



An Action Research on Basic Competence in Science and Technology in Social Studies Course

Sosyal Bilgiler Dersi Bilim ve Teknolojide Temel Yetkinlik Üzerine Bir Eylem Araştırması

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ABSTRACT: Social Studies course is one of the basic courses that prepare students for social life. Change and development have become important in science and technology in the present time. Social Studies course has found its place in the development and change in science and technology. Developments in science and technology are given in Social Studies course, considering the basic competences in science and technology. This research aims to reveal the process of activities related to the basic competence area of Social Studies course regarding science and technology and to determine the views of students and teachers regarding this process. The research was designed in an action research pattern which is one of the qualitative research methods. The research was conducted in the first and second semesters of 2022-2023 academic year. The participants of the research are 6th-grade students and their social studies teacher. The research data, observation form, teacher and student diaries, student products, and semi-structured interview forms were gathered via video recordings of the researcher in the process. Data analysis of the research was conducted using content analysis method. It was concluded that the activities conducted regarding basic competence in science and technology in Social Studies course entertained the students during the course, the course was better comprehended and the subjects were learned easily. In addition, it was concluded that the activities related to the basic competence in science and technology in Social Studies course improved students' ability to conduct research using the scientific research process, and realize the importance of the scientific ethics concept, respect for labor and citing references. Considering the results of the research, recommendations for practitioners and researchers were suggested.

Keywords: Social studies education, science, technology, basic competence, action research

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ÖZ: Sosyal Bilgiler dersi, öğrencileri sosyal hayata hazırlayan temel derslerden biridir. Günümüzde bilim ve teknolojiye ilişkin değişim ve gelişmeler önemli hale gelmiştir. Sosyal Bilgiler dersi, bilim ve teknolojiye ilişkin gelişmeleri temel yeterlikler göz önünde bulundurularak ele alır. Bu araştırmanın amacı, bilim ve teknolojiye ilişkin temel yeterlik alanına ilişkin sosyal bilgiler dersi sürecini ortaya çıkarmak ve bu süreçle ilgili öğrenci ve öğretmen görüşlerini belirlemektir. Araştırma, nitel araştırma yöntemlerinden biri olan eylem araştırması modeline göre tasarlanmıştır. Araştırma, 2022-2023 akademik yılının birinci ve ikinci dönemlerinde gerçekleştirilmiştir. Araştırmanın katılımcıları, 6. sınıf öğrencileri ve onların sosyal bilgiler öğretmenidir. Araştırmanın verileri, gözlem formu, öğretmen ve öğrenci günlükleri, öğrenci ürünleri, yarı yapılandırılmış görüşme formları gibi süreçte araştırmacı tarafından yapılan video kayıtları aracılığıyla toplanmıştır. Araştırmanın veri analizi, içerik analiz yöntemi kullanılarak gerçekleştirilmiştir. Araştırmada, sosyal bilgiler dersinde bilim ve teknolojiye ilişkin temel yeterliklerle ilgili yapılan etkinliklerin öğrencileri ders boyunca eğlendirdiği, dersin daha iyi anlaşıldığı ve konuların kolayca öğrenildiği sonucuna varılmıştır. Ayrıca, sosyal bilgiler dersinde bilim ve teknolojiye ilişkin temel yeterliklere yönelik etkinliklerin, öğrencilerin bilimsel araştırma sürecini kullanma yeteneklerini geliştirdiği, bilimsel etik kavramının, emeğe saygı ve referansları alıntılama gibi konuların önemini fark ettirdiği sonucuna varılmıştır. Araştırmanın sonuçları göz önüne alındığında, uygulayıcılar ve araştırmacılar için önerilerde bulunulmuştur.

Anahtar sözcükler: Sosyal bilgiler eğitimi, bilim, teknoloji, temel yeterlik, eylem araştırması

1. INTRODUCTION

Recent developments in science and technology have caused some changes in human life. It is possible to see the effect of science and technological developments, especially in the changes that occur in the sociological area. The “Industrial Revolution”, which was the turning point of science and technology, enabled many things to change in our lives. Science and technology, constantly changing and developing from that period to the present time, are important in terms of influencing every aspect of life. Science and technological developments dominate every area from smartphones to nanotechnology and artificial intelligence and are improving their condition more and more (Almeida & Simoes, 2019; Silva, Lopes, Sobrinho & Valentim, 2021). Science and technology, of which importance is increasing gradually in human life, influenced institutions, regimes and state policies, in addition to education. This situation allows today's education systems to be intertwined with educational technologies and brings a separate innovation to education (Bongomin et al., 2020; Ciolacu et al., 2017; Keser & Semerci, 2019).

With the use of technology in education, students can make information more concrete and permanent by collaborating with different groups in augmented reality and virtual environments so that they can have different experiences regarding the subject. These innovations, which are adapted to education, enable knowledge to be obtained in different ways (Hicks, Lee, Berson, Bolick & Diem, 2014; Hussin, 2018). Thanks to the changes and developments in science and technology, it is possible to provide an opportunity to direct students to environments where they can have different experiences by updating the course curriculum (McGillivray, McPherson, Jones, & McCandlish, 2016).

In this age, where we have important opportunities in creating and disseminating knowledge, education is renewed by adding something new to itself from information technologies. In the earlier education systems, the student who received the information presented by the teacher in the best way was considered successful, but today's student success situation is perceived differently (Dematrini & Benussi, 2017). Presently students actively participate in the learning process and use the knowledge and skills in this process by filtering it. Science and technology offer various materials that students can use and will contribute to their skills and acquisitions. Teachers can enrich the study by revealing the effects of technology on different learning outcomes in their classrooms (Dematrini & Benussi, 2017; Demirezen & Turan, 2016).

Competence in science aims to benefit from the knowledge and method of explaining what is happening in life in order to understand the problems and produce results based on certain concrete evidence (Buckley, Piacentini, & Von Davier, 2021). Competence in technology is defined as the application of knowledge and methods to meet the needs of individuals. Technological competence refers to the changes that occur in human life and the responsibilities that individuals have as citizens. It can take further education that will actively realize learning throughout the life of individuals (Lynch & Francis, 2021).

