A study examining the effect of multi-sensory stimulation on the descriptive writing of fourth grade students

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The purpose of this study was to determine if multi-sensory stimulation during writing exercises would increase the number of descriptive elements used by fourth grade students. Thirty-five students in two intact classrooms participated in the nonequivalent control group design study. A learning styles questionnaire was administered to both groups to ensure that all modality preferences were represented in each classroom. Two pretests in the form of writing prompts were given to each group. Two weeks later posttests identical to the pretests were administered to each group. During posttest writing exercises, the experimental group was exposed to multi-sensory stimulation. The control group received no sensory stimulation. All writing samples were scored for the number of descriptive elements present. Pretest and posttest scores for each subject were compared for “amount learned.” Based on $t$ tests calculated for each writing prompt, findings were mixed. Results from one writing prompt indicated that the experimental group had significantly higher scores for “amount learned” than the control group, whereas scores for both groups were not significantly different for the other writing prompt. Consequently, the hypothesis was rejected.
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TABLE OF CONTENTS

ACKNOWLEDGEMENTS ..................................................................................................................... iii

LIST OF TABLES ................................................................................................................................. vi

CHAPTER

I SCOPE OF THE STUDY ....................................................................................................................... 1

   Introduction ..................................................................................................................................... 1
   Statement of the Problem ............................................................................................................... 2
   Statement of the Hypothesis ........................................................................................................... 3
   Limitations of the Study .................................................................................................................. 3
   Definition of Terms ......................................................................................................................... 4

II REVIEW OF RELATED LITERATURE .............................................................................................. 6

   Introduction ..................................................................................................................................... 6
   Descriptive Writing in the Classrooms ............................................................................................. 7
   Learning Through Learning Style .................................................................................................... 9
   Teaching to Modalities .................................................................................................................... 10
   Multi-Sensory Instruction ................................................................................................................ 13
   Multi-Sensory Stimulation on Language Skills .............................................................................. 15

III PROCEDURE AND DESIGN .......................................................................................................... 19

   Introduction ..................................................................................................................................... 19
   Description of Subjects .................................................................................................................... 20
   Experimental Design and Procedure ............................................................................................... 21
   Description of Instruments ............................................................................................................. 22

IV ANALYSIS OF FINDINGS .............................................................................................................. 24

   Introduction ..................................................................................................................................... 24
   Analysis of Learning Style Preference ............................................................................................ 25
   Tabulation of Raw Scores ............................................................................................................... 26
   Tabulation of $t$ Test ......................................................................................................................... 29
   Analysis Related to Purpose of Hypothesis .................................................................................... 32

V SUMMARIES, CONCLUSIONS, AND RECOMMENDATIONS ............................................................ 34

   Introduction ..................................................................................................................................... 34
   Summary of Problem ....................................................................................................................... 35
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning Style Preferences Among Subjects</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Raw Scores for Control Group</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Raw Scores for Experimental Group</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>Descriptive Statistics for Writing Prompt 1</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>Descriptive Statistics for Writing Prompt 2</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>Amount Learned for Writing Prompt 1</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td><em>t</em> Test for Amount Learned for Writing Prompt 1</td>
<td>31</td>
</tr>
<tr>
<td>8</td>
<td>Amount Learned for Writing Prompt 2</td>
<td>31</td>
</tr>
<tr>
<td>9</td>
<td><em>t</em> Test for Amount Learned for Writing Prompt 2</td>
<td>32</td>
</tr>
</tbody>
</table>
Chapter I

SCOPE OF THE STUDY

Introduction

Descriptive writing is a type of writing in which the author carefully chooses precise language to represent something. Writers often take notice of sensory details and make comparisons by using metaphors and similes to make their writing more powerful (Thompkins, 2003). For descriptive writing to be meaningful, the author needs to provide enough vivid detail so that the reader will actually have a mental picture of what is being described (Everett & Kilborn, 1997).

The current New Jersey Core Curriculum Content Standards for Language Arts Literacy requires that students use a variety of writing strategies, including a range of styles and conventions, to write for different purposes, audiences, and contexts. In particular, as part of Standard 3.2, one of the cumulative progress indicators calls for students to write a descriptive piece (New Jersey Core Curriculum Content Standards for Language Arts Literacy, 2004).

According to a recent report by the National Commission on Writing in America’s Schools and Colleges, writing skills among elementary students were found to be deficient and in need of improvement (Manzo, 2003). The report called for a national agenda in the hopes of improving writing proficiency.

“Great learning comes through the five senses” (Carter, 2001, p. 82). Information
enters our consciousness via sight, hearing, smell, taste, and touch. The more senses that are activated the more likely the information will stay put. Researchers believe that students develop a preference for a particular sense modality, or learning style, and do best and enjoy learning more if taught to this strength (Sprenger, 2003).

Since a prime goal of education is to foster the student's ability to develop associations, it follows that students would have a better chance of developing these associations if teachers used multi-sensory techniques in the classroom (Christie, 2000).

Research has already shown multi-sensory stimulation to be effective for improving reading comprehension and spelling skills (Vickery, Reynolds, & Cochran, 1987). Additionally, research from two different studies showed that mental imagery training improved scores for originality and sensory description in creative writing samples among gifted elementary students (Jampole, Konopak, Readence, & Moser, 1991; Jampole, Mathews, & Konopak, 1994).

Since cognitive processes used in reading comprehension and creative writing are similar, multi-sensory stimulation offers a promising avenue for improving students' descriptive writing. By providing a choice of sensory experiences in the classroom, teachers help students succeed and reach their learning potential (Prestia, 2004).

Statement of the Problem

A report issued by the National Commission on Writing in America’s Schools and Colleges recommended that public schools devote more time and resources to improve the writing proficiency of America's students. The commission recognized that regular writing assignments have declined in American classrooms because of curricular
demands and referred to writing as the "most neglected" of the three "Rs." The
commission had hoped to raise achievement in an effort to prepare students for future
success (Manzo, 2003).

Moreover, the addition of writing assessments on standardized tests, such as
NJASK and SAT, necessitates extra training in writing (Manzo, 2003).

Furthermore, students in the fourth grade experience a weakness in language
development referred to as the "fourth grade slump." Developmental changes that occur
in students at that age, coupled with the increasing demands of the curriculum, cause
students as a group to fall behind (Chall, 1996).

Finally, the students who were the subjects of this study demonstrated a need for
improved writing skills as evidenced by poor mid-year progress indicators.

Statement of the Hypothesis

This research study examined the effects of multi-sensory stimulation on writing
ability, particularly on descriptive writing. It was hypothesized that fourth grade students
who received multi-sensory stimulation during writing exercises would use significantly
more descriptive elements in their writing than fourth grade students who did not receive
multi-sensory stimulation during writing exercises.

Limitations of the Study

A limitation is a factor that restricts or puts a restraint on the study. The following
were the limitations of this study.

The first limitation was teacher variability between the experimental and control
groups. The research had no control over instructional style, teaching experience, and
teacher attitudes toward descriptive or creative writing. These factors may have affected the internal validity of this study.

The second limitation was the variability in preferred learning styles of the students in each group. The different learning styles were all represented within each group, but not in the same proportion. Results may have been skewed if certain types of preferred learning styles responded to the multi-sensory stimulation better than others.

