The effectiveness of Discis Books when used to improve reading scores of kinesthetic, below grade-level learners

Michelle Bentler
University of Northern Iowa

Copyright ©1994 Michelle Bentler
Follow this and additional works at: https://scholarworks.uni.edu/grp

Recommended Citation
Bentler, Michelle, "The effectiveness of Discis Books when used to improve reading scores of kinesthetic, below grade-level learners" (1994). Graduate Research Papers. 1752.
https://scholarworks.uni.edu/grp/1752

This Open Access Graduate Research Paper is brought to you for free and open access by the Student Work at UNI ScholarWorks. It has been accepted for inclusion in Graduate Research Papers by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.
The effectiveness of Discis Books when used to improve reading scores of kinesthetic, below grade-level learners

Find Additional Related Research in UNI ScholarWorks
To find related research in UNI ScholarWorks, go to the collection of School Library Studies Graduate Research Papers written by students in the Division of School Library Studies, Department of Curriculum and Instruction, College of Education, at the University of Northern Iowa.

Abstract
A reading comprehension study using Discis Books and below grade level sixth grade readers at Harmony Middle School Farmington, Iowa, testing positive as kinesthetic learners, was carried out in a nine week time period. The study's participants completed a learning styles inventory and a comprehension reading inventory. Students were then randomly divided into experimental and control groups. The control group participated in classroom instruction and independent silent reading. The experimental group participated in classroom instruction and computer assisted instruction. A post comprehension inventory was administered.

Data were collected to determine if kinesthetic learners improved reading comprehension through the use of computer-assisted instruction in addition to regular guided reading instruction. The results indicated that kinesthetic learners using Discis Books did improve reading comprehension.
The Effectiveness of Discis Books when used to Improve Reading Scores of Kinesethic, Below Grade-level Learners

A Graduate Research Paper

Submitted to the

Division of Library Science

Department of Curriculum and Instruction

in Partial Fulfillment

of The Requirements for the Degree

Master of Arts

UNIVERSITY OF NORTHERN IOWA

by

Michelle Bentler

July 21, 1994
This Research Paper by: Michelle Bentler

Titled: The Effectiveness of Discis Books when used to Improve Reading Scores of Kinesethic, Below Grade-level Learners

has been approved as meeting the research paper requirement for the Degree of Master of Arts.

Barbara R. Safford
Date Approved: July 28, 1994
Graduate Faculty Reader

Leah Hiland
Date Approved: July 28, 1994
Graduate Faculty Reader

Peggy Ishler
Date Approved: Aug. 29, 1994
Head, Department of Curriculum and Instruction
Abstract

A reading comprehension study using Discis Books and below grade level sixth grade readers at Harmony Middle School, Farmington, Iowa, testing positive as kinesthetic learners, was carried out in a nine week time period. The study's participants completed a learning styles inventory and a comprehension reading inventory. Students were then randomly divided into experimental and control groups. The control group participated in classroom instruction and independent silent reading. The experimental group participated in classroom instruction and computer-assisted instruction. A post comprehension inventory was administered.

Data were collected to determine if kinesthetic learners improved reading comprehension through the use of computer-assisted instruction in addition to regular guided reading instruction. The results indicated that kinesthetic learners using Discis Books did improve reading comprehension.
# Table of Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>iv</td>
</tr>
<tr>
<td><strong>Chapter</strong></td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Significance and Purpose of the Study</td>
<td>7</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>8</td>
</tr>
<tr>
<td>Assumptions</td>
<td>8</td>
</tr>
<tr>
<td>Limitations</td>
<td>8</td>
</tr>
<tr>
<td>Definitions</td>
<td>9</td>
</tr>
<tr>
<td>2. Literature Review.</td>
<td>10</td>
</tr>
<tr>
<td>3. Methodology.</td>
<td>15</td>
</tr>
<tr>
<td>4. Data Analysis.</td>
<td>18</td>
</tr>
<tr>
<td>5. Conclusions, Recommendations, Summary</td>
<td>23</td>
</tr>
<tr>
<td>Bibliography.</td>
<td>26</td>
</tr>
<tr>
<td><strong>Appendixes</strong></td>
<td></td>
</tr>
<tr>
<td>A. List of Discis Books Available for Study</td>
<td>29</td>
</tr>
<tr>
<td>B. Self-Assessment of Modality Strengths</td>
<td>30</td>
</tr>
</tbody>
</table>
# Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Results of the <strong>Self-Assessment of Modality Strengths</strong></td>
<td>18</td>
</tr>
<tr>
<td>2. List of Individual Profiles on the <strong>Classroom Reading Inventory</strong></td>
<td>19</td>
</tr>
<tr>
<td>3. Comparison of Grade-level Scores for Reading at the Independent Level</td>
<td>21</td>
</tr>
</tbody>
</table>
CHAPTER 1

