Journal of Education and Future
year: 2021, issue:19, 61-73
DOI: 10.30786/jef.680174

Opinions of Science and Social Studies Teachers on Teaching Science-Related Subjects in Secondary Schools

Article Type	Received Date	Accepted Date
Research	26.01.2020	16.12.2020

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Abstract

In this research, the views of science and social studies teachers regarding teaching science subjects were aimed to determine. Case study, one of the qualitative research methods, was used in the study. The sample of the study consists of 26 teachers in total, of whom 13 are social studies teachers and 13 science teachers working in public schools in Antalya/Turkey in the academic year of 2018-2019. In order to determine the opinions of teachers, "Interview Form for Teaching of Science Related Topics" which is a semi-structured form consisting six open-ended questions was prepared, and the data collected through interviews were analysed using descriptive statistics. The results in general showed that the topic of "science", which is a common ground for social studies and science courses, was stated by teachers, and it was found out that teachers of both branches did not hold any joint meetings or work in collaboration with each other.

Keywords: science, science teachers, social studies teachers, view.

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Ortaokullarda Bilimle İlgili Konuların Öğretilmesine Yönelik Fen Bilgisi ve Sosyal Bilgiler Öğretmenlerinin Görüşleri

Makale Türü	Başvuru Tarihi	Kabul Tarihi
Araştırma	26.01.2020	16.12.2020

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Öz

Bu araştırmada fen bilgisi ve sosyal bilgiler öğretmenlerinin bilim konularının öğretilmesine yönelik görüşlerinin belirlenmesi amaçlanmaktadır. Çalışmada nitel araştırma yöntemlerinden durum çalışması kullanılmıştır. Çalışma grubunu 2018-2019 öğretim yılı Türkiye/Antalya il merkezinde bulunan MEB'e bağlı okullarda görev yapan 7'si erkek 6'sı kadın 13 sosyal bilgiler öğretmeni; 5'i erkek 8'i kadın 13 fen bilgisi öğretmeni olmak üzere toplamda 26 öğretmen oluşturmaktadır. Öğretmenlerin görüşlerinin belirlenmesi amacıyla yarı yapılandırılmış altı açık uçlu sorudan oluşan "Bilim Konularının Öğretilmesi Görüşme Formu" hazırlanmış, veriler görüşme tekniği ile toplanmıştır. Çalışma verileri betimsel analize tabi tutulmuştur. Araştırmanın sonuçlarının genel olarak değerlendirmek gerekirse, fen bilgisi ve sosyal bilgiler derslerinin ortak konularından "bilim" konusu ifade edilmiş, iki branşın öğretmenlerinin bilim konusunun öğretimine yönelik ortak olarak herhangi bir çalışma ve ortak bir toplantı gerçekleştirmedikleri belirlenmiştir. Buna rağmen öğrencilerin bilim konusuna yönelik dersler arası ilişkilendirme yapabildikleri, öğretmenlerin ise bilim konusunun öğretilmesine dair iki branşa da hizmet edebilecek şekilde ortak geziler planlayabildikleri ancak bunların birtakım imkânsızlıklar nedeniyle gerçekleştirilemediği belirlenmiştir.

Anahtar Sözcükler: Bilim, fen bilgisi öğretmenleri, sosyal bilgiler öğretmenleri, görüş.

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Introduction

Although social studies (sciences) and sciences are thought to have different fields of study, they are basically two types of science that are inextricably linked to each other. At the same time, these two sciences proceed on parallel subjects in primary and secondary school education and attempt to make life meaningful and livable in all its aspects. It is a this point that practices of teachers of social sciences and sciences, who are teachers of these two disciplines in the secondary education period, in the teaching of "science" subjects, which are common to them both, gain importance.

Science is a powerful sculptor of the modern world that has been generated by human beings and is part of them (Switzer and Voss, 1982). When the development of science from past to present is examined, it is seen that just as people's beliefs, lives and economies affect science, science has also led to fundamental changes in human life; it has affected industry, war techniques, agricultural activities, philosophical perspectives, social structure and political activities of societies (Switzer and Voss, 1982; Heath, 1988; Russel, 1968; Lederman, Antink and Bartos, 2014).

