The Implementation of Kinesthetic Learning Activities to Identify

Geometric Shapes with Preschool Students

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Abstract

Sixteen preschool children enrolled in a preschool participated in this study. The purpose of this study was to determine if using kinesthetic learning in a preschool classroom would result in students' correctly identifying geometric shapes. The application of kinesthetic learning activities for the acquisition of these skills were made through the use of a geometric shape intervention. Data was collected using a geometric flashcard assessment and a student checklist. The data suggested that student ability to identify geometric shapes increased.
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CHAPTER I: INTRODUCTION

As a new preschool teacher, the instructor was looking for ways to improve her students’ ability to correctly identify geometric shapes. Through a review of the literature, the instructor investigated learning in a kinesthetic style and the best practices when teaching geometric shapes. Kinesthetic learning style can be described as when a student would be actively learning through movement of his or her body. The instructor discovered through a review of the literature that the best practices when teaching geometric shapes were instruction and activities. The instructional methods of Oberdorf and Taylor-Cox (1999) were to give students the opportunity to explore geometric shapes kinesthetically, provide examples of geometric shapes to students, and help children strive to expand their knowledge. It was also found that Oberdorf and Taylor-Cox and Horne (2003) agreed that a teacher should use correct terminology when teaching geometric shapes. Hannibal (1999), Clements and Sarama (2000) described many activities that could take place to teach geometric shapes. Based on the professional literature and her observations, the instructor decided to implement the kinesthetic learning style to teach students how to correctly identify geometric shapes.

Statement of Problem

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. The research questions were: (1) How did the professional literature define learning in a kinesthetic style? (2) According to the professional literature, what were the best practices when teaching geometric shapes to preschool children? (3) Did implementation of using kinesthetic learning benefit the student’s ability to identify geometric shapes?
Justification

The instructor found that her students were having difficulty in identifying geometric shapes. The instructor observed her class during a small group time and found that some students would shout out numbers in order to identify the shape that was shown. Through this project the researcher was able to implement a kinesthetic learning experience related to four geometric shapes to aid in the identification of the particular geometric shape. If each student would be able to identify each geometric shape this would give the student a basic understanding of the fundamentals of geometry that could be built upon in elementary school.

Definition of Terms

Preschool: For the purpose of this study, this term refers to children ages three through five years old, of multiple abilities in a Midwestern Head Start classroom. A provision of the program allowed students to arrive at and depart from the classroom anytime between 6:00am to 6:00pm.

Geometric Shapes: For the purpose of this study, the following geometric shapes were used: circle, square, rectangle, and triangle.

Kinesthetic Learning: For the purpose of this study, kinesthetic learning can be described as the movement of a student who would be exploring the world around him or her and making discoveries while completing educational activities.

Limitations

This research project was conducted in a rural preschool classroom. There was one major limitation. The age range would be considered a limitation. The students in this classroom ranged in ages three through five years old, further there were “young” three year
olds, who just turned three and five year olds who were about to turn six. This meant each student would be at a different level of development. In conclusion, the age range used for the project may have influenced the results and therefore, may not be applicable to other preschool classrooms.
CHAPTER II: REVIEW OF THE LITERATURE

Introduction

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. The research questions were: (1) How did the professional literature define learning in a kinesthetic style? (2) According to the professional literature, what were the best practices when teaching geometric shapes to preschool children? (3) Did implementation of using kinesthetic learning benefit the student’s ability to identify geometric shapes?

Question 1: How did the professional literature define learning in a kinesthetic style?

In order to answer research question one, the definition of kinesthetic learning style has been divided into two areas. The first area will define a learning style and the second area will define kinesthetic learning.

Learning Style.

A learning style can then be defined several different ways. Valiente (2008) stated that a learning style can be categorized as “critical thinking/memorization, internal/external motivation, active/passive involvement, and the role of the individual group learner” (p. 74). Valiente’s definition of learning style would support Coluccionello’s (1999) definition of a learning style. Coluccionello stated that a learning style is when a student makes meaning and deals with knowledge. To deal with knowledge can be described as how the student would express the new knowledge. An example would be when a child would state, “This window looks like a rectangle.” Oxford’s (2003) definition of a learning style coincides with that of Coluccionello’s. Oxford stated that a learning style would provide direction to learning. Direction to learning could be described as the teacher setting up structured activities for students to complete. She
also stated that within the area of learning styles, each individual would reflect sensory or social style dimensions. A social style dimension could be an activity such as a group of students participating in a shape hunt. A sensory style dimension could be any activity that involves the senses. The senses are sight, touch, hearing, taste, and smell. The sensory style dimension and active involvement could be considered kinesthetic learning.