The use of science and technology in education in the context of producing knowledge increases quality. For this reason, it is necessary to integrate the developments in science and technology into the curriculum in order to raise individuals who are aware of the innovations of the age. In update studies, the 2018 Social Studies Curriculum (SSC) was updated along with all the programs. Considering the basic approach of (SSC), it is stated that individuals who produce and use information have an advantage compared to other individuals. The facilitation of access to information and the development of communication opportunities are linked to rapidly developing information and communication Technologies (Yeşiltaş & Kaymakçı, 2014). In addition, it can be seen in the basic approach of the

program that the demands that allow students to learn the ways of accessing information are also considered important (Sanjeev & Natrajan, 2021).

In the related literature, it is seen that studies focus on the field of technological competence rather than scientific competence. In the study by Acar (2015) regarding the digital literacy status of high school students, it was concluded that the views of parents in terms of the digital literacy of their students indicate differences in terms of income level, employment status, and the type of digital tool used. In the study by Özerbaş and Kuralbayeva (2018), the digital literacy levels of pre-service teachers in Turkey and Kazakhstan were comparatively investigated according to certain variables. In the study, pre-service teachers concluded that having a computer and internet connection; internet usage status and gender influence digital literacy. In the study by Çetin, Çalışkan and Menzi (2012) it was aimed to investigate the “relationships between pre-service teachers’ technology competencies and their attitudes towards technology”. In the study, it was concluded that there is a positive and significant relationship between pre-service teachers' technological competencies and their attitudes towards technology. In the study by Martin and Grudziecki (2006), it was found that digital literacy is a factor that influences participation in education, employment and every aspect of social life. In addition, it was stated that digital literacy has become an important factor in revealing the changing understandings in the world. A definition of digital literacy, which focuses on the process of using digital tools to help people achieve their goals in life, was offered. It was emphasized that students and teachers must closely follow the developments in the digital literacy process. Blikstad-Balas (2015) investigated the effect of students' use of computers on digital literacy practices. In the study, it was concluded that teaching methods performed by visualizing using a computer contributes to the development of digital literacy skills in students. It was also stated that there is a need for research on how to use the Internet more effectively in education. It was also stated that forbidding students to use the internet would not have a positive effect on the development of student digital literacy. In their study, Meyers, Erickson and Small (2013) also stated that it is not enough for students to use technology skills and abilities; also they must know the rules and practices of using technology. In this context, they emphasized that digital literacy includes security and privacy, cognitive authority, reusing digital media, and ethical and responsible use. It was also stated that digital literacy is becoming more important in raising a technologically competent student and an engaged citizen and it is developed not only in schools but also in out-of-school activities such as libraries and museums. In the study by Knobel and Lankshear (2006), similar results were obtained.

In Öztürk’s (2015) study, which aimed to determine the digital citizenship status of secondary school students, it was found that the students use technology enough but do not know how to use their rights in the digital dimension. They do not know how to solve a problem they encounter on the internet and how to behave, and also it was stated that the students use the internet more for homework and research and using social media. In the study by Davies (2011), similar results were found. In the study by Ribble (2011), it was aimed to establish a guideline development process for the application of digital citizenship for leadership, teaching and learning in schools. As a result of the research, a guidebook on digital citizenship practices was prepared. In the content of the guidebook, nine themes were discussed in the context of technology leadership in schools.

The study by Malkoç (2018) aimed to investigate the effect of the use of computer and internet technologies in Social Studies course on student academic achievement and permanence, and it was found that the use of computer and internet technologies in Social Studies course has a positive effect on student academic achievement and permanence. In the study by Yeşiltaş and Kaymakçı (2014) which was titled as “Technology Dimension of Social Studies Curriculum”, it was aimed to reveal the place of

technology in Social Studies curriculum. It was concluded that each stage of SSC provides the opportunity to use “general purposes, content, learning-teaching processes, measurement-evaluation tools and methods” in an effective way in terms of technology. In the study by Sisco (2008), it was concluded that there is a significant relationship between the use of computer technology in social studies courses at schools and academic achievement and technology literacy. In the study by Heafner (2004), it was argued that the use of technology in Social Studies course would increase the motivation for the course by positively influencing the students' self-efficacy and self-values. It was also mentioned that the use of effective technology-oriented educational materials in Social Studies course will make social studies subjects more enjoyable and comprehensible. In addition, it was stated that the use of technology in Social Studies course will have a positive effect on gaining the knowledge and skills necessary for raising active citizens, which is the aim of the course.

In the renewed Social Studies Curriculum, the competencies that students will need at both national and international levels have been determined. In order for students to transform competences into skills and behaviors that can be used throughout their lives, eight key competences were determined; communication in the first language, communication in foreign languages, mathematical competence and basic competences in science/technology, digital competence, learning to learn, social and civic competences, initiative and entrepreneurship, cultural awareness and expression (MoNE, 2019). In the learning outcomes included in the 2024 Social Studies curriculum; students undertake tasks to prepare products enriched with aesthetic elements (short films, public service announcements, posters, cartoons, stories, poems, songs, dialogues, user manuals) for the conscious use of technological products. It is recommended that students have basic knowledge of the effects of technological and scientific developments on human life, security rules to be followed when using digital media, what conscious use is, and fundamental rights and freedoms. Students need to increase their knowledge of the effects of technological and scientific developments on human life, security rules to be followed when using digital media, conscious use, and fundamental rights and freedoms. It is at the forefront for students to know which technological tools they have and how often and for what purpose they use them in their daily lives. Students are allowed to cope with the problems they encounter during the use of technological products and to examine news or situations regarding the conscious use of technology. It is emphasized that the information learned throughout the course will help them use technology more consciously both in the classroom and outside the classroom and make daily life easier (MoNE, 2024).

This study emphasizes the concept of “basic competences in science/technology”, which is among the key competences, One of the newest emerging concepts regarding technological skills is the concept of basic competences in science/technology (Ilomäki, Kantosalo, & Lakkala, 2016). In this respect, the study is important in terms of revealing the basic competencies of students in the field of science and technology in Social Studies course. In particular, the scientific part of the basic competency field in science and technology has been examined to a lesser extent in the literature. In addition, it is thought that the study will be important in terms of guiding researchers who try to address the subject from a different perspective. In the context of the new formation of the 2024 Social Studies course curriculum, it is thought that the research will guide the science and technology dimension of the program. This research is also important in terms of mentioning the scientific part. It is thought that the results of these studies will contribute to the development of social studies teaching, teacher education and curriculum since there are few studies in these areas. The main purpose of the research is to reveal the basic competences of students in science and technology regarding Social Studies course and to determine the views of teachers and students about this process. In this purpose, answers to the following questions were searched in the study.

