efficient.
Eight of the nine teachers indicated that the diagnostic reports were helpful, and
six out of the nine indicated that they used the diagnostic information regularly.
Seven of the teachers noted that they were able to increase their time spent
with individual students. The teachers' perceptions about productivity are presented in Figure 14.

Figure 14. Teachers' responses to the questions on productivity.

The responses to questions about the homework packets were generally positive (see Figure 15), although one teacher responded that the homework packets were not beneficial or effective. Seven teachers noted that the parents responded to the packets and the students liked the packets. Only two teachers indicated that the students' attitudes about homework changed, but six indicated that homework response increased. Only three teachers noted that the packets increased parental involvement.
Overall, the teachers' responses to the questions related to the effectiveness of the computer program were positive (see Figure 16). Only one teacher indicated that the computer-managed reading instruction was not effective, should not be implemented at other centers, should not be continued, and was not an improvement. All of the teachers responded that their students would improve their score on the norm-referenced testing.

The teachers' responses to the questions about student attitudes were mixed (see Figure 17). Seven teachers noted that the students liked the program, five indicated that student motivation improved, and five responded that student attitudes about school improved.
**Figure 16.** Teachers' responses to the questions on effectiveness.

**Figure 17.** Teachers' responses to the questions on student attitudes.
As presented in Figure 18, the teachers' responses to the questions on lab use were also mixed, but generally positive. Only one teacher had not looked forward to using the system. Six teachers indicated that they used the lab more often than last year, and two of those teachers indicated that they had not used the lab at all before this study.

![Graph](image)

**Figure 18.** Teachers' responses to the questions on computer lab use.

In examining the teachers' responses to the questionnaire items, each teacher's total positive score for the 38 items was compared to the mean total positive score for the group. As shown in Figure 19, teachers D, F, G, and I scored above the mean, indicating that they had a more positive attitude toward the computer-managed reading instruction than the other five teachers.
Teachers B and E had particularly low total scores, and teachers A, C, and H had scores that were very close to the mean.

![Figure 19. Teachers' total scores on questionnaire compared with the mean.](image)

The teachers' responses to the questions on the effectiveness of the treatment also were compared to the mean score for the questions on effectiveness (see Figure 20). Teachers A, B, C, D, F, and G scored above the mean. Teacher E was the only teacher to score below the mean.

Figure 21 shows the teachers' perceptions about how the treatment affected students' attitudes. The responses of teachers B, D, F, G, and I
indicated that they perceived that students' attitudes about the treatment were favorable, whereas the responses of teachers A, C, E, and H indicated that they perceived that students' attitudes about the treatment were unfavorable.

**Figure 20.** Teachers' scores on effectiveness compared with the mean score.

**Figure 21.** Teachers' scores on student attitudes compared with the mean.
Figure 22 compares the maximum positive total score on the questionnaire to the mean positive total score of all the teachers, to the score of the teacher with the highest positive total, and to the score of the teacher with the lowest positive total. All scores were below the maximum possible score.

![Figure 22](image)

**Figure 22.** Teachers' high and low scores compared to the mean score.

The maximum positive score on productivity was compared to the mean score of all the teachers, the highest score of the teachers, and the lowest score of the teachers. As shown in Figure 23, the highest score on productivity was equal to the maximum score and well above the lowest score.

Finally, the maximum positive score on the questions related to effectiveness was compared to the mean score on effectiveness, the highest score on effectiveness, and the lowest score on effectiveness (see Figure 24).
Again, the highest score was equal to the maximum score and considerably above the lowest score. It is interesting to note that the maximum scores on the
different categories were represented by different teachers; however, the minimum scores were all from the same teacher.

**Teacher Interview**

The teacher interview was nonstructured and open ended. The teachers' responses were recorded by the researcher and later categorized into seven topics that included training, management, student motivation, the networked testing and skills software, the diagnostic reports, the homework packets, and the teacher's computer familiarity (see Table 24).

Nine of the 10 teachers interviewed commented on teacher training and one, the computer specialist, commented on parent training. All responses related to teacher training were negative. Six of the 10 teachers commented on the overall management of the program, specifically management problems. All 10 teachers remarked about student motivation. Their responses were mixed. Three teachers commented about positive effects on motivation, and six commented about negative effects. One teacher noted both positive and negative effects. Nine teachers referred to the diagnostic reports. Their responses were both positive and negative. The positive comments related to the usefulness of the information; the negative comments related to the irregularity of receiving the reports and the lack of information on using the reports. Nine teachers offered comments on the integrated testing and soils software. Five thought it was appropriate and helpful. Four thought it was
Table 24

Categories of Responses to Teacher Interview

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of teachers</th>
<th>Positive comments</th>
<th>Negative comments</th>
<th>Mixed comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>6</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Student motivation</td>
<td>10</td>
<td>3</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Network and software</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Diagnostic reports</td>
<td>9</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Homework packets</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Computer familiarity</td>
<td>3</td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Inappropriate and served no useful purpose. Seven of the teachers commented on the homework packets. Four teachers spoke negatively about the homework packets, noting that they were not effective academically and did not increase parental involvement. Three teachers indicated that the homework packets were helpful in preparing the students for norm-referenced testing and in involving the parents. Three teachers mentioned their personal skill level with computers. Two teachers commented on prior computer experience. One teacher indicated no prior computer experience.
The comments on training related to four areas: the amount of training, the quality of training, the content of training, and the follow-up on training. Several teachers complained about the insufficient amount of training. Remarks included, "There was a lack of staff development in how to use the system"; "teachers need more training....not adequate training for a non-computer person"; "not enough in-service....more training needed in Skills Bank"; "there was not adequate teacher training....needed more training and instruction"; "no one isolated a block of time to do it....needed 2 hrs. minimum"; "no training....there was just no training for the teachers."

Comments on the quality of training ranged from general comments to specific suggestions. General comments included, "The training was poor"; "poor staff development--too rushed"; "the teachers were not familiar enough with what they were supposed to do." Specific suggestions made were, "The children and teachers needed training in when to use hints"; "the teachers need to know how to load the system"; "boot up"; "how to request data needed from computer, so if the computer specialist is not on campus or is unavailable, the teacher can pull the information"; "the computer specialist was the only one that knew how to get reports and turn on the system....teachers are dead in the water if the computer specialist is not there."

In remarking on training content, teachers noted that no one told them "what it was all about"; "what was the overall plan"; "what was possible....what the plan was when the system started." One teacher complained that the
"importance of the project was not stressed," and another teacher remarked that the "teachers need training in what the whole program can do....information on why it is a diagnostic tool....They did not have the training or information."

Additional remarks noted that the teachers "need to be comfortable to use and knowledgeable of the program"; "they did not know the potential of the program.... did not know how they could use it--the different ways"; "there was no training in that program." Several teachers indicated that they were unaware of the availability of parent reports and noted that they could be an advantage in conferences and reinforcing classroom efforts. Only one teacher was concerned about the lack of information on the instructional content of the program querying, "What happens next year? Do they repeat the same lessons? My students did all of the 18 lessons and all of the tests and quizzes. Is there a different group of passages for next year--or do they repeat the same ones?"

