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The Effect of Science and Technology on Social Change According to the Views of Social Studies Prospective Teachers

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Abstract: This study aimed to analyze the effect of science and technology on social change according to the views of social studies prospective teachers. The research was designed in accordance with the phenomenology pattern, which is one of the qualitative research designs. The research participants were determined according to the criterion sampling, one of the purposeful sampling methods. The research participants consisted of 48 students who received the science, technology, and society course in the social studies teaching undergraduate program. The research data were collected by employing the interview method. Interviews were conducted with the participants via a semi-structured interview form. Expert opinions were obtained in creating the semi-structured interview form. As a result of the expert opinions, the interview form consisted of five questions. The data obtained in the research were analyzed by the content analysis technique. It was concluded that for the question of what science is, participants mostly responded that it is technology, experiment, observation, invention, generating ideas, finding solutions. For the question of what technology is, the research participants mostly replied that it is innovation, modernity, convenience, development, and humans being superior to nature. For the question of what the positive effects of science and technology on social change might be, the participants mostly gave the answer that it contributed to many areas such as the development of communication, facilitating life, contributing to the development of society, modernization, easier access to information, Internet, education, transportation, and medicine.

Keywords: Social studies prospective teachers, Science, Technology, Social change

Introduction

In the global age that we live in, science and technology have become important aspects of our life. According to Sjøberg (2001), achievements in science and technology will probably have an increasing impact on our life in years to come. According to Doğan, Çakıroğlu, Çavuş, Bilican, & Arslan (2011), in addition to being a whole by itself due to its functioning, science is also an alternative research field with subjects such as how it functions, the structure and features of its products. According to Kılıç, Haymana & Bozyılmaz (2010), the investigative nature of science involves doing science and encouraging scientific thinking. This dimension is the use of scientific processes and methods through observation, measurement, classification, deduction, data recording and analysis, and communication.

Technology, on the other hand, has developed from past to present and has become an indispensable part of daily life, especially with products such as telephone, radio, television, the Internet in communication, and trains, planes, and automobiles in transportation. This situation requires people to know the world of technology, to be able to benefit from this technology in a way that will make their life easier and to understand technological advancements. In this context, technology should be included in educational processes and individuals should be trained on these developments (Bacanak, Karamustafaoğlu, & Sacit, 2003). The interaction dimension of science, technology, and society includes the mutual interaction between science, technology, and society, and their understanding of science's impact on society. This dimension indicates that individuals should make educated decisions on scientific and technological issues by investigating interactions between science, technology, and society in multiple ways (Kılıç, Haymana, & Bozyılmaz, 2010). The impact of science and technology on society and therefore on social change cannot be ignored. The opinions of teachers, who are of the vital importance of raising effective individuals on the subject and who are on the teacher training process, are crucial. In this context, the opinions of students in the department of social studies

teaching regarding the impact of science and technology on social change are very important in terms of raising effective individuals. Because one of the important teaching training programs for raising effective individuals is the social studies teaching program. The problem of the present study is the question "What are the opinions of social studies teaching students regarding the impact of science and technology on social change".

Purpose of the Study

The general purpose of the present study is to examine the opinions of social studies teaching students regarding the impact of science and technology on social change.

Method

Research Model

This research was designed according to phenomenology, a qualitative research design. Phenomenology focuses on phenomena that we are aware of; however, we do not have an in-depth and detailed understanding about. Phenomena may appear in various forms such as events, experiences, perceptions, orientations, concepts, and situations. Phenomenology provides a suitable research ground for studies that aim to investigate phenomena that are not completely alien to us, but that we do not fully understand (Yıldırım and Şimşek, 2011, p.72).

Study Group

Participants were identified according to criterion sampling, which is a purposive sampling method. The study group was composed of 48 students in total who were second-year students in the social studies teaching undergraduate program, taking science, technology, and society course.