1. What are the students' basic competences in science and technology in the Social Studies course?
2. What are the views of the Social Studies teacher and students in the context of basic competence in science and technology in Social Studies course?

2. METHOD

This part of the research is presented under the titles of research design, study environment, role of research practitioner, validity and reliability study, data collection, analysis and interpretation of data, and credibility.

2.1. The Research Design

The research was designed in the action research design, which is one of the qualitative research approaches. The research aimed to reveal the basic competencies of the students in the field of science and technology within the scope of the Social Studies course based on a process and to determine the opinions of the teachers and students regarding this process. Since a process-based study was adopted (Mertler, 2017), the action research was selected as the research design. In this context, the basic competencies of the Social Studies course in the field of science and technology were determined in the research and student applications were developed. Thus, it was aimed to determine the basic competency levels in the field of science and technology in the Social Studies course and to increase the qualifications of the students in this regard (Heafner, 2004; Sisco, 2008). The action research process of the research was indicated in Figure 1 which was designed by Mertler (2017).

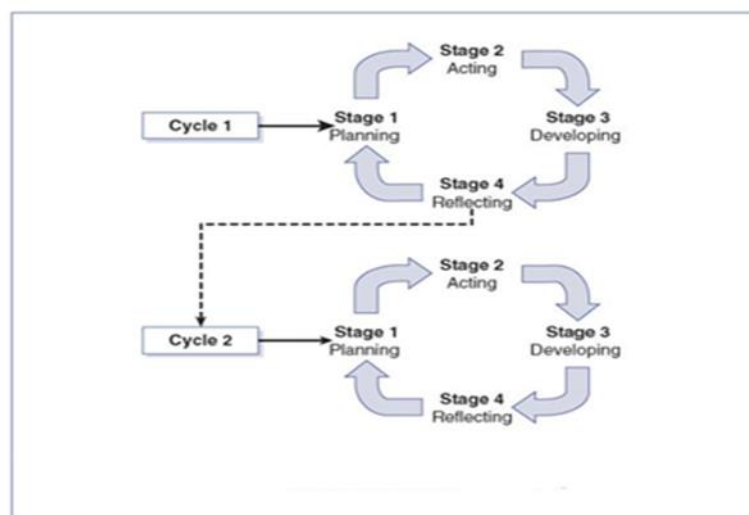


Figure 1: Action Research Process (Mertler, 2017)

2.1.1. Planning Step

This part of the action research took place in four steps (Mertler, 2017). First of all, the literature was investigated and a certain roadmap was outlined in the context of determining and limiting the

subject. It was determined that research in the literature regarding the subject of basic competence in science and technology in Social Studies course is limited. Thus, the research topic was determined as developing basic competence practices in science and technology in the Social Studies course, and realizing these practices.

The second stage of planning was realized by collecting information. Interviews were held with Social Studies teachers and the determined focus group students. Piloting applications were conducted regarding the subject of basic competence in science and technology. In addition, information was obtained from academicians for validity and reliability. A public school was determined for the research. The administrators and Social Studies teachers of this school were informed about the subject. In particular, the teacher, who was giving 6th-grade Social Studies course, was given detailed information about the topic. In this interview, information was obtained about which class the application would be conducted. As a result of the interview, it was determined that the class levels were close to each other and the class with the least number of students was determined in accordance with the method of the study. It was observed by the researcher that the class in which the application was conducted was suitable for the environment and the application of the research. As a result of the observations made in the classroom, it was determined that it was a teacher-based process in which the student was in the passive position while the teacher was at the center. During the observation process, an interview was held with the social studies teacher who was asked how the lesson was taught in the context of basic competence in science and technology, and about students' knowledge regarding this subject. The social studies teacher stated that the subjects were generally lectured with simple and plain language and also stated that the students' knowledge of science and technology was above average. As a result of the observations, focus group interviews were conducted with eight students in the classroom where the application was conducted. As a result of the interviews made with the students, it was determined that social studies teachers perform a teacher-centered lesson and their knowledge about science and technology is at a moderate level. After the observations and interviews, a pilot application was conducted for 4 weeks. It was decided to develop and apply different activities in the context of gaining basic competence in science and technology in the social studies course by consulting academicians regarding the process. Thus, by establishing a relationship between content and application, activities were integrated within the context of basic competence in science and technology.

In the third stage of planning, the literature regarding the subject was investigated in depth. In the literature, no study was found directly regarding the subject of basic competence in science and technology. In the research plan development part, which is the last stage of planning, questions were formed regarding the purpose of the research and data collection tools were determined. In the research teacher observation form, semi-structured interview form, student and teacher diaries, audio and video recordings of the application process, student activity products and academician notes were used as data collection tools. Expert opinion was obtained regarding data collection tools. A working schedule was established regarding the application process. The research approval was obtained from Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee for the application of the research with the decision document dated 10.06.2022 and numbered 2022/238. In addition, after the necessary permissions for the research were obtained from the Provincial Directorate of National Education, the application started. A meeting was held by the researcher with the parents of the participants involved in the application in order to provide information regarding the subject. The parent form and informed consent forms were given to the parents and signed.

2.1.2. Action Step

This step consists of two parts. The first part of the action related to the data collection process. In the research process data was collected via teacher observation form, semi-structured interview form, student and teacher diaries, audio and video recordings of the application process, student activity products and academician notes. The second part of the action is related to the analysis of data. Research data was collected and analyzed simultaneously. The research and student diaries were investigated regularly and the data was summarized during the application process. Audio and video recordings related to the application were analyzed weekly and presented to the academicians.

2.1.3. Development Step

This step is considered as the process of developing the action plan. In this part, a new plan was made, considering the previous action plan. Based on the science and technology learning domain acquisitions of the social studies course, an action plan was developed in which the activity related to the basic competence areas in 4 different science and technology areas was used.

2.1.4. Reflecting Step

This step consists of two parts, sharing the results and reflecting the process. In the part of sharing the results, analyses of the diaries of researchers, teachers and students regarding the applications for basic competence in Social Studies course science and technology, and analyses of the academicians' notes were reported. The results of the report were presented to the academicians. In reflecting on the process part, the academicians investigated the results of the report and made recommendations. In line with these recommendations, changes were made in the next action plans. Thus, action plans continued to be developed throughout the application.