The computer specialist commented that a block of time was needed for parent training during the daytime. She stated, "You have to be careful about the parent training....have to build rapport....They don't trust certain individuals....The computer specialist has to be a buffer....a person with a lot of sensitivity with people of a lower status....not make them feel inferior or they will leave and not come back." She then related an incident with a parent: "One Hispanic lady couldn't figure the computer out and I was helping someone else. She felt like no one cared, so she just left, instead of waiting until I got to her."
The problems with the lack of follow-through staff development were reflected in several teachers' comments. One teacher indicated that the teachers needed "staff development from people who worked with the system." Another teacher noted the need for "cross-curriculum work," and a third teacher remarked that "there was no interaction with the teacher, and reading comprehension is like a stepping stone....The teacher leads the student to the next step." Other comments included, "The teachers' attitudes were affected by the lack of follow-up staff development"; "you have to correlate the lab and classroom--overlapping is necessary"; "teachers need to see it as just another part of the whole picture to integrate it."

Teachers' comments on management were related to the overall quality of the building management, lab scheduling, and monitoring. Generally, teachers noted that management was "critical" and that it was "poor." Several teachers commented on scheduling problems: "The program needs to be ready when kids enter so no time is lost"; "I had to insist my students have the opportunity to get on the system when they were left off the schedule"; "there was very poor management of the scheduling"; "the students needed a longer time period with better scheduling....should not be right at the end....should have started in September"; "it started too late....too many kinks"; "the program was implemented too late....classes too long--one hour is too long for reading comprehension with long passages on the computer screen"; "we tried to cram too much in--too late"; "the teacher could have used it better if there was easy access."
Comments on monitoring reflected the teachers’ frustrations in trying to work with the students in the lab. One teacher remarked that the teachers "needed someone delegated to monitor on a regular basis, to answer questions -- someone on the spot." Another teacher noted that "teachers cannot monitor alone in case technical help is needed." A teacher who had worked with the summer pilot study commented that "you have to monitor to make sure the child is using the help key not just going on." This teacher suggested arranging the students on computers in ability groups or clusters to reduce teacher monitoring, pointing out that a group of students at the same level would probably have the same problems or questions.

Teachers' comments on student motivation were varied. Two teachers commented that student motivation dropped after testing, and several mentioned that the students got bored after two weeks, noting that "it got boring"; "they seem to like it for about two weeks"; "motivation dropped off about half way." Another teacher remarked that her students were not motivated from the beginning, stating that "most of the students were turned off. They hated to go to computer. It was like prodding cattle."

On the other hand, other teachers stated that "half way through, after they got feedback and scores on the program, they became more motivated"; "the gifted students were challenged to a point"; "I felt the student motivation stayed high....students were competitive with one another....interest level increased as they progressed." Another teacher remarked, "The sixth graders' attitudes changed. They complained a lot that it was hard and boring at first."
Then they began to use the hint key and re-do lessons. They looked forward to it. They became competitive. They wanted the scores. They wanted the scores to improve—even the lowest students."

Another topic that the teachers commented on in the interview was the networked software program. The general comments related to the difficulty of the reading level, the frustration of the students in trying to manage it, the content of the material, and the efficiency of the network.

Several teachers criticized the program for being "too difficult." Specific comments included, "The language was too sophisticated and the concepts too difficult"; "the skills were not basic enough"; "the reading comprehension was too long....program needs to build up to a level"; "I had to read a lot to students whose reading levels were poor"; "it was dull and hard....students didn't feel successful." On the other hand, several teachers liked the level of difficulty. One teacher remarked that "it stretched them by presenting the information on a higher level." Two others pointed out that it was "not too difficult once they used the hint key"; "they got frustrated at first, but once they learned how to operate the hint they were okay."

Other comments on the instructional material were varied. Several teachers thought that there was "too much of the same thing" and "not enough variety" in the material. Other teachers remarked that the "program was good"; "it was effective"; "it was an asset."; "it has long range benefits for testing and overall academics."
Although only one teacher commented on the network itself, the remark may relate to some of the frustration with the lack of technical help that the other teachers experienced. This teacher noted that the network automatically placed the students on the last lesson they attempted regardless of subject; therefore, if a class came in for reading, but the last lab was in math, the students were put in math, and the teacher had to change them to reading. She indicated that the network couldn't seem to handle "two different subjects at two different times."

The teachers' comments on the diagnostic reports were generally favorable. They indicated that the reports made it possible to "look and see time frames on answering specifics about students' mastery" and "helped see generalities about the class as a whole." Additionally, they noted that the reports provided information on students which gave them "a direction to go in for the child." One teacher pointed out that the "diagnostic information was available in two places--in the reports and in the scores on the lessons."

Another teacher indicated that the diagnostic information was even useful to the students, stating that "initially the students were putting any answers in just to get through, but when they found out that the computer could print out what they were doing and diagnose, they started paying attention, and trying, and using the hint feature."

On the other hand, some teachers were critical of the reports, noting that the "printouts were used globally not specifically"; "there was not a whole lot of feedback or information on what the students were doing"; "you didn't know if
the student couldn’t do the work or just couldn’t understand because of lack of skills in deciphering”; "the system did not help to track student progress."

Several teachers complained about the infrequency of the reports or the lack of them, and one teacher suggested that the parent reports be mailed rather than sent home with the students where they ended up in "never-never land."

During the interviews, there were several comments on the homework packets. About half of the teachers thought they were a good idea; about half thought they were a waste of time. One teacher noted that the homework packets provided structure for the students who have "little or nothing to do at home," and another remarked that "the students were excited about the practice test for homework that went home right before testing. The kids felt good about recognizing some of the information and about being able to do it." Two teachers indicated that they used incentives and rewards, such as drawings for T-shirts and homework passes.

Three teachers referred to the effect of homework packets on parental involvement. One remarked that the parents were "supportive" in getting homework packets done. Another noted that the "parents got used to them and actually would ask the kids if they had a packet. They followed up on it and looked for them." A third teacher stated that the "homework packets were good. The homework was clear. The parent knew it was coming. The parent sets expectations about the packets being done, and the parents follow up."
Of the teachers that were not pleased with the homework packets, most of them indicated that the homework packets did not necessarily involve parents. One teacher stated, "The parents just signed it. There really was no effect. Only about 15% of them returned them." Another reflected, "The homework packets are not necessarily going to work. Those that regularly do homework do the packets. The others don't care."

During the interview, some of the teachers commented on their own computer proficiency. One teacher volunteered that she had a "slight computer proficiency," and another pointed out, "I am computer literate." Another teacher said that working with the program had helped her become computer literate, and now she owns her own computer. She stated, "I did not have a computer at home before starting. I could not even turn a computer on; but I decided that if the kids could do it, I could!"
CHAPTER 5

CONCLUSIONS

Summary

The purpose of this study was to determine the effect of using a computer-managed instructional system with integrated testing and skills software and homework packets on the reading scores and attitudes of at-risk students in a low-achieving urban school. An additional purpose was to determine the effect of using technology to deliver, measure, and manage instruction on the attitudes of teachers. The review of the literature found little definitive research data pertaining to this area; therefore, this study has used both quantitative and qualitative methods to obtain data on this topic.