Introduction

Every autumn, on the first day of school, thousands of six-year-olds board busses in the morning with the expectation they will be returning home that afternoon able to read. Hopes are crushed as children realize there is more to reading than being a first grader. Over the days, months, and years ahead most of these same children do learn to read. They are the fortunate ones.

Millions of people in the United States can not read. Illiteracy has become a major concern. A joint statement issued February 26, 1990, by President George Bush and the Governors of the United States of America, called America 2000, includes literacy as one goal. That goal states, "By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship" (U.S. Department of Education, 1991, p.3).

What is literacy? Arriving at a uniform definition has not been easy. The national adult literacy survey committee worked to adopt a definition of literacy before it conducted a survey in 1992, authorized by Congress, to determine an accurate estimate of the number of illiterate adults in the United States. The committee concluded that simple illiteracy scales are meaningless. The survey did not produce a single number of illiterates but did instead "produce a variety of estimates that show percentages of adults
performing tasks at different levels of difficulty" (U. S. Department of Education, 1990, p. 4).

Reading is the process of constructing meaning from words and sentences. "Readers construct meaning best when they have whole meaningful text" (Strickland, Feeley, and Wepner, 1987, p. 4). Although the meanings that are constructed may not come directly from the text; "they are the product of the interaction between the reader and the text" (p. 3). Guidance, reinforcement, and corrective feedback are important components in reading instruction. Throughout the learning process, the skill of reading must be practiced.

Teachers and reading experts agree that encouraging children to read is the key to the children's success in later life. Almost all curricular areas include the skill of reading as imperative in the comprehension of subject matter. Students' reading abilities will have an effect whether positive or negative upon their future success.

Reading aloud to, with, and by children is seen by whole language experts as the single most influential factor in young children's success in learning to read. Reading aloud improves listening skills, builds vocabulary, aids comprehension, and promotes a positive student attitude. Routman (1991) also states, "Reading aloud is a powerful technique for promoting story enjoyment and literature appreciation, and for noting what authors do in the writing process so that students can make similar choices for themselves" (p. 33).
Another teaching method is shared reading. In shared reading a student is invited to read along with another reader who can read with fluency and expression. The "expert" reader can be a teacher, adult, student, tape recorder, or now a computer. Shared reading is a rewarding activity because no pressure is put on the student to perform. Self-concepts can be strengthened through the success of reading with someone else rather than reading individually.

Traditionally, most people have learned to read with the whole class, or small groups reading the same story at the same time and answering the questions at the completion of the story. This is called guided reading. The facilitator guides the students through the story with the thinking about and questioning of the story actually being more important than the story itself.

Another type of teaching methodology is independent reading, an activity which students enjoy. During independent reading, students are given the right to select the books that they want to read. A study of fifth graders' activities outside of the school day found that "time spent reading books was the best predictor of a child's growth as a reader from the second to the fifth grade" (Anderson, Wilson, Fielding, 1988, p. 297).

Research shows time after time how vital reading is to a student's future success. A balanced reading program will include all four of the methods previously discussed. Whole language research indicates "all of us learn language most easily when the language is whole, and when the experiences, contexts, and texts are meaningful and relevant to the learners' lives" (Routman, 1991, p. 390).
Unfortunately, the skill of reading does not come easily to everyone. Regular classroom methods will not always work. "Poor readers spend their energy decoding rather than reading for meaning. These students are also less likely to ask questions, less likely to employ alternative decoding strategies, and less likely to think back about what they have read" (Routman, 1991, p.5). "Poor readers are at the mercy of the author; if there is a word they don't know they become easily frustrated" (Discis Books, 1990, p. 36).