2.2. Participants

The research was conducted in the 6th grade of a state secondary school within the borders of Erzurum province. This school was selected for the application because of the small number of classrooms, easy access to the school, and the voluntary participation of the administrators in the research. In this context, the appropriate sampling method was used in the research from purposeful samples. As a result of the interviews and observations, eight focus group students from different gender groups were selected. The selection of the students was made by taking into account their academic success. During the observation process, eight focus students from different genders and different success levels were determined. The information about the focus group students participating in the research is indicated in Table 1.

Table 1: *Information of the Focus Group Participating in the Research*

Item No	Student Code Name	Gender
1	Elif	Female
2	Erva	Female
3	Mehmet	Male
4	Said	Male
5	Yusuf	Male
6	Eren	Male
7	Fatma	Female
8	Betül	Female

The social studies teacher in the application class was 39 years old and male. He graduated from the department of social studies teaching. He had been a teacher for 15 years. He has a master's degree education in the field of social studies.

2.3. The Role of the Practitioner Researcher

The researcher was involved in the action research process conducted. He was involved in the study starting from the pilot application process of the research until the end of the application. The researcher took part in the research as both a participant and an observer with the pilot application. In this process, he collected data related to the research.

2.4. Expert Role

Three academicians from the field of social studies supported the process in order to guide the research. One of the academicians is a professor and the other two are associate professors. Academicians expressed their opinions regarding the preparation and improvement of the action plans, checked the data collected during the application process, made recommendations, and expressed their opinions to evaluate the process. Academicians expressed their opinions by evaluating the audio recordings and videos obtained regarding the process.

2.5. Data Collection

The research involves all the acquisitions of the “Science, Technology and Society” learning area in the Social Studies Curriculum. The application took place in 12 lesson hours in total and the research lasted for 4 weeks. In this process, researcher observation, semi-structured interview forms, student and teacher diaries, audio and video recordings of the application process, student activity products, and academician notes were used to collect data in the research.

2.5.1. Observation of the Researcher

During the application process, the researcher placed a camera in the classroom. The data collected in this process was analyzed. The camera recordings were analyzed at the end of each application. The memory of the camera was deleted and made ready for the next application.

2.5.2. Semi-Structured Interview

Two separate interview forms were prepared by the researcher to be applied to students and teachers. The interview form was developed in two parts. The first part is before the application and the second part is after the application. The interview consists of ten questions in total, five before and five after the application. While forming the interview questions, academicians who are experts in their fields were consulted. Before and after the application, interviews were held with the social studies teacher and focus group students, who participated in the application.

2.5.3. Diaries

Diaries were kept by the students, teacher and researcher regarding the activities conducted, and the process was followed up. The data obtained from the diaries is presented in the results part.

2.5.4. Student Products

Students created stories, puzzles and activity notebooks in the application process. The opinions and recommendations of the academicians regarding the activities were taken as support to the data obtained during the application process. As a result of the application, the academicians stated that the desired goals were achieved in all of the activities.

2.6. Analysis and Interpretation of Data

The data analysis of the research was conducted in two ways as macro and micro analysis with descriptive analysis method. In the macro dimension of the analysis, data collection and analysis were conducted simultaneously. At the end of each application, data analysis was made at the macro level. The analyses made at the micro-analysis level were analyzed at the end of the application by mentioning the interviews, audio and video recordings, diaries and academician notes. The data was processed with the micro-analysis made after the application and the findings were defined and interpreted.

2.7. Credibility

In order to ensure the credibility of the research, the researcher was involved in the application throughout the process. During the application process, information was collected in depth by making continuous observations. Audio and video recordings were taken with the camera to ensure credibility and expert academicians were consulted. In addition, in-depth analysis was made regarding the views received from the participants, and views were directly quoted. Action plans for the practices carried out in the research were also improved and repeated considering the opinions of the academicians.

2.8. Action Plans

In order to apply in the research, 4 action plans were made in the context of basic competence in science and technology in Social Studies course. The process related to the action plans is given below.

2.8.1. Action Plan-1

The first action plan of the research was carried out in the context of the acquisition of “giving examples of the effect of social studies on social life based on studies and findings in social studies”. In this action plan, the lesson was taught with the “newspaper report activity”. Before coming to the lesson, Social Studies teacher asks the students to bring any news in the newspaper to the lesson. The teacher comes to the lesson by taking the article of a scientist and starts the lesson by drawing the attention of the students through this article. Then, based on the newspaper news brought by the students, the teacher related the event in the news with science and explained its effect on social life. The event lasted 3 lessons time.

2.8.2. Action Plan-2

This plan was made in the context of the acquisition of “putting forward ideas about the effects of scientific and technological developments on future life”. In this action plan, the lesson was taught with “the activity of creating a slogan”. The teacher asked the students to bring the necessary materials for the slogan-creating activity. The teacher came to the lesson by preparing a slogan about “the effects of scientific and technological developments on future life”. The teacher shared the activity with the students and talked about the reason why he put forward these ideas. Then, he had the students prepare a slogan regarding the subject and asked them to share and discuss the presentation of the slogan created by each of them in the class. Under the guidance of the teacher, the lesson was student-centered. The activity lasted 3 lessons time.

2.8.3. Action Plan-3

This plan was created in the context of the acquisition of “doing research using scientific research steps”. The teacher gave information to the students about scientific research steps during 1 lesson time. Afterwards, the teacher informed the students that they would conduct a research using the scientific research steps over Education Information Network (EBA). He gave information about sharing the subject on EBA without doing scientific research and starting the research after the subject was decided. Students share their research topic with their teacher on EBA. As the teacher decided that topics were appropriate, the students studied by using the internet and the library as resources. In this process, the teacher stated to the students that they must do research from safe sites and that they must definitely indicate the bibliography of the resources they have used regarding the subject. The students presented their work in the classroom for 2 hours. Afterwards, they put their work on the classroom board.

2.8.4. Action Plan-4

The application process was established in the context of the acquisition of “defending the necessity of obtaining copyrighted and patented products through legal means”. The teacher brings

visuals related to the subject to the class and carries out the “speaking and question-answer activity”. The students examined the images about “copyright and patent rights, piracy and hacker”. The students then interpreted these images. In the question writing part of the activity, the students wrote answers to the questions asked about the visuals.

