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Contents / İçindekiler

Research Articles / Araştırma Makaleleri

Preservice Science Teachers' Views about Scientific Inquiry: The Case of Turkey and Taiwan 161-192
Fen Öğretmen Adaylarının Bilimsel Araştırmaya Yönelik Görüşleri: Türkiye ve Tayvan Örneği
Hatice Baykara Zeha Yakar

Independent Living Needs of Young Adults with Intellectual Disabilities 193-217
Zihin Yetersizliği Olan Genç Yetişkinlerin Bağımsız Yaşam Gereksinimleri
Gizem Yıldız Atilla Cavkaytar

Investigating the Factors Affecting Students' Satisfaction in a Programming Course Designed in 3D Virtual Worlds 218-246
3B Sanal Dünyalarda Tasarlanan Bir Programlama Dersinde Öğrencilerin Memnuniyetine Etki Eden Faktörlerin İncelenmesi
Ali Battal S. Tuğba Tokel

Views on Interactive E-Book Use in Science Education of Teachers and Students Who Perform E-book Applications 247-279
Uygulamaları Gerçekleştiren Öğretmen ve Öğrencilerin Fen Eğitiminde Etkileşimli E-Kitap Kullanımına İlişkin Görüşleri
Ümmühan Ormancı Salih Çepni

Using Draw-Write-Tell Explore Middle School Students' Conceptions of the Social Studies Course 280-305
Ortaokul Öğrencilerinin Sosyal Bilgiler Algılarının Çiz-Yaz-Anlat Tekniğiyle İncelenmesi
Servet Üztemür Erkan Dinç Hüsamettin Ekinci

Friendship Relationships between Turkish-French Children and Their French Peers 306-343
Türk-Fransız Çocuklar ve Fransız Akranları Arasındaki Arkadaşlık İlişkileri
Yasemin Güleç

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Research Article

Preservice Science Teachers' Views about Scientific Inquiry: The Case of Turkey and Taiwan[1,2]

Hatice Baykara[3], Zeha Yakar[4]

Abstract

In recent years, the importance of examining the opinions of preservice science teachers who will educate future science literate individuals towards scientific research has been frequently mentioned. In this research, in order to contribute to the field, 88 preservice science teachers in Turkey and 80 preservice science teachers in Taiwan participated in the study. The data was collected via Views about Scientific Inquiry - VASI Questionnaires. Also, semi-structured interviews with volunteered preservice science teachers. Results showed that there is a significant difference on behalf of preservice science teachers in Taiwan in terms of "the way that the scientific inquiries are done", "the place of experiment and observation in scientific inquiries" as for the first dimension, and "there is no single set or sequence of steps followed in all inquiries" as for the second dimension. Besides, the preservice science teachers from both countries stated their views in "scientific" level on the dimension of "The result of an inquiry should be in accordance with the collected data". Moreover, it was revealed that preservice science teachers in Turkey have difficulty in defining that scientific research always starts with a question; and preservice science teachers in Taiwan have difficulty in defining the scientific data and scientific evidence. Considering all the findings, preservice science teachers' views of scientific inquiry in Taiwan are better than them in Turkey.

Keywords: *Scientific literacy, views about scientific inquiry, pre-service science teachers, science teacher education program*

[1] This article is derived from Hatice Baykara's Doctoral Dissertation entitled "Preservice teachers' views of scientific inquiry and world views: Turkey and Taiwan case",conducted under the supervision of Zeha Yakar.
[2] The ethical committee permission is not required in this study since the data were gathered before 2020 and within the scope of a master's/doctoral thesis.
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Fen Öğretmen Adaylarının Bilimsel Araştırmaya Yönelik Görüşleri: Türkiye ve Tayvan Örneği

Öz

Son yıllarda, geleceğin bilim okuryazarı bireylerini yetiştirecek olan öğretmen adaylarının bilimsel araştırmaya yönelik sahip oldukları görüşlerin incelenmesinin öneminden sıklıkla bahsedilmektedir. Bu doğrultuda alana katkı sağlamak amacıyla bu araştırmada, Türkiye ve Tayvan'daki fen öğretmen adaylarının bilimsel araştırmaya yönelik görüşleri incelenmiştir. Bu amaçla Türkiye'den 88 öğretmen adayı ve Tayvan'dan 80 öğretmen adayından bilimsel araştırmaya yönelik veriler toplanmıştır. Fen öğretmen adaylarının bilimsel araştırmaya yönelik görüşlerinin araştırılması için Lederman ve Lederman, Lederman, Bartos, Bartel, Meyer ve Schwartz (2014) tarafından geliştirilen Views About Scientific Inquiry Qustionnaire- VASI kullanılmıştır. Tarama modelinde olan bu araştırmada nitel ve nicel veri analizi yapılmıştır. Ayrıca ölçekte yer alan açık uçlu sorular sorularak, seçilen öğretmen adaylarıyla görüşmeler gerçekleştirilmiştir. Çalışmadan elde edilen bulgular doğrultusunda fen öğretmen adaylarının, bilimsel araştırmaların yapılışına ve deney-gözlemin bilimsel araştırmalardaki yerine ilişkin olan bilimsel araştırmanın birinci boyutuna ve bilimsel araştırmaların belli bir yöntemi ve basamağının olmadığına ilişkin olan ikinci boyutuna yönelik verdikleri cevaplarda ülke değişkenine göre Tayvan'daki fen öğretmen adayları lehine anlamlı bir farklılığın olduğu ortaya konmuştur. Ayrıca her iki ülkedeki fen öğretmen adaylarının bilimsel araştırmaya yönelik görüşlerinin "Çalışmanın sonucu, toplanan verilerle tutarlı olmalıdır" boyutunda "bilimsel" görüş düzeyinde toplandığı görülmüştür. Bunun yanında Türkiye'deki öğretmen adaylarının "Bilimsel araştırmalar her zaman bir problemle başlar" boyutunda; Tayvan'daki öğretmen adaylarının ise "veriler, kanıtlarla aynı değildir" boyutlarında çoğunlukla "yetersiz" görüş düzeyinde görüşe sahip oldukları belirlenmiştir. Sonuç olarak bilimsel araştırma düzeyleri göz önünde bulundurulduğunda Tayvan'daki öğretmen adaylarının Türkiye'deki öğretmen adaylarına göre daha iyi oldukları söylenebilir.

