
The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2016

Volume 5, Pages 237-240

ICRES 2016: International Conference on Research in Education and Science

THE PERSPECTIVES OF MIDDLE SCHOOL STUDENTS TOWARDS SCIENCE AND SCIENTISTS AFTER PARTICIPATING IN ARTVIN NATURE AND SCIENCE CAMP

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Abstract: “Artvin Nature and Science Camp” was supported by TUBITAK in order to make science and technology-based learning more fun and enjoyable. It is a project aiming to develop students' awareness towards nature and science and gain new information about these two topics. The aim of this study is to determine the perspectives of middle school students towards science and scientists after participating a nature and science camp. The study was conducted on 15 girls and 15 boys (14 6th grade and 16 7th grade students) who were randomly selected from middle schools in Artvin within the scope of TUBITAK 4004-Artvin Nature and Science Camp. In the study, a case study approach which is one of the qualitative research approaches, and a semi-structured interview form was used. Results of these interviews were analyzed using content analysis. NVIVO 10 package program was used in the analyses. In the studies conducted, 30% of the students think that science is “producing, exploring and inventing new things”, 17% of them consider science as “explaining the unknown” and 13% of them think that think that science is “learning new information or combining knowledge”, respectively. Students describe their role model scientists as those mostly invented technological tools and devices, tried to protect health and nature and facilitated the life of people. Besides, students want to invent a phone, “which will never run out of battery, receives signal everywhere and it can be charged through solar energy” as a technological device. Considering the age group of students, the idea of inventing a cell phone is very reasonable. In addition, the number of students who want to develop a flying car and cancer drugs is higher compared to others. In general, the products wanted to be invented are seen to be useful for society and environment. Only 3% of the students want to develop “undefeated warriors for wars and living creatures with modified DNA” to fight in the wars. As a result, it has been seen that students participating in the project think that science should be used for human interest and scientists must invent products for the benefit of man and nature.

Keywords: Science camp, middle school students, science, nature

Introduction

In today's information age, it has become inevitable to educate societies that can keep pace with extreme advances in science and technology (Bozdoğan, Şengül and Bozdoğan, 2013). According to Schibeci (2006), if it is intended to educate societies with individuals, who can understand science and scientists, first views of these individuals about science and scientists should be determined (Özsoy and Ahı, 2014). Students should have a positive image about scientists in order to look at the world through the eyes of the scientists (Kaya, Doğan and Öcal, 2008). Students create their own image about science and scientists in and out of school and these images show resistance to changes compared to information learned in school (Kara and Akarsu, 2013). According to Turkmen et al. (2008), students' negative judgments about science and scientists play an important role in shaping their attitudes toward scientific activities. These negative attitudes may lead students to become distant to science, dislike the scientific courses and fail in science courses (Nuhoğlu and Afacan, 2011). This project was conducted within the scope of 4004-Nature Education and Science Schools, which is a sub-program of TUBITAK Science and Society Projects. The aim of this study is to investigate views of middle school students

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- Selection and peer-review under responsibility of the Organizing Committee of the conference

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towards science and scientists. In this regard, students were asked “What do you think of science?” and “What would you invent if you were a scientist?” and their responses were interpreted.

Method

In this study, case study method, which is one of the qualitative research methods, was used. In this study, nested multiple cases design was used (Yıldırım and Şimşek, 2009). In the nested multiple cases design, different class levels are considered to be an analysis unit.

Study Group

This study was conducted on randomly selected 30 students including 14 7th and 16 8th grade students, who participated TÜBİTAK 4004-Artvin Nature and Science Camp Project, in the middle schools of Artvin.

Data Collection and Analysis

In this study, a semi-structured questionnaire sent by the researchers was used. In this form, there are questions about how students define science and scientists and what inventions they would make if they were a scientist. Results of these interviews were analyzed using content analysis. In the analyses, NVIVO 10 package program was used. In this study, encoding was done according to the categories determined by the content analysis. Themes were created by combining them by considering the categories created, similarities and differences. Then, the data were organized and tried to be reported integrally. The data obtained were reported in percentages.

Findings

The answers of students in response to the questions such as how students define science and scientists and what inventions they would make if they were a scientist are summarized in Table 1 and Table 2.