2.8.5. The Use of Activities Developed in the Context of Basic Competence in Science and Technology in Social Studies Course

During the application process of the research, a total of 4 action plans were carried out, in which the activities developed in the context of basic competence in science and technology in the social studies course were used. 5 different activities were conducted in the 4 action plans. Information about the activities is given in Table 2.

Table 2: Information Regarding the Activities Used in the Application Process

Item No	Activity	Application Week Date
1	Newspaper Report Activity	02-06.01.2023
2	The Activity of Creating Slogan	09-13.01.2023
3	The Activity of I'm Researching	16-20.01.2023
4	Speaking Activity	20-24.02.2023
5	Question Answer Activity	20-24.02.2023

2.9. Ethical Procedures

This study was conducted based on the permission obtained from the Necmettin Erbakan University Ethics Committee dated 10.06.2022 and numbered 2022/238.

3. FINDINGS

In the research, the findings were discussed under two headlines as “The Use of Activities Developed in the Context of Basic Competence in Science and Technology in Social Studies Course” and “The Opinions of Students and Teachers Regarding the Use of Activities Developed in the Context of Basic Competence in Science and Technology in Social Studies Course”.

3.1. Application of Newspaper Report Activity in The Context of Basic Competence in Science and Technology

During the activity, students were asked to give examples to “the effect of social sciences on social life based on studies and findings in social sciences”. Students shared their answers related to the subject with their friends. Afterwards, an article called “the relationship between people and the earth” was shared by the teacher in the class, and the lesson started. Newspaper reports brought by the students to the lesson were put in certain places in the classroom and read by the students in order. What field of science these reports were about was discussed by the students and written on the board. Based on the

ideas suggested, it was discussed under the guidance of the teacher which social studies the newspaper article was about. Examples of ideas suggested by students regarding the subject are given below:

Eren: Since this newspaper article brought by our friend is about the destruction of natural disasters, I think it is related to the science of geography.

Erva: I agree with what our friend Eren said. Besides, I think that it is also related to the science of psychology, since in the following parts of the news it is mentioned that the earthquake had a negative effect on human psychology.

Fatma: The article mentions that a dam will be built to improve agriculture and irrigation. This shows that production will increase and the economy will revive. I think this news is about the science of economics.

Said: I agree with Fatma and I would like to add one more thing to what she said. The people in the region do not want the dam to be built. Therefore, it reacts to the people concerned. This is a social event. Our teacher Ferhat, said that sociology is about society. Therefore, this news has a relationship with the science of sociology.

Experts stated that the activities conducted were appropriate, especially for basic competence areas in science and technology. Experts marked all the items in the video checklist as yes.

In the data obtained from the student diaries related to the subject, students stated that “the lesson was both fun and very good”, “some activities were surprising” and “the lesson was better understood”. One of the students (Mehmet) wrote these sentences in his diary; “We learned the effect of social studies on social life in the course. We expressed our opinions based on the newspaper report brought by our friends. Our teacher wrote them on the board. Then, by discussing them, we learned which subject’s social sciences are related to and which areas of life they influence.”

In the data obtained from the lesson teacher's diary regarding the subject, the teacher stated that “the lesson was interesting and fun”, “class participation is above the class level”, and “contributes to the teaching of science and technology subjects”. In the teacher's diary, it was stated that “I asked the students to read the newspaper report they brought. Afterwards, we had a discussion with the students about the news they read. Finally, I talked about the effects of social sciences on society based on the ideas of the students. I think it is an enjoyable and participatory lesson for students.”

3.2. Application of Slogan Activity in The Context of Basic Competence in Science and Technology

During the activity, students were asked to give examples about “the effects of scientific and technological developments on future life”. Students shared their answers related to the subject with their friends. Later, general network news titled “Science and technology are changing our lives” was shared by a student in the class and the lesson was started. According to the news presented, the students added their ideas about the effect of science and technological developments in the future to the list. Worksheets were given to the students by the teacher. Afterwards, a commercial film about the slogan activity was watched. Students were asked to share the message regarding the subject with their friends. After

watching the commercial, the students were asked to prepare a slogan about the future effects of science and technology. The examples of slogans found by students related to the subject are given below:

Yusuf: We will have a future if we follow science.

Elif: Technology means the future.

Betül: Don't let technology and science turn you away from your friends.

Mehmet: Don't be attached to technology, don't forget your family.

At the end of the lesson, the students evaluated the news they brought in line with their wishes by sharing them with the class. Then, experts evaluated the course process. Experts stated that the activities were appropriate for the field of basic competence in science and technology. It was recommended that the course must be taught by considering the studies that can emphasize the basic competence in science and technology in the activities to be held in the next courses. Experts marked all the items in the video checklist as yes.

In the data obtained from the student diaries related to the subject, students stated that “the lesson is both fun and very good”, “it facilitates learning, contributes to technology and science learning”, and “the lesson finished very quickly”. One of the students’ diaries; “My sense of curiosity increased in the activity that our teacher had us do about the effect of science and technology on our lives in the future. Now I'm starting to wonder how science and technology will be in the future. I wish I could travel through time and see the effect of science and technology in the future (Erva)”.

In the data obtained from the lesson teacher's diary regarding the subject, the teacher stated that “the lesson was interesting and fun”, “class participation is above the class level”, and “contributes to the teaching of science and technology subjects”. In the teacher's diary, it was stated that “Students were not bored during the activities we held regarding the subject. We completed the process by participating in the lesson together. The slogans and news were important in attracting the attention of the students to the lesson.”.

3.3. Application of I'm Researching Activity in The Context of Basic Competence in Science and Technology

In the research process, firstly, a lesson on scientific research process and research ethics was taught by the teacher. Afterwards, students were asked to find research papers on EBA and share them on this platform. Students found their research topics and shared them on EBA. After the teacher stated to the students that the subject was appropriate for research, the students conducted their research by considering scientific research steps and scientific ethical rules. The teacher gave information that especially library and internet resources will guide students in this process. The effectiveness of the research was realized in the context of the acquisition of “doing research using scientific research steps”. In the course, students shared their research with their friends. Teachers and students evaluated the studies presented by the students in the context of scientific research and ethics. The best work in the context of scientific research and ethics was put on the classroom board.