Anahtar Kelimeler: *Bilimsel okuryazarlık, bilimsel araştırmaya yönelik görüş, fen öğretmen adayları, fen öğretmen yetiştirme programı*

Introduction

The most important effects of the education system on society are that science affects a society positively, scientific thinking is spread among the masses of the public and science becomes a part of common thinking. Giving scientific quality to the cultural structure should be among the primary objectives of education at all levels, starting from primary school level. Students trained by the education system prepared for this purpose will be scientific literate individuals who can combine science with art and moral values, use scientific research skills, and find effective solutions to the problems they face today and in the future (MEB, 2005, 2018; Lederman ve Lederman, 2012). Scientific literacy in American National Science Education Standards (NSTA, 2003) is defined as knowing and applying scientific concepts and processes for making personal decisions, participating in social and cultural events and economic productivity (NRC, 1996). Briefly, scientific literacy requires being familiar with scientific issues, understanding scientific initiative, relationships between science and society (AAAS, 1993). For this reason, it is of great importance to teach students the nature of science and the nature of scientific inquiry, which are the most basic components of science literacy (Solomon, 1991; Reif & Larkin, 1991; Driver, Leach, Millar & Scott, 1996). Scientific inquiry is an important factor for students to think like scientists, develop positive opinions about science, and develop critical thinking skills in structuring knowledge and increase students' academic success (Anderson, 2002; Schneider, Krajcik, Marx & Soloway, 2002).

Today, the information that societies produce and share increases with such a speed that the effect of information on the progress of societies is also revealed. In the information age we are in, one of the most important needs is not to reach information, but to be aware of where and how to get the right information. In order to create this awareness and increase the number of scientific literate people of the society, it is very important that the education system of that society aims to provide its students with the skills to reach information rather than transferring the existing information. However, no matter how well the goals are determined in education and training, no matter how functional the course subjects are, it is not possible to get the expected result unless there are teachers with those goals and insights. For this reason, the most important element of an education system is the teacher. Teachers responsible for educating and directing students for educational purposes are expected to develop their understanding of

scientific issues, develop their skills for the nature and use of scientific processes, and guide their students in practicing in their life what they have learned in science classes (Kilpatrick, Swafford & Findell, 2001; Hill, Rowan, & Ball, 2005). However, current research has also shown that science teachers reflect their understanding of science, their views on science and their attitudes towards science into classroom practices (Akerson, Abd-El-Khalick & Lederman, 2000; Morrison, Raab & Ingram, 2009). American National Science Education Standards [NSES] (NRC, 1996) have established standards for the characteristics that teachers should have and listed these standards as follows: "All science teachers will understand the nature of scientific research, state the importance and importance of scientific research in science, have enough scientific knowledge to use it. " (p.59). However, it is also stated in the studies conducted that the opinions of teachers and students about scientific research are not sufficient (Abd-El-Khalick, Lederman, 2000; Lederman, 2009; Lederman, Lederman, Bartos, Bartles, Meyer, and Schwartz, 2013; Schwartz, Lederman and Lederman, 2008). In the light of these studies, the most important research to be done to improve the education system is to examine teacher training programs. In other words, the education of teachers who will work in the education system in teacher training programs is important in terms of the quality of education. Accordingly, teacher training programs should be shaped according to the changing conditions of today, the competencies of teacher training programs should be reviewed, and the policies followed for the current situation and the desired targets should be constantly evaluated through field research. Therefore, it is of utmost importance to determine the pre-service teachers' understanding of scientific inquiry in order to train teachers who can make scientific inquiry applications and offer their students opportunities in this direction (Ma, 2011; Wang, Lv, Jou, and Zhang, 2016).

Individuals who are aware of the interaction between science and society and can conduct a scientific research, in order to raise science literate individuals, many countries organize their education programs for this purpose and take part in international educational performance comparison practices to evaluate their results. Among these applications, "Trends in International Mathematics and Science Study (TIMSS)" and "Program for International Student Assessment (PISA)" are the most commonly used. These international comparison exams play an important role in assessing changes in the education system and identifying deficiencies. In other words, in the light of the data obtained from such studies, issues such as strengths and weaknesses of the current education system, education policies, curriculum, teaching methods

and techniques, and competencies of teachers are reviewed (Keser, 2005; Brown & Brown, 2007).

One of the most important elements of the education system is teachers and teachers are shaped by the current education system (Kilpatrick, Swafford & Findell, 2001; Hill, Rowan & Ball, 2005). Therefore, studying teacher training should be one of the first steps to be taken to improve the education system in general. At the ranking of PISA and TIMSS exams, while Taiwan occupies on top position; unfortunately, Turkey is situated below the average. The literature review shows that they have a similar system of science education in Taiwan and Turkey. However, it is also seen that they have different science teacher training and selection policies (MEB, 2016).