**Kinesthetic Learning.**

In a review of the literature, it was found that there were many descriptions of kinesthetic learning. Wood (2008) observed her students and found that while teaching shapes and other concepts that her students learned best while they were moving through dance. Wood also found that while teaching her students math concepts kinesthetically they were able to have a deeper understanding and remember concepts of what they had learned. Grant’s (1985) findings coincide with Wood’s definition of kinesthetic learning. Grant defined kinesthetic learning as “an approach to teaching that relies on the students’ active, physical participation, allowing children to discover their education and individual capabilities” (p. 455). Grant also stated that in her study, kinesthetic refers to the movement of muscles in response to stimulation from the seeing, hearing and feeling objects. When looking at the research of Dunn, Beaudry, and Klavis (1989), they stated that tactile learning and kinesthetic learning could be used interchangeably. They suggested that tactile learning could be a student learning through his or her hands, such as manipulating objects. They also stated that kinesthetic learning could be defined as whole body movement. Whole body movement could be mimicking and acting out actions such as playing Simon Says or acting out during play time. According to the literature reviewed, generally kinesthetic learning can be described as when a student would be actively learning through movement of his or her body.
Question 2: According to the professional literature, what were the best practices to teach geometric shapes?

A review of the professional literature was conducted to obtain the answer to question two. It was found that the best practices to teach geometric shapes could be considered the type of instruction, activities the children would be completing, and assessment. These best practices are presented below.

**Instruction.**

Oberdorf and Taylor-Cox (1999) gave four types on how to introduce geometric concepts in a classroom. The first type was giving students the opportunity to explore geometric materials kinesthetically. They stated that this opportunity can take place during free-play or could be teacher directed. To explore the geometric shapes kinesthetically, students could be given wooden or plastic shapes that they could manipulate with their hands.

The second type given by Oberdorf and Taylor-Cox (1999) was providing examples to students. To provide examples, the teacher could show students a wooden or plastic shape, the teacher could draw the shape on a piece of paper, or show a flashcard printed with the shape. The student would then be asked to define a particular shape. This could be as simple as a child stating, “I know that this shape is a circle because it is round.”

The third type by Oberdorf and Taylor-Cox (1999) was the importance of the teacher using the correct terminology. They stated that a teacher needed to use correct terminology when referring to a shape and conversely, when students referred to a shape the teacher needed to make sure that the student was also using the correct terminology. Horne (2003) agreed with Oberdorf and Taylor-Cox. Horne stated that when teaching students the names of shapes, the correct terminology must be used. The same terminology should be used consistently so as not to
confuse the students. This would mean that when referring to a square it should be stated that the object is a square and not a box. As the students grow in their understanding of shapes, the student can then be introduced to other categories to define the shape. Other categories to define shape would be referring to a square as a cube or a box.

The fourth type given by Oberdorff and Taylor-Cox (1999) was helping children strive to expand their knowledge. This could be described as a teacher asking questions such as: “How are the shapes different?” or “How are the shapes the same?”

In conclusion, Oberdorff and Taylor-Cox (1999) gave four types on how to introduce geometric concepts in a classroom. The first type was giving students the opportunity to explore geometric materials kinesthetically. The second type was providing examples to students. The third type was the importance of the teacher using the correct terminology. The fourth type was helping children strive to expand their knowledge. Along with the four types of how to introduce geometric concepts in a classroom, there were several suggestions on activities that students could complete.

Activities.