Ziman (1980) stated that science and technology were related to students' lives, so they were directly linked to science and social studies courses, and defined science as a type of curriculum prepared in accordance with concepts and processes (as cited in Mansour, 2009). National Science Teachers Association (NSTA) emphasized the fundamental points of scientific literacy in the citizenship duties of the individual and pointed out the integrated nature of social studies and science. In the same vein, the United Nations Education, Science and Culture Organization (UNESCO) encouraged collaboration on natural and social sciences at a conference held at the University of Manitoba in October 1980 in partnership with science and social sciences, and in this way the relationship between science and social sciences was further strengthened thanks to the support offered by UNESCO. Consequently, unification of these two disciplines has become a goal of national and international education (Barman, Harshman and Rusch, 1982). Studies conducted by NSTA endorsed inclusion of topics of science, technology and society in sciences and social studies courses jointly. In these studies, it was stated that students could take responsibility while making decisions in daily life, use science and technology in light of ethical values, analyze the relationship between science, technology and society, link science and technology to economic and political issues in their ethical aspects in global and personal affairs and emphasized the importance of sciences and social studies in the teaching of science (Lederman, Antink and Bartos, 2014; Bybee,1991; Sumrall and Schillinger, 2004).

In science courses, the human dimension of science generally becomes insignificant, and the courses are conducted in the form of laboratory practice. In the social studies course, on the other hand, scientific topics are not covered adequately and the proposed methods and materials fail to provide consistency of topics in the historical context. What is desired at this point is that the two disciplines should cooperate. This helps students experience the topic as a whole and in a relational manner rather than attempting to learn it bit by bit and in a disconnected way (Mansour, 2009; Bybee, Powell, Ellis, Giese, Parısı and Singleton, 1991; Mansour, 2009; Patrick and Remy, 1985; Anthony, 1973; Maguth, 2012).

Science and social studies curricula in Turkey were examined in order to form a more comprehensive point of view. It is seen as a result of this examination that the subject of science, which is a common topic in the curricula of science and social studies, is intended to be taught in a people-driven manner. Also, the curricula endeavor to teach the students how human life could be changed and improved through science, which is itself a human discovery, within the framework of the program and from the same and different perspectives. This is so much so that the group instructions issued by the Ministry of National Education (MEB, 2018) aimed at teaching common subjects in these two disciplines stated that the meetings to be held at the beginning of the academic year, the beginning of the second semester and at the end of the academic year, should focus on the importance of intergroup and interdisciplinary cooperation. The group instruction stipulates that interdisciplinary cooperation is important in that it helps disciplines to get to know each other, create a whole by complementing each other, encourage educational institutions to cooperate in all fields and implement the educational curricula across the country in a unified manner.