Constructivism is the basis of science teacher training programs in both countries, and programs are based on practice-based education. The programs included the nature of science courses in order to develop pre-service teachers' understanding of science, elements of science and scientific inquiry. In addition, preservice teachers in both countries take scientific research and laboratory courses and perform various applications. Educational sciences courses in both countries' science teacher training programs are similar (MOE-Taiwan, 2001& HEI, 2007). However, there are also some differences between the two countries in terms of understanding of raising science teachers. The first of these, science teacher training programs are four-year programs in Turkey. Preservice science teachers must complete these programs. Those who succeed at the end of the process can graduate. Prospective teachers who graduate take the central exam and those who enter a certain percentage are appointed as teachers. This situation differs in science teacher training institutions in Taiwan. In order to become a science teacher in Taiwan, preservice science teachers must complete the teacher education certificate programs of the college or universities. Individuals who have graduated from different undergraduate programs or are still studying can also continue these programs. Preservice science teachers who graduated from this certificate program, enters a central exam similar to that of Turkey. Then they have to pass the local exam of the region they want to work as a teacher. Although Turkey and Taiwan have different science teacher training policies, the science teaching programs of these two countries aim to raise individuals who understand the nature of scientific inquiry, which is one of the most fundamental components of scientific literacy. Scientific research, which has been researched for a long time in science education, includes scientific process skills used in the structuring of scientific knowledge, and field knowledge, creativity

and critical thinking skills (Lederman, 2009; Lederman, Lederman, Lederman & Antink, 2013). While many resources available in this field (AAAS, 1993; NRC, 2011) focus on the importance of these skills to conduct research; in the American National Science Education Standards (National Science Education Standarts- NSES), the difference between the skills required to conduct research and the basic understanding of the character of scientific research has been highlighted. For this reason, today, the focus of science education has been the applications that will bring the skills and understanding towards doing scientific research.

The nature of scientific inquiry includes processes involving the work of scientists, the processes of creating and accepting scientific knowledge (Schwartz, Lederman & Lederman, 2008; Lederman, Lederman, Bartos, Bartles, Meyer & Schwartz, 2014). Eight different dimensions have been defined for understanding of scientific research, which is beyond the basic research skills (NRC, 2000, 2011). These dimensions and their explanations are as follows (Lederman et al., 2014);

1. Scientific investigations all begin with a question, but do not necessarily test a hypothesis: In scientific research questions may arise in various ways, sometimes from curiosity and sometimes from a theory-oriented prediction. Scientific inquiry begins with questions, but does not necessarily test a hypothesis.

2. There is no single set and sequence of steps followed in all investigations (i.e., there is no single scientific method): It has also been emphasized in the standards that students should gain awareness that scientists do not follow a single scientific method to conduct their research and produce valid knowledge (NRC, 2011).

3. Inquiry procedures are guided by the question asked: Scientific research mainly consists of the questions asked by the scientist, what they already know about the world and their answers. For this reason, scientists can follow different methods and processes for the same questions. Students need to understand that the research questions determine the approaches to be followed.

4. *All scientists performing the same procedures may not get the same results:* Students should realize that scientific data alone does not mean anything, scientists interpret scientific data and conclude (Osborne, Collins, Ratcliffe, Miller & Duschl, 2003).

5. Inquiry procedures can influence the results: Determining and organizing variables, data collection methods, measuring and analyzing variables affect the results obtained by the researcher. Students need to understand that there is a logical connection between the research method, the data collection method and the conclusion reached.

6. Research conclusions must be consistent with the data collected: Each research result will be supported by evidence from the data collected. Students understand that the strongness of scientists' claims depends on supporting these claims with evidence.

7. Scientific data are not the same as scientific evidence: In scientific research, data are observations collected by the scientist during the research and these observations can take various forms (eg numbers, descriptions, photographs, sound, physical examples, etc.). Evidence is the product of the data analysis process and subsequent comments. In order for students to interpret the data, they must first understand the difference between data and evidence.

8. Explanations are developed from a combination of collected data and what is already known: To statements made by scientists; the data they collect for their research, the results they obtain from these data and the information that has been revealed in previous research and accepted as scientific information are guided. In addition, students should understand that scientists have to define the difference of well-supported results from accepted scientific knowledge or must define the superiority of well-explained phenomena over previous theories (NRC, 2011).

Teachers shaped by the current education system are among the most important factors affecting student success. Therefore, examining teacher training should be one of the first steps to be taken to improve the education system in general. Thus, it is believed that investigation of preservice science teachers' views on scientific inquiry, who have continued science teacher education program in Turkey and Taiwan, and making the comparison between the two countries' views on scientific inquiry will bring a different perspective to teacher training programs in our country. For this purpose, in this study, both in Turkey submissions on the scientific research of science teachers in Taiwan were investigated.

Method

The study is a descriptive study in order to determine the pre-service science teachers' opinions about scientific inquiry and survey method, which is one of the descriptive research methods, was used. Survey are research approaches aiming to describe a situation that exists in the past or still as it exists (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2014). The simple descriptive survey approach is one-shot survey for the purpose of describing the characteristics of a sample at one point in time apart (Mertens, 1998).

In this study, 88 preservice science teachers, who continued to the senior class of Science Education department of one university in Turkey; and, 80 preservice science teachers, who continued to the senior class of the National Taiwan Normal University in Taiwan, was participated. In addition, after the application scale, semi-structured interviews were conducted with 10 preservice science teachers from Turkey, and 8 preservice science teachers from Taiwan and the questions in the instrument were asked in the interviews.

Instrument

In this research, "Views on Scientific Inquiry Questionnaire" consisting of seven open-ended questions, which is a qualitative measurement tool, was used to determine the views of preservice science teachers about scientific inquiry. It was developed by Lederman, Lederman, Bartos, Bartel, Meyer and Schwartz in 2014 with the aim of determining views on scientific inquiry. The translation of VASI into Turkish was made by the researcher and the translation into Chinese was made by experts in the field. In order to ensure the language validity of the instrument, it was converted back to English by academicians who are experts in language fields, and it was used in the study after the necessary corrections were made and pilot application was made. The items of VASI have been prepared to determine eight aspects for scientific research. These aspects are; (1) Scientific investigations all begin with a question, but do not necessarily test a hypothesis. (2) There is no single set and sequence of steps followed in all investigations (i.e., there is no single scientific method). (3) Inquiry procedures are guided by the question asked. (4) All scientists performing the same procedures may not get the same results. (5) Inquiry procedures can influence the results. (6) Research conclusions must be consistent with the data collected. (7) Scientific data are not the same as scientific evidence. (8) Explanations are developed from a combination of collected data and what is already known.

