

## **Success And Attitude Levels Of The Students, Who Had Attended And Had Not Attended Nursery School, In Science And Technology Lesson In Elementary School**

Anaokuluna Giden Ve Gitmeyen Öğrencilerin İlköğretimde Fen Ve Teknoloji Dersinde Başarı - Tutum Düzeyleri

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### **ABSTRACT**

In developed countries, the students' curiosities about nature are satisfied by making them interested in science and technology in pre-school education. Therefore, this study examines the variations between attitude and success levels of the students in science and technology, who had had and not had pre-school education. 5-point Likert's attitude scale was used as material. The students were asked that how much points they obtained in science and technology lessons for determining their success. The study was performed with 400 students studying fifth class of elementary school in center four cities in Turkey.

In analyzing of the data, Independent Samples Test (t- test) was employed to determine whether there is a variance between successes of the students, who had attended and had not attended nursery school. Independent Samples Test (t- test) also was employed to determine whether there is a variance between attitude points of the students, who had attended and had not attended nursery school, and also success and attitudes between the students, who were attending private schools and state schools.

A significant difference was seen between attitudes and success of the students, who had had and had not had pre-school education. Hence, every student attends pre-school education.

**Keywords:** Comparative education, attitude levels, science lesson and elementary school

### **ÖZET**

Ülkelerin dünyada gelişmişlik açısından ilk sırayı almasında fen ve teknolojinin önemi tartışılmazdır. Gelişmiş olan ülkeler öğrencilere okulöncesi eğitimde fen ve teknolojiyi sevdirmeye yoluna giderek, onların tabiat merakını gidermektedirler. Bu nedenle bu çalışma okul öncesi eğitimi alan öğrenci ile almayan öğrencilerin ilköğretimde fen ve teknolojiye karşı tutum ve başarı farkını araştırmaktadır. Materyal olarak çalışmada 3'lü Likert tipi tutum ölçek kullanılmıştır. Öğrencilerin başarısını tespit etmede, fen ve teknoloji derslerinden kaç puan aldıklarına ilişkin soru maddesi kullanılmıştır. Çalışma, Van merkezde öğrenim gören 190 tane 5. sınıf öğrencileri ile yürütülmüştür. Örneklemde elde edilen veriler analizinde, öğrencilerden anaokuluna gidenle gitmeyenlerin başarıları arasında bir farkın olup olmadığına ANOVA tekniği ile bakılmıştır. Anaokuluna gidenle gitmeyenlerin tutum puanları arasında farkın olup olmadığına, özel ve devlet okuluna gidenlerin başarıları ile tutumları arasında farkın olup olmadığına da Independent Samples Test (t- testi) tekniği kullanılmıştır. Okulöncesi eğitime giden öğrencilerin tutum ve başarılarında dikkate değer bir başarı görülmüştür. Ancak özel okulla devlet okulu arasında tutum ve başarı açısından bir farka rastlanmamıştır. Ülkelerin geleceği açısından, öğrencilerin fen ve teknoloji dersinde başarılı olması, bilimsel bir tavır kazanması bekleniyorsa, her öğrencinin okulöncesi eğitime devam etmesi sağlanmalıdır.

**Anahtar kelimeler:** Karşılaştırmalı eğitim, fen dersi ve okulöncesi, davranış seviyesi

### **1. INTRODUCTION**

Children enter learning process as soon as they were born. Early years of life are very important for growth and education of a child. The education should not be left to coincidences in these critical years in which children acquire basic knowledge, skills and habits. Therefore, pre-school education should be managed scientifically and hierarchically. Pre-school children are very sensitive to their environment, active, curious and interested in research and asking questions. Their imagination is high. They try to make relations between reasons and results, which they encountered in their daily lives (Lipponen, 2000; Cartwright, 2002; Collins, Joseph, & Bielaczyc, 2004). Therefore, they pay attention to learn reason-result relation. A regular education program should be applied by considering these characteristics of children during pre-school years for preparing them for programmed education period. Thus, when children acquire the knowledge, skills and attitudes

required by pre-school life, they are encouraged to be more successful in elementary school (Smeets, & Mooij, 2001; Conole, Dyke, Oliver, & Seale, 2004).

