Investigation of Kindergarten Children's Basic Concept Knowledge

Aygen ÇAKMAK[1], Fatma ÇALIŞANDEMİR[2], Fatma ELİBOL[3], Ezgi AKINCI DEMİRBAŞ[4]

[1, 3, 4]Faculty of Health Science & [2]Faculty of Education,
Kirikkale University, TURKEY.

[1]ayalp71@gmail.com, [2]fcalisandemir@gmail.com

ABSTRACT

This study has been conducted in order to investigate kindergarten children's basic concept knowledge according to some variables and to determine whether the education programs performed in preschool education make any difference on the level of knowledge of children or not. 220 children at the age of 5-6 who were going to kindergartens of different primary schools in Burdur and who were randomly selected by the sample method participated in the study. The study was carried out one group pretest-posttest on the experimental design without control group from the experimental models. AS the data collection tool, "General Information Form" which was prepared by researchers was used to obtain the information about children and family, Boehm Basic Concepts Test which was developed by Boehm (2000) and whose reliability and validity for Turkish children were ensured by Sucuoğlu et al. was used to determine the basic concept information. Boehm Basic Concepts Test (Boehm-3, 2000) pretest-posttest was performed with the children in May. Following the research, it was determined that the education programs in preschool education and the case of having preschool education and the educational status of parents make a significant difference on pretest-posttest basic concept point average of children (p<.05).

Keywords: Kindergarten, concept knowledge, Boehm-3

INTRODUCTION

The basis of thinking depends on the existence of the concepts; and the source of knowledge obtaining depends on the formation of concepts. The quality of thinking depends on richness of concept, and individuals can tell the environment they live in and the events they experienced only with concepts. As thought evolves, the quality and number of the concepts' meaning increase as well. The formation and development of concepts depends on that each concept gains a special meaning for individuals (Sevinç, 2003).

Basic concepts are used to define the qualities of humans and objects (beautiful, tall, small), position in an environment (in, on, under, beside, behind), time (before, after) and quantity (more, less, a little) (Balat Uyanık, 2003). Basic relational concepts (quantity, time, awareness etc.) are related to the development of children's cognitive abilities (Zhou & Boehm, 2004) and they are extremely important in terms of class performance and social interaction (Ayhan Bütün &Aral, 2007). Concept development is an area that gives important signals about children's cognitive developments and that should be strictly followed (Boehm 2001, Prater, 1993).

According to Piaget's cognitive development stages, the first stage in concept development is "preoperational" intuitive or pre-procedure stage and this stage is between the age of 2 and 7, and is divided into two periods as pre-concept thinking (nominal period) and intuitive thinking. The period of pre-concept thinking involves a period at the ages of 2-4 and the period of intuitive thinking involves a period that goes until the period of concrete operations. While children think through their mental designs (the designs such as symbols, signs,

ISSN: 2223-9944, eISSN: 2223-9553

dreams) in the pre-conceptual period, they try to solve problems through pre-logical approaches in the period of intuitive thinking (Jersild,1976; Güven, 2005)

In the pre-school period, the concepts of children are especially determined by their own experiences and activities (Sevinç,2003; Akman & Üstün, 2003). Children are facing new information every day and they associate this information with existing concepts or create new concepts in addition to them. Learning the concepts for children is relatively slow and difficult, and it progresses from concrete towards abstract (Arı, Üstün & Akman,1994).

How much the concepts are learned, how the concept knowledge changes with age, how children make reasoning on the concepts about their own life and about schools are the subjects the researchers make researches on (Sucuoğlu et al, 2008). Although the majority of children learn the concepts through observation and experience, "teaching the concepts" holds an important place in the school curriculum. Children need to know the basic concepts that identify the quality, position, time and quantity to understand the descriptions their teacher makes within the classroom (Boehm, 2001). Therefore, basic concepts are given great importance associated with the later academic success both at the beginning of education and later. This study has been conducted in order to examine the effect of education programs performed in preschool using Boehm Basic Concepts Test on children's knowledge level of basic concepts; and to determine whether the variables such as the condition of obtaining pre-school education or parents' education level make difference on the basic concepts average scores of children.