Clements and Sarama (2000) suggested that a teacher should use geometry every day in the classroom. They also stated there were many activities that could take place to teach geometric shapes. They suggested that one of these activities could be creating shapes on the floor or carpet. To create a shape on the carpet the teacher could use masking tape to outline the shape so that students could walk on the shape and build on or in the outline of the shape with blocks. Clements and Sarama also discussed using crayons to create the shape being explored. The shapes could be explored by having a cardboard cut out of the shapes taped to a table. The students could then take a piece of paper and place it over the shape to create a “rubbing” of the
shape using a crayon. Hannibal (1999) stated that there were many activities that children could complete to begin learning basic geometric shapes. She suggested that when studying shapes, a teacher should make sure that shapes are in all areas of the classroom. This would be making sure that there are shape puzzles, posters, books, and manipulatives available throughout the room. She also stated that shapes should be pointed out to children. This could be as simple as when a teacher or student pointed out shapes in a book, found shapes around the room, and played games such as “shape bingo.”

Assessment.

Clements, Swaminathan, Zeitler-Hannibal, and Sarama (1999) completed a study that consisted of identifying geometric shapes. Within the study, students were asked to identify circles, squares, triangles, and rectangles. They had students identify these shapes by giving the students a paper that had various shapes on it. The students were then asked to mark the shapes that appeared to be a circle. The interviewer would then ask why the student chose the marked shape as being a circle. These questions could be, “Why did you choose this one? How did you know that was/wasn’t a circle?” This type of assessment was completed for circles, squares, triangles, and rectangles. The researchers found that most children under the age of six were able to identify a circles and squares. They also found that children struggled to identifying triangles. Clements and Sarama (2000) stated that young children “reject triangles that are too ‘long,’ ‘bent over,’ or ‘point not at the top’” (p. 483). In other words, it was easier for students to identify isosceles triangles. Clements, Swamiathan, Zeitler-Hannibal, and Sarama found that students struggled to identifying rectangles. Many of the students identified the rectangles as squares. Students could not see how the two longer sides made the shape of a rectangle instead of a square. Clements and Sarama (2000) stated that students defined a rectangle as “a four-
sided figure with two long parallel sides and ‘close to’ square corners” (p. 483). Clements, Swaminathan, Zeitler-Hannibal, and Sarama’s study of shapes coincides with van Hiele’s (1999) levels of geometric thinking.

Van Hiele (1999) stated that the levels to geometric thinking are nonverbal thinking, visual level of thinking, descriptive level, and informal deduction. Nonverbal thinking can be described as when a student would be asked to identify an object by pointing to it. He stated that the visual level of thinking could be when a student states, “Hey, that is a rectangle because it looks like a door.” Van Hiele described the descriptive level as when a student would be able to state that an object is a rectangle because it has two short sides and two long sides. He also stated that the informal deduction level would be described as when a student would be able to state that all angles of a triangle add up to 180 degrees. In this level, students were able to describe a shape in many ways by angles, length of sides, etc. The nonverbal thinking, visual level of thinking, and descriptive level of thinking could be first introduced in preschool classroom.

Conclusion

In conclusion, after a review of the professional literature the researcher found that learning in a kinesthetic style can be defined as when a student is learning through movement of the body. The research also found that the best practices when teaching geometric shapes to preschool students was through instruction and activities that take place within the classroom. Oberdorf and Taylor Cox (1999) suggested giving students the opportunity to explore geometric materials kinesthetically, providing examples of shapes to students, using correct terminology, and helping children strive to expand their knowledge of shapes. Horne (2003) suggested that when teaching geometric shapes, a teacher should use the correct terminology and use this
terminology consistently. The educational activities of Clements and Sarama (2000) were to create shapes on the carpet or to create a rubbing of the shape by the use of a crayon. Hannibal (1999) stated that shapes should be present throughout the classroom and should be pointed out to children. The researcher found that Clements, Swamiathan, Zeiter-Hannibal, and Sarama (1999) conducted an assessment that related to preschool children identifying geometric shapes.

Clements, Swamiathan, Zeiter-Hannibal, and Sarama (1999) conducted a study where students were asked to identify circles, squares, triangles, and rectangles. Through this study, it was found that students were able to identify circles and squares and struggled to identify triangles and rectangles. Van Hiele (1999) stated that there are levels of geometric thinking. These levels are nonverbal thinking, visual level of thinking, descriptive level of thinking, and informal deduction. Overall, the professional literature reviewed indicated that implementing kinesthetic learning to teach geometric shapes to preschool children helped them correctly identify geometric shapes.
CHAPTER III: METHODS AND PROCEDURES

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. The research questions were: (1) How did the professional literature define learning in a kinesthetic style? (2) According to the professional literature, what were the best practices when teaching geometric shapes to preschool children? (3) Did implementation of using kinesthetic learning benefit student’s ability to identify geometric shapes?