Learning is a continuous activity. Learning and developing knowledge and skills are unavoidable as long as life lasts. Therefore, learning concept is based on very important realities. The two of the most important of these realities is the individual's willingness and continuity of his efforts. When these two elements exist, it is assumed that the first step is taken into learning. Learning is performed by repeating and experiences depending on maturation and readiness levels. Learning by experiencing means that the student learns by using his/her own mind and coordinating his/her psycho-motor skills. According to Piaget, children experience pre-process period (2–7) in this period. In this period, children try to understand the existences found in their near surrounding according to their physical characteristics such as size, form, color, odor, tissue and temperature and also reactive characteristics such as skidding, rolling, sinking and jumping. In this period, natural curiosity of children may be satisfied by science-nature studies.

Because science education is consists of abstract concepts, children find hard to learn these concepts. Children do not have the characteristic for understanding abstract concepts because they are at the pre-process stage. Therefore, it is tried to make a relation between the events and the objects (Parker, 1997; Kerawalla , Pearce, Yuill, Luckin, & Harris, 2008). Children are curious about the toy of an object to understand that object. They want to break down and open it. In brief, they try to understand the unknown by using the known by making analogy. Science studies are important to facilitate daily life and improve skills for children as well as adults.

In science and nature studies, nature is explored and much new knowledge is obtained by acquiring new skills by observation, communicating, estimating and making experiments. Especially the children, who have positive attitudes and curiosity for science as well as are very interested in research and exploration, may be motivated by science and nature studies arranged appropriately. Carl Sagan (1998) told that his parents encouraged him to orient to science and his parents promoted him to make researches and explorations and to learn new knowledge. If the interests of children in science are guessed, it is ensured that they have positive attitudes for science and acquire scientific thinking skills for the years in future (Sahin, 2000, Frost, 1997; Ulcay, 1998, Howesa, et. 2007).

Although science and nature studies are intended for supporting mental growth of children, it has a potential to support all growth areas. If children are oriented to ask questions, explore and make conclusions according to information obtained by them, they are considered that they take an important step into science (Ginsburg & Golbeck, 2004).

In fact, pre-school science education offers opportunities for children to learn their environment, make experiments and develop their hand skills (Howe, 1996) as well as learn about scientific methods such as making observation, testing ideas and making measurements (Akman, 1994). Also it helps them to learn important conceptual information while examining their surrounding (Greenes, Ginsburg & Balfanz, 2004) and to join to something required for them actively while interacting with their surrounding (Griffin, 2004). Furthermore, it ensures that children become sensitive to the events, which occurs around them, and it make children acquire some attitudes such as being curious, being open-minded, honesty and being undaunted by challenges (Yasar, 1993).

Various materials should be used in pre-school activities as much as possible for making children think positively about science in the future. For example, plastic and glass dishes, lenses, magnet, magnifying glass, glass, meter, clock, measurement dishes, boxes, sand, microscope, thermometer, balance, graphic aquarium, gardener's spade, shovel, materials, which they can make their toys, and toys are some of these materials (Alisinanoglu and Ulutas, 2003). Repeating the same activities everyday bores children. Therefore, developers in science education should make decisions on which activity they chose depending on target behaviors to be performed in pre-school education period and also they should allocate time for each activity in the same way during the education process. There

may be too many activities to ensure children develop positive attitudes for science and to contribute to success of children in science lessons in the future education process such as making experiments, nature trips, plant collection and making album.

It is very important for their science education in the future that children establish tough scientific bases and learn scientific thinking by developing their research, examination and observation skills during pre-school education years (Ulucay, 1998, Gürdal et al, 1993).

