The Eurasia Proceedings of
Educational & Social Sciences (EPESS)
ISSN: 2587-1730

The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2019

Volume 15, Pages 13-18

IConSE 2019: International Conference on Science and Education

Evaluation of the Project "Artvin Bilim ve Robotikle Renkleniyor" from the Viewpoint of Middle School Students

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Abstract: The aim of this study is to examine how the middle school students participating in the project "Artvin Bilim ve Robotikle Renkleniyor", which was conducted in Artvin as part of the Scientific and Technological Research Council of Turkey (TÜBİTAK) 4004 Nature Education and Science School program, evaluate the project and the activities in it. In the project, all participants were asked to evaluate the activities with student diaries. Additionally, interviews were conducted with the students on the last day of the project in order to determine their general thoughts on the project and the activities in it. In the study conducted with the qualitative research method, the diaries and end-of-project views of the students were analyzed with content analysis. The data of the study were obtained from a total of 30 students in 6th and 7th grades at six middle schools in Artvin. 19 of the students are female and 11 are male. 14 of these students are in sixth grade and 16 of them are in seventh grade. With the evaluation of the data obtained from the study, the students stated that they found most of the activities informative and fun, that they would like to participate again and that they would recommend the project to their friends. It is seen that students recognize the importance of nature and discover the mutual interaction between nature and science with this project. The students also stated that they liked the learning environment in the project as it made learning enjoyable and that they found it beneficial in terms of enabling them to recognize that active and experiential learning is more permanent. At the end of the analyses, it was observed that the students generally participated in the activities voluntarily and that they had a voluntariness rate of 100% towards the end of the project. Additionally, it was stated that the students aimed to complete the activities on time and were pleased with them.

Keywords: Science school (camp), Middle school student, Student diaries

Introduction

Today, individual and social life necessitates the recognition of knowledge. The contributions of knowledge to individuals and society cause this importance to increase each passing day (Balantekin, 2013). The expected characteristics of humans in the new age can be achieved through raising individuals who know the ways of accessing information and access the most accurate information, analyze the information they obtain, and use technology in daily life by following the developments in science and technology (Kara and Akarsu, 2013). Today, all countries are trying to increase the quality of scientific information and engineering education (Yalçın et al., 2014). Quality science teaching is evaluated as a key point of the world's future in terms of the future of the nations (Yalçım and Şişman, 2018). Students who are raised by learning science and the nature of scientific information and the characteristics of scientific information, approach to science in accordance with the contemporary science understanding (Özden, 2012). In countries where the science and social relations or the correct transmission of information to the social layers are fictionalized well, it is tried to provide the abilities of scientific curiosity, questioning, knowledge generation and associating existent knowledge with the produced knowledge at young ages (Taner et al., 2017). A student who has acquired these abilities would be able to use and produce scientific knowledge in future education steps (Savaş, 2011).

The general purpose of science schools which recently became popular in our country is to demonstrate how closely the scientific facts and concepts are related to daily life and to show that it is enjoyable and entertaining to do science (Birinci Konur et al., 2011). TÜBİTAK which desires a vast majority of the target group, ranging from students to public employees, to interact with science, implemented a program named 4004 - Nature Education and Science Schools (Avcı, 2013). When the studies which reveal the results of projects conducted within the scope of TÜBİTAK 4004 Nature Education and Science Schools projects are examined, Yalçın et al. (2014) stated that almost all of the students appreciated camp activities as a result of the "Who are We: The Engineers of the Future Science Camp" project and the camp positively affected the self-confidence of students towards learning scientific knowledge and participants learned-by-doing throughout the camp; Tekbıyık et al. (2013) determined that the participants of "The Entertaining Exploration of Mysterious World Summer Science Camp II" project completed the camp with positive cognitive and affective acquisitions and students mainly had positive opinions towards the activities; Marulcu, Saylan and Güven (2014) determined that most of the primary-school students participated in the "Little Scientists Science School" project supported by TÜBİTAK found it entertaining and the conducted activities contributed students to associate the subjects they learn in courses with daily life; Konur et al. (2011) stated that science camp influenced students to develop positive attitudes towards the science course and the scientific activities carried out in the camp and scientific environment had significant roles in reaching this conclusion; Göloğlu Demir and Yılmaz (2018) determined that as a result of "Four Days, Four Themes: Science" project the opinions of students towards the project were positive, the project was entertaining for students and students were happy throughout the project.