The third limitation was that the research had no control over sensory stimulation outside the realm of this study. Outside sensory stimulation may have had an effect on the internal validity of the study.

A fourth limitation to this study was the fact that the groups did not contain random samples of students. The groups were products of convenience sampling. Because of this limitation, the results cannot be generalized to other populations.

A fifth limitation was pretest sensitization. All subjects wrote from the same prompt in the posttest as they did in the pretest. Posttest writing samples may have included more descriptive elements simply because the subjects had been exposed to the prompt previously rather than resulting from the treatment.

Definition of Terms

The following are definitions of terms used in this research:

Descriptive writing: a type of writing characterized by the author’s use of sensory details in order to create a mental picture in the reader’s mind.

Learning styles: the way information is learned or processed, expressed as visual, auditory, kinesthetic, and tactile.

Modality: a physiological sense (sight, hearing, touch, smell, or taste).
Multi-sensory: relating to or involving several physiological senses (sight, hearing, touch, smell, and taste):

Writing prompt: a statement that orients the writer to the subject and provides direction and/or purpose for the writing assignment.
Chapter II

REVIEW OF RELATED LITERATURE

Introduction

Descriptive writing involves the use of vivid sensory details in order for the reader to have a mental picture what is being described (Everett & Kilborn, 1997). A recent report by the National Commission on Writing in America’s Schools and Colleges called for a national agenda to improve writing skills among elementary students, which were found to be deficient. The report proposed an increase in the amount of time and resources spent on writing in America’s classrooms (Manzo, 2003).

Since information enters our consciousness via the five senses, the more senses that are activated the more likely the information will stay put (Sprenger, 2003). Using multi-sensory techniques is a good approach for activating these senses and developing associations necessary for learning (Christie, 2000).

Furthermore, engaging all the senses assures that students will have “deep and rich sensory experiences of whatever is to be learned” (Caine & Caine, 1991, p.113).

Research studies have already shown multi-sensory stimulation to be an effective approach for improving reading comprehension and spelling skills (Vickery et al., 1987). Since cognitive processes used in reading comprehension and creative writing are similar, multi-sensory stimulation provides a hopeful remedy for improving students’ descriptive writing (Prestia, 2004).
Research has shown that creative writing scores among gifted elementary students improved significantly when they received mental imagery training (Jampole et al., 1991; Jampole et al., 1994). In addition, a study among 10th-grade English students found that the quality of descriptive writing among those who received auditory and visual stimulation during prewriting was better than those who received no such stimulation (Black, 1993).

The present study explored the effectiveness of multi-sensory stimulation on the descriptive writing abilities of fourth grade students. It was hypothesized that fourth grade students who received multi-sensory stimulation during writing exercises would use significantly more descriptive elements in their writing than fourth grade students who did not receive multi-sensory stimulation during writing exercises.

Descriptive Writing in the Classrooms

Descriptive writing is a type of expository writing that requires that an author provide enough vivid detail so that the reader will actually have a mental picture of what is being described. The writer needs to convey specific elements that contain concrete sensory details utilizing all five senses (Everett & Kilborn, 1997).

Descriptive writing can also be defined as a form of writing in which the author selects specific language, mentions sensory details, and makes comparisons (using metaphors and similes) in order to make the writing more powerful (Thompkins, 2003).

Description enhances other types of writing as well. In a narrative, it can set the scene or make the characters more vivid. In a process paper, description helps the reader understand the finished product. No matter how it is utilized, description significantly
strengthens any piece of writing (Purdue University Online Writing Lab, n.d.).

The New Jersey Core Curriculum Content Standards guides the content taught within all public schools in the state. Under Language Arts Literacy Standard 3.2, it states “proficient writers use a repertoire of strategies that enables them to vary form, style, and conventions in order to write for different purposes, audiences, and contexts” (New Jersey Core Curriculum Content Standards, 2004, p. 83). Specifically, Cumulative Progress Indicator B1 calls for students to be able to write a descriptive piece (New Jersey Core Curriculum Content Standards).

A report by the National Commission on Writing in America’s Schools and Colleges recently called for a national agenda to improve writing proficiency among American students. Data from the 1998 National Assessment of Educational Progress showed that only about one-fourth of 4th graders exhibited grade-level writing proficiency. Because of deficient skills, the report asserted that “public schools must devote more time and resources to improving students’ writing proficiency if they hope to raise achievement overall and prepare students for future success” (Manzo, 2003, p. 10).

The panel, assembled by the College Board, the New York City-based sponsor of the SAT, proposed an increase in the amount of time students spend writing in both English lessons and other subjects. Furthermore, it blamed the decline of regular writing assignments on curriculum limitations and demands on teachers’ time. The report also attributed the decline to the recent focus on raising achievement in mathematics and reading. The panel recommended an increase in resources, technology, and professional development to support additional writing exercises in America’s classrooms (Manzo, 2003).
Learning Through Learning Style

Learning style is defined as “the preferred way in which an individual approaches a task or learning situation” (Cassidy, 2004, p. 421).

It can also be described as a sensory preference. People tend to develop a preference for one particular sense—sight, hearing, touch—over time and process new information from their environment via this sense. Specifically, “they lean on one particular sense to represent most, but not all of their sensory experience” (Dolinsky, 2003, p. 22).

Learning style is the way people focus on and remember new knowledge or skills. “It is composed of cognitive, motivational, and physiological elements that affect each person’s ability to perceive, interact with, and respond to the learning environment” (Dunn & Griggs, 1989, p. 3).

Learning styles can refer to modality preferences (such as visual, auditory, tactile, and kinesthetic), preferences for cooperation versus competition, and individual preferences for environmental factors, such as lighting or temperature (O’Neil, 1990). This study relates learning styles to modality preferences only.

The concept of learning styles is being discussed not only by researchers and psychologists, but also by educators. “It is a key to improving school climate and student achievement by recognizing that all people are not the same, and that all students do not learn in the same way” (Dunn & Griggs, 1989, p. 3).

The rationale behind using learning styles is that it focuses on student strengths rather than weaknesses (O’Neil, 1990). Additionally, data reveals that when teaching methods are aligned to learning styles, students are more motivated, have more self-
confidence, and achieve better academically (O’Neil; Dunn & Dunn, 1979). Moreover, students taught to their preferred learning style tend to internalize the information more readily, retain it longer, and enjoy the learning process more thoroughly than if taught to a less-preferred learning style (Dunn & Griggs, 1989).

It is vital for teachers to have an understanding of learning styles in order to reach all their students. If teachers limit their instructional approach to a single learning style, they will undoubtedly fail to connect with a significant amount of students. When teachers try to accommodate various learning styles, students not only are more engaged, but also will learn to appreciate their own strengths and will ask for what they need to learn more effectively (Pressman & Dublin, 1995).

“Teachers who incorporate appropriate differentiated instruction methods are aware of and pay attention to various learning styles” (VanSciver, 2005, p. 535). In this way, these teachers are helping each student learn in his or her individual way (VanSciver).

Accordingly, while the school wide impact is worthwhile, advocates claim that so-called “at risk” students—those with problem behaviors or family problems that may increase the chance of failure—have the most to gain from using learning styles-based instruction (O’Neil, 1990, p. 5).