MATERIALS AND METHODS

In the study, it was aimed to determine the effect of the education programs in kindergartens on the basic concepts knowledge level of children and whether the variable such as gender, the condition of obtaining pre-school education, parents' education level make differences over the concept knowledge levels of children.The study was conducted on 220 children at the age of 5-6 who were going to kindergartens of different primary schools in Burdur and who were randomly selected by the sample method. In the study, "General Information Form was used to obtain information about the children and their families by the researchers; and "Boehm Basic Concepts Test" which was developed by Boehm (2000) and whose reliability and validity studies were carried out by Sucuoğlu et al. (2007) was used to determine the basic concepts knowledge level.

Boehm Basic Concepts Test is an educational scanning test that was developed for children to understand the verbal instructions and to determine whether the children have the basic concepts that are very important for school achievement. There are some relational concepts such as "more, less, first, second, same and different" between the concepts evaluated by the test. Children use these concepts to make relational decisions about people, objects and situations. The test that can be implemented individual or as a group is used to evaluate the effect of education programs aiming at decreasing the deficiencies related to the concepts of children. Thus, the children whose "concept knowledge" is low and thus, the children to whom the teacher should pay attention and the inadequacies/difficulties of children about concepts can be determined.

Boehm (1986) states that his test can also be used as pre-post test in order to determine the effects of concept teaching programs.It is a test that can be applied to children from kindergarten up to second grade in elementary. The test consisting of small booklets in which there are 50 basic concepts is intended to assess the levels of children about qualitative, spatial, quantitative concepts which are related to language and cognitive development of children. The applications in the study were conducted individually and, the pre-tests was

ISSN: 2223-9944, eISSN: 2223-9553

carried out in October and the post-test was individually carried out in May taking the children's period of adaptation to preschool education institution and, every child was given test materials, was asked instructions and was expected to mark the picture that was correct. 1 point was given for each item correctly marked so the total score a child can get from the test varies between 0-50.

In the study, "t-test" was used to determine the effect of preschool education program, gender, the condition of obtaining preschool education on children's basic concept knowledge level and, "Variance Analysis" was used to determine whether parents' education level makes difference on children's concept knowledge level or not. As a result of the variance analysis, the fact that the difference is due to which group was assessed by "Scheffe Test" (Büyüköztürk, 2005).

FINDINGS AND DISCUSSION

A total of 220 children 108 of them were girls and 112 of them were boys at the age group of 5-6 participated in the study to determine the basic concepts knowledge level of children who are going to kindergarten. While 87 (39.5%) of the children got pre-school education, 133 (60.5%) children didn't. 32 mothers (14.5%) were primary school graduate, 15 (16.8%) secondary school graduate, 71(32.3%) were high school graduate and 96 (43.6%) were university graduate and 6 (2.7%) were postgraduate. 24 of the fathers (10.9%) were primary school graduate, 25 of them (11.4%) were secondary school graduate, 53 of them (24.1%) were high school graduate, 113 of them (51.4%) were university graduate and 5 of them (2.3%) were postgraduate. The basic concept knowledge scores of children were presented in tables after being analyzed and they were discussed by supporting with the related literature.

Table 1. The results of paired group t-test belonging to pre-test/post-test basic concept knowledge mean scores

	Groups	*N*	$\bar{X}$	*Ss*	*t*	*p*
Basic Concept Knowledge	Pre test	220	37.15	7.50	14.370	0.000*
	Post test	220	42.37	5.65		

*P<.05

It can be seen that the post-test mean scores of children in table 1 ($\bar{X}$=42.37) are higher compared to the pre-test mean scores ($\bar{X}$=42.37).As a result of the t-test, it was determined that there is a significant difference between pre-test and post-test ($t_{(219)=}$ 14.370, p=0.000; p<.05). Evaluation of children's concept evaluation is of great importance both in terms of that fact that it contributes to structuring the education programs that will be implemented and that children can reveal their knowledge level in terms of their concept knowledge (Ayhan Bütün & Aral 2007).

Tepetaş & Haktanır (2013) examined the basic knowledge level of children under the age of 6 before and after prepared education activities using Bracken Basic Concept Scale.As a result of the study, the education activities prepared to increase children's concept knowledge has found to make a significant difference in favor of the experiment group.