Table 1. Definitions of students about science and scientists

	VIEWS	Percentage	
		7 th Grade	8 th Grade
Definition of Science	Producing, inventing and exploring new things	28,6	31,3
	Logical and meaningful information	7,1	12,5
	Learning new information or combining them	21,4	6,3
	Knowledge describing the life	7,1	6,3
	Generating knowledge based on observation and experiment	14,3	6,3
	Way to facilitate the work	21,4	0,0
	Explaining the unknown	0,0	18,8
Definition of the Scientist They Follow	Person discovering new things, inventing technological equipment	57,1	43,8
	Person trying to protect humanity and nature	35,7	25,0
	Productive person trying to make life easier	7,1	31,3

According to the interviews, 29% of 7th grade students define science as “producing, exploring and inventing new things”, while 21% define science as “the way of facilitating the work” and “learning new information or combining them”. Considering the definitions of 8th grade students, 31% of the students define science as “producing, inventing and exploring new things”, 18% defines as “explaining the unknown” and 12% of the students define science as “logical and meaningful information”, respectively. Most of the students define scientists they imagine or follow as “individuals discovering new things, inventing technological equipment

Table 2. Inventions that students want to invent

Inventions Wanted to be Invented	Percentage		
	7 th Grade	8 th Grade	
Technological Equipment	Cellphone with unlimited power, higher reception, working with solar power	14,3	18,8
	Space elevator	7,1	0,0
	Solar energy converter	7,1	12,5
	Mind reader	0,0	6,3
	Machine putting thoughts on a paper	0,0	6,3
Inventions Making Transportation Easier	Flying car	7,1	7,1
	Teleportation machine	7,1	7,1
	Portable wing	7,1	7,1
	Time Machine	0,0	0,0
Inventions Protecting Nature and Environment	Liquid growing plants	7,1	7,1
	Material preventing desertification	7,1	7,1
	Environmental cleaning machine	0,0	0,0
	A machine/robot warning those throwing litter	7,1	7,1
	Fertile soil producing machine	7,1	7,1
	Machine producing water from other planets	0,0	0,0
Inventions Protecting Health	Drugs healing cancer	7,1	12,5
	Drugs preventing diseases	0,0	6,3
	Cosmetic products that are not harmful to health	0,0	6,3
Inventions for other purposes	Unbeatable warriors with modified DNA	7,1	0,0
	Robots helping housework	7,1	0,0

Considering the data given in Table 2, both 7th and 8th grade students want to invent a “cellphone with unlimited power, higher reception and working with solar power”. Considering the age group, it is very normal for these students to be interested in cell phones. In addition, the number of those who want to invent a flying car, teleport machine and cancer drugs is higher in both grades compared to others. In general, they want to invent things that are useful products for society and environment. Unlike 8th grade students, some of the 7th grade students (7%) want to develop “unbeatable warriors and creatures with modified DNA” if they were a scientist.

Conclusion and Recommendations

In this study, which was conducted to investigate perspectives of middle school students, who participated in Artvin Natura and Science Camp supported within the scope of 4004-Nature Education and Science Schools as a sub-program of TUBITAK Science and Society Projects, towards science and scientists. According to the responses of participants, they make positive statements about science and scientists in general. This result is consistent with results of the study of Tekbıyık et al. (2013) in the literature. Conspiring views of students in regard with science, the majority of students consider science as “producing, exploring and inventing new things”. Students define scientist they follow as “a person making discoveries and inventing technological equipment”. Since students actively took part in the activities carried out under the project and learnt through living by themselves, they defined science and scientists in the above-mentioned manner. Students’ answers given in response to the question “what would you invent if you were a scientist?” were analyzed under five categories as technological equipment, inventions facilitating transportation, inventions protecting nature and environment, inventions protecting health and inventions for other purposes. Both 7th and 8th grade students want to invent a “cellphone with unlimited power, higher reception and working with solar power”. As a result, in the research, it has been seen that the majority of students realized importance of science and discovered the interaction between nature and science. It is recommended to increase number of these project including activities that will make education more entertaining and allow students to realize that they can use science in their lives.

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