Teaching to Modalities

Not only does new information stay put when our five senses are activated, researchers believe that people develop a preference for a particular learning style—or sense modality—and perform best if taught to this strength (Sprenger, 2003).
“Teaching should be multifaceted to allow all students to express visual, tactile, emotional, and auditory preferences” (Caine & Caine, 1991, p. 87).

Often teachers limit their instructional methods to just one or two modalities. They may be comfortable teaching only learning styles that match their own or how they were taught. Likewise they may be restricted because they feel compelled to “teach to the test,” especially with the advent of standardized testing (Douville, 2004).

This is problematic for several reasons. First, it is necessary to teach using different styles not only to reach different learners, but also to broaden the comfort levels of all students with differing modality preferences (Pressman & Dublin, 1995). In other words, matching instruction to a student’s preferred learning style can be effective, however it is also important to help that student “stretch” by learning through other styles as well (O’Neil, 1990).

Next, teaching to a variety of learning styles becomes much more important with the prevalence of “inclusion,” whereby classrooms are more heterogeneous with a wide variety of students with varying learning styles. Teachers have an enormous responsibility in selecting which modalities will be utilized in the classroom. Some students whose learning styles differ from those taught may actually be labeled as being educationally disadvantaged. The best way to reach a majority of the students is to provide a variety of experiences that cover all learning styles (Pressman & Dublin, 1995).

The interrelation of various teaching modalities is complex. Each classroom experience bears the qualities of several modalities, even if one is dominant. And the selection of modalities offers different ways for the teacher to represent knowledge and create meaning for the students (Kress, Ogborn, & Tsatsarelis, 2001).
Young children learn their native language through “multiple interactive experiences.” They are not taught the language; rather, the educational component of these “multiple interactive experiences” is embedded in the experiences themselves. According to brain-based learning theories, this complete immersion in an experience is the best way to learn. Teachers should include real-life activities in the classroom, from field trips to performances to mental imagery. Acting out skits can improve vocabulary, writing stories teaches grammar, and mathematics, history, and science lessons can be integrated for better understanding. “Success depends on using all of the senses and immersing the learner in a multitude of complex and interactive experiences” (Caine & Caine, 1991, p. 86).

Retention of new information is more effective when activities have emotional connections for the students. Simulations and role plays are usually highly engaging and provide meaning and connections for students. Teachers who incorporate these types of activities in their classrooms are improving the chances of retention (Wolf, 2001).

Teaching to modalities can be complicated. Although teaching to students’ preferred learning styles has shown to increase achievement, there is the question of whether or not a learning style preference is truly a strength. Preferring a particular learning style and truly being able to perform better when taught to that learning style are two different things. It all comes down to perception (Dunn, 1988).

Another challenge exists when some students are able to achieve only through certain methods, and when these methods are not successful for others. “A student’s perceptual strengths and weaknesses are extremely important, for no matter how motivated a youngster might be, inability to absorb and retain through an inappropriate sense tends
to dampen motivation and, certainly, inhibits achievement” (Dunn & Dunn, 1979, p. 244).

Another complicating factor is that success sometimes depends entirely on modality preferences. “Whereas the relationship between ability and performance is relatively straightforward, such that performance improves with increased ability, the effects of style on performance are contingent on the nature of the task” (Cassidy, 2004, p. 438). In other words, a visual learner, for example, might perform well on a picture-based task but poorly on a verbal-based task (Cassidy).

For those working in an educational setting, identifying learner preferences and designing instructional methods based on learning style is “necessary but highly problematic” (Cassidy, 2004, p. 440).

Multi-Sensory Instruction

A fundamental purpose of education is to foster the student’s ability to create meaning from their experiences and to develop associations. According to research on memory, students gain a better understanding when teachers use instructional methods—such as multi-sensory techniques—that promote meaning-making and associations (Christie, 2000; Pressman & Dublin, 1995). For example, one teaching model that combined music with a multi-modal learning styles approach was shown to enhance auditory encoding of information (Pressman & Dublin).

Teachers should provide true-to-life experiences in the classroom as much as possible. Instead, the traditional structure of education is set up so that students sit quietly at their desks and either read or hear about the subject at hand. The following illustrates this point:
Concrete experience is one of the best ways to make strong, long-lasting neural connections. These experiences engage more of the senses and use multiple pathways to store—and therefore more ways to recall—information. This is probably why we remember what we have experienced much better than what we have heard or read. True, it is not possible for students to experience everything we want them to learn, but we probably miss many opportunities to engage students in more authentic learning (Wolf, 2001, p. 188).

Multi-sensory instruction is often referred to as the “Orton-Gillingham” approach, a methodology that looks at brain structure to explain human learning. This approach claims to train logical independent thinking through the visual, auditory, and kinesthetic-tactile modalities. By understanding how the brain works, teachers can offer better learning experiences that accommodate varying learning styles (Sheffield, 1991).

Sensory experiences are brain-based events. The information enters our nervous systems, travels to the brain stem, and is examined and processed so we can experience things. Our senses are always “on” even if we aren’t focusing on all the information being collected by our brains at every moment. “Since all information is received through our five senses, many researchers feel that a preference is developed for a specific sense” (Sprenger, 2003, p. 33) In other words, if one sense becomes dominant, people often are inclined to favor one sensory pathway over the others (Sprenger).

“Whole-brain teaching” stresses a balanced approach whereby cognitive processing involves many areas of learning, such as the senses, emotions, and personal connections. This approach distributes learning throughout the brain so that learning is more meaningful and allows students to work for longer periods. Information passed on via the various sense modalities naturally reaches the largest possible number of students. This does not mean that teachers should give up textbooks and “teacher talk.” They just need a more balanced approach (Pressman & Dublin, 1995).
“Research has shown for years that the more senses we involve in a particular experience, the more vivid that experience remains in our memories” (Sprinkle, 1999, p. 189). Teachers already incorporate multi-sensory experiences—such as speaking orally, writing on the chalkboard, including video presentations, encouraging peer group discussions—as a way to include as many senses in the learning process as possible. The olfactory sense, in particular, elicits the most powerful emotions of all the senses and has a close relationship to memory (Sprinkle).

Renowned child development expert Jean Piaget felt that “the child develops conceptual knowledge through sensory interaction with the environment” (Mann & Taylor, 1973, p. 35).

“Teachers need to present instruction in a multisensory manner, using sight, sound, speech, touch, and movement. Such a method integrates sensory pathways to the brain and provides for a variety of learning styles” (Wadlington, 2000, p. 62).

Multi-Sensory Stimulation on Language Skills

Research has already demonstrated that multi-sensory stimulation has had a positive influence on reading comprehension.

One such study indicated that the use of a multi-sensory teaching approach improved reading and spelling test scores among elementary students in both remedial and nonremedial classes. Specifically, the four-year study involved the implementation of multi-sensory instructional materials developed by Orton, Gillingham, and Stillman in grades one through six in a public school. Results showed that California Achievement Test (CAT) scores in reading and spelling improved over baseline scores for both
remedial and nonremedial classes. In addition, the CAT mean scores tended to increase corresponding to the number of years students had been exposed to this multi-sensory approach (Vickery et al., 1987).

Since cognitive processes used in reading comprehension and creative writing are similar, multi-sensory stimulation offers a promising avenue for improving students’ descriptive writing. By providing a choice of sensory experiences in the classroom, teachers help students succeed and reach their learning potential (Prestia, 2004).