Thus, we can make the comment that the education programs applied in preschool affect children's basic concept knowledge in a positive way.

ISSN: 2223-9944, eISSN: 2223-9553

Table 2. The averages belonging to the basic concept knowledge of children's who are in kindergarten according to gender and t-test results

	Gender	*N*	$\bar{X}$	*Ss*	*t*	*p*
Pre-Test	Girl	108	37.73	6.84	1.137	.009*
	Boy	112	36.58	8.08		
Post-Test	Girl	108	43.20	5.04	2.169	.027*
	Boy	112	41.56	6.10		

*p<.05

When table 2 is examined, the mean scores of pre-test and post-test related to Children's basic concept knowledge seems to make a significant difference according to gender (p<.05). The post-test score means related to basic concept knowledge of children [for girls ($\bar{X}$=43.20) and for boys ($\bar{X}$=41.56)] seems to be higher than the pre-test mean scores [for girls ($\bar{X}$=37.73) and for boys ($\bar{X}$ =36.58)]

Lynn et al. (2005), in their study in which they carried out the Boehm basic concepts test on about 1400 children at the age group of three, determined that all the mean scores of girls except the arithmetic average is higher than the boys. Ergül found that the difference between the mean scores the children took from the Boehm basic concepts in accordance with gender in the Turkish adaptation study for 36-37 month children is not significant. These different results reveal that they are due to the sample size and the age variable.

Table 3. The averages belonging to basic concept knowledge of children who are in kindergarten according to the condition of obtaining pre-school education or not and results of t-test

The Condition of Obtaining Pre-School Education		*N*	$\bar{X}$	*Ss*	*t*	*p*
Pre-Test	Yes	87	40.31	5.26	5.36	.000*
	No	133	35.08	8.03		
Post-Test	Yes	87	44.91	3.81	5.83	.001*
	No	133	40.71	6.05		

*p<.05

According to Table 3, it was determined that the mean scores of pre-test and post-test relating the basic concept knowledge of children make difference according to the condition of obtaining pre-school education or not (p<.05). Considering the average scores on the basic concept knowledge, the average pre-test ($\bar{X}$=40.31) and post-test ($\bar{X}$=44.91) scores of children who got pre-school education are seen to be higher than the pre-test ($\bar{X}$=35.08) and post-test ($\bar{X}$=40.71) scores of children who didn't get pre-school education. This finding gives an idea about the positive impact of the concepts in the pre-school education program on the basic concept knowledge of children.

ISSN: 2223-9944, eISSN: 2223-9553

In the study Üstün & Akman (2003) conducted in order to examine the concept development of children who are at the age group of three and who are attending kindergarten and who aren't, they determined that the mean scores of children who obtained pre-school education got from the test were higher than those of the children who didn't obtain pre-school education.

Table 4. Mean scores, standard deviation and variance analysis results of children who are going to kindergarten belonging to basic concept knowledge according to the education level of parents

	Father Education Level	*N*	$\bar{X}$	*Sd*	*F*	*p*
Pre-test	Primary School	32	30.91	5.31		
	Secondary School	15	33.47	9.10		.00*
	High School	71	36.44	7.36	12.993	1-5
	University	96	40.07	6.38		
	Postgraduate	6	41.17	6.58		
Post-test	Primary School	32	38.41	6.68		
	Secondary School	15	42.07	5.24		.00*
	High School	71	41.01	5.92	7.844	1-4
	University	96	44.10	4.40		1-5
	Postgraduate	6	45.50	3.27		

*p<.05

When examining Table 4, it can be seen that the pre-test and post-test mean scores relating the basic concept knowledge of children makes a significant difference according to mother education level (p<.05). Considering the mean scores relating the basic concept knowledge, the average pre-test ($\bar{X}$=41.37) and post-test ($\bar{X}$=45.50) scores of the children whose mothers are postgraduate are higher than the children who are in the other group. According to the results of Scheffe test, while the difference between concept scores of children whose mothers are primary school graduate to postgraduate in the pre-test is significant, in the post-test, the average of the scores of the children whose mothers have primary school-university and postgraduate education creates this difference (p<.05).

Balat Uyanık (2009a), in his study, examined the basic concepts knowledge of children who just start the primary school and determined that the concept score average of the children whose parents have high education levels are higher.

