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Preschool Teachers' Perspective Of Science Activities

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Abstract

Children have a natural and innate sense of curiosity and discovery. From infancy they use all their senses to explore their environment. Using this experience they begin to perceive, know and make sense of the environment. Children actively continue their discovery process using their information in all new activities and restructuring the information when it is necessary. Preschool education is an education process in which 0-72 months children are prepared for basic education through developmentally and individually appropriate and simulating environment which supports for their physical, mental, affective and social development in accordance with the dominant cultural values. One of the major activities of the preschool education is to guide, reinforce and improve children's innate curiosity and motivation to learn and think. Early science education is delivered in preschool education. It is the first planned and programmed science education for children and is given under the name science and natural activities. It is based on children's interests and needs. The aim of preschool science education is to provide children with an opportunity to learn about basic facts and events about the nature as well as to improve their affective and psychomotor skills and to help their attempts in making sense of themselves and their environment. It also tries to make children better estimations and observations. Therefore, preschool children should be offered and take part in those activities which improve their reasoning, observation, testing and interpreting skills. Preschool science activities are significant in terms of understanding the relationships between objects and events. At this stage children learn about scientific concepts through their active participation in the environment. Such activities reinforce and motivate children to pay attention, make observations and research. Teachers should make use of children's curiosity and prediction skills to improve their scientific understanding and thinking skills. for children participating in scientific activities helps in improving the cognitive, affective and psychomotor as well as scientific skills and facilitates learning. The aim of this study is to reveal the views of preschool education teachers about the preschool science education. The study was designed as a descriptive scanning research. The participants of the study were fifty preschool education teachers working at ten preschool institutions in Afyonkarahisar province. The data of the study were collected through a survey questionnaire with open-ended items. The questionnaire was reviewed by field specialists at Afyon Kocatepe University. Based on the feedback from these specialists the questionnaire was reorganized. Then, the questionnaire was administered to the participants. The questionnaire is made up of two sections. The first section includes four items about the demographical characteristics of the participants. The second one includes ten items about the the views of preschool education teachers about the preschool science education. The findings of the study showed that for the participants science activities at preschool education level mostly contributed to cognitive gains. They reported that they used experiment equipment for the science activities at

preschool education level. They also added that the most frequently used techniques in these activities were visits, observation and demonstrations.

Key words:pre-school teacher, science education, science activities, views on the science activities

Introduction

Children have a natural inborn curiosity and exploring sensation. They try to explore their environments through their sense organs beginning from their births. They begin to perceive, understand and make sense of their environments. The child actively maintains this exploration process in every single task by struggling to create new knowledge through his own preexisting knowledge and to restructure this knowledge if necessary. (Akman et al., 2010). Pre-school education is an education process, which is suitable for 0-72 months old children's level of development and their individual characteristics; which also provides rich stimulating environment opportunities and supports their physical, mental, emotional and social developments by leading them in accordance with cultural values of the society and preparing them to primary education in an integrity. (National Education Council, 1993) Preschool teaching has taken highly important responsibilities such as managing, encouraging and developing the characteristics of a child who cares about his environment and who is motivated to think and learn. (Senemoğlu, 1994). In preschool institutions, science is one of the most practicable areas to be provided to children with respect that they can observe and be more sensitive to their environment, they can improve their manipulative skills, they can share their own activities with friends and they can be encouraged to search and study. Science lead changes in children's attitudes towards life, it effects their behaviors and broadens their interests. Besides, it teaches them how to think more effectively and improves their problem solving skills. (Oğuzkan and Oral, 1993).

The first planned- programmed education related to science is given under the title of science and nature activities depending on the child's real needs and interests (Yaşar, 1993). Science education enables the children to solve the problems by teaching real life knowledge. The knowledge of the world we live in, a healthy life, our organs and protection of the environment is gained through science education. It brings out inquisitive and creative ways of the children. The science education which is taught through experiments, models and dramatization is much more effective (Aygören, 2000). Science education primarily starts in the family, which means a child's parents take the role of the first science teacher of the child. However, these activities are generally carried out in the family environment by coincidences. The purpose of the science education in preschool period is not only to give basic knowledge to children about how basic phenomenon and incidents happen in nature, but to up skill affective and psychomotor skills and to help them understand their own environments as well (Ayvaci, H.Ş., Devecioğlu, Y., and Yiğit, N., 2002). The fact that every subject which can draw children's attention can be utilized in order to up skill the targets and the behaviors in the program makes a significant contribution to children to use their curiosity and discovery skills and to have a better knowledge of their own environments, as well as learning through all senses via learning by doing-experiencing (Parlakıldız and Aydın, 2004). It is a must to organize a science and nature corner in preschool institutions. This corner plays a very important role as providing a stimulating environment to children for their mental development. (Dere and Ömeroğlu, 2001). The tools that must be used in science activities