When the relevant literature is examined, it is seen that there are studies conducted jointly regarding the school subjects of science and social studies (Gülten and Kılıç, 2014; Karakuş, Karaaslan and Pehlivan, 2018; Şahin and Güven, 2016; Adalar and Yüksel, 2017; Yılmaz, 2016; Ateş, 2018). It has also been observed that there are some separate studies concerning the teaching of the topic of science in science and social studies courses (Roberts and McDonald, 2015; Scruggs and Mastropieri, Okolo and 2008; Kocabıyık Kaymak, 2016; Özensoy, 2014; Karasu Avcı and Faiz, 2019; Nalçacı, Akarsu and Kariper, 2011; Ratzer, 2014; Joerges and Nowotny, 2003; Özgelen and Öktem, 2013; Mıhladız and Doğan, 2017; Yenice and Ceren Atmaca, 2017). When the common subjects of science in these two disciplines are taken into consideration, research in the literature of disciplines of science and social studies on the teaching of common topics is quite limited (Bybee, Powell, Ellis, Giese, Parısı and Singleton,1991; Barman, Harshman and Rusch, 1982; Sumrall and Schillinger, 2004). When the studies in each discipline investigating the teaching of science topics independently of the other discipline are examined, it is seen that these studies are also limited (Heath,1988; Gennaro,1975; Bybee1987a, Patrick and Remy 1985; Akins and Akerson 2002). However, although this issue is very important, it is seen that joint studies on teaching science in both social studies and science courses are insufficient. Considering that both social studies and science courses are two main disciplines that support and complement each other in teaching the topic of science, the collaboration of the teachers of these two disciplines and the teaching of these subjects in a planned and joint manner will help better comprehension of both social and numerical aspects of science as a whole because the subject of science acts as a fundamental bridge between the two disciplines. Therefore, the present study aims to determine science and social studies' views concerning teaching of science topics in order to contribute to elimination of this gap in the relevant literature and by virtue of our belief that curricular objectives could be achieved more easily and effectively if disciplines of science and social studies cooperate in the teaching of science topics.

Method

Case study, which is one of the qualitative research designs, was used in this study. According to Yin (2009), case study derives its topic of investigation from real life and explores a situation from among current issues (as cited in Creswell, 2018). According to Stake (2006), for a study to be case study, it has to be selected on the basis of certain limitations (achievement, age level, certain student grades etc.) and units of analyses need to be created (as cited in Merriam, 2009).

The Sample

The sample of the study consists of 26 teachers in total, of whom 13 are social studies teachers, 7 male and 6 female, and 13 science teachers, 5 male and 8 female, working in public schools in Antalya/Turkey affiliated to the National Ministry of Education in the academic year of 2018-2019. Typical case sampling, one of the purposive sampling methods, was used in this study. According to Merriam (2018), typical case sampling involves ad hoc inclusion of everyone fitting the profile of the subject intended to be investigated in the sample. The schools and the teachers were determined on the basis of easy access and voluntariness. Some information about the sample is given in Table 1.

Table 1
Information on the Sample

		N
Length of service	1-5 years	4
	6-10 years	3
	11-15 years	6
	16-20 years	6
	21 and more years	7
Educational Background	B.A.	21
	M.A.	5
Faculty of graduation	Faculty of Education	21
	Faculty of Letters	5
Department of Graduation	Social Studies Teaching	10
	History- Geography Teaching	1
	Department of History-Geography	1
	Science Teaching	9
	Physics Teaching	1
	Department of Physics-Chemistry-Biology	3

Data Collection and Analysis

The data of this study were collected using the interview technique. The interview technique is a qualitative technique that provides data for studies about the states of individuals such as emotions, thoughts and instincts, which cannot be observed directly, and thus enables individuals to be exposed to their perceivers (Patton, 2002).

In order to determine the opinions of the teachers in the sample about teaching science subjects, the "Interview Form for the Teaching of Science Subjects " consisting of five semi-structured interview questions was prepared in line with the opinions of 2 researchers in the field of science and 2 researchers in the field of social studies. Semi-structured interview forms help participants to express their perceptions through their own opinions and consist of flexible sentence structures (Merriam, 2018). Appointments were made with the teachers prior to the interviews and the interviews were held on appropriate days and at appropriate hours in a suitable part of the school where they were employed.

The research data were analyzes using the descriptive analysis method. In descriptive studies, the views of individuals who are interviewed or observed are presented through direct quotations in order to reflect them in an effective way (Yıldırım and Şimşek, 2013). The research data were analyzed simultaneously by the researchers and the reliability formula proposed by Miles and Huberman (1994) "R (Reliability) = 100 x [Na (Consensus 25) / Na (Consensus 25) + Nd (Discordance 3)]" was used to calculate the reliability between them. As a result of the calculation, reliability was found to be 89 and concluded that the research analysis was reliable. The branches and fields of graduation of the teachers were given as they were but their names were coded in the form of "T1, T1 etc." by virtue of ethical rules. For each category, at least one teacher's answer was given below the tables in order to raise reliability and support the findings.