The methods of data collection included the reading comprehension sub-test of a norm-referenced achievement test which determined the level of reading achievement; the How I Feel About Myself student survey, which determined students' attitudes related to academic self-concept and achievement motivation; the How My Class Acts student survey, which determined students' attitudes related to the learning environment; and the Teacher Questionnaire and the teacher interview notes, which determined teachers' attitudes about training/computer competency, the homework packets, the testing and skills software, the diagnostic reports, and student motivation.
The analyses of quantitative data were performed with the **SPSS** and **STATISTICA/Mac** software on a Macintosh computer to test for significant differences between pretests and posttests of reading achievement, correlations between completed homework packets and reading achievement, correlations between the frequency of parental signatures on homework packets and reading achievement, significant differences between pretests and posttests of students' attitudes, and correlations between teachers' responses on the Teacher Questionnaire. The analyses included *t* tests and the analyses of variance and covariance, which were used to test for differences in raw scores on the pretests and posttests of reading achievement and differences in raw scores on the student attitude surveys. Additional analyses included parametric and nonparametric correlation tests, which were used to test for correlations of homework completion and achievement, parental signatures and homework completion, parental signatures and achievement, and teachers' responses to the questionnaire. The remaining qualitative data were transformed into a system of categories and analyzed descriptively.

**Discussion**

The research questions addressed in this study provided the framework for determining the usefulness of integrated testing and skills software for reading instruction with at-risk students. According to Foertsch (1992), reading comprehension is influenced by the goals for reading, the characteristics of
readers, and the abilities of readers to use the reading strategies that are necessary to achieve comprehension. Foertsch adds that in order for reading instruction to be most effective, "Subject matter, teaching materials and activities, and the instructional context must be carefully orchestrated to create a meaningful and motivating learning experience" (p. 9). Habenicht, Byoune, and Futcher (1990) reported that children who were right hemispheric seemed to be at-risk for reading difficulties, and they indicated that African-American children tended to be more right hemispheric than Caucasian children. The present study involved predominantly African-American children in a low-achieving urban school. The computer was used to deliver instruction because it provided a multisensory and nontraditional approach to instruction. According to Toch (1991), teachers say that many disadvantaged students who shun traditional teaching "take to technology enthusiastically" (p. 79). Integrated testing and skills software was used because remedial readers seem to benefit from goal setting, explicit feedback and continuous monitoring of progress with supportive prompts, and self-evaluation (Coley & Hoffman, 1990; Miller, 1991; Schunk & Rice, 1991).

The study originally proposed integrating an eight million item test-bank with the testing and skills software. However, due to difficulties in procuring the hardware and subsequent noncompatibility of hardware interface, the item test-bank was omitted from the project. In addition, the re-assignment of the leaders of the study (the principal, the dean of students, and the computer specialist)
caused confusion about the seat of authority and responsibility for the study and procrastination in transferring that authority and responsibility.

To compensate for the delay in setting up the hardware and coordinating the personnel, the laboratory schedule for the students was increased from once a week to twice a week. The training program for the teachers was provided by university personnel, district personnel, and building site personnel and was offered during the day, at night, and on a Saturday.

Although the selection of students and teachers for this sample was nonrandom, the study provided evidence to support the assumption that at-risk students respond favorably to computer-managed instruction, and teachers benefit from the information provided by integrated testing and skills software.

Findings

Research Question 1

The results of Research Question 1 described the significant differences between the pretreatment and posttreatment reading achievement scores of students who participated in computer-managed reading instruction using integrated testing and skills software. When the difference between the pretest and posttest raw scores was compared, there was not a significant difference at the ninety-five percent probability level, but the comparison group's mean was considerably higher than the treatment group's mean. The raw scores on the
posttest were then analyzed to determine if there was a significant difference between grade levels, and the results indicated that the scores of sixth graders at both schools were significantly higher than those of the fourth or fifth graders.

**Research Question 2**

The results of Research Question 2 described the significant differences between the pretreatment and posttreatment reading achievement scores of students who completed individualized homework packets based on reading comprehension skill deficiencies diagnosed by the integrated testing and skills software. The achievement of the students in the homework group differed significantly from the achievement of the students in the comparison group and from the students in the treatment group who had not completed any homework packets. The achievement scores of the sixth graders in the homework group, who completed more total packets than the students in the other two grades, differed significantly from the scores of other students in the homework group. Additionally, the teacher who taught reading to 75% of the sixth-grade students had participated in the summer training program, as well as the training offered by the university.

**Research Question 3**

The results of Research Question 3 described the significant differences between the posttreatment reading achievement scores of students who had no
parental signatures on the homework packets, students who had one parental signature on the homework packets, students who had two parental signatures on the homework packets, and students who had three parental signatures on the homework packets. The achievement scores of students who had parental signatures on the homework packets differed significantly from the scores of students who had no signatures; however, there was no significant difference based on the different frequencies of signatures. On the other hand, the sixth graders had more total parental signatures on the homework packets than did the fourth or fifth graders, and their achievement scores differed significantly from those of the fourth or fifth graders. Furthermore, the frequency of parental signatures was significantly related to the number of completed homework packets. Those students with parental signatures completed more packets.

Additional results of Research Question 3 described the gender of parental signatures on the homework packets, the frequency of parental help with the homework packets, and the regularity of the homework group's attendance. At all three grade levels, approximately eighty percent of the parental signatures were from females; only about twenty percent of the parental signatures were from males. Only 34 students indicated that they had help with the homework packets. Of the students that indicated that they had help, over sixty percent were sixth graders. At all three grade levels, in the homework group all the students were present for the pretest and the posttest. In fact, more sixth graders were present for the posttest than for the
Research Question 4

The results of Research Question 4 described the significant differences between the pretreatment and posttreatment scores of the students who participated in the computer-managed reading instruction using integrated testing and skills software on the student survey How I Feel About Myself. A comparison of the posttest scores for the treatment and comparison groups indicated that there was no significant difference between the two groups at the ninety-five percent probability level on the three factors of the test: home-based academic self-concept, school-based academic self-concept, and achievement motivation. The mean scores for school-based academic self-concept and achievement motivation were higher for students in the treatment school, but there was no difference in mean scores for home-based academic self-concept. On the other hand, there was a statistically significant difference on the student responses to two of the individual questions. The treatment school students perceived their teachers significantly more positively than did the comparison school students on the statements "My teachers think I am smart" and "My teachers like my schoolwork."

Research Question 5

The results of Research Question 5 described the significant differences between posttreatment scores on How My Class Acts for students in the treatment and comparison groups. A comparison of the scores indicated that
there was no significant difference between the treatment group and the comparison group at the ninety-five percent probability level on the four factors: satisfaction with learning, friction among students, cooperation among students, and cohesiveness among students. However, the treatment school students appeared to be more satisfied with their learning, and they appeared to perceive less friction and more cohesiveness among themselves than did students at the comparison school. An analysis by grade level of the treatment group revealed a significant difference at the ninety-five percent probability level between the sixth grade and the fourth grade on the factor that related to friction among students. The sixth graders perceived significantly less friction among the students in their class than did the fourth graders.

When individual questions were analyzed, there was a significant difference at the ninety-five percent probability level on the responses to three questions. The treatment school students had significantly more positive responses to the statements, "In my class, the students take up for each other." and "In my class, the students would like to be elsewhere." However, the comparison school students had significantly more positive responses to the statement, "In my class, the students try even if it is hard."

Research Question 6

The results of Research Question 6 described the attitudes of teachers about the computer-managed reading instruction using integrated testing and
skills software, as measured by the Teacher Questionnaire and teacher interviews. Based on the teachers' responses to the Teacher Questionnaire, the majority of the teachers felt positive about the computer-managed reading instruction, especially regarding the diagnostic information, the effectiveness of the homework packets, and student motivation.

