

## Examining the Impact of Education on the Acquisition of Map and Globe Reading and Interpretation Skills in Terms of Gender

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### ABSTRACT

The purpose of this study was to examine the impact of map and globe education on map and globe reading and interpretation skills of children who attend preschool education in terms of gender. A quasi-experimental model with pre-test/post-test control group was employed in the study. The study group of the research consisted of a total of 56 children in kindergarten, 28 of whom were in the experimental group (16 girls, 12 boys) and 28 in the control group (14 girls, 14 boys). The data were collected by using the "Map and Globe Reading and Interpretation Skills Assessment Test for Children Aged Five". In the analysis of the data, the t-test for independent groups was used to determine the mean scores for gender between the experimental and control groups, and the t-test for dependent groups was used to compare the mean scores of the experimental and control groups regarding gender. It has been found as a result of the research that the implementation of map and globe education program contributed positively to the map and globe reading and interpretation skills of both girls and boys in the experimental group.

### KEYWORDS

Preschool education; map; globe; map and globe skills.

## INTRODUCTION

Children are naturally interested in the social sciences from birth, and with their birth they begin to discover themselves, their environment and the world. Children, at every stage of their development, try to understand and make sense of their social and physical environment, learn more and more about the society that surrounds them, and develop awareness (Mindes, 2005). The natural curiosity and desire to explore that exist in children allows us to characterize them as natural geographers (Wiegand, 1993). Children begin to acquire skills for landscaping and using the environment when they begin to recognize their own bodies through physical experiences. For instance, babies' movements, crawling and walks introduce them to the location in space. Perceiving one's position in space, positioning one's own body in relation to the space, and knowing the positions of objects are the first steps towards geographic literacy. As children grow up, they continue to explore the world by asking questions about the objects, events, people and phenomena around them. As their interaction with the environment increases, the boundaries of the world surrounding them expand, their knowledge and experience about events and places increases, their navigation skills improve (Catling, 2001; Güler & Tuğrul, 2007). As Catling (2001) puts it, "children's geographical experiences are socially constructed" (p. 31). Thus, the opportunities and support provided to children by adults effectively help them acquire geographic experiences.

Geography education, provided to children from the preschool period in accordance with their level of development, is of great importance for them to get to know the world around them, learn about this world and understand the world. Effective geography education is possible with the acquisition of geographical skills. Geography education not only helps children to develop skills such as creative thinking, problem solving, reasoning, and questioning, but also helps them acquire geographic skills such as map reading, analysis and interpretation, map preparation, and drafting (Can Yaşar, İnal, Uyanık & Yazıcı, 2012).

Experimental studies conducted on map and globe skills training in the preschool period (Atkins, 1981; Anderson, 1987; Davis & Hyun, 2005; Goria & Papadopoulou, 2008) has shown that children can develop their map and globe skills when a systematic and planned education is given. In the literature, we see that gender is considered as a variable in some experimental studies in which the effectiveness of educational programs prepared for the development of map and sphere skills is investigated (Umek, 2003; White, 1995; Anderson 1987; Harwood & Usher, 1999).

There is a broad consensus that "men generally perform better than women in tasks that require spatial ability" (Wiegand, 2006, p. 97) even though there are different opinions in the literature on the differences in the abilities of boys and girls in map and spatial skills (Taylor, 1998). Since the term spatial skill encompasses different abilities such as spatial perception, spatial visualization and mental rotation (Linn & Petersen, 1985), the results for gender differences also vary according to the type of spatial skill measured. Research results have shown that boys perform better than girls, especially on mental rotation tasks (Linn & Petersen,

1985). However, Linn and Petersen (1985) found as a result of their meta-analysis that “there is a moderate gender difference for spatial perception and a small gender difference for spatial visualization tasks” (p. 1491).

Maccoby & Jacklin (1974) argued that gender differences in spatial skills appear at the onset of adolescence (as cited in Levine, Huttenlocker, Taylor & Langrock, 1999); contrary to this view, several studies have shown that gender differences in spatial skills appear during the preschool years (Siegel & Schadler, 1977; Levine, Huttenlocker, Taylor & Langrock, 1999; Levine, Ratliff, Huttenlocker & Cannon, 2012).

While Munroe, Munroe & Brasher (1985) emphasized the importance of education in developing the spatial skills of girls, Mohan & Mohan (2013) stated that spatial skills can be learned with the help of teaching activities. Wiegand (2006) stated that it is important for girls to be given opportunities by teachers at school about using and drawing maps. On the other hand, Dursun (2010) underlined the importance of developing spatial skills and spatial positioning skills of both girls and boys with education starting from an early age.