Results

1. Findings about the examples which the teachers in the sample gave regarding common subjects with different disciplines

In this section, the views of science and social studies teachers were evaluated concerning the common subjects in their courses with other disciplines. According to this, 9 of the social studies teachers in the sample stated that they had common subjects with the mathematics course, while 8 argued the same for the Turkish course, 6 for history, 6 for geography, 6 for religious culture, 2 for sociology and 1 for biology, anthropology, physics, archaeology, philosophy, visual arts, technological

design and English courses. 12 out of 13 of the social studies teachers stated, within the scope of the research subject, that their course contents had common subjects with the science course. On the other hand, when the views of the science teachers concerning common subjects with other disciplines were asked, it was seen that 11 stated that their discipline had common subjects with the mathematics course, whereas 4 argued the same for Turkish, 3 for technological design, 2 for geography, biology, chemistry, physics, physical education, music, English and art, and 1 for religious culture and computer. With regard to the research topic, 12 of the 13 science teachers remarked that their course had common subjects with the social studies course. An overall examination revealed that the mathematics, Turkish, technological design, geography, physics, English, biology and religious culture were proposed as subjects that were common to both disciplines. Some of the answers given by the teachers are as follows:

> It is fairly linked to *science*. Especially, subjects such as energy sources and environmental pollution taught in 5th and 6th grades are among our common subjects. Apart from this, science and technology, development of technology, scientists, steps of scientific research are subjects that are directly related to the *social studies* course. In addition, we talk about inventions in our classes and dwell on their contribution to science and technology. Besides science, history of Islam and Hegira in the *religious culture, course*, reading comprehension, grammar and self-expression in the *Turkish* course and chronology in the *mathematics* course are related. (Social Studies Teacher, Faculty of Education, T6).

> There are common points in terms of the topics such as past scientists and their deeds, discoveries, their history and their contributions to human life, which are covered in the *social studies* course, the topic of calculations in the *mathematics* course, the topics of model design and electric circuits in the technological design course, topics of drawing, graphic reading, and handicrafts taught in the *art* course, and topics of speed and balance in the *physical education course*. (Science Teacher, Faculty of Science/ Biology T11).

2. Findings about the views of the teachers in the sample on the teaching of common subjects

In this section, the views of science and social studies teachers about what they did in the teaching of the common subjects of the two courses. Since majority of the teachers in the sample had difficulty answering the question of what the common subjects to the two disciplines were, they were given the subject headings (science, economy, geography, environment, sustainable development) and asked to make comments. Accordingly, 8 of the 13 social studies teachers in the sample expressed views about all of the headings, while 2 stated that they had studied the topics of environment and science but did not remember the others; 3, on the other hand, said they did not remember sustainable development from among social studies topics and attempted to make a comment. 8 of the 13 science teachers in the sample expressed their views on all of the headings, whereas 3 stated that they did not remember the topic of economy and added that they had not heard economy as a common subject in the social studies course. 2 science teachers, on the other hand, remarked they did not teach the subject of sustainable development at all as it was the last chapter of the book or they had no idea about that topic. Some of the answers the teachers gave are as follows:

> Regarding the topic of science, I teach about emergence of science, its philosophy, biographies of scientists, what they produce under what circumstances and what kind of contribution they make to society; I make students watch films and documentaries about these topics, and I even ask students to manufacture their prototypes again. (…) As regards environment and environmental pollution, I ask "who wants to live in a dirty home/school?" and then we go out to clean the school within the framework of "keep your environment clean first". Also, I ask their favorite pet and explain how we pollute its environment. (Social Studies Teacher, Faculty of Education, T5).