Children in their daily life and activities demonstrate many characteristics relating to scientific thinking. They make recommendations (Gelman and Brenneman, 2004, Smith, 2001, Henderson and Lucas, 1998). One of the methods, which provide this thinking, is planned and programmed science studies, which will be performed by specialists (Gutierrez 1995). If natural curiosity of children is promoted properly, it is possible that they develop positive attitudes for science (Smith, 2001; Rillero, 1994).

That is effective on science comprehension and education of children (Aktas Arnas, 2002). The need for knowing may cause children ask questions. Children may learn many things by this way. This knowledge determines readiness level of children in the future (Tipps, 1982, R. Powell, et., 2007).

The more children join in science studies in preschool period actively, the more their skills for comprehending and interpreting information improve. The children, who had science education in pre-school period, are expected to be more successful compared with those, who did not (Frost, 1997). Therefore, children acquire knowledge, skills and attitudes required by pre-school life by attending pre-school education and then, they may be more successful in elementary school (Kücükturan, 2003; Erkan, 1993; Yılmaz, 1990; Shaw et al 1992; Bal, 1993).

According to the reasons and expectations mentioned above, examining the variances in success and attitude of the students, who had and not attended pre-school science education, is important. Therefore, science and nature curiosity of the students studying 5th class of first grade of elementary school should be tested. Also, it is believed that the study contributes to make families conscious on the matters what type activities should be performed in pre-school period and to promote children for pre-school education.

### **1.1. Objective**

The objective of the study is to determine whether there is a variance between success and attitudes of the students, who had and not attended pre-school science education and also to determine the relation between success and attitude levels of the students, who are attending private schools and state schools.

## **2. METHOD**

### **2.1. Participants**

This study was conducted in the center of four cities in the second term of 2006-2007 academic years. These cities are Nevşehir (located in Inner Anatolia Region), Istanbul (located in Marmara Region), Van (located in East Anatolia Region) and Trabzon (located in Black Sea Region). The level of education and development of the cities representing the sample was paid heed to be different from each other. Six private and six state schools were chosen for the sampling. In this way, the study was conducted with 400 students of the 5th grade of the first level of elementary education. 200 of the students had been attending to private schools, and the other half had been attending to state school. The state schools were paid attention to be among favorite schools. Because the number of the students sent to preschool education is much less than it ought to be. Preschool education is not compulsory in Turkey. It is voluntary. The number of the students in the classes of those schools was between 25 and 35. The number of the girls and boys was paid attention to be equal. 52 per cent of the students are male and 48 per cent of students are female. The average age of the students is 12 years old.

## 2. 2. Materials

Five–point Likert scale of which reliability was reckoned as 0.85 was used as material. This scale was developed by the researcher in order to be used on various samples and objectives. 40 items existed in the scale (attitude towards science- knowledge scale). The reason for the choice of 5-point Likert scale is to ensure the students to respond the items existing in the attitude scale in an easy and comprehensive manner without getting bored. Additionally, another reason is the level of education that the students have. The students were presented with five options as of “I definitely agree, I agree, I am undecided, I don’t agree and I definitely don’t agree. The students’ grades of science and technology class were taken from their teacher. The grading system in the school existing in the sampling is five- point grading system.

## 2. 3. Procedures

The scale was applied to the sample in spring term of 2006-2007 academic year. In Van and Nevşehir, the researcher himself performed the scale, in the other two cities one of his close friend performed it. Among 500 questionnaires, 400 of them were evaluated. Incompleted and indefective ones were not taken into consideration. The responses to the items were lined up from positive to negative respectively as I definitely agree(5), I agree (4) I am undecided (3), I don’t agree (2) I definitely don’t agree(1). When we categorize the points, we come to a conclusion that the item 5(I definitely agree) corresponds to 4.20-5.00, the item 4 (I agree) to 3.40-4.19, the item 3 (I am undecided/ I ‘m not sure), to 2.60-3.39, the item 2 (I don’t agree) to 1.80-2.59 and the item 1 (I definitely don’t agree) to 1-0.79 intervals. Positive attitude point can be accepted as of 3.39 (Kaya, 2003; Erdemir and Çepni, 2007). Accordingly, the total highest and lowest point that can be obtained from 40 items can respectively be 200 and 40.