Tzuriel & Egozi (2010) conducted an experimental study with 116 children with an average age of 6 years and 7 months with a pre-test post-test control group, revealing that gender differences can be eliminated with educational programs that will be prepared in accordance with the age and developmental levels of children. An educational program aimed at the representation and transformation of visual-spatial information was provided to the experimental group, and a mental rotation test was administered to all children participating in the study before and after the educational program was implemented. As a result of the study, it was found that the gender differences that existed initially in the experimental group disappeared after the educational program was implemented, and the educational program was effective in eliminating the gender gap.

Investigating the effectiveness of the map drawing method and the map reading method in a study in which second grade students participated, Umek (2003) found as a result of the study that girls preferred to draw maps and boys preferred to read maps while there was no big difference in success between the genders. It was also noticed that the educational program increased the interest in maps among students.

On the other hand, White (1995) compared the academic achievement of mixed and same age groups in map reading skills in a study conducted with first, second, third and fourth grade students. As a result of this research, there was no significant difference was found between the genders in terms of success.

As a result of the study conducted with the participation of kindergarten children under the age of seven, Anderson (1987) realized that boys in high verbal groups performed better than girls, and this situation emerged especially when they were trained in the use of maps by acting in the field. It was found that girls with high verbal skills in the group who were trained by the traditional method performed better than boys. While boys performed better in the task

of reading the illustrated map and the abstract map, girls performed better in the task of understanding the map.

Harwood & Usher (1999) evaluated the map drawing skills of eight and nine-year-old children in their study. In the study, utilizing the experimental design with pre-test/post-test control group, the children were asked to draw a map showing the route from school to church as a pre-test. The experimental group underwent seven weeks of education regarding bird's-eye view, symbols and map key issues, and no intervention has been made in the control group. Even if there was no statistically significant difference found between the scores of girls and boys at the end of the study, although girls performed at a higher level at the beginning, it was observed that boys were more successful at the end of the study and responded more positively to training.

Considering the limited number of such studies, it seems that the studies examining the effect of systematic and planned education on the development of map and globe skills of children in the early childhood period on their mapping skills in terms of gender are not sufficient. It is hoped that this study shall contribute to the literature on the effects of education to be provided in improving the map and globe reading and interpretation skills of girls and boys in early childhood.

In this study, an answer shall be sought to the question:

- Does the educational program for using maps and globes affect the map and globe reading and interpretation skills of five-year-old girls and boys attending pre-school?

Sub-questions:

- Is there a statistically significant difference between the *pre-test/post-test* mean scores of the children in the *experimental group* regarding the skills of reading and interpreting maps and globes by gender?
- Is there a statistically significant difference between the *pre-test/post-test* mean scores of the children in the *control group* regarding the skills of reading and interpreting maps and globes by gender?
- Is there a statistically significant difference between the *post-test* mean scores of the children in the *experimental and control groups* regarding the skills of reading and interpreting maps and globes by gender?
- Is there a statistically significant difference between the *post-test/follow-up test* mean scores of the children in the *experimental group* regarding the skills of reading and interpreting maps and globes by gender?

## METHOD

### Research Method

As a type of quantitative research, a quasi-experimental design with pre-test/post-test control group has been employed in this study, which aims at determining the effect of map and globe

education on the ability of five-year-old girls and boys to read and interpret maps and globes. In the current study, in addition to the experiences of the children selected for the experimental group, Map and Globe Education Program was additionally utilized for them by the researcher, while teachers kept following the usual daily educational programs for the children in the control group.

### Study Group

Considering that the impartial assignment of children to groups in an educational institution would disrupt the existing classroom structure and order, the experimental and control groups were formed using the appropriate sampling method. While determining the schools; factors such as the proximity of the geographical locations of the schools, the closeness of the education and socio-economic levels of the families who send their children to these schools, the similarity of school infrastructures and facilities, easy transportation and time were taken into consideration. The experimental and control groups were determined with respect to the volunteerism of the school administration and teachers about the implementation.

The study group consisted of 56 five-year-old children in total at the end of the data collection process, 28 of whom were in the experimental group (16 girls, 12 boys) and 28 in the control group (14 girls, 14 boys).