The reading process for the remedial student may be different from the reading process for the average or gifted student. Learning styles differ among individuals. Remedial reading students see things holistically and globally; they have great difficulty breaking words into parts for analysis. Teachers need to understand the differences and make changes to the strategies used whenever possible. If a child's interest is stimulated it will arouse creativity and curiosity.

Studies that deal with matching instructional methods to learner characteristics are called Aptitude-Treatment Interaction research. Smith (1976) confirms results indicating that matching learning styles significantly enhances educational outcomes (p. 48). Smith and Renzulli (1984) believe teachers should make informed decisions about incorporating activities in which learning style differences can flourish. On the other hand, teachers should not accommodate learning style preferences on all occasions for all students. Carbo, Dunn, and Dunn, (1986) report children with visual preferences learn best with books, films, filmstrips, handouts, computer software, and other resources. Children with auditory
strengths learn best with tape recordings, and resources that stimulate discussions. Kinesthetic-dominate children need resources that are not sufficiently available in many schools. These children need to touch, feel, and experience what is being learned. Kinesthetic children learn best through playing games, hands-on activities, trips, dramatics, and computers (p. 91).

Computer-assisted instruction helps meet the needs of kinesthetic preferred children. Curriculum is taught through the use of appropriate software and students are motivated to use computers. Companies are producing interactive software products to get the user involved in the learning process.

Discis Books are interactive computer-based books that will run on any Macintosh computer with a CD-ROM drive. The image on the screen looks like pages in an open book that appear to turn. No keyboarding skills are required so distractions are held to a minimum when the keyboard is removed. The user only has to be able to point and click with a mouse because the system is mouse-driven. Authentic text and illustrations from well-known books are enhanced by real voices, music, and sound effects. "All spoken information comes from recorded human voices rather than digitized, computer-produced speaking" (Jacobson, 1992, p. 411).

Discis Knowledge Research was founded by John and David Lowry in 1988. The Lowrys began developing Discis Books with the assistance of Apple Canada, Inc. for the Macintosh computer. At this time, there are fourteen Discis Books available for grades kindergarten through eight. See Appendix A. Discis Books also come with teacher support materials which include motivational and
enrichment activities as well as suggestions on incorporating the books into a literature-based or whole language curriculum.

First and second language learning can be assisted by Discis Books. They are available in English with second-language capabilities in Spanish, French, and Cantonese. English-as-a-second-language students may find that Discis Books fill a gap in their education by providing untiring repeated practice with the language and instant in-context information. Each story can be read again and again at the student's pace.

"A book's presentation may be individualized to meet the personal needs of each reader" (Martin, 1992, p. 42). Each story can be customized in many ways by the teacher or the student. The student can read the story as it appears on the screen or the story can be read clearly to the student by the computer, with the choice of a man, woman, or child's voice. Individual phrases are highlighted to coordinate with the narrator's pacing, allowing students to follow the text. Clicking a word with the mouse will elicit the pronunciation, syllabification, or second language translation. Double click a word and one gets an oral in-context definition of the word. Click an illustration and the object is pronounced along with the word printed inside a box. Control is in the hands of the user.

Other customizing features are: variable delays between phrases, slower reading rates, adjusting the font size and style, and turning the sound on and off. Students may also make use of an electronic bookmark to keep their place if they do not finish reading the story. If a student turns "help" on, the mouse pointer turns into a question mark. A voice will then give an explanation of any
feature pointed to with the mouse. In the translation books, "help" gives aid in both languages.

Significance and Purpose of the Study

Whenever recommendations are made for changing the way content is taught in the classroom, the teacher should ask the following questions. Why is it necessary to modify instructional practices based on a "new" concept? Will it enhance teacher effectiveness? Will it improve students' learning and increase their motivation? Teachers' knowledge of students' learning styles could help in answering these questions. Combining attempts to teach to remedial readers' learning styles with quality instructional computer strategies may facilitate an increase in reading comprehension.

The technological advances of interactive software combining the capabilities of computers and CD-ROM disks offer an alternative instructional method. A limited amount of research has been published connecting learning styles and computer-assisted instruction. No research has been found by the researcher to have been published pertaining to the effectiveness of Discis Books as a learning and instructional tool.