> I talk about definition of science, its steps, how a statement problem is written. For example, I mention invention of the light bulb (…).I think we do not have the topic of *economy*. If one had to, then one would talk about how daily economy is etc. I suppose, but we do not teach. I did not know that there were common topics in *social studies*. We teach the topic of *geography*, geographical formations, magma etc. I do not teach in detail (…) In general, I teach the topics in the form of coding. Regarding environment, I teach population, community, species and their harmony with human beings. I do not remember the topic of sustainable development clearly but I remember touching upon their positive and negative aspects superficially (Science Teacher, Faculty of Education, T5).

3. Findings about the views of the teachers in the sample on the joint work they did regarding the teaching of common subjects

In this section, opinions of social studies and science teachers were obtained about what kind of a method they follow in the teaching of common subjects and whether or not they prepare a joint lesson plan, work or material. It can be said that 11 of the social studies teachers excepting two did not do any work on the teaching of common subjects and their opinions were only at the level of exchange of ideas. It was found that the other two social studies teachers prepared and used joint projects and materials. As for the science sample, on the other hand, apart from one teachers, 12 teachers did not conduct any joint work and their views were at the level of exchange of ideas only. It was stated that one science teacher prepared material for the common subject. Here are some of the answers the teachers gave:

> We prepared a joint Project. It was a project called "history-scented nature" that included 400 students and 40 academicians. There were many topics in it, notably archaeology, geology and ecology. Indeed, we generally continue to carry out product-based multidisciplinary work. Therefore, we jointly develop projects with themes such as history, nature and environment within the framework of workshop training. (Social Studies Teacher, Faculty of Education, T3).

> We have never done a joint study, but sometimes I may ask opinions about how I should it (…) for example, students were having difficulty concretizing the subject especially when it came to the topic of movement of earth's crust. My friend, a *social studies* teacher said "shake two tables next to each other so that a gap occurs between the two tables when they are shaken so violently. This is what fault shift is like and thus occur earthquakes". From that day on, I began to teach this subject easily through this example and students now better understand the topic (Science Teacher, Faculty of Education, T12).

4. Findings about the views of the teachers in the sample about joint meetings/group work

In this section, social studies and science teachers were inquired about whether they had joint meetings and whether they were aware of the article on the teaching of common subjects in the group meeting minutes. Moreover, they were asked whether they decided in the meetings they held to cooperate in teaching common subjects and their opinions were taken about what the possible outcomes of such cooperation could be. 12 of the social studies teachers stated that they did not have a joint meeting with science teachers whereas one teacher said that they held a joint meeting. 4 teachers stated that they were knew the article in the group minutes on intergroup and interdisciplinary cooperation stipulating teaching of common subjects, while 6 said they did not know of such an article. 10 of the science teachers, on the other hand, sated that they did not hold joint meetings with social studies teachers, whereas 1 teacher said they had joint meetings. 9 teachers stated that they were aware of the article on the teaching of common subjects mentioned in the group minutes, while 1 teacher stated that they were not aware of this article. In general, teachers stated that collaborating in the teaching of common subjects would support the professional development of the teacher and increase the academic achievements of the student by attracting attention to the course. Some of the answers the teachers gave are as follows:

> Yes, we had a joint meeting. We make decisions and implement them. Science teachers often have difficulty teaching global warming, environment, habitat, and the uses of animals for people, and I support them within a common plan, and they support me in the areas that I have difficulty with. This cooperation will benefit both the student and the teacher. Numerical and verbal sciences are intertwined, and cannot be considered independently of each other. Thanks to this collaboration, the student assimilates the courses and subjects very comfortably by associating them with each other; the teacher can explore the aspects in which he can do joint projects and increase the number of activities and events (...) and discover to look at matters from the point of view of another course. (Social Studies Teacher, Faculty of Education, T5).

> We never did. I know about the article, but it stays on paper, we write it, but I've never met some who implemented it. It'd be nice if it was done. For example, issues of recycling and sustainable development remain very theoretical. It would be much more effective if the facilities were installed; it could be prepared as a joint project, but we fail to do so. (Science Teacher, Faculty of Education, T10).