Most of the teachers (89%) felt that the system was easy to use and did not increase their workload, and the majority of teachers (56%) felt that it positively affected students' attitudes about school. Additionally, the teachers indicated that they had increased their use of the computer lab. On the other hand, most of the teachers (78%) were negative regarding the amount of training related to computer competency and the follow-up staff development and support. Moreover, although the majority of the teachers (78%) felt that the parents responded to the homework packets, they did not feel that the homework packets increased parental involvement. Teachers' responses to the questions related to effectiveness and students' attitudes were positively correlated, as were their responses to the questions related to effectiveness and productivity. On the other hand, the teachers' responses to the questions related to teacher training/computer competency and productivity were negatively correlated, as were their responses to the questions related to teacher training/computer competency and homework packets.

Based on the teachers' responses to the interview, most of the teachers felt that the diagnostic reports provided useful information, but they felt that there
was not enough training and follow-up support and not enough information on
the software. Additionally, they felt that the overall management of the program
was poor, especially regarding the implementation schedule and instructional
support. The teachers had mixed feelings about the instructional software
regarding the level of difficulty, the variety of material, and the effect on student
motivation. The teachers also had mixed feelings about the effectiveness of the
homework packets and the degree to which they involved the parents.

**Summary of Findings**

This study described how computer-managed instruction with integrated
testing and skills software affected the reading achievement and attitudes of at-
risk students and the attitudes of teachers about using technology.

Based on the major findings of this research study, the following
statements seem justified:

1. Twelve 1-hour sessions of reading instruction using integrated
testing and skills software were insufficient to produce a significant increase in
reading achievement.

2. The completion of homework packets appeared to significantly
increase student achievement.

3. Having parents sign the homework packets appeared to have a
significant positive effect on student achievement.
4. Having parents sign the homework packets appeared to positively affect student homework completion rate.

5. Mothers appeared to be more involved with their children's schoolwork than fathers.

6. The sixth graders appeared to be more willing to ask for and receive parental help with the homework packets.

7. Students who completed homework packets appeared to have a better attendance rate.

8. The students who received reading instruction using integrated testing and skills software appeared to view their teachers more positively.

9. The sixth-grade students appeared to experience less friction among their classmates.

10. The students who received reading instruction using integrated testing and skills software appeared to view their classmates as cooperative and the learning environment as satisfying.

11. The teachers appeared to view the reading instruction using integrated testing and skills software as effective and easy to use and the diagnostic information as helpful.

12. The teachers appeared to view the reading instruction using integrated testing and skills software as motivating to students.

13. The teachers appeared to view the homework packets as effective in regard to achievement, but ineffective in regard to parental involvement.
14. The teachers appeared to increase their computer lab usage.

15. The teachers appeared to need more information on the software and more training on the hardware.

Conclusions

Although there was not a significant difference in achievement scores of students in the treatment school and the comparison school, there were some definite advantages to using integrated testing and skills software to deliver, measure, and manage the reading instruction. The sixth graders improved their scores more than the fourth and fifth graders, perhaps because the teacher who taught seventy-five percent of the sixth grade reading classes had participated in the training offered by the university during the summer pilot study, as well as the training offered by the university between January and April at night and on weekends.

Students who completed the individualized homework packets significantly increased their reading achievement scores. According to Work and McLaughlin (1990), reading is an integration of skills; therefore, the additional practice on the component skills contributes to the whole integrated process of reading. The homework packets provided additional time on task and skill practice and possibly contributed to an overall increase in reading achievement.
Moreover, students who had parental signatures on the packets significantly increased their reading achievement scores. According to Anglum, Bell, and Roubinek (1990), parental help with homework was related to reading achievement. Moreover, Grolnick, Ryan, and Deci (1991) reported that children of highly involved parents feel more competent, especially if the involvement is maternal. Since approximately eighty percent of the signatures came from female parents, the maternal involvement may have contributed to the increased reading achievement scores of those students who had parental signatures on the packets.

Additionally, those students who got parental signatures tended to complete more packets. Perhaps the parents began to expect the homework packets and provided reminders and follow-up support to the students. On the other hand, it was obvious that some packets were signed by the students. This could have been the result of students signing for illiterate parents. It also could have been because the student thought the teacher expected the packet to be signed, and the student wanted to comply. More sixth grade packets had signatures. This may have occurred because the teacher that taught most of the sixth grade classes was very supportive of the study and may have over-emphasized the importance of getting the packets signed.

More sixth graders than fourth or fifth graders indicated that they had help with the packets. The sixth graders may have had more encouragement from the teacher to get help, but also they may have been more realistic and realized
they needed help. The cognitive development of the fourth graders, who had the fewest signatures, may have prevented them from realizing that they needed help, or they may have thought that getting help was an indication of being a poor student. Since the sixth grade did significantly better than the fourth or fifth grade on their reading achievement scores, perhaps a combination of parental help, which may have boosted their confidence and provided extra motivation, and teacher encouragement made the difference.

The homework group appeared to have a more regular attendance. They were present for both the pretest and the posttest, whereas approximately thirty percent of the other students who were present for the pretest were not present for the posttest. Perhaps the homework group was made up of students who were more conscientious and who had parents who were more supportive of the school's expectations.

The students at the treatment school seemed to have a better school-based self-concept than the students at the comparison school. Perhaps the feedback from the computer software, the hint keys, and the self-paced learning gave the students more confidence in their learning ability. Moreover, the computer-managed instruction did not judge or provide subjective feedback, but offered an accepting environment and frequent corrective feedback on performance. This could explain why the students in the treatment group perceived their teachers more positively.
The teachers' responses to the Teacher Questionnaire indicated that there was a negative correlation between the way the teachers responded to the questions on homework packets, training/computer competency, and productivity. Perhaps their lack of training/computer competency created difficulty in producing the homework packets, which made them feel less productive. On the other hand, the teachers' responses to the Teacher Questionnaire indicated that there was a positive correlation between students' attitudes, productivity, and effectiveness. Perhaps the attitudes of the teachers about productivity and the effectiveness of the program affected their students' attitudes.

In the interview, the teachers complained about the lack of teacher training, the lack of information that was provided on the software, and the lack of their understanding of the potential of the software program.

Although several opportunities for training were made available to the teachers during the current study, there was very little motivation to make use of them. In fact, of the nine teachers that participated in the study, only one teacher attended the training that was offered by the university. That teacher had also participated in the pilot program conducted during the summer. At that time, she received five full days of hands-on training on the integrated testing and skills software and had 10 days to implement it with students; therefore, this teacher was more able to integrate the program into the curriculum and implement it effectively in the computer lab. One possible reason for the other teachers' lack
of motivation was that the building leadership did not stress the importance of the project and actively support the teachers' attendance at the training sessions. The principal had the discretion to direct forty-five minutes of the teachers' weekly planning time. The principal could have directed the teachers to use that time for computer training, because the computer specialist also was available at that time. Moreover, the school's staff development calendar included computer training classes in September, October, November, March, and April. These classes were not offered. Additionally, several teachers complained about the lack of follow-up staff development related to integrating the testing and skills software with their regular classroom instruction. Again, the principal should have provided the instructional leadership.