The present study sought to demonstrate that multi-sensory stimulation would have similar effects on writing abilities, particularly descriptive writing. Sensory experiences can positively affect writing abilities as noted in the following:

Writing can be a motivating learning experience, however, if the student has something memorable to write about. Much of the success in writing depends on what has occurred before the student starts writing. When students see powerful slides or films, discuss a controversial issue, or act out a moment in history, they are gaining not only information but also motivation for writing (Wolf, 2001, p. 173).

Some formal and informal research points to mental imagery training and multi-sensory stimulation as a means for improving writing skills.

A study conducted on gifted fourth- and fifth-grade students showed that those who received mental imagery training scored significantly higher for certain elements in a creative writing sample than those who didn’t receive the training. During this research, students in the treatment group were given sensory descriptive passages to read and were trained in the use of mental imagery. Students in the control group were given randomly selected short stories and were asked basic comprehension questions. The researchers found that students in the treatment group significantly outperformed the control group.
subjects on originality and use of sensory descriptions in a creative writing sample (Jampole et al., 1991).

A follow-up study that examined the creative writing skills of third- and fourth-grade gifted students confirmed these findings. In this study, students who received guided imagery training were generally more original and used more sensory descriptions in their creative writing than students who received a different kind of instruction (Jampole et al., 1994).

An English teacher who used sensory experiences to teach poetry writing to her ninth graders reported positive results when she implemented multi-sensory workshops into her classroom (Baart, 2002).

Another study explored the use of auditory, visual, and audio-visual stimuli on the quality of descriptive writing among 10th-grade English students. Specifically, three separate groups received treatments in the form of viewing images, hearing music, or both during the prewriting phase of a descriptive writing exercise. Findings showed that the treatment group receiving both auditory and visual stimuli scored significantly higher than the control group that received no sensory stimulation during the prewriting phase. However, the audio-visual treatment group did not score significantly better than either the auditory-only or visual-only groups. Likewise, the study did not show that receiving audio stimulation alone or visual stimulation alone is any more effective than receiving no sensory stimulation during the prewriting phase (Black, 1993).

These results were consistent with prior research by Schuster and Vincent, which showed that music used in combination with visual imagery will increase learning. In
addition, a study by Thompson found that audio-pictorial presentations will improve students' creative writing (Black, 1993).
Chapter III

PROCEDURE AND DESIGN

Introduction

Descriptive writing is a form of writing in which vivid details give the reader a mental picture of what is being described (Everett & Kilborn, 1997). Sensory details and precise language provide the foundation for good descriptive writing (Thompkins, 2003). Recently, a national commission found that elementary students in America’s schools are in need of improved writing skills (Manzo, 2003).

Multi-sensory stimulation is one way to foster creative thinking. Since information enters our consciousness via sight, hearing, smell, taste, and touch, activating more senses will increase the likelihood of securing information (Sprenger, 2003). Also, research asserts that students do better and are more motivated if taught to their preferred learning style (O’Neil, 1990; Dunn & Dunn, 1979).

Research has already shown that a multi-sensory teaching approach is effective for improving reading comprehension skills (Vickery et al., 1987). Other studies point to mental imagery training (Jampole et al., 1991; Jampole et al., 1994) and audio-visual stimulation (Black, 1993) as having positive effects on the creative writing of elementary students.

This research study examined a similar approach. The research hypothesis stated that fourth grade students who received multi-sensory stimulation during writing
exercises would use significantly more descriptive elements in their writing than fourth grade students who did not receive multi-sensory stimulation during writing exercises.

Description of Subjects

The participants in this study were 35 students in two intact fourth grade classrooms at a suburban elementary school located in Gloucester County, New Jersey. One fourth-grade classroom was randomly assigned as the experimental group and the other fourth-grade classroom was randomly assigned as the control group. The experimental group consisted of 17 regular education students, with 10 male and 7 female subjects. The control group included 18 regular education students, with 11 male and 7 female subjects. Since this study examined the increase in the number of descriptive elements utilized from pretest to posttest for each individual student, the demographic characteristics (i.e., race, socioeconomic status) and educational characteristics (i.e., cognitive ability, learning style preference, instructional style of teacher) among the sample groups did not need to be equitable.

The school in which the research took place contained 314 students from grades three through six, with over 4,200 students in the district overall. The average class size was 20.1 students and the predominant language spoken by students at home was English (95.7%). The school was located in a suburban township covering 17.5 square miles in Gloucester County, New Jersey. According to the 2000 U.S. Census Report, the township had a population of 26,763. The racial composition included 83.4% White, 12.4% African American, 1.53% Asian, .21% Native American, .03% Pacific Islander, 1% from other races, and 1.41% from two or more races, while 2.86% of the population were
Hispanic or Latino of any race. The median household income was $50,147 with 5.9% of the population living below the poverty line.

Experimental Design and Procedure

This research study was constructed as a quasi-experimental study using a nonequivalent control group design. This design may have added threats to internal validity, such as history. History refers to the occurrence of events during the study that are not part of the treatment but affect the dependent variable. In this study, the researcher had no control over sensory stimulation outside the realm of the treatment. This “unplanned” sensory stimulation may have influenced the participant’s use of descriptive elements.

Another threat to internal validity based on the study design was differential selection of participants, which suggests that the groups were different before the study began.

One advantage of this study design is that subjects were unaware that they were participants in a study because of the use of intact classrooms.

Subjects from both the experimental and control groups were given a Learning Styles Questionnaire (LSQ) containing 20 questions that assessed modality preferences (see appendix A). The Learning Styles Questionnaire was used for informational purposes of the researcher only to ensure that all modality preferences were effectively established in each classroom.

In addition, each group was given two separate writing prompts and asked to provide a one-page, descriptive writing sample for each prompt. The first writing prompt
(see appendix B) was presented in written form to both groups on the same day. The second writing prompt (see appendix C) was presented in written form to both groups two days later. The resulting writing samples, or pretests, were scored for the number of descriptive elements included in each sample.

Two weeks later the experimental group was given the same two writing prompts used as the pretests. The first and second writing prompts were administered two days apart. Participants were asked to provide another one-page, descriptive writing sample (or posttest) for each prompt. While the subjects were writing, they were exposed to multi-sensory stimulation that related to the writing prompts. During the same timeframe, the control group was given the same writing prompt assignments without the multi-sensory stimulation. The posttest writing samples were scored for the number of descriptive elements included in each sample.

Scores from the pretests and posttests for each subject were compared and analyzed.

All writing assignments and treatment were conducted during the classes’ regular language arts lesson times. Scores from subjects who did not complete both a pretest and posttest using the same writing prompt were disallowed.

Description of Instruments

A Learning Styles Questionnaire (see appendix A) was used to ascertain each student’s preferred learning style—visual, auditory, or kinesthetic/tactile. This questionnaire was developed by the researcher and consisted of 20 multiple-choice questions compiled from various sources. This questionnaire was used for the
informational purposes of the researcher only to ensure that all modality preferences were effectively established in each classroom.

The first writing prompt (used for the pretest and posttest for both groups) directed participants to write a one-page description of an orange from the perspective of an alien who has never seen one before (see appendix B). Subjects were invited to use their senses as they attempted to describe the orange. There was no prewriting for this activity. Treatment for the experimental group (posttest only) consisted of giving each subject an actual orange to provide multi-sensory stimulation as they wrote.