Experts stated that the students must be more active, especially in the evaluation process regarding the activity. Experts marked all the items in the video checklist as yes.

In the data obtained from the student diaries related to the subject, students stated that they “participate in the lesson”, “they are happy in the lesson”, “learn the subject”, “students liked the lesson” and “provide scientific research and scientific ethics skills”.

One of the students (Betül) stated in her diary; “Our teacher told us to do research using scientific research steps. I researched the effect of computers on social life. In my presentation in the course, I talked about how I conducted my research in accordance with research steps and ethics. Then I presented my research to my friends. Professor Ferhat and my friends liked my research very much. This study made me enjoy social studies course even more.”

According to the data obtained from the lesson teacher's diary regarding the subject, the teacher stated that “the information learned is more memorable”, “contributes to the skills of research and research ethics”, and “student self-confidence increases”. In the teacher's diary, it was stated that; “The appointment I gave to the students to make research using scientific research steps increased the student's interest in the lesson. The lesson became more permanent in the mind. The student developed the habit of doing research by paying attention to scientific ethics. Students gained self-confidence by presenting their work in class.”

3.4. Application of Speaking and Question-Answer Activity in the Context of Basic Competence in Science and Technology

The application process was formed in the context of the acquisition of “defending the necessity of obtaining copyrighted and patented products via legal means”. The teacher brought visuals related to the subject to the classroom and performed a “speaking and question-answer activity” related to it. The students examined the images related to “copyright and patent rights, piracy and virtual piracy”. The students then interpreted these images. In the question writing part of the activity, the students wrote answers to the questions asked about the visuals.

Experts stated that there were no problems with the activity, especially during the evaluation process, in which the students actively participated during the lesson. In addition, they stated that activities must be diversified in order to gain basic competence in science and technology. Experts marked all the items in the video checklist as yes.

In the data obtained from the student diaries related to the subject, students stated that “the activities are instructive in teaching the subject”, “the news about the subject is interesting”, “the importance of the social studies course is understood” and “the value of ethics and justice is comprehended”.

One of the students (Yusuf) wrote these sentences in his diary;

“In today's lesson, we learned the necessity of obtaining copyrighted and patented products via legal means. Our teacher brought us visuals related with the subject. He had us watch the news about it on the smart board. I learned how important copyright and patent rights are. I learned justice, morality and respect for labor. I learned how to pay attention to ethical rules, especially while surfing the internet. While researching the Internet, I learned not to steal information that belonged to somebody else. Our teacher emphasized that while talking about digital ethics.”

According to the data obtained from the lesson teachers' diary regarding the subject, the teachers stated that "the lesson was both good and enjoyable", "the student's participation in the lesson is at a high level" and "the activities are effective in teaching the subject".

In the teacher's diary, it was stated that; "In today's lesson, the subject of obtaining copyrighted and patented products via legal means was discussed. I brought pictures related to the subject. They discussed these issues. I asked them to write answers in their notebooks. The students read what they wrote."

3.5. Student and Teacher Views Regarding the Activities of Basic Competence in Science and Technology in Social Studies Course

In the research, the findings regarding the contribution of the use of basic competence activities in science and technology in Social Studies course to students are presented below.

3.5.1. Students' Opinions

The students participating in the research stated that the activities "made the lesson fun", and enabled them to learn "thinking scientifically", "science ethics", "the effects of science and technology on life in the future", "the effect of science and technology on life" and "respect for labor in scientific studies".

The students' views on how the activities conducted in the context of basic competence in science and technology in Social Studies course make the course fun are presented below.

"I used to find Social Studies course boring because it was verbal. However, after doing these activities, the lesson started to be fun. Thank you all. We had fun and learned the lesson. (Elif)"

"I think the activities were very good. Making such activities in the lesson made the lesson fun. When the lesson is fun it helps us understand the subject better. The research that our friends did in the classroom using scientific research steps was very entertaining. Likewise, the newspaper report activity was a lot of fun. (Yusuf)"

"I had a lot of fun at the slogan activity. I also had a lot of fun in the activity where my friends brought news about social science to the class. I wish classes were always like this. (Said)"

The students' views on how the activities performed in the context of basic competence in science and technology in Social Studies course enable scientific thinking are presented below.

"The study I have done using scientific research steps contributed a lot to me in terms of scientific thinking. I have become more conscious about it. For example, I learned that I did not know how to cite references in the bibliography in a text. (Betül)"

"I researched the effect of the computer on future life using scientific research steps. This gave me a lot of information about how to use both computer and scientific research steps. (Mehmet)"

"The studies we have done so far have guided me both in gaining knowledge about the subject and studying like a scientist. I also learned about the current and past events of where we live. (Yusuf)"

Students' views regarding the contribution of the activities performed in the context of basic competence in science and technology in Social Studies course to learning science ethics are presented below.

“Especially the scientific studies we have done taught me scientific ethics. I learned to respect one’s work. (Erva)”

“Learning to do research made me very happy. In this process, we were told by our teacher what we must pay attention to. While choosing the research topic, I paid particular attention to ethics. Because our teacher told us that it is against scientific ethics to show someone else's work as if we did it ourselves. In this process, I realized the importance of scientific ethics. (Fatima)”

“I learned that all news we get from the internet about the researched subject cannot be true. Some people post false news on the Internet as if they are true. While doing research, I realized that since all news cannot be true, it must be proved by comparing it with different sources, and while doing this, I have to do it within the framework of ethical rules. (Eren)”

The students' views regarding the effects of science and technology on our lives in the future of the activities conducted in the context of basic competence in science and technology in the Social Studies course are presented below.

“The slogans we found about the subject were interesting. I was very curious about how science and technology will have an effect on every aspect of our lives in the future. Because I started to think to myself what would be the situation that would influence our eating and drinking even our clothing. The short film our teacher showed me about the subject both made me happy and worried about the future. It made me sad when the society is separated from each other. All these friendships will disappear. This is a painful situation. (Elif)”

“I was very impressed in the course where we witnessed the future effects of science and technology. I have gained some experience in mentioning that there will be no field that will not be influenced by science and technology in the future and that we must be prepared for this situation. As human beings, we will not isolate ourselves from this situation, and we will not allow this situation to cause us lose some of our values. (Said)”

“I think I've learned a lot about the future effects of science. We found a slogan about this subject and watched a movie. I really liked the slogan and the movie. (Fatma)”

The students' views regarding the effects of science and technology on life in the activities performed in the context of basic competence in science and technology in the Social Studies course are presented below.