In order to answer the third question (Did implementation of using kinesthetic learning benefit student’s ability to identify geometric shapes?), the instructor taught the following shapes: circle, square, rectangle, and triangle using kinesthetic learning activities. In order to discover if any changes were made in students’ ability to identify geometric shapes, the instructor assessed them at the beginning and end of the intervention.

Participants

The participants were students enrolled in a preschool age classroom that was part of a Head Start program located in a small city in the rural Midwest. The students were enrolled in a classroom that consisted of sixteen girls and four boys ranging in age from three to five years old. Twelve of the students in the study came from English speaking families and four of the students came from bilingual families with the bilingual families speaking English and Spanish. English was the primary language used in the classroom.

Treatment/Intervention

The intervention for this project was the implementation of a kinesthetic style lesson to aid preschool students in correctly identifying geometric shapes. Students were instructed using kinesthetic learning strategies. Kinesthetic learning can be described as when a student is
actively learning through movement of his or her body. Before creating the intervention for this project, the instructor completed a review of the professional literature regarding the benefits of kinesthetic learning for children.

After a review of the professional literature, seven best practices from four articles were found for teaching geometric shapes through kinesthetic activities. Oberdorf and Taylor-Cox (1999) gave four suggestions on how to introduce geometry into the classroom. These suggestions included giving students the opportunity to explore geometric materials kinesthetically, providing examples of shapes to students, using correct terminology, and helping children strive to expand their knowledge of shapes.

In addition, Horne (2003) suggested that when teaching students the names of shapes, the correct terminology must be used so as not to confuse the students. This would mean that when referring to a square, the terminology that should be stated would be that the object is a square and not referring to the object as a box. In the third article, Clements and Sarama (2000) suggested activities that used geometry in the classroom every day. These activities were creating large shapes on the carpet by using masking tape or a cardboard cut out. The fourth article by Hannibal (1999) stated that shapes should be available and displayed in all areas of the classroom and should be pointed out to children when appropriate. Appropriate times to point out shapes would be during a group time or when taking a walk in the hallway and outdoors. These suggested best practices were integrated into the intervention.

This project measured students' ability to identify the geometric shapes of a circle, square, rectangle, and triangle during a series of lessons that took place over a four day period. The intervention portion of the project started by using large group instruction and then transitioned into small group instruction. The first activity of the intervention consisted of
teaching geometric shapes by describing the characteristic of the shape in a large group setting. The second activity had the instructor reading a book about the shape. The students discussed the characteristics associated with the shape that they saw in the book. After reading the book, the instructor then told the students that day they would be cutting a shape, in this case a circle, out on a piece of paper, complete a shape march around the cardboard cut out of the shape, and go on a shape hunt. After this explanation, students were then divided into small groups of seven to complete the third activity where each student cut a tracing of the shape out on a piece of paper. After this activity was completed in the small group, this group along with the instructor, met at a two foot cardboard cut out of a circle that was placed on an open area of the room’s floor. When they gathered around the shape on the floor, they held their newly created shape in their hands and marched around the cardboard cut out of the shape while listening to the shape song that was approximately three minutes long (Frog Street’s Sing and Read Shape CD 2003).

After the fourth activity of marching around the shape, students in that small group went on a shape hunt with the instructor. For the final activity, the shape hunt, students walked around the room with the instructor and the students pointed to the shape of the day that was present around the room. As one group completed the shape hunt with the instructor, the other group of students cut the shape out from a piece of paper and marched around the large cardboard shape to the song with the teacher assistant. These same activities were used to teach a circle (Monday), squares (Tuesday), rectangles (Wednesday), and triangles (Thursday). On the fifth day, the instructor had a review and assessment of student understanding of all four shapes.

Instruments/Protocol

In order to gather data to answer the third research question (Did implementation of using kinesthetic learning benefit the student’s ability to identify geometric shapes?), two data
collection instruments were used. They were an adaptation of the Get It Got It Go! (GGG) (Ohio Department of Education 2008) and an instructor created tally sheet.