The second writing prompt (used for the pretest and posttest for both groups) directed participants to write a one-page description of an outdoor scene from the perspective of a movie director giving direction to the set/props people (see appendix C). Subjects were invited to use their senses as they attempted to describe the scene. There was no prewriting for this activity. Treatment for the experimental group (posttest only) consisted of the subjects being taken outside near a tree to provide multi-sensory stimulation as they wrote.

Pretest and posttest writing samples were scored for the number of descriptive elements included in each sample (see appendix D). Scores for each participant were compared and analyzed by performing $t$ tests to determine significance.
Chapter IV

ANALYSIS OF FINDINGS

Introduction

Descriptive writing is a form of writing that involves the use of vivid sensory details to give the reader a mental picture of what is being described (Everett & Kilborn, 1997). A recent report by the National Commission on Writing in America's Schools and Colleges called for a national agenda to improve the writing proficiency of elementary students (Manzo, 2003).

Information enters our brains via our senses. Researchers believe that students develop a preference for a particular sense modality, or learning style, and do best if taught to this strength (Sprenger, 2003). By utilizing multi-sensory techniques to present instruction, teachers integrate sensory pathways to the brain and support a variety of learning styles (Wadlington, 2000).

Research has shown that mental imagery training significantly improved creative writing scores among gifted elementary students (Jampole et al., 1991; Jampole et al., 1994). Furthermore, a study among 10th-grade English students found that providing auditory and visual stimulation during prewriting improved the quality of students’ descriptive writing (Black, 1993).

This study sought to produce similar results. It was hypothesized that fourth-grade students who received multi-sensory stimulation during writing exercises would use
significantly more descriptive elements in their writing than fourth grade students who
did not receive multi-sensory stimulation during writing exercises.

The research study was constructed as a quasi-experimental study using a
nonequivalent control group design. Participants were 35 students in two intact fourth
grade classrooms at a New Jersey elementary school. One classroom acted as the
experimental group and the other was the control group.

Analysis of Learning Style Preference

At the outset of the study, all participants were administered a Learning Styles
Questionnaire (LSQ) in order to assess modality preferences. This questionnaire
consisted of 20 multiple-choice questions. Results (listed in table 1) were tabulated for
informational purposes only to ensure that all learning style preferences were effectively
established in each classroom.

As table 1 indicates, preferences for all types of learning styles were present in
equitable proportions within both the experimental group and the control group. The
kinesthetic/tactile learning style emerged as the dominant preference.

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Preference</td>
<td>29%</td>
<td>23%</td>
</tr>
<tr>
<td>Auditory Preference</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>Kinesthetic/Tactile Preference</td>
<td>41%</td>
<td>45%</td>
</tr>
</tbody>
</table>
Tabulation of Raw Scores

The procedure consisted of giving both the experimental group and the control group a pretest and an identical posttest for two separate writing prompts. The pretest/posttest consisted of a one-page descriptive writing sample that was scored for the number of descriptive elements it contained. Treatment for the experimental group involved exposure to multi-sensory stimulation during the posttest writing exercise.

The following tables are compilations of each subject’s raw scores on the pretest and posttest for each writing prompt. Scores from subjects who did not complete both a pretest and posttest using the same writing prompt were excluded from the tabulations for analysis. Table 2 shows raw scores for the control group.

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Writing Prompt 1</th>
<th>Writing Prompt 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>1</td>
<td>23.33</td>
<td>22.96</td>
</tr>
<tr>
<td>2</td>
<td>27.83</td>
<td>27.87</td>
</tr>
<tr>
<td>3</td>
<td>25.47</td>
<td>20.18</td>
</tr>
<tr>
<td>4</td>
<td>24.17</td>
<td>26.74</td>
</tr>
<tr>
<td>5</td>
<td>23.08</td>
<td>21.62</td>
</tr>
<tr>
<td>6</td>
<td>28.57</td>
<td>27.36</td>
</tr>
<tr>
<td>7</td>
<td>19.48</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>29.57</td>
<td>30.21</td>
</tr>
<tr>
<td>9</td>
<td>18.01</td>
<td>25.53</td>
</tr>
<tr>
<td>10</td>
<td>26.27</td>
<td>20.16</td>
</tr>
<tr>
<td>11</td>
<td>24.07</td>
<td>25.20</td>
</tr>
<tr>
<td>12</td>
<td>21.80</td>
<td>20.14</td>
</tr>
<tr>
<td>13</td>
<td>28.05</td>
<td>—</td>
</tr>
<tr>
<td>14</td>
<td>20.75</td>
<td>23.21</td>
</tr>
<tr>
<td>15</td>
<td>19.72</td>
<td>28.17</td>
</tr>
</tbody>
</table>

26
For Writing Prompt 1, two subjects were disallowed (n=16).
For Writing Prompt 2, no subjects were disallowed (n=18).

---

Raw pretest and posttest scores for each subject in the experimental group are presented in table 3.

### Table 3

**Raw Scores for Experimental Group**

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Writing Prompt 1</th>
<th>Writing Prompt 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>1</td>
<td>24.36</td>
<td>25.00</td>
</tr>
<tr>
<td>2</td>
<td>25.00</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>25.26</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>24.24</td>
<td>26.32</td>
</tr>
<tr>
<td>5</td>
<td>17.82</td>
<td>22.12</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
<td>21.43</td>
</tr>
<tr>
<td>7</td>
<td>36.05</td>
<td>33.72</td>
</tr>
<tr>
<td>8</td>
<td>21.95</td>
<td>23.96</td>
</tr>
<tr>
<td>9</td>
<td>26.09</td>
<td>29.55</td>
</tr>
<tr>
<td>10</td>
<td>19.61</td>
<td>23.02</td>
</tr>
<tr>
<td>11</td>
<td>30.09</td>
<td>—</td>
</tr>
<tr>
<td>12</td>
<td>21.32</td>
<td>25.93</td>
</tr>
<tr>
<td>13</td>
<td>29.17</td>
<td>31.30</td>
</tr>
<tr>
<td>14</td>
<td>31.37</td>
<td>35.71</td>
</tr>
<tr>
<td>15</td>
<td>30.67</td>
<td>27.87</td>
</tr>
<tr>
<td>16</td>
<td>21.79</td>
<td>—</td>
</tr>
<tr>
<td>17</td>
<td>22.22</td>
<td>27.19</td>
</tr>
</tbody>
</table>

For Writing Prompt 1, five subjects were disallowed (n=12).
For Writing Prompt 2, six subjects were disallowed (n=11).
Data sets for each writing prompt were compared and analyzed separately. The researcher acknowledged that results could produce mixed findings.

Table 4 details the descriptive statistics for writing prompt 1. For the control group (n=16), the mean for the pretest was 24.16 with a standard deviation of 3.29. The mean was slightly lower on the posttest at 24.08 with a standard deviation of 3.53. For the experimental group (n=12), the pretest mean was 25.41 with a standard deviation of 5.42. On the posttest, the mean was higher at 27.64 with a standard deviation of 4.23.