“The events in the newspaper report were interesting. Before the subject of the effect of social sciences on our lives was discussed, my grandfather used to read the newspaper, and I used to read it too. However now, while reading the newspapers, I started to question what field of science the event was related to. (Elif)”

“I was interested in the newspaper report activity that we have done about the subject. It was very interesting that the newspaper article brought by one of our friends was related to both economics and sociology. In the evening, while my father was watching the news at home, I told him which science the news was related to. My father was very surprised. He said how important reading is. My father stated that there was no such education in his childhood and that we must appreciate this education process. (Mehmet)”

The students' views stating that the activities performed in the context of basic competence in science and technology in the Social Studies course teach respect for labor in scientific studies are presented below.

“You witnessed how much effort we made for our studies. Personally, if someone said to me that these studies are not mine, I would be very angry. I would overreact. As much as I react, we must also respect the work of other people and respect their efforts in order not to get reactions. Our teachers and families already tell us this but I understood this better in our activities because, no one can touch a patented work. Especially the developments in science and technology pave the way for the violation of these rights. (Yusuf)”

“We have seen an increase in crime cases on piracy lately in our activities. This situation made me very sad. Sometimes I see people selling CDs on the street while I'm out with my mom. Once I saw them running away from the police. Now I understand that they are pirating. They ignore the labor of people who work hard and make a product. Now, when I encounter such a situation, I will complain to the relevant authorities. (Betül)”

3.5.2. Teachers' Opinions

The Social Studies teacher, who participated in the research, stated that the activities performed in the lesson provided learning about “the effect of science and technology in life”, “scientific thinking”, “scientific ethics”, “the importance of copyright and patent”.

The teacher's views regarding the effect of the activities performed in the context of basic competence in science and technology in the Social Studies course on science and technology in life are presented below.

“Students understood the effect of science and technology on life in the lesson we had. What is happening in science and technology in our country and the world, and how does it influence life? Where are we in this effect? Why do developments in science and technology interest us? With such questions, students began to question the effect of science and technology on making sense of life. In this respect, the activities were very important.”

The teachers' views regarding the effect of activities performed in the context of basic competence in science and technology in Social Studies course on scientific thinking are presented below.

“The students became aware of scientific thinking in the activities we performed about the subject. They understood how important the social studies course is in terms of scientific thinking. Why is scientific thinking important? They understood its effect on our lives and the importance of making sense of this thinking with events.”

The teachers' views regarding the effect of activities performed in the context of basic competence in science and technology in Social Studies course on learning scientific ethics are presented below.

“Students learned scientific ethics in their study. They learned what resources to use while doing research. They also understood that it was important to indicate the origin of the sources they benefit from, both in the text and the detailed bibliography. They realize that it is not both legally and ethically correct to pretend that someone else's work is their own. They realized that it is easy to reach information via developing technology and that unlimited information can be reached easily. However, they realized that not all the information they reach is correct, and had to be confirmed by comparing information with

different sources. They realized that not every internet site was safe and that there were different ways of detecting that.”

The teachers’ views regarding the effect of activities performed in the context of basic competence in science and technology in Social Studies course on learning the importance of copyright and patent are presented below.

“Students realize that it is very important to protect people's ideas and products in our speaking about news and question-writing activity. They understood that they had copyright and patent rights so that other people's works could not be taken and used as their own. They learned that all kinds of ideas and products belong to the person who created them and thus they have patents and copyrights. They also learned that these people can legally use their ideas and products and make a profit by delivering them to people. They realize that piracy, which is the opposite of this, is not legally appropriate and they need to be more sensitive in this regard.”

3.6. Recommendations for Activities carried out in the Context of Basic Competence in Science and Technology in Social Studies Course

The teachers and students who participated in the research made recommendations regarding the activities performed in the context of basic competence in Social Studies course science and technology. Examples of these recommendations are given below.

3.6.1. Students' Opinions

The students participating in the research made recommendations for the activities carried out in the lesson such as “studying in groups in scientific research”, “bringing scientists to the class”, and “making the lesson outside the school”.

“We conducted scientific research studies individually. I think it would be better if these studies were done in groups. Because the research process is difficult and long. If we had worked as a group, we would have made it easier to work by sharing the work with our friends. (Erva)”

“It would be good if one of the pioneers in technology and science came to the lesson while we were doing the activities of the science and technology unit. I would love to meet and talk to a scientist. It is something I wonder. (Yusuf)”

“The activities were very good but I think something is missing. I think it would be good both for the lesson and for us to plan at least one of our lesson activities as an out-of-school activity. (Said)”

3.6.2. Teachers' Opinions

The Social Studies teacher participating in the research focused on the activities carried out in the course such as “involving the student in the curriculum in the context of basic competence in science and technology”, “developing the infrastructure of the schools” and “increasing the number of seminars of the ministry regarding the basic competence in science and technology for contribution to the development of the teacher”.

“I think that the content of the social studies curriculum regarding the subject and the activities in which the students are centered and the course is taught are limited. I think that there must be a revision of the basic competence in science and technology in both time and course curriculum.”

“Considering the fact that there are nearly 60 thousand public schools in our country, how many of them are suitable in terms of basic competence in science and technology? I think very few. We see them in our school. The Ministry must take urgent steps in this regard and improve the infrastructure of schools in accordance with science and technology because, now science and technology is becoming a popular topic in every field of education.”

“The recommendations for my colleagues and groups are actually very important. Because we, teachers, are at the center of education. First of all, teachers need to be developed. Especially in science and technology, this situation needs to be solved urgently for both the school and the ministry. As far as I have observed, I see that some teachers who have the same branch are not aware of technological and scientific developments and cannot keep up with this change. For this, I think that the ministry must urgently organize compulsory in-service training seminars that will ensure the development of teachers in science and technology.”

4. DISCUSSION and CONCLUSION

The research aims to determine the opinions of students and teachers about the activities carried out in the context of basic competence in science and technology in Social Studies course.