Data Analysis

The data obtained in the study were analyzed using content analysis, which is one of the qualitative data analysis methods. In order to examine the responses of the participants to the forms, the rubric developed by Lederman (2014) was used, the pre-service teachers' answers were evaluated, and their views on scientific inquiry were classified as informed, mixed and naive. If preservice science teachers could justify their answers regarding the questions correctly, they were categorized as an "informed" view. Preservice science teachers provided sufficient explanation, but if the reasons for their answers are not clear or incomplete, they are categorized as a "mixed" view. If preservice science teachers did not provide sufficient opinions or their explanations were wrong, their opinions were categorized as "naive" view; and, if the preservice science teachers gave irrelevant or incomprehensible answers to the question, his answers were categorized as "not clear" view. Also, using rubrics, qualitative data collected by VASI was converted into quantitative data. Statistical Package for the Social Sciences-21 (SPSS-21) program was used to analyze the quantitative data obtained. In this study, the Chi-Square Test (Crosstabs) was applied to determine the possible differences between the pre-service teachers' answers to the VASI. Because of the fact that this nonparametric statistical analysis method is used to determine whether there are significant differences for events or objects, in this study, it was used to determine the difference between the views on the scientific inquiry of preservice science teachers in Taiwan and Turkey. In addition, frequency and percentage analyzes of the data were performed and interpretations were made by looking at these distributions.

Findings

In this study, the answers given by preservice science teachers in Turkey and Taiwan who participated in the research were analyzed under the eight aspects of the scientific inquiry and classified as informed, mixed and naive. The views of Turkish and Taiwanese preservice science teachers about the scientific inquiry aspects for these categories are presented in Figure 1 and Figure 2 respectively.

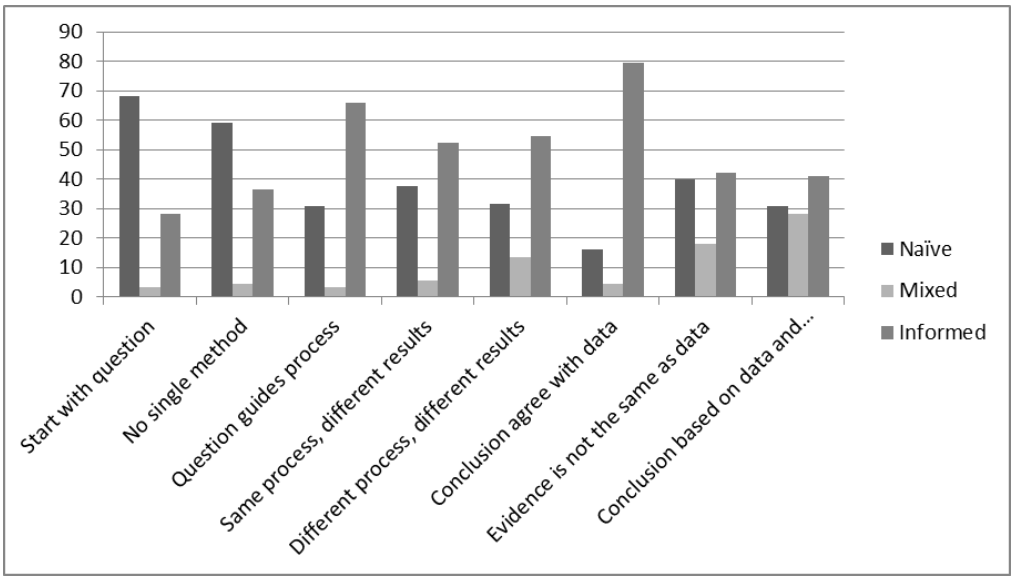

Figure 1. Views on Scientific Inquiry of Preservice Science Teachers in Turkey (n = 88)

Considering the graph in Figure 1, the preservice science teachers in Turkey have "informed" view in the four dimensions of scientific research more than naive view.

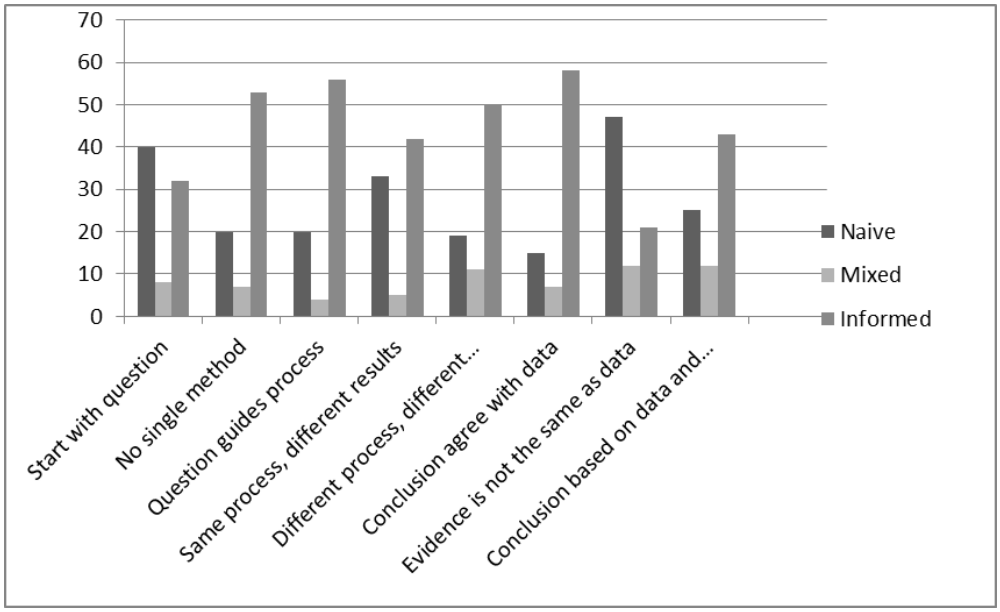

Figure 2. Views on Scientific Inquiry of Preservice Science Teachers in Taiwan (n=80)