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Mean</td>
<td>24.16</td>
<td>24.08</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>3.29</td>
<td>3.53</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Mean</td>
<td>25.41</td>
<td>27.64</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>5.42</td>
<td>4.23</td>
</tr>
</tbody>
</table>

Descriptive statistics for writing prompt 2 are outlined in table 5. For the control group (n=18), the mean for the pretest was 23.26 with a standard deviation of 5.01. The mean for the posttest was 24.05 with a standard deviation of 4.82. For the experimental group (n=11), the pretest mean was 29.89 with a standard deviation of 4.72. The mean for the posttest was scarcely lower at 29.72 with a standard deviation of 6.62.
To determine if the presence of multi-sensory stimulation significantly increased the number of descriptive elements in students’ writing samples, “amount learned” was calculated for each individual subject. Subject’s pretest and posttest scores were compared and analyzed to see if there was a significant difference between “amount learned” scores of the experimental group (that received multi-sensory stimulation) and the “amount learned” scores of the control group (that received no sensory stimulation). Specifically, posttest scores were subtracted from pretest scores for each participant. Next, a constant was added to the differences for both groups’ scores to yield positive numbers. Finally, a $t$ test for independent samples was performed to determine whether the means of the two sets of “amount learned” scores were significantly different at a probability level of .05.

This process was performed separately for each writing prompt.
Table 6 details the “amount learned” data for writing prompt 1. The means used for comparison were 6.91 for the control group and 9.24 for the experimental group.

Table 6

Amount Learned for Writing Prompt 1

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th></th>
<th>Experimental Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest (a)</td>
<td>Posttest (b)</td>
<td>Difference (a-b=c)</td>
<td>Pretest (a)</td>
</tr>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
<td>(b)</td>
</tr>
<tr>
<td>23.33</td>
<td>22.96</td>
<td>-0.37</td>
<td>6.63</td>
<td>24.36</td>
</tr>
<tr>
<td>27.83</td>
<td>27.87</td>
<td>0.04</td>
<td>7.04</td>
<td>24.24</td>
</tr>
<tr>
<td>25.47</td>
<td>20.18</td>
<td>-5.29</td>
<td>1.71</td>
<td>17.82</td>
</tr>
<tr>
<td>24.17</td>
<td>26.74</td>
<td>2.57</td>
<td>9.57</td>
<td>36.05</td>
</tr>
<tr>
<td>23.08</td>
<td>21.62</td>
<td>-1.46</td>
<td>5.54</td>
<td>21.95</td>
</tr>
<tr>
<td>28.57</td>
<td>27.36</td>
<td>-1.21</td>
<td>5.79</td>
<td>26.09</td>
</tr>
<tr>
<td>29.57</td>
<td>30.21</td>
<td>0.64</td>
<td>7.64</td>
<td>19.61</td>
</tr>
<tr>
<td>18.01</td>
<td>25.53</td>
<td>7.52</td>
<td>14.52</td>
<td>21.32</td>
</tr>
<tr>
<td>26.27</td>
<td>20.16</td>
<td>-6.11</td>
<td>0.89</td>
<td>29.17</td>
</tr>
<tr>
<td>24.07</td>
<td>25.20</td>
<td>1.13</td>
<td>8.13</td>
<td>31.37</td>
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<tr>
<td>21.80</td>
<td>20.14</td>
<td>-1.66</td>
<td>5.34</td>
<td>30.67</td>
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<tr>
<td>20.75</td>
<td>23.21</td>
<td>2.46</td>
<td>9.46</td>
<td>22.22</td>
</tr>
</tbody>
</table>

Mean = 6.91

Analysis of the data for writing prompt 1 revealed the findings presented in table 7. At a probability level of .05, the t stat of 1.809 was significant when compared to the critical level of 1.708. Data indicated that there was a significant difference in the number of descriptive elements used by the multi-sensory group compared to the group with no sensory stimulation.
The "amount learned" data for writing prompt 2 is shown in table 8. The mean for the control group was 10.78 and the mean for the experimental group was 9.83. A second t test for independent samples was performed on these scores to determine significance.

### Table 8

**Amount Learned for Writing Prompt 2**

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th></th>
<th>Experimental Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Difference</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>(a)</td>
<td>(b)</td>
<td>(a-b=c)</td>
<td>Learned (c+10)</td>
</tr>
<tr>
<td>17.99</td>
<td>12.30</td>
<td>-5.69</td>
<td>4.31</td>
<td>29.27</td>
</tr>
<tr>
<td>13.00</td>
<td>17.35</td>
<td>4.35</td>
<td>14.35</td>
<td>31.52</td>
</tr>
<tr>
<td>22.50</td>
<td>24.56</td>
<td>2.06</td>
<td>12.06</td>
<td>25.84</td>
</tr>
<tr>
<td>26.82</td>
<td>24.18</td>
<td>-2.64</td>
<td>7.36</td>
<td>21.95</td>
</tr>
<tr>
<td>16.88</td>
<td>32.69</td>
<td>15.81</td>
<td>25.81</td>
<td>25.00</td>
</tr>
<tr>
<td>28.00</td>
<td>24.80</td>
<td>-3.20</td>
<td>6.80</td>
<td>31.03</td>
</tr>
<tr>
<td>32.35</td>
<td>31.25</td>
<td>-1.10</td>
<td>8.90</td>
<td>26.53</td>
</tr>
<tr>
<td>21.79</td>
<td>22.68</td>
<td>0.89</td>
<td>10.89</td>
<td>37.93</td>
</tr>
<tr>
<td>24.40</td>
<td>27.21</td>
<td>2.81</td>
<td>12.81</td>
<td>33.10</td>
</tr>
<tr>
<td>25.63</td>
<td>23.20</td>
<td>-2.43</td>
<td>7.57</td>
<td>34.92</td>
</tr>
<tr>
<td>27.37</td>
<td>25.66</td>
<td>-1.71</td>
<td>8.29</td>
<td>31.71</td>
</tr>
<tr>
<td>16.54</td>
<td>20.69</td>
<td>4.15</td>
<td>14.15</td>
<td></td>
</tr>
<tr>
<td>21.01</td>
<td>20.27</td>
<td>-0.74</td>
<td>9.26</td>
<td></td>
</tr>
</tbody>
</table>

**Mean = 9.83**
For writing prompt 2, analysis revealed that the $t$ stat of 0.394 was not significant at a probability level of .05. This stat was well below the critical level of 1.73. Therefore, this data suggested that there was no significant difference in the number of descriptive elements between the multi-sensory group and the group with no sensory stimulation. Findings are presented in table 9.

**table 9**

<table>
<thead>
<tr>
<th>$t$ Test for Amount Learned for Writing Prompt 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$ stat</td>
</tr>
<tr>
<td>0.394</td>
</tr>
<tr>
<td>Degrees of freedom</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>$t$ critical level</td>
</tr>
<tr>
<td>1.73</td>
</tr>
<tr>
<td>P value</td>
</tr>
<tr>
<td>0.348</td>
</tr>
</tbody>
</table>

Analysis Related to Purpose of Hypothesis

The purpose of this study was to test the following hypothesis: fourth grade students who received multi-sensory stimulation during writing exercises will use significantly more descriptive elements in their writing than fourth grade students who do not receive multi-sensory stimulation during writing exercises.
Since data from two different writing prompts were analyzed separately for statistical significance, mixed results were possible.

A Learning Styles Questionnaire, administered to all participants, revealed that equitable proportions of all learning styles—visual, auditory, and kinesthetic/tactile—were present in both the control group and the experimental group.