The original GGG is a timed flashcard assessment that is used to assess preschool children on their picture naming, rhyming, and alliteration abilities. To administer the GGG, the Ohio Department of Education recommended that the instructor take part in the GGG administration training. To adapt the GGG for the purpose of this project, the instructor first went through the GGG administration training and administered the GGG to her students. After using the GGG assessment with her students, she believed that this type of assessment could be adapted to assess students’ ability to identify geometric shapes. The instructor determined that this type of assessment would work well for her students since her students were used to completing this is the type of assessment.

To adapt the GGG, the instructor made a set of geometric flashcards. This set of flashcards consisted of line drawings of five circles, five squares, five rectangles, and five triangles on white card stock. After the students had been assessed at the beginning and end of the intervention with the flashcards, the instructor recorded the number of shapes that the individual students were able to correctly identify on a score sheet (see Appendixes A and B for scoring sheets).

As explained in the previous section, during the intervention, the students participated in a shape hunt with the instructor. The instructor recorded the observations of the children identifying shapes around the room during this hunt on the instructor created tally sheet. This tally sheet (see Appendix C for tally sheet) consisted of five columns. The first contained the children’s names. The next four columns were blank and headed by circle, square, triangle, and rectangle respectively. If the student was able to identify the shape of the day, the instructor
wrote an A in the appropriate column in the same row as the student’s name. If the student was unable to identify the shape during the shape hunt, the instructor wrote a U in the shape column and row with the student’s name. If the student was absent that day, the instructor wrote why the student was not at school on that day. The observations were recorded in the same way when the student participated in the shape hunt.

Procedures

To begin the project, the instructor presented her proposal to the education coordinator at Head Start. After discussing the project and how it would assist students’ ability in recognizing geometric shapes, the instructor was granted approval to conduct the study. The instructor then explained to each parent during a home visit that she was creating a lesson that would be used to assess the students’ to identify the shapes of a circle, square, rectangle, and triangle. All of the parents verbally agreed that their child could take part in this project.

Assessment of students’ knowledge of shapes was conducted before instruction began by using geometric flashcards. These flashcards were an adaptation of the Get It! Got It! Go! (Ohio Department of Education 2008). The set of flashcards used during the assessment consisted of five circles, five squares, five rectangles, and five triangles. In a quiet area of the classroom, in this case the library center, the instructor had a student sit across from her. She told the student that they were going to look at some flashcards with shapes on them and the student had to identify what shape was on the flashcard. The instructor turned over each card then and the student identified or was unable to identify the shape. If a student was able to correctly identify the shape the card went to the right. If a student was unable to identify the shape the card went to the left. When the student had finished with the flashcards, the instructor recorded the number of shapes that each student was able to correctly identify on a score sheet. The assessments were
conducted at the beginning and end of the intervention. For this study, the initial assessment was conducted the week before the intervention on geometric shapes began. The final assessment took place on the fifth day (Friday), after a review of the shapes the students learning during the intervention. The students were assessed individually and the scores for each of the assessments were recorded on a score sheet.

The second data collection instrument was a tally sheet. The instructor observed her students while completing the shape hunt to gather data to determine if the student was able or unable to point to shapes around the room and name that shape. The data was recorded on a tally sheet during the shape hunt.

Timeline

In December 2008, the instructor approached the education coordinator and asked for her permission to conduct the project. Prior to the implementation of the intervention, the instructor created the flashcard assessment, stencils to create the cut out; circles, squares, rectangles, and triangles. The implementation of the kinesthetic activities began in March 2009 after the initial flashcard assessment was conducted. The intervention was implemented during a week in March 2009.

Data Analysis

The instructor administered the pre-intervention assessment using the geometric flashcards. The students were scored based on the number of shapes that they identified correctly. The number of shapes that were identified correctly were then recorded on a score sheet. Then the same assessment was administered after the intervention and the students’ scores were recorded on the scoring sheet. At the end of the intervention, the instructor added all the students’ scores of the correctly identified shapes for the pre-intervention and post-intervention
assessments. Finally, the instructor compared the two sums to determine the difference between
the two assessments.