5. Findings about the views of the teachers in the sample on classroom practices in the teaching of science topics

In this section, the social studies and science teachers were asked whether their students associate the science topics they taught with other courses and whether they received feedback from the students. 12 of the 13 social studies teachers stated that their students could make association between courses whereas 1 said that he was not sure whether the students could manage to make associations. 12 of the science teachers, on the other hand, stated that their students could make associations between the courses while 1 stated that the students wished to make associations but failed to do so. Here are some of the answers the teachers gave:

> When I am teaching scientists or industrial revolutions, the students themselves make the association saying "teacher, we have already learned about it in the *science course*. This makes knowledge permanent. (Social Studies Teacher, Faculty of Letters, T9).
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> We would love to, but how much of this the students are able to manage this, I don't know. Nonetheless, they may ask other teachers for information in order to reinforce the topic. (Social Studies Teacher, Faculty of Education, T7).
>
> That is the most important problem. It is a grave matter because they fail to do that (Science Teacher, Faculty of Science/Biology T11)
>
> I don't have to make a special association. Kepler, Copernicus, etc. are included in both subjects, so they say, "We've seen this." It's the same when we are talking about the earth or the solar system. These are already the subject of the actual *social studies* class, so it's easier for them to relate. (Science Teacher, Faculty of Education, T2).

Discussion, Conclusion and Recommendations

When the findings obtained from the analyses made in accordance with the purpose of the study were examined, it was found that the teachers gave the following examples regarding common subjects with other disciplines: science teachers, stated that their classes were related to topics covered in geography, mathematics, religious culture, biology, chemistry, physics, physical education, Turkish, technological design, information technologies, music, English and painting courses; social studies teachers, on the other hand, stated that their course topics were related to history, geography, sociology, astronomy, geology, archaeology, philosophy, anthropology, physics, religion, technological design, visual arts, Turkish, mathematics and English courses. 12 of the 13 science teachers stated that their courses were related to social studies; likewise, 12 of the 13 social studies teachers stated that their courses were related to science. It was determined within the scope of this study that science was a common topic in both disciplines. Lee (2007) also found that social studies courses are related to courses like science, mathematics, linguistic arts, art, physical education, sociology, geography, and music.

In their views about the topics of science, economy, geography, environment and sustainable developments as common subjects with the social studies course, 8 science teachers explained how they conducted the classes as far as the said topics were concerned, but interestingly enough, they added that they did not know economy was in the field of social studies and that they did not remember teaching anything about economy in their classes. They further stated regarding the topic of sustainable development, that since the topic of sustainable development was the last chapter of the book, it was not given adequate care or that they did not remember it among the topics of science. 8 of the social studies teachers, on the other hand, explained how they carried out the classes with regard to all of the said topics, while 3 teachers said they did not remember the topic of sustainable development among the social studies topics; 2 teachers stated that they had not heard the topics of economy, geography and sustainable development among social studies topics. Within the scope of the study, all science and social studies teachers agree that science is a common subject for the two courses. As for the relevant literature, Rubba (1989) stated, in parallel with the findings of the study, that science teachers attached importance to teaching the subject of science and taught the subject of science in their classes. Unlike the findings of this study, however, Bybee (1987a) stated that science teachers said they did not know that the topic of science was a common subject with social studies. It was found in the study that while they were teaching the topic of science, social studies teachers often discussed the issues of scientists

and their lives, discoveries, their contribution to human life, and had the students watch documentaries or films; science teachers, on the other hand, stated that they dealt with the steps of scientific research, scientists, and inventions. On the basis of this, it is possible to say that human dimension of the topic of science is often lacking and that it is not often mentioned how much science affects human life and how it can change the conditions of the period. In a study they conducted, Barman, Harshman and Rusch (1982) stated that a majority of the science and social studies teachers argued for an interaction between the topics of science and society and added that their effects on human beings should be dwelt on.