This research project attempted to find out if sixth grade kinesthetic learners at Harmony Middle School, Farmington, Iowa, reading below grade-level improved their reading comprehension through the use of Discis Books with the traditional guided reading instruction.
Hypothesis
The reading comprehension of the majority of below grade-level kinesthetic learners will not improve through the use of computer-assisted instruction given in addition to guided reading instruction.

Assumptions
Students' learning styles and reading comprehension levels can be identified. Students can be identified to fit the criteria of below reading level, kinesthetic learners through the results of a valid and reliable learning styles inventory and a valid and reliable reading inventory. Students identified as kinesthetic below grade-level readers would volunteer to be a part of this study and would participate for the extent of the study.

Computer-assisted reading instruction is a viable teaching methodology.

The reading instructor would be familiar and adept with the use of Discis Books and would have access to the students, materials, and equipment needed to complete this study.

Limitations
This study used exclusively the commercial product called "Discis Books" as computer-assisted instruction. The number of Discis Books as well as the number of computer/CD-ROM stations available were limitations for students who were absent and needed to make up time. The researcher was not be the instructor in this experiment.
Definitions

For the purpose of this study, the following definitions were used:

**Kinesthetic**- a learning style in which learning takes place using all five senses.

**Below grade-level readers**- sixth grade students whose results from the reading inventory rank below sixth grade.

**Reading comprehension**- "the processing of constructing meaning from written words and sentences" (Strickland, Feeley, and Wepner, 1987, p.4).

**Computer-assisted instruction**- "the use of computer software to support the objectives of the curriculum" (Wheeler, 1988, p.11).

**Interactive text**- any computer mediated text that can be manipulated to facilitate a reader's comprehension while he or she is reading.

**Learning style**- "the way that students are affected by their (a) immediate environment, (b) sociological needs, (d) physical characteristics, and (e) psychological inclinations when concentrating and trying to master and remember new or difficult information or skills" (Carbo, Dunn, and Dunn, 1986, p.2).

**Independent reading level**- "the level at which persons can read comfortably on their own" (Silvaroli, 1982, p.6).

**Instructional level**- "the level at which a student can learn with help and guidance" (p.6).

**Frustration level**- "the level that is beyond a student's instructional level" (p.6).
CHAPTER 2

Literature Review

Current understanding dictates that reading should be taught in contexts that are meaningful to students. The student must remain the focus in the instructional process but sometimes educators get caught-up in the instruction of reading. A computer used in the reading classroom is just a tool, it is not a replacement for the teacher. Some reading teachers did not accept computers into their classrooms when they first appeared in schools. It was thought that the "students would be interacting with machines instead of people, they would loose their sense of the printed page, and students would never develop the intimate relationship that exists between a reader and a book" (DeGroff, 1990, p. 570).

Computers facilitate reading for real purposes when it involves whole and meaningful text. This technology has the capability of serving as a tool in reading instruction, however, "it is not a replacement for an adult reading to a child" (A Tale of..., 1991, p. 66). "It could redefine some popular notions about what a book is— or rather what a book does" (Publishing: Lean, Green..., 1991, p. 94).

Research in whole language has indicated that skill oriented worksheets are a waste of time. Early software programs were drill, drill, drill. Students practiced reading skills in isolation. A person could have concluded that the early computer software programs looked and worked like worksheets. Potter (1989) found, "without quality software, a computer is useless" (p. 14). Whitaker, Schwartz, and Vockell, (1989) caution, "It is not a good idea to buy
and use a program simply because it is considered a good program. Always have a goal in mind when you direct your students to use a particular piece of instructional software" (p. 160). Potter (1989) says, "The software must support the regular reading instruction program" (p.14). "Curriculum and instruction rather than technology will determine the role of the computer in the classroom" (DeGroff, 1990, p. 568). A quality reading software program should consist of a mix of functions. The program should include: specific skills, vocabulary development, increased reading rate, comprehension techniques, and a way to individualize the entire program. "The computer can be used as an educational tool for remedial readers by using software that allows for reading for meaning" (Wheeler, 1988, p.33). Norton and Resta (1986) found that remedial readers improved when computer software was in problem-solving or simulation formats.