The shape hunt observations that occurred during small group were recorded on a tally
sheet. The tally sheet recorded whether the student was able or unable to identify the shape of
the day during the shape hunt. At the end of the intervention, the instructor analyzed the data
gathered from the shape hunt. This was done by determining the number of students who were
able to identify the shape of the day. This sum was converted to a percentage of students who
were able to complete the task.

Conclusion

After developing the intervention and assessment, the instructor implemented kinesthetic
activities to determine if preschool students’ would be able to identify geometric shapes
correctly. To answer the third research question (Did implementation of using kinesthetic
learning benefit student’s ability to identify geometric shapes?) a geometric flashcard assessment
was completed at the beginning and end of the intervention. The scores were then analyzed and
the instructor examined and analyzed the results from this data collection instrument. The
instructor also collect and analyzed the data from the shape hunt. The instructor kept a tally
sheet of each individual student to see if the student was able to point out shapes within the
room. These results were used to determine if implementing kinesthetic learning activities
would result in preschool school students’ ability to be able to correctly identify geometric
shapes.
CHAPTER IV: RESULTS

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. The research questions were: (1) How did the professional literature define learning in a kinesthetic style? (2) According to the professional literature, what were the best practices when teaching geometric shapes to preschool children? (3) Did implementation of using kinesthetic learning benefit student’s ability to identify geometric shapes?

In order to answer the third question (Did implementation of using kinesthetic learning benefit student’s ability to identify geometric shapes?), the instructor collected data using a geometric flashcard assessment and a tally sheet for a week in March 2009. The geometric flashcard assessment consisted of line drawings of five circles, five squares, five rectangles, and five triangles on white card stock. After the students had been assessed at the beginning and end of the intervention with the flashcards, the instructor recorded the number of shapes that the student was able to correctly identify on a score sheet. The tally sheet consisted of data collected while students participated in a shape hunt with the instructor. The instructor kept the observations that occurred during this hunt on a tally sheet. This tally sheet had separate columns for circle, square, triangle, and rectangle. The instructor wrote an A if the student was able to identify the shape during the shape hunt and a U if the student was unable to identify the shape during the shape hunt. The shape hunt observations took place each day during the intervention.

Geometric Flashcard Assessment

In order to determine whether students were able to identify the geometric shapes of circle, square, triangle, and rectangle; data was collected using the geometric flashcards
assessment before and after the intervention. The results indicated that as a class, identification of geometric shapes rose over the period of a week.

The week before the intervention, the instructor completed the initial assessment using geometric flashcards with each student. The scores ranged from 0 shapes recognized to 18 shapes recognized. The average score for the class in identification of geometric shapes was 10.75.

After the intervention was completed, the instructor then completed the final assessment using geometric flashcards with each student. The scores ranged from 8 shapes recognized to 20 shapes recognized. The average score for the class in identification of geometric shapes was 16.25. Figure 1 below shows the average score of the class for the geometric flashcard assessment before the intervention and after the intervention.

![Graph showing average scores]

*Figure 1: Average of class’s identification of geometric shapes*

The graph showed that before the intervention the class’s identification of shapes was 10.75. After the intervention took place, identification of shapes increased to 16.25. This means
that after the intervention, students could identify 5.5 more geometric shapes than before the intervention.

**Tally Sheet Assessment**

The other assessment that was used during the intervention was a tally sheet. This assessment recorded the individual student’s participation in the shape hunt activity. This assessment took place each day during the intervention.

The assessment consisted of small groups of students, approximately six students per group, completing a shape hunt with the instructor and that each student had to find the shape of the day around the room. As the students were identifying and finding the shape, the instructor marked on the tally sheet if the student was able or unable to identify and point to the shape. This same activity and assessment was used for circles, squares, rectangles, and triangles.

The first assessment consisted of the students identifying and pointing to a circle. During the intervention, 100% of the students present were able to identify and point to a circle. The second assessment consisted of the students identifying and pointing to a square. During the intervention, 100% of the students present were able to identify and point to a square. The third assessment consisted of the students identifying and pointing to a triangle. During the intervention, 100% of the students present were able to identify and point to a triangle. The fourth assessment consisted of the students identifying and pointing to a rectangle. During the intervention, 100% of the students present were able to identify and point to a rectangle. In sum, all students could point to and identify the shape of the day.