The majority of science and social studies teachers stated that they did not carry out a joint concrete study (plan, project, activity, material, etc.) with the other discipline, and that the cooperation between them usually remained at the level of exchange of ideas. In the relevant literature, unlike the finding of our study, Barman, Harshman and Rusch (1982) stated that science and social studies teachers acknowledged the need for communication between them in the teaching of common subjects and especially scientific topics, and added they had to conduct joint projects. In the studies of Sağdıç (2019), McCall, Janssen and Riederer (2010), and DiCamillo and Bailey (2016), it is pointed out that in order to provide a strong social studies teaching, teachers should, in particular, care about interdisciplinary learning and make plans such as various activities and excursions. Yıldırım (1996), on the other hand, stated that unless interdisciplinary interactions were not carried out via projects, activities etc., then problems could be experienced regarding transfer of information. In a study they conducted, Bybee and Bonnstetter (1987) stated that a large portion of the teachers agreed on the need to prepare and use joint materials in the teaching of science topics. Bybee (1987a), on the other hand, argued, in the context of participation in democratic processes in topics of science, that science teachers needed to cooperate with social studies teachers in joint projects.

A large section of the science teachers stated that they did not hold meetings with social studies teachers in regard to teaching of common subjects but added that they were aware of the article in the group minutes stipulating that common subjects should taught in cooperation. The majority of the social studies teachers, on the other hand, remarked, in a similar fashion to the responses of the science teachers, that they did not hold meetings concerning teaching of common subjects but they were aware of the article in the group minutes stipulating cooperative teaching of common subjects. Both science and social studies teachers stated that the decisions taken from the meetings remained on paper as a formality and that the decisions taken were not generally implemented; therefore, they stated that the decisions and plans for teaching common subjects were processed in the minutes of the meeting but they did not implement them because they had no obligation. This finding of the study is similar to the findings in the relevant literature (Güler, Altun and Türkdoğan, 2015; Yüksel, 2018; Alım and Doğanay, 2016 and Turan, Dönmez and Çakmak, 2009) concerning different disciplines such as that group meetings were not attached due importance, that meetings took place as a formality or the decisions taken were not implemented. In studies conducted by Riordan (1996) and Patrick & Remy (1985), the teachers were found to be of the opinion that cooperation between them would be beneficial pedagogically, in terms of professional development, individual support and maintaining relationship; as for the students, cooperation could help them acquire fundamental information especially regarding science, develop their decision-making and problem-solving skills and increase their academic achievement levels. In addition, Lenoir and Hasni (2016)'s study found that interdisciplinary cooperation could help students to comprehend the subjects via a integrative point of view, and bring a dynamic and constructive perspective in providing their cognitive development.

When their views were asked about whether their students could make connections between the courses of social studies and science in the teaching of the subject of science, both the science and social studies teachers stated that generally their students were able to make connections between the courses, by relating a science topic they studied in one discipline to the science topic covered in the other discipline, and that they remembered their knowledge about the topic at hand. In the relevant literature, Şahinkaya and Aladağ (2010) stated, in parallel with the findings of this study, that in their study students were able to make connections between the common subjects of the social studies course and other disciplines. However, unlike the findings of the present study, Akins and Akerson (2002) maintained in their study that students failed to make connections between science and social studies as far as science topics were concerned. Moreover, it was found in studies conducted that science and

social studies pre-service teachers had misconceptions about science and the nature of science (Çınar and Köksal, 2013; Arı, 2010). This could be the reason for the failure to make a connection between science and social studies courses in regard to science topics.

The following suggestions could be made on the basis of the findings obtained:

- Plans should be made to encourage science and social studies teachers for cooperation between groups in the teaching of common subjects, especially science.
- Due importance should be paid to inter-group meetings; the common subjects should be determined in these meetings; in-term plans should be made accordingly and implementation of these plans should be checked regularly.
- Projects and other efforts aimed at the teaching of the topic of science, which is a common subject for science and social studies courses, should be supported and teachers and students should be encouraged in this regard.
- Efforts should be made to inform teachers of the importance of teaching the topic of science and other common subjects of the two disciplines in cooperation.

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