Table 59Part-I). The averages belonging to basic concept knowledge of children who are in kindergarten according to their fathers' education level

	Father Education Level	*N*	$\bar{X}$	*Sd*	*F*	*p*
Pre-test	Primary School	24	32.29	7.35		.00*
	Secondary School	53	35.84	6.75	7.403	1-5
	High School	25	34.91	7.42		

ISSN: 2223-9944, eISSN: 2223-9553

Table 5(Part-II). The averages belonging to basic concept knowledge of children who are in kindergarten according to their fathers' education level

	Father Education Level	*N*	$\bar{X}$	*Sd*	*F*	*p*
Pre-test	Primary School	24	32.29	7.35		
	Secondary School	53	35.84	6.75		.00*
	High School	25	34.91	7.42	7.403	
	University	113	39.35	6.98		1-5
	Postgraduate	5	41.00	6.96		
Post-test	Primary School	24	39.46	6.02		
	Secondary School	53	41.08	5.64		.02*
	High School	25	41.28	6.51	4.462	1-4
	University	113	43.65	4.83		1-5
	Postgraduate	5	45.40	3.64		

*p<.05

According to Table 5, it has been determined that the pre-test and post-test mean scores of children relating to their basic concept knowledge make a difference according to the education level of fathers (p<.05). It has been observed that the pre-test ($\bar{X}$=41.00) and post-test ($\bar{X}$=45.40) mean scores of the children whose fathers are postgraduate are higher than those of children who are in the other group. According the results of Scheffe test, while the difference between the concept scores of the children whose fathers are primary school graduate-postgraduate in the pre-test are significant, in the post-test, the mean scores of children whose fathers are primary school-university graduate and postgraduate creates this difference (p<.05).

Balat Uyanık (2009b), in his study he studied the concept knowledge of children who are in kindergarten, determined that the education level of fathers creates a significant difference on the concept knowledge of children.

Ayhan Bütün (2008), in his study he evaluated the concept development of children at the age of six who are in kindergarten using Bracken Basic Concept Scale, determined that the education level of parents creates a significant difference on concept development mean scores of children.

CONCLUSION AND RECOMMENDATIONS

In this study, the effect of basic concept knowledge of the children at the age of 5-6 who are in kindergarten has been studied according to some variables. 220 children were included in the study and Boehm Basic Concepts Test was used in order to determine the basic concepts of children. It has been determined that the post-test mean scores of the children participated in the study relating to their basic concept knowledge are higher than the pre-test mean scores and; that the variables such as gender, the condition of obtaining pre-school education, education level of the parents create a significant difference on the basic concept knowledge of children (p<.05). In accordance with the result obtained, it can be observed that pre-school

ISSN: 2223-9944, eISSN: 2223-9553

education programs affect the level of children's basic concept knowledge. Accordingly, the followings can be suggested;

1. To make assessments about the basic concept knowledge of children in different sample groups and all over the country,
2. Reshaping the education programs or making new regulations by assessing the levels of concept knowledge of children,
3. With reference to the principle that every child is a different individual, frequently making the individual assessments regarding the basic concept development and in accordance with the results, supporting the concept development of the children individually if needed,
4. Supporting the children's level of knowledge regarding the basic concepts through various activities, and providing planned support towards increasing the level of preparedness for primary school and literacy,
5. In order to provide concept achievements for children in an effective way, in the education process given in the departments which train teachers for pre-school education institutions; giving more space to practical studies on how the educational status and materials for the children's concept achievements should be prepared and how the environment should be regulated,
6. Organizing in-service trainings, courses and seminars on the subjects they need by identifying the problems they have about education status of teachers towards concept achievement of children.

REFERENCES

[1] Akman, B., & Üstün, E. (2003). Concept development in 3-year-old children, *Hacettepe University Journal of Education Faculty, 24*,137-141.

[2] Arı, M., Üstün, E. ve Akman, B. (1994). An Instructional Practice Based on the Storyline Method Oriented to Support Basic Concept Knowledge Levels of 6-Year-Old Children. *Education and Science, 38*(169), 62-79.

[3] Ayhan, A. B., Aral, N. (2007). The Adaptation Study of the Bracken Basic Concept Scale-Revised Form For Six-Year-Old Children.*Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 32, 42-51.