To consider the graph in Figure 2, the preservice science teachers in Taiwan have "informed" view in the six dimensions of scientific research more than naive view.

1. Aspect: Scientific investigations all begin with a question, but do not necessarily test a hypothesis

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the first aspect of scientific inquiry are presented in Table 1.

Table 1.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the First Aspect of Scientific Inquiry

1. Aspect of Scientific Inquiry	Informed	Mixed	Naive
Scientific investigations all begin with a question, but do not necessarily test a hypothesis	It is scientific. This person may have started with the question. Why are the beaks of these birds different? It started with a question and continued with research on it, made examinations, observed, and made classification. So it is scientific. ($PST_{TURKEY}2$)	An idea that may not start with scientific questions. But to get absolutely reliable information, that person puts his curiosity and question into a scientific way and starts his research. In fact, the research begins with a scientific question, with curiosity. ($PST_{TURKEY}5$)	Scientific research sometimes begins with curiosity, not always with scientific questions. ($PST_{TURKEY}66$)
	Scientific inquiry includes observation, revealing the problem, presenting and proving the hypothesis. If the data is handled carefully and systematically when it is collected and concluded, the research that this person has done is scientific. (PST_{TAIWAN} 9)	Yes, but we need to define scientific questions, I think we can hardly define things like religion and emotion, for example. (PST_{TAIWAN} 33)	Sometimes scientific research can be from direct observation and experiments without questions. Sometimes, a theory is suddenly created only after something has been observed for a long time and then designs and proves the experiment. (PST_{TAIWAN} 16)

*PST – Preservice Science Teacher

In this aspect of the VASI, the a and b part of the first question and the second question targets understanding that scientific inquiry always starts with a problem, that problems that inspire research actually arise from observations and that this is a part of science. The results obtained for this aspect, only 28.4% of preservice science teachers in Turkey and 40% of preservice science teachers in Taiwan have "informed" view. When the answers given to the questions in this aspect are examined in detail, in the case of the part a of the first question, opinions of

whether the birdwatching research given in the question is scientific or not were taken. When the results were examined, it was determined that approximately half of the preservice science teachers in both countries did not have sufficient views about this aspect and that they could not accept the research mentioned in the first question of VASI scientifically, because they stated that only observation was made. In addition, 46.6% of teachers in Turkey, while 37.5% of teachers in Taiwan stated that scientific research always starts with a problem, and it is determined that they have "informed" view on this subject.

Also, when the answers to the questions of the first aspects are examined in detail; When the answers given by the Turkish preservice science teachers to the part a of the first question (1a) of the first aspect "Would you scientifically accept the examination of this person?", it was determined that only 19.3% of their answers were at the level of "informed" view. In addition, 32.5% of Taiwanese preservice science teachers were found to be at the "informed" view. It has been determined that pre-service teachers at this level are able to provide sufficient answers regarding how scientific research should be together with their reasons, and they use definitions such as "observation were made for research" and "systematic data collection were made". In another question of this dimension, the opinions of the preservice teachers on whether the examination of the bird watcher should be accepted as an experiment or not were received. The findings stated that 76.1% of preservice science teachers in Turkey and 42.5% of preservice science teachers in Taiwan was found to have a "naive" view. It was determined that these preservice science teachers could not determine the difference between experiment and observation, and they experienced a confusion about this issue. Moreover, quite a few of the teachers in Turkey, while close to half of the teachers in Taiwan has "informed" view. It was determined that these pre-service teachers could explain the reason for this research sample that it was not an experiment, and could distinguish between experiment and observation. When the findings for the other question of this aspect, for scientific research always start with a problem, in Turkey (50%) and in Taiwan (61.2%), most of the preservice science teachers have "naive" view unfortunately. It was found that these preservice science teachers often stated that scientific research could always start with curiosity or by chance, not with questions.

2. Aspect: There is no single set and sequence of steps followed in all investigations

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the second aspect of scientific inquiry are presented in Table 2.

Table 2.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Second Aspect of Scientific Inquiry

2. Aspect of Scientific Inquiry	Informed	Mixed	Naive
There is no single set and sequence of steps followed in all investigations	Scientific research can have more than one method. If we go through the same research, the observation method was used in this study. Instead, it can also use the test method by intervening. There are two different methods here, both scientific. (PST_{TURKEY} 55)	It can be done in many ways, for example, a researcher can prove the boiling point of water with one experiment, while another researcher can prove it with another experiment. (PST_{TURKEY} 5)	All scientists follow the same path. Identifying the problem, setting up hypotheses, designing the experiment, determining the variables, etc. (PST_{TURKEY} 6).
	There are different methods. For example, the first one is the experiment. Hypotheses simply follow the experimental processes and prove their hypothesis. It creates hypothesis with deductive method, tests it by experiment and supports its hypothesis. Another method is survey. By collecting many data and classifying (books, bibliography etc.), analysis is made and the literature is collected. Unlike the experiment, after editing the data, there is evidence to fit the hypothesis. The two methods are different, but the purpose of the two is to link the cause and effect in each study. Both can be considered scientific method. (PST_{TAIWAN} 10)	Yes. There are various methods for testing surface tension, for example. You try it with experiment or.. (PST_{TAIWAN}76)	It should be the only method because science can be analyzed by the logical method and it has general stages. (PST_{TAIWAN} 4)