A t-test was administered for independent samples in order to examine whether there is a statistically significant difference between the pre-test scores of the map and globe reading and interpretation skills of the children in the experimental and control groups by gender and the results are as follows:

**Table 1.** Independent t-Test Results on the Comparison of Experimental and Control Group Pre-test Scores by Gender

Test	Group x Gender	N	X	SS	t	p
Pre-test	Experimental Girl	16	11,19	3,08	-1,18	0,25
	Control Girl	14	12,43	2,59		
	Experimental Boy	12	11,25	3,72	-1,13	0,27
	Control Boy	14	12,71	2,89		

For the purpose of the research, the pre-test scores of the boys and girls in the experimental and control groups were compared with the independent sample t-test (Table 1). Based on the results obtained, there was no statistically significant difference between the pre-test mean scores of girls ( $t=-1.18$ ;  $p>0.05$ ) and boys ( $t=-1.13$ ;  $p>0.05$ ) in the experimental and control groups. Map and globe reading and interpretation skill levels of girls and boys in the experimental and control groups were similar before the training program was implemented.

### **Data Collection Instruments**

*“Map and Globe Reading and Interpretation Skills Assessment Test for Children Aged Five”*, which was developed as the data collection instrument by the researcher, has been administered to collect the data in the study. First of all, the scope of the test was determined in the development process of the assessment test, and then, taking into account the Preschool Education Program (MEB, 2013) and the related literature, competencies for the acquisition of map and globe reading and interpretation skills for five-year-old children were established. Afterwards, studies, activity examples and theses on the use of maps and globes in preschool were examined, an illustrated children’s map was drawn to measure map and globe reading and interpretation skills, colored visuals were prepared, and evaluation questions were formed based on this map and visuals.

Expert opinion was sought to ensure the validity of the test scope. Considering the suggestions and contributions of experts, competencies for the acquisition of map and globe reading and interpretation skills, question statements, and the illustrated map drawn and colored visuals have been re-arranged.

For the validity-reliability analysis of the assessment test, necessary item analyzes were made and item difficulty index and item discrimination index were calculated. “The point-biserial correlation coefficient” was used to calculate item discrimination.

The reliability of the test was calculated using the Kuder Richardson-20 (KR-20) formula. The reliability coefficient of the evaluation test according to KR 20 was calculated as 0.76. Fraenkel, Wallen, and Hyun (2012) stated that “the reliability of a test being 0.70 and above would be sufficient for the reliability of that test” (p. 157).

### **Map and Globe Education Program**

The Map and Globe Education Program, which was developed by the researcher, aimed to support all developmental areas of the child, considering the developmental levels and characteristics of children aged five years.

Throughout the preparation work of the program, the developmental characteristics of five-year-old children and objectives, indicators and descriptions related to location in the space for the development of map and globe reading and interpretation skills in the preschool education program (MEB, 2013) were reviewed, concepts indicating direction, location and dimension in space were examined.

Next, national and international master's theses and doctoral dissertations and academic publications, and examples of activities aimed at improving map and globe reading and interpretation skills on the websites prepared for the education of preschool children were reviewed. In the planned activities, attention was paid to the fact that children make sense of their environment with actions, movements and interact with concrete objects and materials. While teaching map skills (position, perspective, signs, distance/scale and direction) to children, games were used both as a method and as a type of activity, movement activities were mostly

included, and activities that would increase the motivation and interest of children in their learning and arouse their curiosity were planned using various materials.

In order to ensure the content validity of the prepared educational program prepared, a total of 10 field experts were consulted, including a curriculum development specialist, five faculty members from the field of child development and preschool education, two faculty members from the field of elementary social studies education, and two preschool teachers.

The pilot study of the educational program organized in accordance with the expert opinions has been carried out. The pilot study was carried out with 12 children studying in the five-year-old age group of a private preschool educational institution. Randomly selected five activities were implemented as part of the pilot study for two weeks. The purpose of the pilot study was to determine the time to be allocated to the activities, to identify the difficulties that may be encountered during the implementation, to obtain information about the suitability and use of educational materials and the interest of children in educational situations.

### **Implementation of Data Collection Instruments and Educational Program**

Prior to data collection, the consent of the research was obtained in order to determine the ethical appropriateness of the study. Afterwards, official consent was obtained from the Ministry of National Education in order to implement the Map and Globe Reading and Interpretation Skills Assessment and Map and Globe Education Program in selected schools.