**Conclusion**

In conclusion, the results from the geometric flashcard assessment showed an overall increase in identification of geometric shapes. Data was collected before and after the
intervention took place. Results showed that students could identify 5.5 more geometric shapes from the pre-assessment to the post-assessment. In addition, the instructor observed that 100% of the students were able to point to and identify geometric shapes that were present throughout the classroom during the shape hunt. The results were calculated after data were recorded by the instructor before, during, and after the intervention.
CHAPTER V: DISCUSSION

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. The research questions were: (1) How did the professional literature define learning in a kinesthetic style? (2) According to the professional literature, what were the best practices when teaching geometric shapes to preschool children? (3) Did implementation of using kinesthetic learning benefit student’s ability to identify geometric shapes?

Meaning of Findings

These findings support the literature on best practices to teach geometric shape through kinesthetic instruction and activities. In using kinesthetic instruction and activities gave students the ability to use movements of their whole body to exploring shapes; by cutting, marching, and pointing to shapes. Students’ progress was measured by using a geometric flashcard assessment at the beginning and end of the intervention. Also students’ ability to identify geometric shapes was measured by the instructor collecting data on a tally sheet while students participated in a shape hunt. Through the intervention, students were able to increase the number of geometric shapes (circle, square, rectangle, and triangle) they could identify.

Evidence of students’ comprehension of identifying geometric shapes was through the geometric flashcard assessment. The students’ scores rose between the beginning of the intervention to the end of the intervention. Scores at the beginning of the intervention were 10.75 and after the intervention it rose to 16.25. Over a four day period a growth of 5.5 geometric shapes identified was observed.

The tally sheet that was used during the shape hunt is more evidence of students’ comprehension of identifying geometric shapes. During the shape hunt, students were split into
groups of approximately six students; each group of students would then search the room for the shape of the day. All students were able to identify the shape of the day during the shape hunt.

The consistency of the findings was strengthened by the process of using the same set of geometric flashcards at the beginning and end of the intervention and completing the shape hunt each day. The procedure in completing the geometric flashcard assessment and shape hunt was identical for each student. This provided that all data collect was consistent for all students since they were all assessed in the same way.

Summary

The purpose of this project was to determine if kinesthetic learning in a rural preschool classroom would result in children correctly identifying geometric shapes. Sixteen students in the class were instructed over a week long period by using kinesthetic activities. Assessment was conducted by using geometric flashcards at the beginning and end of the intervention. In addition, data was collected on a tally sheet that was scored during the students’ shape hunt. The results showed an overall improvement of identification of geometric shapes over the week long intervention. The conclusion can be drawn that an intervention using kinesthetic learning activities to teach geometric shapes would be beneficial to preschool students who are struggling to identify geometric shapes.

Recommendations

There are two recommendations that should be considered if any further research is conducted on this topic. The first recommendation would be to have another instructor available so that students would be able to be split into smaller groups. The problem was that during the course of the cutting activity, the instructor observed there were various levels of cutting skills by her students. During the cutting activity it was observed that the levels of the cutting skills of
the students' were: needed help by the instructor, slow and steady, and independent. If there was another instructor available, students could be arranged in groups by their cutting ability so that the flow of activities might have gone smoother and students would not have had to have as much wait time to move onto the shape march.

The second recommendation would be to assess children individually during the shape hunt instead of as a small group. The problem was that during the course of the shape hunt, the instructor observed that several students would point to shapes only after the instructor congratulated other students who were able to identify and point to the shape of the day right away. By assessing the students individually, the instructor would be able to tell if each student was able to identify and point to the shape of the day with knowledge that was learning during the instruction.

Conclusions

In conclusion, the purpose of this study was to show how the use of kinesthetic learning could improve preschool students' ability to identify geometric shapes. The project was conducted over a five day period and results from the assessments indicated that kinesthetic learning activities lead to students' increased ability to identify geometric shapes. Preschool students who are able to identify geometric shapes have a stronger foundation in the basics of understanding and learning geometry.
References


Appendix A

Beginning of Intervention

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Appendix C

*Shape Hunt*

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(The instructor wrote an *A* if the student was able to identify the shape during the *shape hunt* and a *U* if the student was unable to identify the shape during the *shape hunt*. If the child was absent, the reason was written.)