The Effectiveness Of Montessori Education Method In The Acquisition Of Concept Of Geometrical Shapes

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Abstract

Montessori method is an education program which is comed about and developed spontaneously and intends to gives children an opportunity to be able to improve themselves and to have freedom of movement and activity in a prepaned environment. The materials planned specially for Montessori method are being used to acquire the concept of geometrical shapes. In this regard, the effectiveress of Montessori Education and the Minister of Education of preschool curriculum has been evaluated on the acquisition of geometrical shapes concepts to 4-5 year-old children in preschool. It has been concluded that the acquisition of geometrical shapes concept of children who received Montessori Education is much more successful than the children who received traditional education.

Keywords: Montessori education, preschool education, concept of geometrical shapes.

1. Introduction

Preschool education can be defined as a developing and education period which covers the years beginning from the birth and to the day of basic education and when the children’s physical, psycho-motor, social-emotional, mental and language developments significant in their future lives are comleted on a large scale and is shaped by the education received in family and society (Aral and her friends, 2000, page 12).

Helping the children to acquire necessary knowledge, skills, attitude and basic habits and to learn and apply the standarts of judgement of society can be provided by a planned education and guidance. This guidance duty belongs to the teacher in an obvious curriculum (Üstünoğlu, 1990, page 58).

There have been many curriculums constituted for different purposes and used in preschool education in different countries nowadays. Each curriculum has got a different view of education, student-teacher interaction, system of educating teacher, choice of material and classroom order. Schools carry out their education practises by choosing one of or a few of these programs appropriate for them.

In preschool education programs, different types of activities are being used for developing the children’s self-care, mental, language, social, emotional and motor skills. The activities related to the concepts or learning concepts which concern mental development and language development are quite significant for the children in this period. One of the necessary conceps in Preschool Education Program is learning the concept of geometrical shapes. In Preschool Education Programs, activities such as educational toys, group games, drama, activities of art, music activities and education for literacy are being used in the acquisition of concept of geometrical shapes.

One of the programs used in preschool education is Montessori Education Program constituted by Maria Montessori in 1907. Montessori metod is an education program which is comed about and developed spontaneously and intends to gives children an...
opportunity to be able to improve themselves and to have freedom of movement and activity in a prepared environment (Montessori, 1997, page 7).

Maria Montessori has designed special materials for the acquisition of geometrical shapes and while doing this study she has worked with the mathematicians well-known in that period of time. These materials are quite effective in the acquisition of concept of geometrical shapes in early ages of children.

Montessori Method provides that the children effectively participate in the program which is combined with the concrete materials. Montessori Method has been designed according to the age, level of development and culture. Programs and activities can be designed as for each individual (Poyraz ve Dere, 2001, page 148). In Montessori Method effective learning is carried out by showing behaviours with working with Montessori Materials. Materials are designed for the children in a way that they can understand the concepts such as shape, size, colour, touching, tasting and the relationship between these concepts. The materials are also designed for the children by giving an opportunity to be able to use these materials freely as appropriate for their level of development (Oktay, 1987, page 66).

The effectiveness of Montessori Education Method and the Minister of Education of Preschool Education in the acquisition of geometrical shapes concepts to 4-5 year-old children in preschool has constituted the objective of this study. Below subjects used in the study are:

1. There hasn’t been a noteworthy difference between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children and the control group children.
2. There has been a noteworthy difference between the pre test and the post test scores of the form for the Concept of Geometrical Shapes of experiment group children.
3. There has been a noteworthy difference between the pre test and the post test scores of the form for the Concept of Geometrical Shapes of the control group children.
4. At the end of Montessori Education Method, there has been a noteworthy difference between the post test scores of the form for Concept of Geometrical Shapes of the experiment group children and the control group children.

2. Method

The study includes an experiment and a control group and repeated measurements (pre test and post test). The study consists of the experiment group applied Montessori Education and the control group applied traditional preschool education.

4-5 year-old of 40 children in 2007-2008 Konya Selçuk University, Vocational Education Faculty, İhsan Doğramacı Kindergarten have participated in the study.

The data of this study have been gathered by “A form of Concept of Geometrical Shapes” and “A Personal Information Form” applied to preschool children. “A form of Concept of Geometrical Shapes” has been applied to the experiment group children and the control group children as pre test and post test. The studies of validity and reliability of the tool of gathering data (A form of Concept of Geometrical Shapes) which was prepared by the researcher consulting with opinions of experts have been done and it’s reliability coefficient has been found as $r_x = .74$.

After the studies of pre test finished, Montessori Education Program for six weeks was prepared and the children received Montessori Education worked with Montessori materials such as: geometric cabinet, geometric form cards, geometric solids, geometric cards, binomial cube, constructive triangles, mystery bags, geometric shapes by themselves (with teacher) and participated in other activities Montessori Education has been carried out by a researcher who participated in “Applied Montessori Education Seminar” for 112 hour. The children who received traditional preschool education have participated in some activities such as educational toys, table activities, group games, music, story, drama and the education for literacy and have made some activities related to concept of geometrical shapes. The activities of the control group children related to concept of geometrical shapes for six week program have been followed and observed by the researcher.

3. Findings and Interpretation

Subject 1. Whether there has been a noteworthy difference between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children and the control group children or not has been researched in Table 3.1.