In the interview, the teachers expressed satisfaction with the diagnostic reports and the information they provided on each individual student and the class as a whole. Moreover, the teachers indicated that the students were often motivated by the feedback they received from the computer-managed instruction and the diagnostic reports. In addition, the teachers indicated that the homework packets were effective for their students because they provided a constructive use of the students' time after school and familiarized the students with the type of questions that appeared on the norm-referenced achievement test.
Implications

Although there was not an overall significant difference in reading scores between the treatment school and the comparison school, the significant differences in parts of the treatment are worthy of additional investigation. The target school district recently released the results of the spring achievement testing. The achievement gap between the Caucasian and minority students remained, especially in reading. In fact, those schools which receive funds based on large minority enrollments or enrollments of students scoring below grade level were below the grade level standards (Garcia, 1992). Furthermore, the district's learning centers, which were aimed at closing the gap in achievement between Caucasian and minority students, did not achieve their court-ordered goals. As a result, the state comptroller's office recently commissioned a management audit to determine the efficiency of the expenditures on the centers (Garcia, 1992). Therefore, the small gains in this six-week study could have broader implications when considering the big picture of maximizing achievement gains and minimizing expenditures.

Recommendations

1. This study should take place over a full school year. Perhaps if the treatment had been implemented for a full year and students had received individualized homework packets every week, the results would have been even more significant. It seems that one of the critical aspects of the proposed
treatment was the computer test-bank (CTB) that was to be integrated with Skills Bank II. The availability of an eight million item test-bank would offer teachers an almost limitless resource for remediation and reinforcement, as well as a valuable resource for enrichment. In the interviews, all of the teachers expressed an interest in the test-bank and appeared enthusiastic about its potential. The additional expenditure to integrate CTB with Skills Bank II would be less than leaving the test-bank unused or using only a fraction of its potential.

2. The diagnostic reports need to be produced each instructional session. The teachers indicated that they would like to have the diagnostic reports on a regular basis but were not able to generate them for themselves. Because the computer specialist appears to have insufficient time to print the reports on a regular basis, the teachers should be trained to operate the system. On the other hand, unless the training is required and supported by the administration, the teachers will not take advantage of it.

3. The students need weekly homework packets with fewer activities. The packets used for the study contained several pages of skills practice. Student completion rates dropped significantly between the first and second packet (a forty percent change) and between the second and third packet (a seventy-four percent change). The motivation to complete several pages at one time may have been more than was reasonable to expect from these students. Shorter assignments distributed more frequently may be more effective and may produce a larger participation rate.
4. The teachers should be required to attend computer training sessions. Teacher training was a critical aspect of this study. Although the training was offered, it was on a voluntary basis, and the teachers had to give up personal time to participate. The majority of the teachers (78%) felt that the training was inadequate; however, only one of the teachers attended all of the training sessions that were offered after school and on Saturday. This same teacher also participated in the training offered during the summer prior to the beginning of the study.

5. The training should be offered during school time. The teachers need approximately one hour of training on the potential of the program and how to read and use the information from the reports. They need approximately two hours of training on how to print their own reports, and approximately two hours hands-on training using Skills Bank II integrated with CTB. In addition, they need approximately two hours hands-on training in how to create and generate individualized homework packets. The six hours of training could be accomplished during in-service or during the principal's designated time each week. The teachers would not have to give up personal time, and all teachers would receive the training, not just one as was the case in this study.

6. The students should receive instruction on the integrated testing and skills software bi-weekly. One of the teachers commented that the program would be more effective if it was used every other week. She indicated that the
students seemed to need a rest period from the intense instruction. This may be a viable solution to the problem of decreased motivation.

7. The teachers should share the diagnostic reports with their students. According to one of the teachers, as the students got feedback from the reports, they became competitive with each other and more motivated to better their scores. Therefore, it may be helpful to share the reports with the students and let them keep a record of their progress.

The Need for Future Study

According to Clark (1991), there is a "dearth" of evaluations on program interventions for at-risk students (p. 105). He urges school districts to analyze the cost of these programs and collect data to provide evidence of what works. Trevino (1991) indicates that the best programs for at-risk students build self-esteem by structuring work so that it can be done successfully and celebrating small levels of accomplishment, and Purcell-Gates and Dahl (1991) point out that even though reading achievement among children from low-income, inner-city families consistently falls below national norms, the children make greater gains when parents intervene at home with academic assistance. Therefore, the use of individualized homework packets needs further study. These packets could be designed so that the student could successfully complete them within a short period of time, and the packets could provide an opportunity for parents to provide academic assistance at home. Although using packets generated from
a computer test-bank would be ideal, the classroom teacher could design individualized packets from worksheets.

The present study needs to be replicated over a longer period of time in order to further determine the cost-benefit ratio of investing in a computer network and integrated testing and skills software.

During the pilot study, the researcher noticed that the students spent approximately five to seven minutes at the beginning of each computer session determining what background and text colors to choose. Once a pleasing combination was selected, they began working on their assignment. The effects of background and text colors on reading material for at-risk students needs to be investigated. Their right-hemispheric learning styles may be significantly affected by color.
Background Information

In May 1986, the United States Fifth District Court, under Judge Barefoot Sanders' order, granted the motion to expand the South Dallas Management Plan and all requirements of the April 30, 1984, Desegregation Court Order. This order set the guidelines for academic and remediation programs, selection of teachers, and the use of a 1:18 teacher-student ratio in schools designated as Learning Centers (Lawrence, McGill, & Howard, 1991).

This represented a "bold effort to provide a high quality education in a neighborhood setting" and to provide an "alternative to the historical and previously attempted vehicle of providing transportation to distant sites as a remedy and presumably for a better educational opportunity" (DISD, 1989). The cornerstone of this effort was "a deep seated belief that a history of educational deprivation" could be overcome (DISD, 1989). The comparison learning center opened in the 1986-87 school year to serve the disadvantaged in the west part of the targeted school district (Dryden, Johnson, & Bouldin, 1991). The treatment learning center opened in the 1988-89 school year to serve the disadvantaged in the south part of the targeted school district (Lawrence, McGill, & Howard, 1991). The treatment learning center's expressed goal was "to provide a safety net for those children who are 'at risk' and to provide academic challenges for all students" (DISD, 1989).
In addition to the academic and remediation programs and reduced teacher-student ratio, these learning centers include an extended school day, extensive voluntary learning support programs before and after the school day, specially selected and trained teachers and administrators, enhanced curricula in all major areas, on-going staff development activities, special incentives for professional growth, and increased pay for teachers (Dryden, Johnson, & Bouldin, 1991).

The incentive pay structure for teachers is based on an elaborate formula that compares the learning center students’ achievement with the rest of the district. For each of the three areas (language arts, reading, and mathematics) in which the center students exceed the district students’ gain in each percentile band on the standardized testing, the teachers at the center receive a sizeable bonus. The incentive pay is based on the following formula:

The standardized difference between a Center’s and District’s gain will be greater than 30%, 20%, 10%, and maintenance plus for students in the 1-29, 30-49, 50-79, and 80-99 pretest percentile bands, respectively. Furthermore, the ITBS language arts, reading and mathematics subtests will serve as separate measures of achievement; all tests will be based on 1985 test norms; all statistics will be based on at least 20 students (if less than 20 students are in a given pretest percentile band, a center will be declared successful in that band if and only if the median posttest percentile is greater than the lower limit of the band); all statistics will be based on continuously enrolled students; and a center will test more than 95% of the students eligible for testing. For the purpose of calculating the target goal for each band all intermediate calculations were truncated to the nearest hundredth place to eliminate rounding bias. Since the arithmetic means have higher precision (not accuracy) than a single measure, estimates of the District means were taken as the lower limit of the
99% confidence interval using the standard error of the mean as the measure of uncertainty. Finally, all target means were truncated to match the accuracy of the measure (Dryden, Johnson, & Bouldin, 1991, p. 118).