Computer-assisted instruction does has some limitations. The expense of the hardware is a major stumbling block that school districts are hurdling by purchasing through co-ops and/or spreading the cost out with payment plans, and/or by receiving grant monies. Hardware is not the only expense; quality software is another major purchase. Reasonably priced quality programs do exist and a selection tool can help to locate them. Another limitation is the computers' inability to listen to a student read. Also, the computer is limited to respond as it is programmed. Teachers can listen, offer encouragement, and make the spontaneous responses that the computer can not make. Teachers are a necessary factor in the success of computer-assisted instruction.
Computer-assisted instruction has advantages. According to Kamil, (1987), instruction can be individualized, an authentic curriculum can be developed, and strategies for improving attention and motivation can be incorporated into computer-assisted instruction easily (p. 65). Dr. George McConkie, Professor at the Center of Study for Reading at the University of Illinois has conducted several studies in computer assisted reading with adults who have poor reading skills. He found computer-aided technology produces "remarkable results in increasing reading skill levels" (Discis Books, 1990, p. 36). Potter (1989) reports the results of an experimental study using a summer remedial reading program for sixth through eighth graders who failed reading classes the previous year. Two classes used computer-assisted instruction and two classes were the control. After five weeks, "no significant difference existed on subtests for vocabulary, reading comprehension, and reference skills, however, the computer-assisted instruction classes did achieve significantly higher in total reading scores than did the control classes" (p. 32).

"Students using computer-assisted instruction feel that they are in charge, opposite of a typical classroom where the teacher is in charge" (p. 12). "Computer aided reading puts people in control by allowing them to increase their vocabulary, determine definitions and read at their own pace" (Discis Books, 1990, p.36). Students also have the power to control the pace of their work and they can receive immediate feedback on what they have done.

Wheeler's (1988) research supported other findings that learning is facilitated when the learning style of a student is
accommodated during instruction. Most low achieving students have similar learning style characteristics, and the low achiever's achievement is impacted by a software format that is holistic in design. Manipulating computer formats influenced by learning styles facilitates learning (p. 25).

The time has come for technology to have a vital role in the reading classroom. Many new exciting products are available or are becoming available. Discis Books, published by Discis Knowledge Research, are one of the first interactive reading computer-assisted instructional programs to be produced commercially. "Discis Books allow for the words to be learned in context and through pictures, while providing an individualized vocabulary list that can later be reviewed" (Wood, 1992, p.1).

Discis Books have many advantages over other computer software. The procedures of the CD-ROM format of books claim to encourage learning and promote improved understanding of written language. English-as-a-second-language students benefit from the clear voice reading to them. Oral reading is also beneficial to the children whose parents do not read aloud. Customization to meet each student's individual needs provides the student with the self-concept to succeed. Students may proceed at their own pace. Students do not have to rely on the teacher to give them an answer, the computer will do it. Students are provided with a way to have instantaneous access to any part of the story.

Discis Books do have weaknesses. First of all, the books are expensive. They range in price from $74.95 to $89.95. They run only on a CD-ROM with a Macintosh computer. Discis Books would
add to their appeal with the addition of movement in the illustrations. Even though the books are customized for individual students, "some of the information in the programs are well above the comprehension level of the targeted student user" (Eiser, 1991, p. 8). Another concern deals with "conveying meanings either unintentionally or implicitly, through labeling. These meanings are transmitted through illustrations, vocabulary, voice quality, ... and countless other mechanisms we are not consciously aware of" (Jacobson, 1992, p. 415). The books are sold individually and in collections of ten titles, but the teacher's guide is not included with the purchase of a single CD-ROM and must be acquired separately.

An opportunity exists to add to the body of knowledge in this fast growing technological era. The studies discussed in this paper indicate a need to provide an optimum learning situation for every student taking individual learning styles into consideration. No published studies on the effectiveness of Discis Books have been found by the researcher. Discis Knowledge Research, Inc. had a goal, "to develop a new medium for reading and learning which would result in a better level of understanding" (Discis Books, 1990, p.35).