Table 3.1. The comparison between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children and the control group children

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>20</td>
<td>1.65</td>
<td>.81</td>
<td>1.43</td>
<td>.846</td>
</tr>
<tr>
<td>Control Group</td>
<td>20</td>
<td>1.30</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$p > 0.05$
As can be seen in Table 3.1, there hasn’t been a noteworthy difference as 0.05 level (p>0.05) between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children and the control group children. Therefore; it can be said that the experiment group children and the control group children’s pre-condition competences are not different from each other. These findings confirm the first subject.

**Subject 2.** Whether there has been a noteworthy difference between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children or not has been researched in Table 3.2.

<table>
<thead>
<tr>
<th>Tests</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>20</td>
<td>1.65</td>
<td>.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post test</td>
<td>20</td>
<td>5.35</td>
<td>.81</td>
<td>-19.14</td>
<td>.001</td>
</tr>
</tbody>
</table>

As can be seen in Table 3.2, there has been a noteworthy difference as 0.05 level (p<0.05) between the pre test scores of the experiment group who received Montessori Education. In pre test, $X = 1.65$ and in post test, $X = 5.35$. Thus, it can be said that Montessori education program is effective in the acquisition of concept of geometrical shapes. These findings confirm the second subject.

Aydoğan (2007), has researched in her study “Education of Concept Program” suitable for Piaget and Montessori Method is effective or not on 6-year-old children development of concepts related to numbers and geometrical shapes. At the end of the study, it has been observed that there has been a noteworthy increase in behaviours of the experiment children to whom Education of Concept Program was applied, recognizing and distinguishing shapes of triangle, square, rectangle, circle related to geometrical shapes when compared with the control group children to whom traditional program was applied. Findings above are consistent with the findings of this study.

**Subject 3.** Whether there has been a noteworthy difference between the pre test and post test scores of the form for Concept of Geometrical Shapes of the control group children or not has been researched in Table 3.3.

<table>
<thead>
<tr>
<th>Tests</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test</td>
<td>20</td>
<td>1.30</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post test</td>
<td>20</td>
<td>2.80</td>
<td>1.36</td>
<td>- 8.11</td>
<td>.001</td>
</tr>
</tbody>
</table>

As can be seen in Table 3.3, there has been a noteworthy difference as 0.05 level (p<0.05) between the pre test and post test scores of the control group children. Who received traditional education. In pre test, $X = 1.30$ and in post test, $X = 2.80$. Thus it can be said that traditional education is effective on the acquisition of concept of geometrical shapes. These findings confirm the third subject.

**Subject 4.** Whether there has been a noteworthy difference at the end of Montessori Education Method, between the post test scores of the form for concept of Geometrical Shapes of the experiment group and control group children or not has been researched in Table 3.4.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>20</td>
<td>5.35</td>
<td>.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>20</td>
<td>2.80</td>
<td>1.36</td>
<td>7.19</td>
<td>.001</td>
</tr>
</tbody>
</table>

As can be seen in Table 3.4, there has been a noteworthy difference as 0.05 level (p<0.05) between the post test scores of the experiment group and control group children. These findings confirm the fourth subject.
As can be seen in Table 3.4, there has been a noteworthy difference as 0.05 level (p < 0.05) between the post test scores of the form for Concept of Geometrical Shapes of the experiment group and control group children. According to the findings, there is a 2.55 score difference in favor of the experiment group between the post test scores arithmetical average of the experiment group and control group. These findings confirm the fourth subject.

It can be said that the children has an example (prototip) about geometrical shapes during the per test workings. However, it has been observed that after Montessori Education Program, the experiment group children were much more successful in recognizing the different forms of geometrical shapes compared with the control group children during the post test workings. Therefore, it can be said that Montessori Education Program and Traditional Education Program have different conclusions in the acquisition of geometrical shapes concepts and Montessori Education Program is much more effective in the acquisition of geometrical shapes concepts.

At the end of her study, Asfuroğlu (1990) has observed that the children who received education of Montessori materials could discriminate the shape of circle from the shape of triangle, square more easily compared with the children who received education without materials. The findings of her study confirm the findings of this study.

4. Conclusion and Suggestions

At the end of the study;

Whether there has been a noteworthy difference between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children and the control group children or not has been researched and there hasn’t been a noteworthy difference between the pre test scores of two groups.

Whether there has been a noteworthy difference between the pre test scores of the form for the Concept of Geometrical Shapes of the experiment group children or not has been researched and there has been a noteworthy difference between the pre test and the post test score of the experiment groups.

Whether there has been a noteworthy difference between the pre test and post test scores of the form for Concept of Geometrical Shapes of the control group children or not has been researched and there has been a noteworthy difference between the pre test and the post test scores of the control group.

Whether there has been a noteworthy difference between the post test scores of the form for concept of Geometrical Shapes of the experiment group and control group children or not has been researched and there has been a noteworthy difference between the post test scores in favor of the experiment group.

In the light of general conclusions of the study, some suggestions can be developed as below:

1. To be able to develop the children’s skills such as recognizing, naming, matching, arranging, grouping and discriminating the shapes, the tools and the materials related to the geometrical shapes different features as different angle, dimension or length not as the same measurement and similar shapes.

2. In-Service Training Programs should be arranged for preschool teacher in order to help them how the preschool children acquire concept of geometrical shape and which methods and techniques can be more effective while teaching these concepts.

3. To use multipurpose materials and tools by enriching teaching-learning lives with different environments and activities should be suggested to the teachers.

4. In-Service Training Programs, Seminars and Meetings should be arranged in order to make educators and parents conscious of Montessori Education Program in our country and in other countries.

References