Of the initial group of students assigned to the comparison learning center in 1986, 56% were achieving below the 30th percentile, and 79% were achieving below the 50th percentile on the norm-referenced achievement reading subtest (Prince, Mack, & Tollette, 1991). The initial group of students assigned to the treatment learning center in 1989 were achieving at a similar rate.

The Texas Assessment of Academic Skills (TAAS) was administered for the first time to third and fifth grade students in October, 1990, and only 32% of the fifth graders at the comparison learning center and only 36% of the fifth graders at the treatment learning center mastered the objectives in reading comprehension (Dryden, Johnson, & Bouldin, 1991). Table 25 presents the information on the TAAS results for 1990 and 1991 (DISD, 1992).

A norm-referenced achievement test was administered in the spring of 1991. As shown in Table 26, neither the comparison learning center nor the treatment learning center exceeded the standardized gains of the district in reading by the percentage specified in the Court order (Dryden, Johnson, & Bouldin, 1991). At the treatment learning center, 50% of the returning fifth and sixth graders scored below the 30th percentile in reading, 18.75% scored
between the 30th and 50th percentiles, and only 3.75% scored above the 80th percentile (DISD, 1989).

### TABLE 25

**Grade 5 TAAS Results, 1992–70% Standard**

<table>
<thead>
<tr>
<th></th>
<th>Comparison learning center</th>
<th>Treatment learning center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading '90</td>
<td>32%</td>
<td>36%</td>
</tr>
<tr>
<td>Reading '91</td>
<td>38%</td>
<td>33%</td>
</tr>
<tr>
<td>Mastery '90</td>
<td>42%</td>
<td>33%</td>
</tr>
<tr>
<td>Mastery '91</td>
<td>43%</td>
<td>32%</td>
</tr>
</tbody>
</table>

### TABLE 26

**Percentile Band Gains on the ITBS Reading Subtest**

<table>
<thead>
<tr>
<th>Percentile band</th>
<th>District gain</th>
<th>Comparison center gain</th>
<th>Treatment center gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-29</td>
<td>1.2</td>
<td>.84</td>
<td>.96</td>
</tr>
<tr>
<td>30-49</td>
<td>.9</td>
<td>.55</td>
<td>1.00</td>
</tr>
<tr>
<td>50-79</td>
<td>.8</td>
<td>.57</td>
<td>.71</td>
</tr>
</tbody>
</table>
The median scores for each percentile band for the comparison learning center and the treatment learning center are displayed in Table 27. In spite of the inability of either center to meet its goals in reading, district evaluators found that there was no "significant infusion of new strategies" in daily reading instruction and there were "rarely any type of follow-up activities" to the reading instruction which would expand the interests or comprehension of the students (Dryden, Johnson, & Bouldin, 1991).

<table>
<thead>
<tr>
<th>Percentile band</th>
<th>Comparison center median score</th>
<th>Treatment center median score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-29</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>30-49</td>
<td>40</td>
<td>37</td>
</tr>
<tr>
<td>50-79</td>
<td>61</td>
<td>53</td>
</tr>
<tr>
<td>80-99</td>
<td>86</td>
<td>85</td>
</tr>
</tbody>
</table>

A survey of students' reading characteristics indicated that the students at both schools were weak in background knowledge, skimming, reviewing, judging materials, and study reading (Dryden, Johnson, & Bouldin, 1991);
however, the comparison learning center's mean scores were slightly lower than the treatment learning center's mean scores (see Table 28).

During the 1990-91 school year, the teachers at the comparison learning center had an average of 14 years experience, 90% of them were female, approximately 50% of them were Caucasian, approximately 45% were African-American, and approximately 5% were Hispanic. During the 1990-91 school year, the teachers at the treatment learning center had an average of 7 years of experience, 95% were female, approximately 48% of them were Caucasian, approximately 48% were African-American, and less than 5% were Hispanic.

### TABLE 28

<table>
<thead>
<tr>
<th></th>
<th>Comparison learning center</th>
<th>Treatment learning center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background knowledge</td>
<td>2.07</td>
<td>2.14</td>
</tr>
<tr>
<td>Skimming</td>
<td>2.01</td>
<td>2.02</td>
</tr>
<tr>
<td>Reviewing</td>
<td>2.32</td>
<td>2.33</td>
</tr>
<tr>
<td>Judging materials</td>
<td>2.34</td>
<td>2.34</td>
</tr>
<tr>
<td>Study reading</td>
<td>1.98</td>
<td>2.13</td>
</tr>
</tbody>
</table>
APPENDIX B
# Learning Center

## How I Feel About Myself

**1991-1992 Student Climate Survey**

**Name_____________________ Grade______**

**Teacher's Name:_________________**

**Directions:** We want to know how you feel about yourself. Using a number 2 pencil, darken the circle next to your answer.

1. I try my best in school.
   - O often
   - O sometimes
   - O never

2. I do my homework.
   - O often
   - O sometimes
   - O never

3. I listen in class.
   - O often
   - O sometimes
   - O never

4. I try to get good grades.
   - O often
   - O sometimes
   - O never

5. I pay attention in class.
   - O often
   - O sometimes
   - O never

6. My grades come from hard work
   - O often
   - O sometimes
   - O never

7. I believe that good grades will help me later in life
   - O often
   - O sometimes
   - O never

8. I continue with school work even if it is hard
   - O often
   - O sometimes
   - O never

   - O often
   - O sometimes
   - O never

10. My teachers think I am smart.
    - O often
    - O sometimes
    - O never

11. My family thinks I can make good grades.
    - O often
    - O sometimes
    - O never
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Other children think I am smart</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>13. My family thinks I can learn in school.</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>14. My teachers call on other students more than me.</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>15. I am as smart as others in my class</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>16. I am smarter than my teacher thinks I am.</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>17. My teachers like my school work.</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
<tr>
<td>18. My friends do better in school than me.</td>
<td>o often</td>
<td>o sometimes</td>
</tr>
</tbody>
</table>
Learning Center Survey
How My Class Acts
1991-1992

Student Name__________________________
Homeroom Teacher_______________________
Grade______Section_____________________

Directions: We want to know what you see in your class. Using a number 2 pencil, darken the circle next to your response.