*PST- Preservice Science Teacher

The b and c of the first question in the second dimension of the VASI scale and the preservice science teachers' views about the method and steps of scientific inquiry were tried to be determined. One of the most common beliefs about science is the idea that there is only one standard method in scientific research. When the findings regarding this dimension were examined, most of the preservice science teacher in Taiwan (66.2%) had a scientific view and

were able to justify their answers with various examples. But, unfortunately, more than half of the science teachers in Turkey (59.1%) is determined to have a "naive" view towards this aspect. These preservice science teachers emphasized that scientists should follow a single way to reach scientific information, otherwise their studies will not have a scientific quality. Based on the findings of this study, it is possible to say that the preservice science teachers in Turkey have an important misconception about this aspect.

3. Aspect: *Inquiry procedures are guided by the question asked*

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the third aspect of scientific inquiry are presented in Table 3.

Table 3.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Third Aspect of Scientific Inquiry

3. Aspect of Scientific Inquiry	Informed	Mixed	Naive
Inquiry procedures are guided by the question asked	Team A is better, because it is necessary to keep something under control. The effect of other factors on what we keep constant is being investigated. There may also be two tires or more. So team A is more accurate because it tries multiple brand tires. (PST$_{TURKEY}$ 4)	Those who try a brand in different ways have done the proper experiment, tried three tires, but I'm not sure…. I think this is more accurate because the other group is a controlled experiment that has tried different brands. (PST$_{TURKEY}$ 5)	I think it would be better to try a tire in three different ways, because we can understand why. But if we try different tires with different processes, it would not be more convincing. (PST$_{TURKEY}$ 3)
	Team A is trying different brand tires in different ways. Team B is trying only one brand on the road. Since different brand tires are asked in the question, team B cannot answer the question of which brand tires are better. But team A can answer. (PST$_{TAIWAN}$ 66)	Since the brand is asked, one time is not enough. He needs to try more than one. (PST$_{TAIWAN}$ 11)	There is only one control variable. Thus, the link between the brand of the wheel and its easy explosion can be found. (PST$_{TAIWAN}$ 10)

*PST- Preservice Science Teacher

Data for the this aspect of scientific inquiry, which is "The research process is guided by the questions", collected by the fifth question of VASI and the findings of the study stated that majority of the preservice science teachers in both countries Turkey (65.9%) and Taiwan (70%) have "informed" view. Based on this result, it can be said that science teacher candidates are

aware that the scientific research process varies depending on the research question. In the "informed" view responses to this question, expressions such as "different brands of tires should be tried in the experimental design because the possibility of explosion of different brand tires is asked" is frequently encountered.

4. **Aspect:** ***All scientists performing the same procedures may not get the same results.***

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the fourth aspect of scientific inquiry are presented in Table 4.

Table 4.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Fourth Aspect of Scientific Inquiry

4.Aspect of Scientific Inquiry	Informed	Mixed	Naive
All scientists performing the same procedures may not get the same results.	I think there will be a difference. Because we are all different, we think differently. Even if we look at the same thing, we will find different things. (PST_{TURKEY} 3)	The same question, the same way. they may have different results or they may have the same result! ..... But it is better that they achieve the same result, their scientificity increases. (PST_{TURKEY} 15)	They all come to the same conclusion. Because asking the same questions and doing the same process means doing the same scientific research. If we consider the situation of getting different results, maybe there will be error situations. I think they come to the same conclusions of all kinds. (PST_{TURKEY} 2)
	They may not reach the same conclusion. Everyone thinks differently. Even if we look at the same thing, we create different thoughts, findings, explanations. Even with the same data, different researchers can draw different conclusions. Different interests and different infrastructures also affect this. (PST_{TAIWAN} 29)	They come to different conclusions because there are many different factors in the process. Researchers' thoughts are important. But it must be repeatable for its science. That is one. (PST_{TAIWAN} 38)	Science is universal, whoever does it, they reach the same method, the same question, the same result. (PST_{TAIWAN} 34)

*PST- Preservice Science Teacher

The findings of this aspect of scientific inquiry; that the scientific data alone does not mean anything, the importance of reaching the result by the interpretation of the scientific data by the scientist; stated that more than half of the preservice science teachers in both countries, Turkey

(52.2%) and Taiwan (56.8%), has been determined to have "informed" views. Besides, 37.5% of preservice science teachers in Turkey and 41.3% of preservice science teachers in Taiwan for this aspect of scientific inquiry, as quite a high percentage, have "naive" view. Generally, in the statements of prospective teachers with insufficient opinions, it is determined that science is universal and scientists will reach the same result even if they use different methods.

5. Aspect: *Inquiry procedures can influence the results*

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the fifth aspect of scientific inquiry are presented in Table 5.