## 2.4. Statistical Analysis

In analyzing of the data obtained from the sample, Independent Sample Test (t-test) technique was employed to find out if there was a difference between the students who had and hadn’t attended to nursery school, if there was difference between the attitude points of attended to nursery school, and if there was a difference between the success and attitude of the students attending to private and state school. Because single factor variance analysis is carried out to test if the discrimination between irrelevant or more samples has a meaningful difference or not (Büyüköztürk, 2001). The t-test is also used to test if the difference between averages of two irrelevant samples has a meaning (Büyüköztürk, 2002).

## 3. FINDINGS AND COMMENTS

The findings and data obtained from the scale, which was applied to the sample, are shown on the tables below.

Table 1. Success comparison of the students who had or not attended nursery school

Success	Nursery school	N	$\bar{X}$	Sd	df	t	p
	Those, who had attended nursery school		200	4.47	.656	398	2.93
Those, who had not attended nursery		200	4.26	.771			

The results of analysis show that there is a meaningful difference between the success in science and technology lesson of the students, who had and not attended nursery school ( $t(398) = 2.93, p < .005$ ). In other words, success shows variances depending on that the students who had and not attended nursery school. According to the success of the students, who had attended nursery school, is ( $\bar{X} = 4.47$ ) and that of those, who had not attended nursery school, is ( $\bar{X} = 4.26$ ) over five. Also, considering standard deviation, the points obtained by the students, who had not attended nursery school, are more variable ( $Sd = .771$ ), the points obtained by those, who had attended nursery school,

are less variable ( $Sd = .656$ ), as seen on Table 1. Then, it may be said that those, who had attended nursery school, are more successful.

Table 2. Attitude comparison of the students who had or not attended nursery school

Attitude	Nursery school	N	$\bar{X}$	Sd	df	t	p
	Those, who had attended nursery school		200	4.42	.183	398	2.49
Those, who had not attended nursery		200	4.49	.197			

A meaningful variance in attitude for science and technology lesson is seen in favor of the students, who had attended nursery school ( $t(398) = 2.49, p < .01$ ). The attitude for science and technology lesson of the students, who had attended nursery school, is more positive ( $\bar{X} = 4.42$ ) than that of those, who had not attended nursery school ( $\bar{X} = 4.49$ ). In the test of the attitude for science and technology lesson of the students, who had attended nursery school, Sd is calculated as 0.183, while it is calculated as 0.197 for those, who had not attended nursery school, as seen on Table 2.

Table 3. Comparison of the success and attitude of the students, who are attending private and state schools

	School type	N	$\bar{X}$	Sd	df	t	p
Success	Private	200	4.32	.738	398	.499	.618
	State	200	4.38	.718			
Attitude	Private	200	4.45	.192	399	2.49	.61
	State	200	4.42	.193			

It is seen on Table 3 that there is not a meaningful relation between success and attitude points of the students studying in state schools and private schools ( $t(398) = 0.49, p < 0.61$ ) and ( $t(399) = 2.49, p < 0.61$ ). While success of the students studying in private schools in science and technology lesson was calculated as ( $\bar{X} = 4.32$ ), their attitude was calculated as ( $\bar{X} = 4.45$ ). Average of success points of the students studying in state schools was ( $\bar{X} = 4.38$ ) and that of their attitude was ( $\bar{X} = 4.42$ ). Considering the averages of the findings, it is seen that there is not a meaningful variance between success and attitude points of the students studying in state schools and private schools.