1. In my class the students like each other.  
   - often  
   - sometimes  
   - never

2. In my class, the students play together.  
   - often  
   - sometimes  
   - never

3. In my class, the students disrupt the class.  
   - often  
   - sometimes  
   - never

4. In my class, the students take up for each other.  
   - often  
   - sometimes  
   - never

5. In my class, the students trust each other.  
   - often  
   - sometimes  
   - never

6. In my class, the students pick on each other.  
   - often  
   - sometimes  
   - never

7. In my class, the students are friendly.  
   - often  
   - sometimes  
   - never

8. In my class, the students blame each other.  
   - often  
   - sometimes  
   - never

9. In my class, the students agree with each other.  
   - often  
   - sometimes  
   - never

10. In my class, the students like to learn new things.  
    - often  
    - sometimes  
    - never

11. In my class, the students try even if it is hard.  
    - often  
    - sometimes  
    - never

12. In my class, the students are bored.  
    - often  
    - sometimes  
    - never

13. In my class, the students learn a lot.  
    - often  
    - sometimes  
    - never
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>In my class, the students want to please the teacher.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>In my class, the students enjoy the class.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>In my class, the students think that learning is fun.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>In my class, the students find the class too easy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>In my class, the students would like to be elsewhere.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>In my class, the students help each other learn.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>In my class, the students work by themselves.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>In my class, the students share ideas.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>In my class, the students try to finish work.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>In my class, the students work in small groups.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>In my class, the students explain work to each other.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>In my class, the students listen to each other.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>In my class, the students ask tough questions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>In my class, the students compare each other's work.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D
Teacher Questionnaire

Name ____________________________  Grade Level ________
Years of Teaching _____  Degrees Earned_______  Years at Colonial _____

Directions: Quickly circle a "Y" (yes) or "N" (no) response to the following questions. Do not think a long time about the response that best describes your opinion. You will have the opportunity to explain your choice later.

1. Do you think the computer-managed reading instruction was effective?  Y  N
2. Did using the system reduce your planning time?  Y  N
3. Did the student profiles help you in any way?  Y  N
4. Were the class profiles useful?  Y  N
5. Were the homework packets beneficial to your students?  Y  N
6. Was the system easy to use?  Y  N
7. Did using the system take too much time?  Y  N
8. Did the students like it?  Y  N
9. Did using this system increase your work load?  Y  N
10. Did your time spent with individual students increase?  Y  N
11. Did you send homework packets home each session?  Y  N
12. Did the students like the homework packets?  Y  N
13. Were the homework packets effective?  Y  N
14. Did the parents respond to the homework packets?  Y  N
15. Did the students like the computer-managed instruction?  Y  N
16. Do you think this program should be implemented at the other centers?  Y  N
17. Do you think this is the best way to correct reading deficiencies?  Y  N
18. Would you like to continue to use this program?  Y  N
19. Do you think the training was adequate? Y N
20. Do you have a computer at home? Y N
21. Did you use the system for planning instruction? Y N
22. Were you looking forward to using the system this year? Y N
23. Did you use the computer lab before participating in this program? Y N
24. Did you use the computer lab this year more often than you did before? Y N
25. Do you feel uncomfortable about using the computer network? Y N
26. Will your students will improve their score on the ITBS this year? Y N
27. Was the computer-managed instruction an improvement? Y N
28. Did the students' attitude about homework change? Y N
29. Did homework response increase because of the homework packets? Y N
30. Have you had any computer courses or workshops? Y N
31. Did the homework packets increase parent involvement? Y N
32. Were the diagnostic reports helpful? Y N
33. Did you use the diagnostic information regularly to plan? Y N
34. Could you have been as effective without the diagnostic information? Y N
35. Do you think that the money spent on the system was well spent? Y N
36. Did student motivation improve because of the new system? Y N
37. Did the new system affect student attitudes about school? Y N
38. Do you think this new system made you more efficient? Y N
PERSONAL INDEX JOURNAL

Wednesday, September 11, 1991

Proposal accepted -- guess we can start the study.

Thursday, September 12,

Called G to see if he talked to T. He said T said hardware and software are on their way. G offered to help with installation, hoping to speed things up. He also said that D, M, and T were no longer at the treatment learning center. New principal is S. New dean is L. New computer person is P. None of these people are familiar with grant. I wonder if the old group will oversee the grant or this new group. I'm concerned that everybody is going to be too busy with their new jobs to worry about this!

Monday, September 16, 1991

G called -- still no hardware and software.

Tuesday, September 17, 1991

Called the school district to find out about climate surveys. The school district has no money and will not be doing surveys! Guess I'm paying for the surveys if I want to get the study done!
Friday, September 20, 1991

G called -- no hardware and software yet. I broke the news about the surveys. We agreed to meet tomorrow and print up our own. I hope Kinko gives us a deal!

Saturday, September 21, 1991

G and I made copies of student surveys for the treatment learning center and the comparison learning center.

Tuesday, September 24, 1991

G called -- same message. I am beginning to feel panic. Have to act casual because G worries so. My proposal says we'll do this from October to April. This is not looking good.

Thursday, September 26, 1991

G called. No surprises -- now there are delays because the bids did not include certain specifications. I am beginning to smell a rat. Is this called the bureaucratic dodge?

Saturday, September 28, 1991

G called. He had talked to P who knows nothing about the project and doesn't know what she's supposed to do. G said that P indicated that the
teachers haven't been told about what's going on and they are upset about finding out about it via the "grapevine." I'm concerned that if we have to rely on the teachers and they are not on our side, we could be in trouble! I told G that it was alright for him to worry now!

Sunday, September 29, 1991

G called T again and she had her usual message, "no progress."

Monday, September 30, 1991

G called again! He said that nothing arrived today! October is tomorrow! I told him to start worrying good! He told T that P was anxious and T agreed to meet with her for some "on the job training."

Friday, October 4, 1991

G called to report that T did not meet with P, but she said the equipment would be in "next week." This reminds me of a routine dodge, "the check is in the mail!"

Monday, October 7, 1991

Called the comparison learning center and "met" J over the phone. I explained the project and told her we would be ready to do the pre-test as soon as the equipment came in. She said that we needed to wait until TAAS testing
was over. I told her that that was not a problem and we would do it at her convenience.

Sunday, October 13, 1991

G called. Said some of the equipment had arrived. But -- there are problems! Seems like the equipment is not compatible and extra cards will have to be ordered. Why am I not surprised? Guess we can kiss October goodbye! G also told me his "horror stories" about his trip with the community liason -- walking over bodies, stares, crack houses. Yuk!

Monday, October 21, 1991

Talked to G. He's low -- real disappointed in survey response from parent meeting last week -- only fifteen surveys. He was making flyers to go home with kids promising a pizza party. We both feel that this project is getting too expensive.

Thursday, October 24, 1991

G called after he talked to T. He said that November 1 was the deadline for the company to either deliver or lose the contract.
Sunday, November 3, 1991

Talked to G. All hardware in! But IBM won’t install because hardware may not be compatible enough for IBM to guarantee the system. Here we go again! Told G to call J and arrange for survey delivery.

Monday, November 4, 1991

G called J at the comparison learning center and arranged to deliver the surveys on Friday. J agreed to do the surveys next week. G was impressed by how nice she seemed.

Friday, November 8, 1991

Talked to G. He delivered surveys to both the comparison learning center and the treatment learning center.

Thursday, November 14, 1991

G called. He picked up surveys. The comparison learning center’s were sorted and alphabetized. The treatment learning center’s were in a pile! Guess we’ll spend some time sorting before we can begin tabulating.

Sunday, November 17, 1991

G called. He had talked to T and she said hardware still on hold and some software missing, too!! It seems they let these bombs drop little by little. G
in panic. I must admit, I'm in one, too! At least we have the pre-test surveys done.

Wednesday, December 11, 1991

G called. Still no word on equipment or when system will be up and running. I tried to tell G that it was beyond our control and there was nothing we could do. This was REAL RESEARCH!! He agreed to let it be until after Christmas.