Table 5.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Fifth Aspect of Scientific Inquiry

5. Aspect of Scientific Inquiry	Informed	Mixed	Naive
Inquiry procedures can influence the results	They can come to the same conclusion, or to different conclusions. Here, the individual differences of scientists are important. For example, two different scientists who deal with a question with different methods can draw the same conclusion because of differences of thought, or they can reach different conclusions too. (PST_{TURKEY} 40)	If they ask the same questions and follow the same procedures, they will definitely come to the same conclusion. If they asks the same questions and follows different processes, they may reach the same conclusion, or may not reach the same conclusion too. There may be differences. (PST_{TURKEY} 26)	Scientists ask the same questions. Regardless of the way, the same result is obtained. (PST_{TURKEY} 61)
	... if the same data cannot reach the same result even if it is the same method, they can reach different results with more possibilities here. Because the processes followed are different. (PST_{TAIWAN} 29)	.....for example, the same substance may come out of different chemical reactions, even if it is the same chemical reaction (for reasons such as degrees, pressure), different substances can come out. We cannot know this. (PST_{TAIWAN}51)	.... minor errors in the accuracy of the processes applied and the process they follow may affect the result. (PST_{TAIWAN} 60)

*PST- Preservice Science Teacher

According to findings for this aspect that the research process can affect result, many preservice science teachers in both countries in Turkey (54.5%) and in Taiwan (62.5%) have "informed" view. Based on this result, it is possible to say that preservice science teachers who have

"informed" view are aware that scientists who ask the same questions and follow different procedures can reach the same result or different result depending on the procedures performed. But the research findings shows that 31.8% of preservice science teachers in Turkey and 23.7% of preservice science teachers in Taiwan have "naive" view for this aspect of scientific inquiry. To this result, it is possible to say that these preservice science teachers have a lack of knowledge that the results of the research may differ depending on the difference of the research process.

6. Aspect: *Research conclusions must be consistent with the data collected*

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the sixth aspect of scientific inquiry are presented in Table 6.

Table 6.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Sixth Aspect of Scientific Inquiry

6.Aspect of Scientific Inquiry	Informed	Mixed	Naive
Research conclusions must be consistent with the data collected	With growth, the light is inversely proportional. The table says this. This plant may not be a light-loving plant. (PST_{TURKEY} 30)	B is more accurate. When there is light, plants grow. There must be an inverse proportion. (PST_{TURKEY} 17)	A is true. Light and plant growth are directly proportional because plants do photosynthesis, that is, they need light. (PST_{TURKEY} 87)
	B choice is correct. I made a direct inference. The numbers in the table are inversely proportional to each other. Although there may be another factor, we only have this data at the moment. (PST_{TAIWAN} 63)	A and C cannot be. No inverse proportion. But wrong. (PST_{TAIWAN} 76)	In this experiment, no other effective factor was designed for plant growth. Therefore, it can be determined that such a result has occurred due to the reaction of the plant only against sunlight. (PST_{TAIWAN} 9)

*PST- Preservice Science Teacher

When examined the findings of this aspect that each research result should be supported by evidence from the data collected, the majority of preservice science teachers in both countries, in Turkey (79.5%) and in Taiwan(72.5%), have "informed" view. Based on this result, it can be said that most of the science teacher candidates who have scientific views towards this dimension are successful in reading data and have the knowledge that the results of the research depend on the data collected. In addition, 15.9% of preservice science teachers in Turkey and 18.7%of preservice science teachers in Taiwan were found to be missing in reading data; and it was determined that there was a lack of knowledge of these preservice science teachers that

the results of any research depend on the data collected. These preservice science teachers ignored the data given in the question and selected the "plants grow longer in much light" option based on their knowledge.

7. Aspect: *Scientific data are not the same as scientific evidence*

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the seventh aspect of scientific inquiry are presented in Table 7.

Table 7.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Seventh Aspect of Scientific Inquiry

7.Aspect of Scientific Inquiry	Informed	Mixed	Naive
Scientific data are not the same as scientific evidence	Data is the information collected, and evidence is the implications presented depending on this situation. (PST_{TURKEY} 30)	Data and evidence are not the same. Data are the values we obtain, and evidence is the result of the data. (PST_{TURKEY} 6)	Data and evidence are the same. Data is the result of an experiment, and evidence is to prove that experiment. (PST_{TURKEY} 13)
	Data is the information collected, it is meaningless by itself. If the data fits the question after collection and analysis, it is used as evidence and makes sense. (PST_{TAIWAN} 27)	It is not exactly the same. There is a difference between data and evidence. One of them just has the result. The other is evidence that can support the hypothesis after it is organized and classified. The data (numbers) do not represent evidence, but the evidence comes from the data (number). (PST_{TAIWAN} 10)	The data is also included in the evidence. The data may be correct; it may also be wrong. But the evidence has already been proven in general. (PST_{TAIWAN} 8)

*PST- Preservice Science Teacher

The findings for this aspect of scientific inquiry that the data and evidence serve different purposes in the scientific research showed that the 39.7% of preservice science teachers in Turkey examining and 26.2% of preservice science teachers in Taiwan have "informed" view. These preservice science teachers could identified the difference between data and evidence, and they stated that "The data is research-related information collected in the research. The proof is the researcher's explanation by supporting this data with various sources". On the other

hand, findings of the research showed that nearly half of the preservice science teachers in Turkey (42%) and over half of preservice science teachers in Taiwan (58.7%) had "naive" view for this aspect. Because of this result it is possible to say that these preservice science techers could not differentiate the evidence and the data.

8. *Aspect: Explanations are developed from a combination of collected data and what is already known*

In Turkey and in Taiwan, some examples of preservice science teachers' responses to the eighth aspect of scientific inquiry are presented in Table 8.