Smith and Renzulli (1984) found "giving students the opportunity to pursue reading in a self-chosen fashion increases their "investment" in the learning material being prescribed" (p. 47). Perhaps children's reading comprehension will improve when all children have the opportunity to control their learning through their learning styles. "Teachers teach, children learn, and the computer serves as a tool for teaching and learning." (DeGroff, p. 572).
CHAPTER 3

Methodology

Students who formed the population for this study were drawn from the sixth grade class at Harmony Middle School, Farmington, Iowa. Students were first given a learning styles inventory to learn their modality strength. Students scoring below grade-level on the reading inventory were given a learning styles inventory.

The learning styles inventory used was for middle school-aged students. Frender, (1990), developed the *Self-Assessment of Modality Strengths*, (p.22-24). See Appendix B. The inventory was a self-assessment of learning modality strengths. Students individually completed the learning styles inventory in approximately fifteen minutes. The assessment consisted of fourteen questions in which the students chose the best answer for herself/himself from three choices given. The choices represented auditory, visual, and kinesthetic learning. After completion, the inventory was then hand-scored by the students and the results tabulated.

The students identified as kinesthetic learners were then given a reading inventory to test reading comprehension levels. The kinesthetic below grade-level readers became the population for this experiment. Since the total population was small in size, no sampling procedure was needed. Members of the control and experimental groups were selected into the groups randomly, alternating between the two groups.
The researcher used the 4th edition of the *Classroom Reading Inventory* by Nicholas J. Silvaroli (1982) and published by Wm. C. Brown Company Publishers. The *Classroom Reading Inventory* is a version of an informal reading inventory using an individual testing approach to identify a subject's minimum level of specific word-recognition and comprehension skills. The *Classroom Reading Inventory* is used to determine the subject's independent, instructional, frustrational, and hearing capacity levels.

The time required for administering the *Classroom Reading Inventory* is twelve minutes or less. Forms A, B, and C, may be used in a variety of ways. The forms may be used for pretesting, posttesting, silent and oral reading, and hearing capacity levels. Form D is designed for mature subjects with the story content dealing with mature topics. The paragraphs included in the inventory were evaluated for their readability level by four well-known readability measures.

Both groups participated in scheduled classroom reading instruction for the full class period each day. The control group took part in individual independent reading for twenty minutes, three times per week while the experimental group individually interacted with Discis Books for twenty minutes, three times per week. The reading teacher worked with both the control and experimental groups monitoring progress and providing encouragement. The classroom reading teacher met with the researcher once a week to discuss the study and control the implementation of details. The equipment and Discis Books were
located in the classroom of the reading teacher on a computer cart so that it could be relocated if necessary.

Another form of the Classroom Reading Inventory was given to both groups at the conclusion of the nine week time span. An alternate form was used so the subjects were reading unfamiliar material. The results were tabulated and compared to the results from the pretest. The researcher then determined the difference in reading ability between subjects in the experimental and control groups of kinesthetic below grade-level readers.
CHAPTER 4

Data Analysis

All sixth graders at Harmony Middle School during the 1992-93 school year were given the Learning to Learn: Strengthening Study Skills and Brain Power learning styles inventory to complete on March 20, 1992. Students answered fourteen multiple choice questions and then completed the scoring page. The structure of the inventory is self-correcting, however, upon the students' completion of the scoring, the researcher also tabulated the results to ensure accuracy. See Table 1.

<table>
<thead>
<tr>
<th>Modality</th>
<th>No. of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory</td>
<td>15</td>
</tr>
<tr>
<td>Visual</td>
<td>12</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
</tr>
</tbody>
</table>

Table 1

Results of the Self-Assessment of Modality Strengths

The inventory results for the forty-six students were compiled along with student identification numbers assigned in the order the finished inventories were handed to the researcher.

The data collected were reordered according to kinesthetic preference. Nineteen students who scored 5 or higher of the 14 questions on the kinesthetic modality were selected to be given Form A of the Classroom Reading Inventory. The Classroom Reading Inventory is one version of an informal reading inventory designed to identify a minimum level of specific word-recognition and
comprehension skills. Each student was individually tested to determine independent, instructional, and frustrational reading levels.

Eight of the nineteen students given the informal reading inventory successfully scored above grade-level and were eliminated from the study's population. The eleven remaining below grade-level readers became the sample for this research project. This analysis is shown in Table 2.