For writing prompt 1, a $t$ test for independent samples was calculated to determine the difference in "amount learned" scores between the control and experimental groups. At the probability level of .05, the $t$ stat of 1.809 was determined to be significant. This analysis showed a significant difference between the scores and supported the hypothesis.

For writing prompt 2, a separate $t$ test for independent samples was performed to determine the difference in "amount learned" scores between the control group and the experimental group. The $t$ stat was computed to be 0.394. At the probability level of .05, this analysis showed no significant difference between the scores. In addition, the mean posttest score of the experimental group was very slightly lower than the mean pretest score. Therefore, the hypothesis was not supported by the data for writing prompt 2.

Consequently, since the findings based on two different writing prompts were mixed, the research hypothesis could not be accepted and was therefore rejected.
Chapter V
SUMMARIES, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Descriptive writing requires the use of vivid sensory details so that the reader will get a mental picture of what is being described (Everett & Kilborn, 1997). Multi-sensory stimulation, which provides a range of sensory experiences, offers a promising avenue for improving students’ descriptive writing (Prestia, 2004). Also, by utilizing multi-sensory techniques to present instruction, teachers integrate sensory pathways to the brain and support a variety of learning styles (Wadlington, 2000).

This study sought to determine whether providing multi-sensory stimulation to fourth grade students during writing exercises would increase the number of descriptive elements used in a writing sample compared to a control group. Participants included 35 students in two intact classrooms. An experimental group of students received multi-sensory stimulation while they were asked to write separate one-page descriptions based on two different writing prompts. A control group was asked to write one-page descriptions based on the same two writing prompts without receiving multi-sensory stimulation.

The results of the study were mixed given that the groups showed a significant difference in the number of descriptive elements used for one writing prompt, but showed no significant difference for the other. Therefore, the hypothesis was rejected.
Summary of Problem

Writing skills among elementary students were found to be deficient as a result of a decline in regular writing assignments in American classrooms, according to a recent report by the National Commission on Writing in America's Schools and Colleges. The report called for a national agenda to improve proficiency by devoting more time and resources to the subject of writing, especially in light of new writing assessments on standardized tests (Manzo, 2003).

This research focused on fourth grade students in part because the students who were the subjects of this study demonstrated a need for improved writing skills based on poor mid-year progress indicators. Additionally, students in the fourth grade experience a weakness in language development known as the "fourth grade slump." This slump is a result of developmental changes occurring at this age as well as the increasing demands of curriculum that cause students as a group to fall behind (Chall, 1996).

Summary of Hypothesis

This research study examined the effects of multi-sensory stimulation on writing ability, particularly on descriptive writing. It was hypothesized that fourth grade students who received multi-sensory stimulation during writing exercises would use significantly more descriptive elements in their writing than fourth grade students who did not receive multi-sensory stimulation during writing exercises.

Summary of Procedures

Thirty-five fourth grade students in two intact classrooms participated in this study. A Learning Styles Questionnaire was administered to all subjects to ensure that all
modality preferences were represented in each classroom. Pretests in the form of two separate writing prompts were administered two days apart to both the control group and the experimental group. Two weeks later posttests in the form of two separate writing prompts (identical to the pretests) were administered two days apart to both the control group and the experimental group. During the posttest writing exercises, the experimental group only was exposed to multi-sensory stimulation related to the writing prompts. All writing samples were scored for the number of descriptive elements present. Pretest and posttest scores were compared for “amount learned” for each individual subject. For each writing prompt, a $t$ test was calculated to determine if the “amount learned” was significantly different between the groups.

Summary of Findings

Results of the Learning Styles Questionnaire revealed that equitable proportions of all learning styles—visual, auditory, and kinesthetic/tactile—were present in both the control group and the experimental group.

Findings of the study were mixed since results from writing prompt 1 contradicted those from writing prompt 2. Results from writing prompt 1 indicated that the experimental group had significantly higher scores for “amount learned” than the control group’s scores for “amount learned.” However, “amount learned” scores for both groups were not significantly different for writing prompt 2.

The purpose of this study was to determine if fourth grade students who received multi-sensory stimulation during writing exercises would use significantly more descriptive elements in their writing than fourth grade students who did not receive
multi-sensory stimulation during writing exercises. Therefore, based on these findings, the hypothesis could not be accepted and was therefore rejected.

Conclusions

The results of this study did not support the original hypothesis, which stated that fourth grade students who received multi-sensory stimulation during writing exercises would use significantly more descriptive elements in their writing than fourth grade students who did not receive multi-sensory stimulation during writing exercises. However, separate conclusions can be drawn from the individual writing prompts.

Data from writing prompt 1 did show a significant increase in the “amount learned” of the experimental group that received multi-sensory stimulation compared to the control group. The number of descriptive elements in the writing samples of the control group remained relatively static from pretest to posttest, while the mean of the raw scores of the experimental group increased two points from pretest to posttest. This result was supported by research that demonstrated a connection between multi-sensory stimulation and improved creative writing abilities.

Regarding writing prompt 2, data showed that there was no significant increase in the “amount learned” of the experimental group compared to the control group. The mean of the raw scores of the control group increased minimally from pretest and posttest. Scores of the experimental group actually decreased very slightly from pretest to posttest. The researcher believes that the nature of the multi-sensory stimulation that accompanied this writing prompt was partly responsible for this outcome. While students were asked to write their essays, they were brought outside to experience multi-sensory stimulation in
the form of fresh air, trees, the sound of birds, etc. In reality, they were confronted with a loud lawnmower, students from other classrooms, uncomfortable writing conditions, and other uncontrollable distractions that did not contribute to the desired sensory experience. As a result, many students were too distracted to settle down to the task, ran out of time to properly complete the assignment, and provided short descriptions, all of which tended to influence the scoring of descriptive elements.

The researcher believes that there were additional factors that may have affected the results of the overall study. While providing their writing samples, some students did not follow the directions that were given. These students wrote their essays using descriptive elements, but were often telling a story and not describing the objects as directed. This resulted in scoring that did not accurately reflect the objective of the assignment.

In addition, the quality and repetition of the descriptive elements were not properly anticipated. To simplify scoring, adjectives, adverbs, and any non-linking verbs were all counted regardless of descriptive quality. In fact, many students used bland words that were counted as “descriptive.” Also, some students used the same word repetitively and it was scored as “descriptive” each time.

Another point the researcher recognizes is that it is possible to be more descriptive in an essay using fewer words. This study did not allow for such a possibility.

In summary, the researcher feels that the instrument used in this study (a descriptive elements scoring chart) did not accurately measure what it was intended to measure, that is, descriptive writing ability. The researcher also feels strongly that this study would have been much improved if had utilized a holistic scoring method.
(i.e., a rubric). In this way, the writing sample could be scored for its adherence to the instructions, use of diverse elements and words, and overall descriptive impression.

In addition, the researcher realizes that the multi-sensory stimulation provided for writing prompt 2 should have been more tightly controlled to minimize distractions while subjects were writing. Instead of taking students outdoors, an option would be to bring the sights, smells, and sounds of the outdoors inside the classroom via videotapes, audiotapes, and hands-on materials.

The researcher did notice that, regardless of which writing prompt was provided, the subjects in the experimental group that received multi-sensory stimulation were more interested in the activity and more motivated to write than they were without multi-sensory stimulation.