and science corners get children to become more responsive towards their environment and nature by stimulating them mentally and to become skillful at using science tools. The tools that are used in a science corner must be simple and harmless materials which children can find in real life, as well as being at their level (Sığırtmaç and Özbek, 2011). Along with the materials, another factor in a child's education is teacher. According to Wortham (1998), the teacher, as a guide, an answerer and an assistant, actively takes part in the science and nature corner. That the teacher's curiosity is live and active set a good example for the children's curiosity. Thus, this significant behavior has a fundamental part in the frame of teaching science (Ünal and Akman, 2006).

Purpose of the Study

The purpose of this study is to determine preschool education teachers' opinions about the science activities.

Method

This study was performed with 50 preschool teachers who currently work at 10 preschool institutions in both city and town centers in Afyonkarahisar. The survey is a descriptive study in screening model. An open-ended survey form was used as a data collection tool to determine the preschool teachers' opinions about the science activities. The data collection tool was put into its final form after necessary arrangements and additions were made by specialist instructors. The open-ended survey form was carried out to the teachers. The survey data was collected through individual interview. The open-ended survey form that contains preschool teachers' opinions about science activities consists of two sections. The first section contains four variables which aim to determine personal information of the preschool teachers. The second section, on the other hand, covers 10 factors that aim to specify the preschool teachers' opinions related to science activities.

Results

Table 1: The Demographic Information of Teachers Participating in the Study

		n
Gender	Female	49
	Male	1
Seniority	0-5	24
	6-10	27
	11-15	9
	16-20	3
	20 and over	1
Level of Education	Associate Degree	20
	License	30
	Master	0
	PhD	0
Do you keep up with magazines and publications about science education?	Yes	22
	No	28
Do you have a science center in your classroom?	Yes	43
	No	4
Do you think the science center materials are adequate?	Yes	16
	No	30

In Table 1, the personal information of the teachers such as gender, seniority, education level was stated in addition to their comments of whether they keep up with science magazines and journals and if they have a science center with adequate materials in their classes.

Table 2. Teachers' Opinions Related to Contributions of Science Activities to the Developmental Areas of Children

	n
Contribute to children's cognitive development	50
Ensures learning by doing-experiencing	13
Develop psychomotor skills	12
Contribute to children's language development	6
Effect to social and affective domain	5
Develop self-care skills	2
Total	88

As seen in Table 2, preschool teachers stated that science activities contribute to children's cognitive development the most. They also stated that learning by doing-experiencing make a contribution to this development, as well. Teacher No: 37 states that language development along with cognitive development and learning by doing-experiencing also make a contribution. Teacher No: 17 stated that visual perceptions uncover mental process, while mental perceptions are uncovered through question-answer method.

Table 3. Teachers' Opinions Related to Activities of Scientific Process Skills

	n
Experimental activities	21
Trip-observation activities	7
Science and nature activities	6
Activities to improve math skills	3
Classification and conclusion activities	2
Educational toys activities	1
Total	40

As seen in Table 3, preschool teachers stated that science activities have the most importance for scientific process skills, while observation trip activities have the second rank. Teacher No:44 also stated that he conducted various activities related to grading, grouping, experiment, observation and problem solving skills. Teacher No:37 stated that he utilized all kind of observation trip and experiment activities.

Table 4. Teachers' Opinions Related to Materials Used in Science Activities

	n
Test materials (Magnifying glass, magnet, thermometer, mirror, counter)	30
Plastics	15
Model (Pipette, bottle, cup, cup)	14
Sea shells	4
Plants	3
Binoculars	3
Hour	1
Total	40

As seen in Table 4, preschool teachers stated that testing tools are in the first place in terms of utilizing, while plastic tools are in the second and models are in the third. Teacher

No:44 stated that he used a world model, our body model, skeleton model and teeth model. Also, teacher No:5 stated that he used microscope and animal kingdom materials.