As a pre-test, "*Map and Globe Reading and Interpretation Skills Assessment Test for Children Aged Five*" has been administered to children in the experimental and control groups. The statistical analysis of the pre-test data, which compared the mean scores of the groups in the assessment test, showed that there was no statistically significant difference between the mean scores, and levels of the map and globe reading and interpretation skill were similar. According to the pre-test findings, two classes (Experimental A and Experimental B group) of five-year-old children attending one of the kindergartens constituting the study group were determined as the experimental group, and the five-year-old children attending the other two kindergartens were determined as the control group.

The educational program on the use of maps and globes was implemented to the experimental group for 10 weeks by the researcher. While the children in the control group received daily educational programs by their teachers, they did not receive any education on map and globe education program.

Having completed the implementation of the map and globe education program, the "*Map and Globe Reading and Interpretation Skills Assessment Test for Children Aged Five*" has been administered to the experimental and control groups as a post-test.

Four weeks after the post-tests were administered to the experimental and control groups, the *Map and Globe Reading and Interpretation Skills Assessment Test for Children Aged Five* was re-administered to the experimental group as a follow-up test.

### Processing and Analysis of Data

The scores acquired as part of the research from the evaluation test administered to the experimental and control groups as pre-test, post-test and follow-up tests were coded into the SPSS 22.0 program by the utilization of the appropriate statistical analyzes.

An independent sample t-test was employed to determine the gender-related achievement differences between experimental and control groups, in addition to employing a dependent sample t-test to compare the gender-related achievement mean scores of experimental and control groups within themselves. Moreover, as the effect size in all analyzes, the Cohen d value was calculated.

The results of the analysis were evaluated at the 95% confidence level and  $p < 0.05$  values were considered statistically significant.

## FINDINGS

### Findings Regarding the First Sub-Question

A dependent sample t-test was administered in order to find out whether there is a statistically significant difference between the pre-test and post-test scores of map and globe reading and interpretation skills belonging to the children in the experimental group by gender and the results are shown below.

**Table 2:** Dependent t-Test Results on the Comparison of Experimental Group Pre-test/Post-test Scores by Gender

Group x Gender	Test	N	X	SS	t	p	Cohen d
Experimental Girl	Pre-test	16	11,19	3,08	-15,27	0,00*	5,26
	Post-test	16	24,19	1,64			
Experimental Boy	Pre-test	12	11,25	3,72	-12,45	0,00*	4,07
	Post-test	12	23,92	1,88			

\* $p < 0,05$

The pre-test and post-test scores of the boys and girls in the experimental group were compared with a dependent sample t-test for the purpose of the study (Table 2). Findings indicated that there is a statistically significant difference found between the pre-test and post-test mean scores of the girls ( $t = -15.27$ ;  $p < 0.05$ ) and boys ( $t = -12.45$ ;  $p < 0.05$ ) in the experimental group. It was observed that the map and globe education program received in the experimental



group contributed positively to the map and globe reading and interpretation skills of both girls and boys in the experimental group. The map and globe education program proved to have a wide impact on map and globe reading and interpretation skills of both girls and boys.

### Findings Regarding the Second Sub-Question

A dependent sample t-test was administered in order to find out whether there is a statistically significant difference between the pre-test and post-test scores of map and globe reading and interpretation skills belonging to the children in the control group by gender and the results are seen below.

**Table 3:** Dependent t-Test Results on the Comparison of Control Group Pre-test/Post-test Scores by Gender

Group x Gender	Test	N	X	SS	t	p	Cohen d
Control Girl	Pre-test	14	12,43	2,59	-2,98	0,01*	1,16
	Post-test	14	15,43	2,50			
Control Boy	Pre-test	14	12,71	2,89	0,00	1,00	-
	Post-test	14	12,71	3,83			

\*p<0,05

The pre-test and post-test scores of the boys and girls in the control group were compared with a dependent sample t-test for the purpose of the study (Table 3). Findings indicated that there is a statistically significant difference found between the pre-test and post-test mean scores of the girls in the control group ( $t=-2.98$ ;  $p<0.05$ ). However, there was no statistically significant difference found between the pre-test and post-test mean scores of the boys in the control group ( $t=0.00$ ;  $p>0.05$ ). Findings thus suggested that the education received in the control group contributed positively to the map and globe reading and interpretation skills of the girls in the control group, while it did not contribute to the map and globe reading and interpretation skills of the boys in the control group.