Implications and Recommendations

This study did not support similar studies that demonstrated that multi-sensory stimulation has a positive impact on creative writing abilities of elementary students. When their senses are engaged, students are more motivated, work longer, and are able to write more creatively. Educators should strive to incorporate sensory experiences into their lessons whenever possible.

Nevertheless, the results of this study are not able to be generalized to other classrooms because the sample size was small and, in the opinion the researcher, the instrument did not accurately measure descriptive writing ability and the multi-sensory stimulation provided for one of the writing prompts was too distracting.

Further research on this topic is recommended. Larger samples of students should
be studied. Also, the limitations in Chapter I should be addressed in subsequent studies.

The researcher also recommends that future studies use a holistic scoring method to more accurately measure the descriptive writing abilities of students. Another recommendation is to more closely control the multi-sensory stimulation to which students are exposed.

It is the researcher's belief that, with a more appropriate instrument and better-controlled sensory experiences, results of this study would have conclusively supported research that states that multi-sensory stimulation has a positive effect on creative writing abilities of elementary students.
BIBLIOGRAPHY


Dunn, R. & Dunn, K. (1979). Learning styles/teaching styles: Should they...can they...be matched? Educational Leadership, 36(4), 238-244.


APPENDIX A

Learning Styles Questionnaire
Learning Styles Questionnaire

Read each sentence and choose the answer that best fits you.

1. When I watch a television show, I most remember
   A. the costumes, scenery, and the actor/actresses.
   B. the action in the show or how it makes me feel.
   C. what the characters say to each other.

2. When I am alone, I like to
   A. talk on the telephone.
   B. play a game or go outside and play.
   C. read or watch television.

3. If I buy my own clothes, I usually buy
   A. very comfortable clothing.
   B. light-colored clothing in popular styles.
   C. bright-colored clothing.

4. When I remember something (like a party or vacation), I usually
   A. hear the sounds and conversations I had there.
   B. remember how I felt about it.
   C. see a picture of it in my mind.

5. My favorite way to learn something is to
   A. have someone tell me how to do it.
   B. have someone show me a picture or see it in a book.
   C. do it myself.

6. When I study, I like
   A. to be real comfortable – like on a bed or a couch.
   B. to have absolute silence and sometimes read aloud.
   C. to have soft music playing and lots of light.

7. My favorite kind of class is when the teacher
   A. uses the overhead or board a lot and I can copy down the information.
   B. tells us the information and I can just listen.
   C. lets us try to do the stuff ourselves.

8. When I spell a word, I
   A. spell it out loud to see if it sounds right.
   B. write it down and see if it feels right.
   C. write it to see if it looks right.
9. I
A. love to talk on the phone.
B. think talking on the phone is okay, but I’d rather see someone
to talk to them.
C. would rather be out doing something than talk on the phone.

10. The most uncomfortable situation for me would be
A. to not be able to move around.
B. to not be able to talk.
C. to not be able to watch television or read.

11. When I study, I prefer
A. to be quizzed out loud by someone else.
B. to quietly read my notes.
C. to walk around or play with a toy as I study.

12. When I meet someone new, I usually
A. touch or shake hands with them.
B. pay attention to his or her face.
C. notice his or her voice.

13. When I see a chart or graph, I usually
A. read the caption that goes with it.
B. ask someone to explain it to me.
C. trace the lines with my finger.

14. A terrific gift for me would be
A. a magazine on my favorite topic.
B. sporting equipment.
C. a CD of my favorite music.

15. When I agree with what someone says, I would say
A. “That sounds good.”
B. “I see what you mean.”
C. nothing, but nod my head vigorously.

16. I learn best by
A. reading the information.
B. hearing someone talk about it.
C. doing it.

17. You are planning a surprise party for your best friend’s birthday. Do you
A. call some friends and talk about it.
B. invite friends over and let the party develop.
C. picture the party activities in your mind.
18. After reading a play you need to do a project on it. Would you prefer to
   A. act out a scene from the play.
   B. read a speech from the play in front of the class.
   C. write a summary of the play.

19. Two friends ask you for directions to someone's house nearby. Do you
   A. tell them the directions.
   B. draw a map or write down the directions.
   C. walk them over there yourself.

20. Do you prefer a teacher who likes to use
   A. class discussions and guest speakers.
   B. field trips, experiments, and hands-on activities.
   C. handouts, diagrams, pictures, and slides.
APPENDIX B

Writing Prompt 1
Directions:
You are an alien from another galaxy. Your spaceship has landed on Earth in a field where there are oranges all over the ground. You have never seen this type of fruit before. Your mission is to write a letter describing an orange with enough details so that your fellow aliens back on your home planet will understand what one is like.

Use all your senses – seeing, hearing, smell, touch, and taste – as you write about it. Use interesting adjectives and exciting adverbs. Use comparisons to describe it (an example of a comparison is: “a paper clip is as light as a feather”).

Try to fill up one page with your description. Begin your letter using the opening below:

Dear Fellow Aliens,

I saw the strangest thing today. The Earthlings call it an orange. It was...
Writing Prompt 1

*Directions for teacher:*

1. Tell the students that they will be doing a descriptive writing assignment; pass out writing prompt handouts and lined paper; read directions aloud to class; students should be given adequate time to write one page, but do not need to be timed.

2. On board: write “Descriptive Writing” and then underneath that write “Use adjectives, adverbs, and comparisons” as reminders. If students need clarification of what “comparisons” means, you can describe metaphors and similes (although I don’t believe they know those terms yet!).

3. If students request more clarification, refer them to the written instructions on the handout. Students should not be given further direction.
APPENDIX C

Writing Prompt 2
Writing Prompt 2

Directions:
You are directing a made-for-TV movie about a kid who is shrunk down and forced to live in a tree with a family of squirrels. The people making the movie set, props, and costumes aren’t sure what you want. Your job as director is to describe the scene when the shrunken kid first sees the tree he must live in and runs into the mommy squirrel. Remember that there must be a lot of details so the movie scene is designed properly. (You are not writing the story.)

Use all your senses – seeing, hearing, smell, touch, and taste – as you write about it. Use interesting adjectives and exciting adverbs. Use comparisons to describe it (an example of a comparison is: “a paper clip is as light as a feather”).

Try to fill up one page with your description.
Writing Prompt 2

Directions for teacher:

1. Tell the students that they will be doing a descriptive writing assignment; pass out writing prompt handouts and lined paper; read directions aloud to class; students should be given adequate time to write one page, but do not need to be timed.

2. On board: write “Descriptive Writing” and then underneath that write “Use adjectives, adverbs, and comparisons” as reminders. If students need clarification of what “comparisons” means, you can describe metaphors and similes (although I don’t believe they know those terms yet!).

3. If students request more clarification, refer them to the written instructions on the handout. Students should not be given further direction.
APPENDIX D

Descriptive Elements Scoring Chart
Descriptive Elements Scoring Chart

Participant: ____________________________________________________________

Record number of descriptive elements present in each writing sample:

<table>
<thead>
<tr>
<th>Descriptive Elements</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adverbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similes/Metaphors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptive Verbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Total descriptive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>elements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of words in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>writing sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>(Line 1 ÷ Line 2) x100</td>
<td>(Line 1 ÷ Line 2) x100</td>
</tr>
</tbody>
</table>