Friday, January 10, 1992

G called. He said he had talked to T and network was up. However, no CTB. This is getting old.

Tuesday, January 7, 1992

Received letter from M about a meeting date on January 24 at her school for the grant committee. Guess we'll get it rolling now.

Friday, January 24, 1992

Met with everybody concerning grant. M was eloquent in explaining how plan had been altered. Looks like we'll have to make some adaptations to proposal. Hope there is enough time for study. Dr. P seemed to think we were still okay.
Saturday, January 25, 1992

Went to P's house in Arlington to meet with her and G to see if we could structure the study so that all is not lost. We discussed all the participants and came up with a plan. P seemed very helpful and seemed to understand our dilemma. She gave us some interesting information about the politics and personalities involved. Looks like bureaucrats mired in c.y.a.!!

Wednesday, January 29, 1992

Met for class. The university is providing credit for the "staff development" part of the grant. Only one teacher from the treatment learning center there. Several teachers in class were from M and D's schools. Wondered where the rest of the the treatment learning center group was!

Wednesday, February 5, 1992

Class met and discussed CTB and Skills Bank. Everybody got on system to practice Skills Bank. CTB boxes there, but CTB was not able to run.

Saturday, February 8, 1992

Met all day Saturday in computer lab. We did more work with Skills Bank and found out from B that CTB was not networkable and could not integrate with Skills Bank. No one seemed to have a manual for CTB and a very expensive part that would allow integration was not ordered. Guess we can just
Monday, February 10, 1992

G called. Guess what? No pre-test given. Surprise! Surprise!

Monday, February 16, 1992

Called G and he said that he had talked to P and the students began the project using Skills Bank. She had worked out schedule so that the students would get two hours per week in the lab with Skills Bank. I decided to trust that it would occur.

Tuesday, February 17, 1992

Called Dr. L at T.C.U. and made appointment to talk with her about study and statistics help.

Wednesday, February 18, 1992

Met with Dr. L at T.C.U. She said we needed raw scores for norm-referenced achievement test. Called the school district this afternoon. Talked to E. She said that she could not get the raw scores. She said I needed to talk to her boss, S. I called S. She said there should be no problem and she would call E. S called back after talking to E and said it couldn't be done. She said I
needed to talk to her boss, N. I called N. He said that I had to talk to Dr. E. I called Dr. E. He was not in. I left my name and number.

Thursday, February 19, 1992

No word from Dr. E. Called his office again. He was out of town until next week! I left my name and number for him to call. Visited with his secretary and explained that it was very important.

Monday, February 23, 1992

Didn't hear from Dr. E. Guess I'll call again tomorrow.

Monday, March 2, 1991

Called Dr. E again. He was not in. Talked some more with his secretary. Commiserated about him being a "busy man" and what a "big job" he had. Found out secretary's name was O. Told her I'd call back later in week.

Thursday, March 13, 1992

Called Dr. E again. O sympathized that he was not available. Maybe I'll wait until after spring break to try again.
Thursday, April 2, 1992

Called Dr. E again. Left name and number. O and I "chatted."

Tuesday, April 7, 1992

Posttest administered. Project over. I wonder if anything happened.

Saturday, April 11, 1992

Made another 1,000 copies of surveys!

Wednesday, April 15, 1992

Met in city for class. Got status report on project. Only three homework packets went home; CTB never got going; classes did meet schedule for participation in project.

Thursday, April 16, 1992

Called J and arranged to bring posttest surveys by on Monday so she could administer them Tuesday when the other students are testing.

Monday, April 20, 1992

Took surveys to the comparison learning center. The people are really nice. J explained that the sixth grade was on a trip, but she'd administer the surveys to them when they returned.
Tuesday, April 21, 1992

Called Dr. E again. He was "in a meeting." I must have sounded especially distressed, because O asked me if anything was wrong. I unloaded on her about my frustrations in getting information. She said that she would personally talk to Dr. E between meetings and see that he called me.

Wednesday, April 22, 1992

No word from Dr. E.

Thursday, April 23, 1992

O called me at school. She asked me to explain the project to her and exactly what I needed and why, so she could be clear when she talked to Dr. E. I did. She seemed unusually willing to help and seemed to feel sorry for me. She said she would have Dr. E call me tomorrow. I gave her my home phone and school phone. We'll see what happens now.

Friday, April 24, 1992

Talked to G. He took surveys to the treatment learning center. Told him about my "friendship" with O.
Saturday, April 25, 1992

Still haven't heard from Dr. E. Guess O was not successful. Wonder where to go from here?

Monday, April 27, 1992

Got to school and found out that Dr. E left a message on the school answering machine late Friday afternoon! He said that he was going out of town but would have someone from Research and Evaluation call me. Phone call came in at 8:10 am. It was J M with R&E. He said that Dr. E had called him and told him to get whatever I needed. I explained what I needed and he said he would mail it to my house.

Tuesday, April 28, 1992

Scores arrived in the mail today! Called G! Maybe things are looking up.

Saturday, May 2, 1992

Started inputing scores. Realized that J M had sent 4th, 5th, and 6th from last year, but I needed 3rd, 4th, and 5th. Called G. Told him I assumed that J M would realize that if I needed this years' 4th, 5th, and 6th, then he needed to send me last years' 3rd, 4th, and 5th. Asked him if he would call J M on Monday and see if we could get the third grade scores from last year. I was too
embarrassed to call. After I had gone to that much trouble to get information, I wasn't clear! G said he'd call.

Wednesday, May 6, 1992

G called. He picked up student surveys.

Thursday, May 7, 1992

Third grade scores arrived in the mail. J M is my bud!

Friday, May 8, 1992

Called L to arrange for teacher interviews. We agreed on May 20th. L said she would schedule the teachers and have everything ready.

Saturday, May 16, 1992

G spent weekend and we worked on inputing data. Discovered sixth grade surveys from the comparison learning center missing.

Monday, May 18, 1992

Called J and told her about missing surveys. G brought more surveys to her.
Wednesday, May 20, 1992

Spent day at the treatment learning center interviewing teachers. No one had kept a diary. Overheard counselor talking about posttest scores being delayed. Called J M to verify. He said it could be 30 to 60 days. I cried. No August graduation! Secretary asked me if someone died. I said, "sorta!"

Thursday, May 21, 1992

Conned my son R into picking up sixth grade surveys at the comparison learning center. He got there and guess what? They had forgotten to do them!! R, knowing how important it was, told them he would just wait while they administered them. He sat and waited until he had them all!

Saturday, May 23

Recorded data from sixth grade comparison learning center surveys.

Monday, June 15, 1992

Found out that only three teachers showed up for NECC. Also found out that some districts had received posttest scores.

Thursday, June 18, 1992

Called J M. Asked about posttest scores. He said that he would send them as soon as he could, but the school district was in the middle of a federal
audit and he had "his bosses breathing down his neck." He said he may not get to it until August. I begged. He said he'd try to work my run in as soon as possible, but to not count on it. He assured me that he had my address and would mail them to my house.

Friday, July 3, 1992

Received raw scores for posttest from J M. This is the final bit of information. The end is in sight!
REFERENCES


DISD. (1989). *A plan for the continuing development and implementation of learning centers in south and west Dallas, Grades 4-6*. Dallas, TX: Dallas Independent School District.