#### 4. DISCUSSION AND RESULT

It was emphasized by the studies that it is very important for their science education in the future that children establish tough scientific bases and learn scientific thinking by developing their research, examination and observation skills during pre-school education years (Ulucay, 1998, Gürdal et al, 1993).

As seen on Table 1, the success of the students, who had attended nursery school, is ( $\bar{X} = 4.47$ ) and that of those, who had not attended nursery school, is ( $\bar{X} = 4.26$ ) over five. Then, it may be said that those, who had attended nursery school, are more successful. Accordingly, it is understood that the students, who had attended nursery school, is more successful. This is parallel to the results of the study performed. The students try to learn by asking some questions. This knowledge determines readiness level of children in the future. Therefore, children will be more successful in the future (Tipps, 1982; Frost, 1997; Kücüküran, 2003; Erkan, 1993; Yılmaz, 1990). In other words, success shows variances depending on that the students who had and not attended nursery school. Accordingly, it is understood that the students, who had attended nursery school, is more successful than those, who had not.

Especially positive attitudes for science, curiosity and willingness to research and exploration may be motivated more. However, these may be performed by nursery school. If the interests of children in science are guessed, it is ensured that they have positive attitudes for science and acquire scientific thinking skills for the years in the future (Sahin, 2000, Frost, 1997; Ulcay, 1998). The attitude for

science and technology lesson of the students, who had attended nursery school, is more positive ( $\bar{X} = 4.42$ ) than that of those, who had not attended nursery school ( $\bar{X} = 4.49$ ). It is seen that the results are supported by similar studies. The goal is that a support to challenges is provided for children to maintain their positive attitudes (Yasar, 1993, Bogard, et., 2007). If natural curiosity of children is promoted properly and experience and observation opportunities are offered to them by pre-school education, it is possible that they develop positive attitudes for science in the development stages in the future (Smith, 2001; Rillero, 1994; Aktas Arnas, 2002).

Accordingly, as seen on Table 3, the averages of both success ( $\bar{X} = 4.45$ ) in science and technology lesson and attitudes ( $\bar{X} = 4.42$ ) of the students, who had attended nursery school are more positive and higher than that of those, who had not (respectively  $\bar{X} = 4.42$  and  $\bar{X} = 4.49$ ). This is parallel to the results of the study performed as mentioned above.

Considering to the results of the averages, there is not a significant relation between success and attitude points of the students studying in state schools and private schools. Therefore, it is concluded that there is not a meaningful relation between success and attitude points of the students studying in state schools and private schools, as seen on Table 3. Having chose successful state schools found in city center as sample and numbers of the students ranging between 25 and 35 were effective on that there is no a significant difference between success and attitude. It was understood that the most important factors affecting on students' success are the number of the students of the class and the success of the teacher in first grade of elementary school.

## 5. RECOMMENDATIONS

If students are encouraged to be successful in science and technology lesson and to acquire a scientific attitude, nursery schools should be made popular and ensured that every student attend them. Homes should be arranged as nursery schools and families should be made conscious about what they should do in places in which nursery schools do not exist.

It is a fact that developing positive attitudes and curiosity of the students for science will affect their success in the future. Because children cannot understand abstract concepts and their growth characteristics are not suitable, natural events should be made concrete and it should be ensured that children enjoy themselves while learning. The individuals around children should answer their questions patiently.

The ratio of attending nursery school is low in our country. Therefore, families should be made conscious that the children, who attend nursery school, will be more successful in science and technology in the future. Families should be supported for this matter.

Every child plays with toys at first and then compares them with real ones to love animals and nature. This is a natural curiosity existing in every child. It should be ensured that children watch interesting films about nature frequently in pre-school ages.

It was seen in the study that there is not any significant variance between success and attitudes between the students, who were attending private schools and state schools. Therefore, the number of the students of a class should be within 25 and 35. Also, it was seen in this study, success of teachers is important in elementary school. Accordingly, successful teachers should be awarded for motivating them and also other teachers should be promoted.