[4] Ayhan Bütün, A. (2008). Altı yaş grubundaki çocukların kavram gelişimlerinin cinsiyete anne baba öğrenim düzeyine ve anaokuluna devam etme süresine göre incelenmesi. *Çağdaş Eğitim Dergisi, 33*(350), 33-38.

[5] Balat Uyanık, G. (2003). *Altı yaş grubu korunmaya muhtaç ve ailesinin yanında kalan çocukların okula hazır bulunuşluk ile ilgili temel kavram bilgilerinin karşılaştırılması*. Doktora Tezi. Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.

[6] Balat, Uyanık, G. (2009a). Examining the knowledge of basic concepts of children starting primary education. *Early Child Development and Care, 179*(7), 911–918.

[7] Balat, Uyanık, G. (2009b). An examination of the relationship between kindergarten childrens gender and knowledge of basic relational concepts. *Education and* Science, *34*(153), 117-126.

[8] Boehm, A. E. (1986). *Boehm Test of Basic Concepts*. The Psychological Corporation. San Antonio: Harcourt Brace & Company.

ISSN: 2223-9944, eISSN: 2223-9553

[9] Boehm, A. E. (2000). *Boehm-R Boehm Test of Basic Concepts Revised Manual.* ThePsychological Corporation. Hartcourt Assesment Company, San Antonio.

[10] Boehm, A. E. (2001). *Boehm Preschool Examiner's Manual*. The Psychological Corporation, Hartcourt Assesment Company, San Antonio.

[11] Büyüköztürk, Ş. (2005). *Sosyal Bilimler İçin Veri Analizi El Kitabı.* Ankara: Pegem Akademi Yayınları.

[12] Ergül, A. (2007). *Boehm okul öncesi temel kavramlar testi-3'ün 36-47 aylık çocuklar için Türkçeye uyarlama çalışması*. Yüksek lisans tezi. Ankara Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

[13] Güven, Y. (2005). *Erken Çocuklukta Matematiksel Düşünme ve Matematiği Öğrenme.* İstanbul: Küçük Adımlar Yayınları.

[14] Jersild, A. (1976). *Çocuk Psikolojisi*. Çev. Gülseren Günce. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Yayınları No: 62, Ankara.

[15] Lynn, R., Raine,A., Venables, P.H.,& Mednick, S.A. (2005).Sex differences in 3 years old on the Bohem Test of Basic Concepts: Some data from Mauritius. *Personality and Individual Differences, 39*, 683-688.

[16] Prater, M. A. (1993). Teaching concepts: procedures for the design and delivery of instruction. *Remedial and Special Education*, *14*(5), 51-66.

[17] Sevinç, M. (2003). *Bilişsel gelişim ve düşünce becerilerinin gelişimi.* Erken çocuklukta gelişim ve eğitimde yeni yaklaşımlar. İstanbul: Morpa Kültür Yayınları.

[18] Sucuoğlu, B., Büyüköztürk, Ş., & Ünsal, P. (2007). Boehm Temel kavramlar testinin geçerlik ve güvenirlik çalışmaları.*4. Ulusal Dil ve Konuşma Bozuklukları Kongresinde* sunulan sözlü bildiri, 2-5 Mayıs 2007, İstanbul.

[19] Sucuoğlu, B., Büyüköztürk, Ş., & Ünsal, P. (2008). Türk Çocuklarının Temel İlişkisel Kavram Bilgilerinin Değerlendirilmesi. *Elementary Education Online, 7*(1),203-217.

[20] Tepetaş, G.Ş., & Haktanır, G.(2013). Altı yaş çocuklarının temel kavram bilgi düzeylerini desteklemeye yönelik öyküleştirme yöntemine dayalı bir eğitim uygulaması. *Eğitim ve Bilim*, *38*(169), 62-79.

[21] Üstün, E., & Akman, B. (2003). Üç yaş grubu çocuklarda kavram gelişimi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 24*, 137-141.

[22] Zhou, Z., & Boehm, A. E. (2004). American and Chinese children's knowledge of basic relational concepts. *School Psyhology International*, *22*(1), 5-21.

ISSN: 2223-9944, eISSN: 2223-9553