In this context, it was aimed to determine the opinions middle-school students towards the "Artvin Bilim ve Robotikle Renkleniyor" (Artvin is Enlivened with Science and Robotics) project and the activities of the project which was supported by TÜBİTAK within 4004-Nature Education and Science Schools projects. Thus, answers were sought for the following questions: What are the opinions of students who have participated in the Artvin Bilim ve Robotikle Renkleniyor

1- Project towards the activities conducted in the project?

2- What are the opinions of students towards the project?

Method

Middle-school students who have participated in the "Artvin Bilim ve Robotikle Renkleniyor" project which was conducted in Artvin within the scope of TÜBİTAK 4004 Nature and Science School program were asked to evaluate the project and the activities of the project with student diaries. Furthermore, on the last day of the project, students were interviewed in order to determine their opinions towards the project and the activities of the project. In the study which was conducted with qualitative research method, the diaries of students and the end of the project opinions were analyzed with content analysis. The data of the study was obtained from 30 middle-school students who were studying in 6th and 7th grade of six middle schools in Artvin. 19 of the students were female and 11 of them were male. 14 of these students were studying in sixth grade and 16 of them were studying in seventh grade.

Findings

In the project, all of the participants were asked to evaluate the activities with student diaries at the end of each day. The results of the evaluations were summarized in the table below.

Table 1. The evaluation of student diaries

Activities		Voluntary participation in the activity	Paying attention to complete the activity on time	Contribution to the group	Sharing the opinions with the group	Satisfaction from the activity
Let's Make Our Own Solar System	Yes	28	29	27	28	26
	Partially	2	1	3	1	3
	No	-	-	-	1	1
Let's Learn the Organs of Plants	Yes	28	30	26	26	30
	Partially	2	--	2	--	--
	No	-	--	2	4	--
Robotics	Yes	30	29	26	28	29
	Partially	-	1	4	1	1
	No	-	--	--	1	--
I am Producing Electricity with My Wind Turbine	Yes	30	30	29	29	28
	Partially	--	--	1	1	1
	No	--	--	--	--	1
The Recycling Adventure of Paper	Yes	30	30	30	27	29
	Partially	--	--	--	1	--
	No	--	--	--	2	1
Let's Clean Our Water	Yes	30	29	28	28	30
	Partially	--	1	1	1	--
	No	--	--	1	1	--
Robotics	Yes	29	30	27	28	30
	Partially	1	--	2	1	--
	No	--	--	1	1	1
The Mysterious World of Bugs	Yes	30	30	29	28	30
	Partially	--	--	--		--
	No	--	--	1	2	--
Robotics	Yes	30	29	28	28	30
	Partially	--	1	2	2	--
	No	--	--	--	--	--
What is in the Sky?	Yes	30	30	29	29	30
	Partially	--	--	--	--	--
	No	--	--	1	1	t

When Table 1 was examined, it was observed that students usually volunteered to participate in the activities and their condition of volunteering increased to 100% towards the end of the project. Furthermore, almost all of the students paid attention to complete the activities on time and they stated that they were satisfied with the activities. The conditions of students in working with the group and sharing their opinions with the group slightly decreased on the 2nd and 4th day compared to other days.

In addition to the student diaries, students were interviewed on the last day of the project and the analysis of the results was summarized in the table below.