Table 5. Teachers' Opinions Related to Methods and Techniques Used in Science Activities

	n
Presentation Method	14
Trial - Error Techniques	12
Experiment-Monitoring-Application-Discovery Techniques	10
Demonstration- Demonstration Technique	10
Teaching by Making Living	8
Problem Solving Method	3
Total	57

As seen in Table 5, preschool teachers stated that presentation method was the most to have been used during the practice of a science task. Trial-and-error techniques have the second place and experiment and discovery method was the following method that have been used. Teacher No:14 stated that he used trial-and-error, test-observe-practice-discover method during the practice of the science task. Teacher No:8 stated that he used learning by doing-experiencing technique.

Table 6. Teachers' Opinions Related to Issues Taken into Consideration When Planning Science Activities

	n
To be suitable for children's age and their level of development	34
Materials' being simple and practical	12
Intended to children's needs and intentions	12
Being educational and fun	6
Activities that attract attention to visual perception	5
Total	69

As seen in Table 6, preschool teachers stated that when planning the science activities, they paid the most attention to activities in order them to be suitable for children's age and their level of development, while the materials' being simple and practical is in the second place and activities' being intended to children's needs and intentions is in the third. Teacher no:3 stated that he took children's level of readiness into consideration during the science activities. Teacher no:8 stated that he paid attention to include the daily life problems that children come across when planning the science activities.

Table 7. Teachers' Opinions Related to Main Points That Are Paid Attention During the Practice of Science Activities

	n
Active participation by children	21
Children's being eager and ambitious	13
The level of development of children	11
Suitable for learning outcomes	10
Total	55

As seen in Table 7, preschool teachers stated that three factors lead the main points that are paid attention during the practice of science activities. While the most important one of these points is watching the active participation, paying attention to children's being eager and ambitious is in the second and watching the level of development of children in the third place. Teacher no: 35 stated that he practiced the task by using a simple and plain language

and integrating children into the task. Teacher no:27 stated that his method was to get children actively participate.

Table 8. Teachers' Opinions Related to Activities Carried out to Realize Participation of the Parents in Science Activities

	n
Participation of parents in experiment and observation activities	35
Food and beverages making activities with parents	12
Homework activities	10
Total	57

As seen in Table 8, preschool teachers stated that three factors lead the main points that are related to participation of the parents in science. While the most important one is the participation of the parents to experiment and observation activities, making foods and beverages together with the parents is in the second and homework activities are in the third place. Teacher no: 44 stated that he invited the parents and include them to the task process. He also stated that he carried out activities by giving responsibilities such as plant and animal nutrition at home

Table 9. Teachers' Opinions Related to Places Used in Science Activities

	n
Class	36
Garden	26
Science Center	5
Total	67

As seen in Table 9, preschool teachers stated that three factors lead the main points that are related to places which are used in science activities. While the most important one is the class, the garden is in the second and science centers are in the third place. Teacher no: 44 stated that he carried out activities in class depending on the weather conditions. Teacher no 17 stated that he carried out the task in class or garden depending on where it must be carried out.

Table 10. Teachers' Opinions Related to Utilizing Technology in Science Activities

	n
Using internet sharing websites,	27
Utilizing videos, slide shows, projections	27
Using technological tools	5
Total	59

As seen in Table 10, preschool teachers stated that three factors lead the main points that are related to utilizing technology in science activities. While the most important one is using internet sharing websites, utilizing videos, slide shows, projections is in the second and using the technological tools is in the third place. Teacher no: 29 stated that he used internet for preschool websites and science-related websites. Teacher no: 26 stated that he used interactive whiteboard and computer.

Table 11. Teachers' Opinions Related to Courses Taken for Science Education during Bachelor's Period

	n
Science education course	17

Science and nature studies	5
Mathematics	1
Music	1
Game	1
Total	25

As seen in Table 11, preschool teachers stated that two factors lead the main points that are related to courses which are taken in bachelor's period for science education. While the most important one is the science education course, the science and nature studies is in the second place. Teacher no:26 stated that he had science and nature studies course, which is adequate. Teacher no:37 stated that he took preschool science education course, which is essential and effective.