Table 2
List of Individual Profiles on the Classroom Reading Inventory

<table>
<thead>
<tr>
<th>Student</th>
<th>Independent</th>
<th>Instructional</th>
<th>Frustrational</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 1</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>* 2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>* 6</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>* 7</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>* 11</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>* 12</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>7</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>* 15</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>* 17</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>18</td>
<td>7</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>* 20</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>22</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>7</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>* 32</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>* 45</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Total 19

Note: Dashes indicate students who tested beyond the limits of the inventory.

* Students meeting the criteria for the study.
Based upon data gathered in this study, 58 percent of the students favoring a kinesethetic modality were below grade-level readers and 42 percent of the students favoring a kinesethetic modality were above grade-level readers.

All eleven students agreed to participate in the research project for the entire nine week time period. The participants were randomly assigned alternately to the control and experimental groups.

The classroom teacher and the researcher kept a folder on each student. Included in the folder were: the learning styles inventory, informal reading inventory pre-test, reading log, Discis Book titles used, schedule of times met, and the informal reading inventory post test.

Each student in the experimental group was assigned three, twenty minute blocks of time at one of the two computers equipped with a CD-ROM player. Approximately fifteen minutes of the time, the students worked independently. During the other five minutes, the participants were observed by either the classroom teacher or the researcher.

The control group met together for twenty minutes, three times per week, in the library for independent reading. Each member of the control group met individually with the classroom teacher or the researcher at least once a week to discuss what they were reading and to read a passage orally.

The classroom teacher and the researcher met every Thursday morning from 8:00-8:15 to discuss the experiment as a whole as
well as the students' progress or problems that might have developed.

At the conclusion of the nine week experiment, the hypothesis, "The reading comprehension of the majority of below grade-level kinesthetic learners will not improve through the use of computer-assisted instruction in addition to guided reading instruction," was tested. All eleven students were reevaluated using Form B of the Classroom Reading Inventory.

A comparison of the pre and post-test scores showed that the majority of the participants in this study improved whether they were using Discis Books or reading independently as shown in Table 3.

### Table 3

Comparison of Grade-level Scores for Reading at the Independent Level.

<table>
<thead>
<tr>
<th>Student Groups</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>+</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>3</td>
<td>+</td>
</tr>
<tr>
<td>32</td>
<td>1</td>
<td>2</td>
<td>+</td>
</tr>
<tr>
<td>45</td>
<td>5</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>6</td>
<td>+</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>7</td>
<td>+</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>5</td>
<td>+</td>
</tr>
</tbody>
</table>
Sixty-six percent of the study's participants in the experimental group did improve reading comprehension, and 60 percent of the control group improved their reading comprehension. The hypothesis is rejected.
Conclusions

The analysis of the data relevant to the hypothesis reveals that the majority of the participants in the experimental group had improved reading comprehension scores. The control group had improved reading comprehension scores as well. The hypothesis, "The reading comprehension of the majority of below grade-level kinesthetic learners will not improve through the use of computer-assisted instruction in addition to guided reading instruction," was rejected.

The researcher and teacher concluded that Discis Books were very motivational when used with the experimental group. The control group was not nearly as excited to read. Individuals repeatedly requested to be moved to the experimental group, however, the control group did state that they looked forward to the book discussions with the researcher and the teacher. The researcher and teacher speculate the additional time each week spent reading was the reason for the increased reading comprehension. Most participants using Discis Books enjoyed the stories and could independently control the interactive features. The experimental group students also stated that the programs are simple enough for any elementary school-aged student to operate. Members of the experimental group were proudest of their perceived improvement in oral fluency. The researcher did not
study oral fluency, so it is not known if the participants did or did not improve in this area.

Motivation to use the Discis Books increased school wide. Following the conclusion of the study, the Discis Books were always in demand. Students reserved the computers a week early and a time limit of one class period per week using the Discis Books had to be enforced to accommodate the demand.

The purpose of this study was to gain information as to the effectiveness of Discis Books when used to improve reading scores of kinesthetic, below grade-level learners.

Recommendations

If the study is repeated, the researcher recommends a larger population and rotation of the groups after nine weeks to determine if there is more growth from computer-assisted instruction or independent reading. An interesting adaptation of this study would be to use first graders with advanced reading abilities. The researcher also recommends a study incorporating oral fluency. All members of the experimental group perceived self-improvement in this area.