### Findings Regarding the Third Sub-Question

An independent sample t-test was administered in order to find out whether there is a statistically significant difference between post-test scores of map and globe reading and interpretation skills belonging to the children in the experimental and control groups by gender and the results are as follows.

**Table 4:** Independent t-Test Results on the Comparison of Experimental and Control Group Post-test Scores by Gender

Test	Group x Gender	N	X	SS	t	p	Cohen d
Post-test	Experimental Girl	16	24,19	1,64	11,47	0,00*	7,47
	Control Girl	14	15,43	2,50			
	Experimental Boy	12	23,92	1,88	9,20	0,00*	3,71
	Control Boy	14	12,71	3,83			

\*p&lt;0,05

The post-test scores of the boys and girls in the experimental and control groups were compared with an independent sample t-test for the purpose of the study (Table 4). Findings showed that there is a statistically significant difference found between the post-test mean scores of the girls ( $t=11,47$ ;  $p<0,05$ ) and boys ( $t=9,20$ ;  $p<0,05$ ) in the experimental and control groups. Findings thus suggested that the map and globe education program received in the experimental group was found to be effective in improving the map and globe reading and interpretation skills of boys and girls. The presence in different groups had a wide effect on the ability to read and interpret maps and globes.

#### Findings Regarding the Fourth Sub-Question

A dependent sample t-test was administered in order to find out whether there is a statistically significant difference between the post-test and follow-up test scores of map and globe reading and interpretation skills belonging to the children in the experimental group by gender and the results are given below.

**Table 5:** Dependent t-Test Results on the Comparison of Experimental Group Post-test/Follow-up Test Scores by Gender

Group x Gender	Test	N	X	SS	t	p
Experimental Girl	Post-test	16	24,19	1,64	1,50	0,15
	Follow-up test	16	23,56	1,67		
Experimental Boy	Post-test	12	23,92	1,88	-0,28	0,78
	Follow-up test	12	24,08	2,27		

The post-test and follow-up test scores of the boys and girls in the experimental group were compared with an independent sample t-test for the purpose of the study (Table 5). Findings showed that there is no statistically significant difference found between the post-test and follow-up test mean scores of the girls ( $t=1,50$ ;  $p>0,05$ ) and boys ( $t=-0,28$ ;  $p>0,05$ ) in the

experimental group. Consequently, findings suggested that the map and globe education program received in the experimental group was found to be effective in ensuring the persistency of map and globe reading and interpretation skills of both boys and girls.

## DISCUSSION

As a result of this research, it was found that the map and globe reading and interpretation skills of children receiving map and globe education did not differ by gender, and the educational program positively contributed to the map and globe reading and interpretation skills of both girls and boys.

Maps are tools that have a wide range of usage in our daily lives. Having the skills to read, use and interpret maps in solving the problems we face and in today's society, which is becoming increasingly complex and mobile, is quite essential (White, 1995). Given to this great importance, it seems that the map education provided to children within the scope of geography lessons in the educational life is insufficient. Unfortunately, children leave the school system without learning how to use maps effectively (McClure, 1992; Thurmond, 1985).

Reading, using and interpreting maps constitutes an important part of geography education. "No one can teach or learn geography without using a map" (Natoli, 1995; cited in Maxim, 1997, p. 206). Children thus need to acquire essential map reading skills to improve their geographical knowledge. It is a fact that people rarely develop map and globe skills on their own because the development of these skills takes place within the school system. It takes practice, review and re-teaching in the process of developing those skills (Rayner, 1999). Therefore, map and globe skills should be acquired in a systematic and planned manner in accordance with children's development levels throughout their educational lives (Joyce, 1964; White, 1995).

Studies on map and globe education have shown that children can develop their map and globe skills when systematic and planned education is given (Crabtree, 1968; Plumleigh, 1970; Atkins, 1981; Anderson, 1987; White, 1995; Harwood & Usher, 1999; Manzella, 2007; Goria & Papadopoulou, 2008).

It was seen that there are different results reached in the related literature regarding the views on gender differences in spatial skills and when these differences occur. Although Maccoby and Jacklin (1974) argued that the gender difference in spatial skills emerges at the beginning of adolescence (as cited in Levine, Huttenlocker, Taylor & Langrock, 1999), Linn and Petersen (1985) found out as a result of their meta-analysis study that gender differences in some spatial skills (spatial perception) begin at the age of 8 years. Yet, Levine, Huttenlocker, Taylor, and Langrock (1999) stated that there are some studies showing that gender differences in spatial skills emerge in the preschool years.