In the research, it was concluded that the activities carried out in the context of science and technology basic competence in the social studies course (newspaper report activity, slogan, creation, doing research, speaking, question and answer and diary) "made the lesson fun". Similar results are also found in the literature. In educational environments, students' learning by researching influences the development of their basic competencies in science and technology. Students increase their interest in science by searching for information independently within the framework of the scientific process, and this makes the lesson fun (Jobirovich, 2022). Students who learn scientific knowledge, concepts and steps enjoy the lesson and research by searching the subject like a scientist (Love, Cysyk, Attaluri, Tunks, Harter, Sipos, 2023).

In the research, it was concluded that the activities carried out in the context of basic competence in science and technology in the social studies course “facilitate learning, contribute to learning technology and science” and “the lesson ends very quickly”. In the literature, there are studies that indicate similar results with the study. In this direction, each lesson taught with the support of science and technology provides an environment in which students are aware of science and technology, in which the student participates in the process, and the success of the lesson increases. In the study of Daşdemir (2019), it was concluded that the student's interest in technology and science increased during the teaching of science and technological processes. In studies conducted in the context of different courses, the use of technology-focused materials in schools affects students' interest and success in the course (Burak, 2022; Dikmen & Bahadır, 2021; Dikmen & Tuncer, 2018; González-Peña, Morán-Soto, Rodríguez-Masegosa & Rodríguez-Lara, 2021; Göksu and Bolat, 2020; Gür and Bulut-Özek, 2021; Kablan, Topan and Erkan, 2013; Lutf, Aftinia, and Permani, 2023; Morrison, 2006; Scipanov and Nistor, 2020; Sönmez, 2019; Toraman, Çelik and Çakmak, 2018).

In the research, it was concluded that students “gained scientific research and scientific ethics skills” by conducting scientific studies by taking into account the scientific research steps and by doing related activities in the activities carried out within the scope of science and technology basic competence in Social Studies course. In this context, the research makes a great contribution to the literature in terms of gaining scientific research and scientific ethics skills by using scientific research processes of students. In the study by Dilci (2009), it was concluded that the students did research without scanning the literature and that no bibliography was included in the study. In the study by Scipanov and Nistor (2020), it is stated that literature, bibliography and originality are the phenomena that are intertwined in a study. This can be done within the framework of scientific ethics. Since the students in the study evaluate scientific ethics within the scope of morality (Ecevit, 2006; Goldfarb & Pritchard, 2000; McLaughlin, 1970), it can be seen as a perception of value. In the study by Uçar (2012) emphasizing the importance of scientific ethics, it is mentioned that ethics must be given to children at an early age.

In the research, it was concluded that the activities carried out in the context of basic competence in science and technology in the social studies course teach “the effects of science and technology on our lives now and in the future” and “respect for labor in scientific studies”. There is research in the literature in this context. Çelikcan (2010) stated that the science and technology unit of the social studies course is presented as intertwined with humans and society. In the questions asked to the students in a lesson in which scientific ethics is taught, the students mentioned the concepts of “objectivity, respect for labor and attribution” (Asempapa & Love, 2021; Love & Hughes, 2022; Scipanov & Nistor, 2020; Stern, 1997; Uğurlu & Sert, 2020). Thus, students can continue to make sense of the ethics concept by learning and being more careful in scientific studies. By having students do scientific process studies, more students’ experience in ethical issues can be increased. Students who are aware of the effects of science and technology on life engage in learning more actively, being intertwined with life. Students who know that science and technology have a serious impact on life now and in the future pay more attention to the lesson and ask their teachers every question with a sense of curiosity during the lesson. Studies have been conducted on students who use science and technology effectively to be more active in the lesson (Liesatyadharna et al., 2023; León & Liew, 2015; Kurtoğlu & Baydere, 2021; Naumoska, Dimeski, & Stojanovska, 2023; Tunkham, Donpuksa, & Dornbundit, 2016). In addition, presenting scientific topics with real-life effects affects students' presentation of their experiences better and their active participation in the process. Similar results have been reached in studies conducted on the subject (Higde, 2022; Sulaeman et al., 2021).

As a result of the research, considering certain deficiencies some recommendations were made “working as a group in scientific research”, “bringing scientists to classroom”, “making the lesson outside the school”, “involving different activities by putting the student in the center of the curriculum in the context of basic competence in science and technology”, “developing the infrastructure of schools in this regard” and “the ministry contributing to the development of the teacher by increasing the seminars specific to the field of basic competence in science and technology”. As a result of the research, it is possible to find studies regarding the missing areas related to the subject in the literature. In the study by Yeşiltaş and Kaymakçı (2014), it was concluded that considering the place of technology in the Social Studies curriculum, there are not many words that emphasize technology. In the study by Pala (2020), it was concluded that the social studies curriculum uses today's science and technology intensively, and the main competence area in science and technology is mostly in the learning area of “Science, Technology and Society”. Taş and Kiroğlu (2018) state that SSC basic competence in science and technology is seen especially in the acquisitions of science and technology. In the study by Akkoyunlu

and Soylu (2010), it was concluded, contrary to these studies, the basic competence in science and technology in the textbooks was distributed in a balanced way in terms of both class and unit.

As a result, it is important to raise students by developing programs that keep up with changing conditions, as well as raising students with certain knowledge and skills. The content of the training programs changes due to the changing conditions. Educational environments must not only plan pedagogical activities but also help students' learning activities. Students must develop their critical and creative thinking skills. The content of the education programs developed in the context of basic competence in science and technology will be important to teach the student to search and find information independently, and to apply theoretical knowledge in practice. Such educational content will increase the student's interest and knowledge in science and technology (Jobirovich, 2022).

According to the results of the research, several implications regarding the activities used in the context of basic competence in Social Studies course science and technology are presented below.

- Videos can be developed by experts in the context of basic competence in Social Studies course science and technology. These videos can be shared in digital environments within the scope of a joint project of the Council of Higher Education (CHE) and the Ministry of National Education and offered to the teachers for their applications in the lesson.

- In Social Studies course, online newspapers and magazines can be purchased for the classes to be informed about science and technology by allocating a certain monthly budget under the guidance of the teacher.

- In Social Studies course, teachers can include activities that will center the student to gain knowledge and skills in terms of basic competence in science and technology.

- Considering the deficient parts of this study research can be conducted in terms of basic competence in science and technology in Social Studies course.

- Research can be conducted on the values that will be acquired by students in the context of basic competence in science and technology in Social Studies course.

- Research can be conducted to address different aspects of the basic competence area of science and technology in Social Studies course.

Conflict of interest statement

The author declared that there is no competing interests.

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