Table 2. Interview results

Activities			**Number**
The dimension of the Activities	Instructive activities	Let's Make Our Own Solar System	8
		Plant Hunt	6
		I am Making My Own Morse Code	5
		I am Teaching Colors to My Robot	8
		Let's Learn Wild Animals	10
		Robotics 2: The Fastest Robot Contest	10
		What is in the Sky	10
		Basic First Aid	2
		Robotics 3: A Robot that Follows a Line	4
	Entertaining activities	Let's Make Our Own Solar System	2
		I am Making My Own Morse Code	3
		I am Producing Electricity with my Wind Turbine	4
		The Recycling of Paper	2
		Let's Clean Our Water	1
		I am Teaching Colors to My Robot	5
		Let's Learn Wild Animals	11
		Robotics 2: The Fastest Robot Contest	6
		What is in the Sky	3
		Poster	3
		Horon	3
		Basic First Aid	3
	Non-entertaining, non-instructive activity	I had fun in all of the activities	27
		Documentary	1
		Reading book	1
		I am Producing Electricity with My Wind Turbine	1
	Activities that are Desired to be Added	Everything was wonderful	26
		Archery	2
		Nature Trip and Camping	2
Learning Process and Environment	Similar and different aspects of the learning process that takes place in the project and the school	Teachers were active in the school, here, we were active while learning	5
		In the project, everything was more based on the life, in touch with nature and more permanent compared to school	6
		We learned while having fun and based on experiment and observation compared to school	8
		We learned robotic coding in addition to the education in school	3
		Group study and staying in a natural environment	2
	Opinions towards the environment of the project	Everything was beautiful, especially our rooms and the environment where the activities were conducted provided us to establish better relationships with our friends.	20
		The environment was wonderful, learning in this environment was far better.	10
The contribution of the project on the perspective towards nature		I learned how important it is to protect nature	7
		My interest in nature increased	5
Suggestions and the Sustainability of the Project	The desire to re-participate in this project	Yes	30
		No	--
	Recommending the	Yes	30

	project to the friends	No	---
	Suggestions	It could have been longer than 1 week.	4
		We could have more nature trips	2
		The number of individuals in the groups and the group studies could have been reduced.	3

When Table 2 was examined, it was observed that students found most of the activities entertaining and instructive, wanted to participate again and stated that they will recommend to their friends. It can be observed that with the project, students acknowledged the importance of nature and realized that nature and science are interacting with each other Additionally, students found the learning environment in the project pleasant since it makes learning entertaining. Furthermore, students stated that the project was beneficial since it provided them to realize that active learning and learning-by-doing are more permanent.

Discussion and Conclusion

According to the data that was obtained with the study in which the opinions of middle-school students towards the "Artvin Bilim ve Robotikle Renkleniyor" project that was supported within the scope of TÜBİTAK 4004 Nature Education and Science Schools and their opinions towards the activities of the project, it can be observed that students found most of the activities entertaining and instructive, wanted to participate again and stated that they will recommend to their friends. It can be observed that with the project, students acknowledged the importance of nature and realized that nature and science are interacting with each other Additionally, students found the learning environment in the project pleasant since it makes learning entertaining. The conducted studies also indicate similar results (Yalçın et al., 2014; Tekbıyık et al., 2013; Akay, 2013; Göloğlu Demir and Yılmaz, 2018; Marulcu, Saylan and Güven, 2014). Yıldırım, Atila and Doğar (2016) determined that students learn the scientific information in daily life while having fun and found out that this method is more permanent.

Furthermore, students stated that the project was beneficial since it provided them to realize that active learning and learning-by-doing are more permanent. As a result of the analyses, it was observed that students usually volunteered to participate in the activities and their condition of volunteering increased to 100% towards the end of the project. Furthermore, almost all of the students paid attention to complete the activities on time and they stated that they were satisfied with the activities. Additionally, all of the students stated that they want to re-participate in the project and they will recommend the project to their friends. In addition to these results, a couple of students suggested project duration to be longer and to increase the number of nature trips.

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