DISCUSSION and CONCLUSIONS

The purpose of this study is to determine preschool education teachers' opinions about the science activities. According to the study results, it was concluded that the science activities contribute to cognitive domain at most (Table 2). Elmas and Kanmaz (2015) stated that preschool science education not only enables children to understand and see the unknowns in their environment by utilizing their natural exploration and curiosity, but significantly contributes to children's psychomotor, emotional, social and cognitive developments as well.

Preschool teachers stated that science activities have the most importance for scientific process skills, while observation trip activities have the second rank. (Table 3). Sığırtaç and Özbek (2011) determined that the most used method in science activities is "experiment", followed by drama and observation trip methods. Çınar (2013) identified that most preschool teachers utilize kitchen works, nature trips and watching documentary activities in teaching science and nature subjects, while only a few carry out collection and learning and using the tools activities. Karamustafaoğlu (2006) stated that preschool teachers use methods, such as telling, dramatization, using models and testing, in science and nature activities.

Preschool teachers stated that testing tools are in the first place in terms of utilizing, while plastic tools are in the second and models are in the third. (Table 4). Çakır (2011) put the tools that can be in science activities corner in order as follows; human body model, earth model, measuring instruments (weighing machine, thermometer etc.), microscope, telescope, magnifying lens, magnifying glasses, magnet, various educational toys, various mirrors, cups in different sizes, jars and bottles, sand, vase, cotton, watering tool, live plants, animals (bird, fish, rabbit, cat, ant, worm, guinea pig, turtle, caterpillar etc.), cage, cottage, collections (leaf, paper, stamp, stone etc.), various posters about science and nature, banners, plastic cups in different sizes, measuring cups, film, meter, watch, graphics (height, weight, date of birth etc.) number cards, numbers (wooden, plastic, carton), geometric figures such as triangle, square, cube, circle etc., height and weight figures, sticks and circles, paper, wooden or plastic money, weather forecast board, seasons board.

Preschool teachers stated that presentation method was the most to have been used during the practice of a science task, while trial-and-error method have the second place and test and discovery method was the least to have been used. (Table 5). Aktaş Arnas (2002),stated that science education is not conveying these science knowledge to the children in preschool period. On the contrary, he stated that children should learn this knowledge in a

process by doing-experiencing. In order to achieve this, he also stated that preschool teachers should establish environments in which children can ask questions, observe what they ask, test what they ask and make interpretations after their trials.

As seen in Table 6, preschool teachers stated that when planning the science activities, they paid the most attention to activities in order them to be suitable for children's age and their level of development, while the materials' being simple and practical is in the second place and activities' being intended to children's needs and intentions is in the third (Table 6).

Saçkes et al (2012), stated that children tend to observe and think about the nature and this tendency should be developed by introducing effective science learning opportunities in preschool period. Moreover, they stated that teachers have a very significant role for providing children with rich and effective science learning experiences.

Preschool teachers stated that three factors lead the main points that are paid attention during the practice of science activities. While the most important one of these points is watching the active participation, paying attention to children's being eager and ambitious is in the second and watching the level of development of children in the third (Table 7).

Preschool teachers stated that three factors lead the main points that are related to participation of the parents in science. While the most important one is the participation of the parents to testing and observation activities, making foods and beverages together with the parents is in the second and homework activities are in the third place (Table 8). Sığirtmaç and Özbek (2011) stated that science education in early ages is important for preschool teachers. It is also determined that the most used method in science activities is "experiment", followed by drama and observation trip methods. When the teachers carry out science activities, they chat with the students through question-answer method first, introduce their materials, informing them about the task and finally carry out the task.

Preschool teachers stated that three factors lead the main points that are related to places which are used in science activities. While the most important one is the class, the garden is in the second and science centers are in the third place. Teacher no: 44 stated that he carried out activities in class depending on the weather conditions (Table 9).

Preschool teachers stated that three factors lead the main points that are related to utilizing technology in science activities. While the most important one is using internet sharing websites, utilizing videos, slide shows, projections is in the second and using the technological tools is in the third place (Table 10).

Preschool teachers stated that two factors lead the main points that are related to courses which are taken in bachelor's period for science education. While the most important one is the science education course, the science and nature studies is in the second place (Table 11).

At the end of the study, the followings can be suggested:

Using more different materials in science activities,

Using more constructivist methods and techniques in activities,

Ensuring children actively involved in activities,

Increase family participation in plans,

Greater use of technology in science activities,

Carrying out more science activities in outside environment in touch with nature.

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