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Appendix

THE SCIENCE ATTITUDE SCALE

Dear students, aim of this scale is to determine whether there is a variance between attitude points of the students towards science, who had attended and had not attended nursery school. The scale is only aimed for research and not other. Determine your opinion to apposite of propositions given in scale, please.

Gender: Female ( ) Male ( ) Class: ( )  
 Did you take **science lesson** in preschool education? Yes ( ) No ( )  
 Father occupation: ..... Mother occupation: .....  
 Your success score from the science lesson: (.....) (.....) (.....)

	I extremely agree	I agree	Neutral	I disagree	I extremely disagree
1) The science lesson is a necessary lesson to learn.	( )	( )	( )	( )	( )
2) The science lesson is a related lesson to real living.	( )	( )	( )	( )	( )
3) The science lesson is more difficult than other lessons.	( )	( )	( )	( )	( )



4) The science lesson isn't suitable for every student.	( )	( )	( )	( )	( )
5) The science lesson is open to discover and produce.	( )	( )	( )	( )	( )
6) The science lesson cannot be learned without studying.	( )	( )	( )	( )	( )
7) The science lesson is very useful to develop of country.	( )	( )	( )	( )	( )
8) I more like practical part of the science lesson.	( )	( )	( )	( )	( )
9) The science lesson incites me to research.	( )	( )	( )	( )	( )
10) I like to tamper in of electronic devices at home.	( )	( )	( )	( )	( )
11) The science lesson is very boring.	( )	( )	( )	( )	( )
12) I repair my toys damaged myself.	( )	( )	( )	( )	( )
13) The science lesson cannot never precisely be understood.	( )	( )	( )	( )	( )
14) I perceive to make a mistake in the science lesson as normal.	( )	( )	( )	( )	( )
15) I believe every student will like the science lesson.	( )	( )	( )	( )	( )
16) If whoever like the science lesson they take it in preschool education.	( )	( )	( )	( )	( )
17) The science lesson will be learned with experiment.	( )	( )	( )	( )	( )
18) I like to prepare my science homework by using computer.	( )	( )	( )	( )	( )
19) I used to like science lessons when I attained at preschool education.	( )	( )	( )	( )	( )
20) I have a broke down moral in science lesson in common.	( )	( )	( )	( )	( )
21) I listen teacher more careful in science lesson.	( )	( )	( )	( )	( )
22) I feel a peaceful after science lesson.	( )	( )	( )	( )	( )
23) I look forward next science lesson.	( )	( )	( )	( )	( )
24) I complete at home my homework which cannot finish it at school.	( )	( )	( )	( )	( )
25) If I want to be a teacher I will be science teacher in future.	( )	( )	( )	( )	( )
26) I more like the toy which related science on computer and internet.	( )	( )	( )	( )	( )
27) Every student must take the science lesson in preschool education.	( )	( )	( )	( )	( )
28) The science lessons in preschool education influence me like science in primary school.	( )	( )	( )	( )	( )
29) I rather believe that I am successful in science lesson myself.	( )	( )	( )	( )	( )
30) I like the science lesson.	( )	( )	( )	( )	( )
31) I hate from study the science lesson long time.	( )	( )	( )	( )	( )
32) I abstain from I will dissolve problem related the science.	( )	( )	( )	( )	( )
33) I don't appreciate the science lesson a lot.	( )	( )	( )	( )	( )
34) I get anxious before examinations of the science lesson.	( )	( )	( )	( )	( )
35) The science lesson annoys me.	( )	( )	( )	( )	( )
36) I hate homework related the science lesson.	( )	( )	( )	( )	( )
37) I don't ask any question in the science lesson.	( )	( )	( )	( )	( )
28) I can never be successful in the science lesson.	( )	( )	( )	( )	( )
39) I concern news related science on visual media.	( )	( )	( )	( )	( )
40) I watch documentary film related the science on TV.	( )	( )	( )	( )	( )