Data Collection and Analysis

The research data were collected using the interview method. Interviews were collected from participants through a semi-structured interview form. Experts were consulted while preparing the semi-structured interview form. The interview form had 5 questions after having consulted experts on the matter. The data obtained in the research were analyzed using the content analysis technique.

Findings

Table 1. Science according to prospective social studies teachers

Grade level	Science	f
2nd grade	Technology,	18
	Experiment	11
	Observation	10
	Invention	8
	Idea generation	4
	Finding solutions	2

According to Table 1, prospective social studies teachers answered the question "What is science" as follows: technology (f18), experiment (f11), observation (f10), invention (f8), idea generation (f4), and finding solutions (f2).

Table 2. Technology according to prospective social studies teachers

Grade level	Technology	f
2nd grade	Innovation	25
	Modernity	22
	Convenience	20
	Progress	18
	Human superiority over nature	12

According to Table 2, the following findings were acquired on the question "What is technology according to prospective social studies teachers": innovation (f25), modernity (f22), convenience (f20), progress (f18), and human superiority over nature (f12).

Table 3. Positive effects of science and technology on social change according to prospective social studies teachers

Grade level	Positive effects	f
2nd grade	Developing communication	12
	Facilitating life	11
	Contributing to societal development	7
	Modernization	5
	Easier access to information	2
	Internet	2
	Education	2
	Transportation	1
	Medicine	1

According to Table 3, the following findings regarding the positive effects of science and technology on social change stated by prospective social studies teachers were: developing communication (f12), facilitating life (f11), contributing to societal development (f7), modernization (f5), easier access to information (f2), Internet (f2), education (f2), transportation (f1), and medicine (f1).

Results and Discussion

In the study, in which the opinions of prospective social studies teachers regarding the impact of science and technology on social change were investigated, the following results have been obtained: Participants mostly answered the question "What is science" as technology, experiment, observation, invention, idea generation, and finding solutions. On the question "What is technology", participants stated that it was innovation, modernity, convenience, progress, and human superiority over nature. According to Bacanak, Karamustafaoğlu & Sacit (2003), new technological developments usually take place due to societal needs or the need to improve existing technology. In other words, society controls technology by evaluating its value. The first among these is the lack of awareness in teachers and administrators about the suitability of using technology in schools. The reason behind that is insufficient budget and inexperienced teachers and administrators. In addition, technology is not used much in training prospective teachers in institutions training teachers. Teachers should improve themselves in order to use technology in educational activities at the desired level. To this end, administrators should provide time and opportunity for teachers. In this context, the effective use of science and technology at all grade levels, from primary school to higher education, should be underlined and deficiencies in the infrastructure on the matter should be eliminated. Thus, during the global age, we live in, this may contribute to raising individuals who could adapt to the conditions of upcoming periods, effective for the society, and who are productive.

On the question asking what the positive effects of science and technology on social change could be, participants mostly stated that it could develop communication, facilitate life, contribute to several areas such as societal development, modernization, easier access to information, Internet, education, transportation, and medicine. According to Kılıç, Haymana & Bozyılmaz (2010), the interaction dimension of science, technology, and society involves the mutual interaction between these three aspects and their understanding of the impact of science on society. This dimension is that individuals should make educated decisions on scientific and technological issues by investigating interactions between science, technology, and society in multiple ways.
When research results are evaluated in general, concepts of science and technology for prospective social studies teachers are important and useful concepts both for societies and themselves. Therefore, science and technology could contribute to social change in many positive ways.

Recommendations

In the study, the opinions of prospective social studies teachers regarding the impact of science and technology on social change were investigated. In future studies, the opinions of other prospective teachers studying in different departments regarding the impact of science and technology on social change could be examined. Considering the fact that science and technology have an important impact on societies, science and technology

infrastructure/education could be increased at all grade levels, from primary school to higher education. In this way, this could contribute to raising modern, effective, and productive individuals.

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