A comparison of Borderbund and Discis Books on CD-ROM would be an interesting study. Both products have similar goals as outcomes but the degree of interactiveness varies.

Summary

The sixth grade class at Harmony Middle School participated in a learning styles inventory. All students scoring 5 or higher in the kinesthetic modality were then administered an informal reading inventory to determine independent, instructional, and frustrational
reading levels. Below grade-level readers were then selected as the population for the study. Students were randomly assigned into experimental and control groups. For nine weeks, both groups attended guided classroom reading instruction. In addition to guided reading instruction, the experimental group individually used Discis Books for 20 minutes three times a week, while the control group used their 20 minutes three times a week for independent reading. Individuals from both groups met independently with the researcher or the teacher to monitor the progress or problems that might arise. Results of the data collected indicate that kinesthetic learners are not necessarily below grade-level readers but a small majority do read below grade-level. Reading comprehension scores on the post test improved from the pre test for both the experimental and control groups.
BIBLIOGRAPHY


"A Tale of Peter Rabbit." *School Library Journal* 37(November


Appendix A
Discis Books

Aesop's Fables
Cinderella
Heather Hits Her First Home Run
A Long Hard Day at the Ranch
Moving Gives Me a Stomache Ache
Mud Puddle
The Night Before Christmas
The Paper Bag Princess
Scary Poems for Rotten Kids
The Tale of Benjamin Bunny
The Tale of Peter Rabbit
The Tell-Tale Heart
Thomas' Snowsuit
APPENDIX B

Self-Assessment of Modality Strengths

Read each question or statement and circle the most appropriate answer. Some will be difficult to answer, but try to respond according to how you would react most often.

1. You usually remember more from a class lecture when:
   a. you do not take notes but listen very closely
   b. you sit near the front of the room and watch the speaker
   c. you take notes (whether or not you look at them again)

2. You usually solve problems by:
   a. talking to yourself or a friend
   b. using an organized, systematic approach with lists, schedules, etc.
   c. walking, pacing, or some other physical activity

3. You remember phone numbers (when you can't write them down) by:
   a. repeating the numbers orally
   b. "seeing" or visualizing the numbers in your mind
   c. "writing" the numbers with your finger on a table or wall

4. You find it easiest to learn something new by:
   a. listening to someone explain how to do it
   b. watching a demonstration of how to do it
   c. trying it yourself

5. You remember most clearly from a movie:
   a. what the characters said, background noises and music
   b. the setting, scenery and costumes
   c. the feelings you experienced during the movie

6. When you go to the grocery store, you:
   a. silently or orally repeat the grocery list
   b. walk up and down the aisles to see what you need
   c. usually remember what you need from the list you left at home

7. You are trying to remember something and so you:
   a. try to see it happen in your mind
   b. hear in your mind what was said or the noises that took place
   c. feel the way "it" reacted with your emotions
8. You learn a foreign language best by:
   a. listening to records or tapes
   b. writing and using workbooks
   c. attending a class in which you read and write

9. You are confused about the correct spelling of a word and so you:
   a. sound it out
   b. try to "see" the word in your mind
   c. write the word several different ways and choose the one that looks right

10. You enjoy reading most when you can read:
    a. dialogue between characters
    b. descriptive passages that allow you to create mental pictures
    c. stories with a lot of action in the beginning (because you have a hard time sitting still)

11. You usually remember people you have met by their:
    a. names (you forget faces)
    b. faces (you forget names)
    c. mannerisms, motions, etc.

12. You are distracted most by:
    a. noises
    b. people
    c. environment (temperature, comfort of furniture, etc.)

13. You usually dress:
    a. fairly well (but clothes are not very important to you)
    b. neatly (in a particular style)
    c. comfortably (so you can move easily)

14. You can't do anything physical and you can't read so you choose to:
    a. talk with a friend
    b. watch TV or look out a window
    c. move slightly in your chair or bed
Scoring

1. Count the total number of responses for each letter and write them below.

   a. _____ auditory  (learn best by hearing)

   b. _____ visual    (learn best by seeing)

   c. _____ kinesthetic (learn best by touching, doing, moving)

2. Notice if one modality is significantly higher or lower, or if any two modalities are close in number.

3. Were the results as you expected them to be? Is that the way you see yourself?