While it was realized that opinions about gender differed in the literature, it has been discovered by the research that spatial skills can be improved through education (Baenninger & Newcombe, 1989; Dursun, 2010; Mohan & Mohan, 2013) and that gender differences can be eliminated with educational programs to be prepared (Tzuriel & Egozi, 2010). The results of a

meta-analysis study conducted by Baenninger and Newcombe (1989) indicated that the effect of education is similar for men and women, both groups benefit from education equally. The results of another meta-analysis study conducted by Marulis, Lui, Warren, Uttal and Newcombe (2007) confirm these findings as well (as cited in Tzuriel & Egozi, 2010).

On the other hand, this study discovered that there is a statistically significant difference between the pre-test and post-test mean scores of the girls in the control group in terms of map and globe reading and interpretation skills, but, there is no statistically significant difference between the pre-test and post-test mean scores of the boys in the same group. This means that the current preschool education program has made a more positive contribution to the map and globe reading and interpretation skills of the girls in the control group compared to the boys. Their experiences in preschool educational settings and the education they received could be affective on this difference between the pre-test/post-test mean scores of map and globe reading and interpretation skills of the girls in the control group. Studies carried out regarding the use of maps revealed that education is important in developing spatial skills, that teachers should provide opportunities for girls to use maps at school and that differences between education and gender may thus be removed (Munroe, Munroe & Brasher, 1985; Baenninger & Newcombe, 1989; Wiegand, 2006; Dursun, 2010; Thommen et al., 2010; Tzuriel & Egozi 2010; Mohan & Mohan, 2013). This finding of the study is in line with the studies that found that girls benefit more from educational programs compared to boys (Coluccia & Louse, 2004; Tzuriel & Egozi, 2010).

The reason for the difference between the pre-test/post-test mean scores of map and globe reading and interpretation skills of the girls in the control group may also be related to environmental factors. According to the researchers who based the gender difference on environmental factors, the time difference that men and women devote to spatial activities is the most important factor in the emergence of gender differences in spatial skills. Compared to women, since childhood, men usually prefer to play games that develop spatial skills and engage in sports activities, as well as they are allowed by their families to explore their surroundings from an early age (Taylor, 1998; Levine, Huttenlocker, Taylor & Langrock, 1999; Coluccia & Louse, 2004; Dursun, 2010). Nowadays, things are changing in favor of girls that help them develop their spatial skills, such as decreasing gender differences in spatial skills and spatial positioning skills related to the use of maps, the changing nature of children's activities, girls involving in activities where mostly boys performed, and girls also participating in space-related activities. It appears that these changes have improved the spatial skills and spatial positioning skills of girls (Baenninger & Newcombe, 1989). Therefore, extracurricular activities and experiences of the girls in the control group may have contributed positively to their ability to read and interpret maps and globes.

In conclusion, this study and the other research results mentioned above show that an education that will start from an early age can improve map and globe skills in both girls and boys.

## CONCLUSION AND IMPLICATIONS

The current study found a statistically significant difference between the pre-test and post-test mean scores of the map and globe reading and interpretation skills of girls and boys in the experimental group employing the map and globe education program. The map and globe education program implemented has made a positive contribution to the map and globe reading and interpretation skills of both girls and boys in the experimental group. It has also been observed that the educational program applied has a significant impact on ensuring the persistency of the abilities to read and interpret maps and globes in both girls and boys. Hence, compared to the settings where the current preschool education program is applied alone, the implementation of the map and globe education program together with the current preschool education program (MEB, 2013) found to be more effective in helping both girls and boys acquire the skills of reading and interpreting maps and globes.

For the purposes of this study, the map and globe education program aimed at improving the map and globe reading and interpretation skills of five-year-old girls and boys has been implemented for 10 weeks.

Therefore, in further studies:

- It could better to apply the program throughout a full academic year in order to examine the long-term effects of implementing map and globe activities.
- Integration of the map and globe education programs be prepared into existing preschool education program may have a significant contribution to raising map-literate individuals. Yet, in order to have a successful integration, in addition to preschool teachers and children need to work together with cartographers, it is necessary to cooperate with cartographers and experts in the preparation of map and globe education programs as well as in the design of children's maps. Consequently, the Ministry of National Education may prepare exemplary educational programs aimed at developing map and globe skills in the preschool period and work to support these programs with maps appropriate for children's developmental levels.

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