Table 8.
Examples of Preservice Science Teachers' Responses Representing their Informed, Mixed and Naive Views on the Eighth Aspect of Scientific Inquiry

8.Aspect of Scientific Inquiry	Informed	Mixed	Naive
Explanations are developed from a combination of collected data and what is already known	I think they may have set off from their anatomy. From the anatomy of present-day creatures over extinct creatures that lived in past ages. The hind limb bones are thicker. Since the center of gravity is probably on the back and for walking ... They may have thought that the second is the best possibility. Scientists use the results of previous studies when explaining scientific results. They need to base scientific knowledge on the source to explain its results. It is necessary to explain with evidence. They use this kind of information by publicizing the results of the experiment. (PST_{TURKEY} 5)	Support is needed to stand up. The hind legs in the second picture are smaller. They look at creatures and compare. They use information. (PST_{TURKEY} 22)	His hind legs should be stronger because his balance is on him. If he is weak, he cannot benefit from many things. The second reason is that we can think in terms of moving faster. It can catch its prey better. As I said, there may be a nutritional structure, movement. Where the weight is more or less. While scientists are explaining their results, they set out by examining the environment. (PST_{TURKEY} 6)
	Scientists thought that dinosaurs were moving with two legs. The second reason would be difficult to walk with small feet, so there should be big feet on	In order to be able to walk physiologically, it must be this way. They looked at the previous fossils. They ask other researchers. (PST_{TAIWAN} 9)	So hard. Need more information. For example, physiology, front legs, hind legs and muscle. (PST_{TAIWAN} 73)

	the back so that he can carry the body. Scientists may have studied and compared different types here. For example, they might have looked at the monkeys, saw the strong feet on the back and thought about it. While scientists explain their results on this issue, they ask other researchers and check their studies. (PST_{TAIWAN} 44)

*PST- Preservice Science Teacher

According to findings for this aspect of scientific inquiry that the results of the researches are created by research data and interpretation of the available information, 40.9% of preservice science teachers in Turkey and 53.7% of preservice science teachers in Taiwan have "informed" view. It shows that preservice teachers who have this view are aware that the explanations made in scientific research are formed by comparing and combining the data collected in the study with the results of previous studies. But in addition, of the 30.7% of preservice science teachers in Turkey and 31.2% of preservice science teachers in Taiwan was determined to have "naive" view. The frequency values of preservice science teachers' answers regarding the aspect of VASI are presented in Table 9.

Table 9.
Frequency Values of Preservice Science Teachers' Views on the Dimensions of Scientific Research According to Country Variable

		Informed		*Mixed*		*Naive*	
		PST inTurkey	PST in Taiwan	PST inTurkey	PST in Taiwan	PST inTurkey	PST in Taiwan
Research Question	f	25	32	3	8	60	40
Scientific Method	f	32	53	4	7	52	20
Research Process	f	61	56	3	4	24	20
Social Effect on Science	f	50	44	5	7	33	29
Process-Result Relationship in Research	f	48	50	12	11	28	19
Research Result	f	70	58	4	7	14	15
Data-Evidence Difference	f	37	21	16	12	35	47

Scientific Explanation	f	36	43	25	12	27	25

*PST- Preservice Science Teacher

The findings of the research, more than half of preservice science teachers in Turkey at the four aspects of scientific inquiry, and more than half of preservice science teachers in Taiwan at the six aspects of scientific inquiry shows that they have "informed" view. In addition, findings showed that in five aspects of scientific inquiry, preservice science teachers in Taiwan have more "informed" view than preservice science teachers in Turkey. The chi-square test was conducted to compare the views of preservice science teachers in the two countries regarding the aspect of scientific inquiry and the results are presented in Table 10.

Table 10.
Chi-Square Test Results of Preservice Science Teachers for VASI

Aspects of Scientific Inquiry	*χ2*	*p*
Research Question	6.76	0.03*
Scientific Method	19.89	0.00*
Research Process	3.26	0.19
Social Effect on Science	1.12	0.56
Process-Result Relationship in Research	1.43	0.48
Research Result	1.60	0.44
Data-Evidence Difference	4.89	0.08
Scientific Explanation	4.89	0.08

∗(χ2, p<0.05)

When Table 10 is examined, it has been shown that there is a significant difference in the answers given by preservice science teachers to the first and second dimensions of scientific inquiry, according to the country variable. These differences for both of aspects of scientific inquiry is positive in terms of preservice science teachers in Taiwan [χ2 (1) = 6.76, p = 0.03; χ2 (1) = 19.89, p = 0.00]. It was determined that there was no significant difference in the answers given by the preservice science teachers for the other six aspects of scientific inquiry, according to the country variable.

Discussion and Conclusion

This study has been planned to analyze views of preservice science teachers on scientific inquiry in Turkey and Taiwan and to make comparisons for finding out the differences. According to the conclusions of the analysis, it is found that there are some differences between the views of preservice science teachers on scientific inquiry in both countries. The conclusions of the study can be summarized as following:

One of the most significant conclusions of this study is that most preservice science teachers in Turkey and Taiwan have "inadequate" views about scientific inquiries always starting with a problem and not necessarily having to test a hypothesis. The research findings obtained from both countries indicate that most of the preservice science teachers state that scientific inquiries can start out of curiosity or by chance and do not always need to start with a problem. In addition, it is found that many of the preservice science teachers cannot distinguish scientific questions from daily ones. Therefore, as the answers of the preservice science teachers in both countries are not satisfying, science teacher education programs in both countries can be considered to have deficiencies. Similar results have also been obtained from the researches about teachers and preservice science teachers conducted by Karaman and Apaydın (2014), Şenler (2015), Bologna Soares de Andrade and Cola Levoratob (2017), Leblebicioğlu et al. (2017), Aydemir, Uğraş, Cambay and Kılıç (2017). These studies show that teachers and preservice science teachers have inadequate information about that scientific inquiries have to start with scientific questions. As the questions of scientific inquiries determine purpose of the research, data collection method, analysis and evaluation methods (Lewis, 2014; NRC, 2000), the conclusion actually indicates that preservice science teachers know scientific research only as a concept, but do not deeply comprehend the meaning.

There is not only one scientific method and science does not fully depend on experiments. McComas (2000) states that doing experiment is the most useful method in science but it is not the only one. Therefore, it will be incorrect and misleading to call physical science as "experimental science". Physical sciences contribute hugely to science by means of theoretical thinking methods and theoretical structures. The conclusion of the study indicates that although preservice science teachers in Taiwan has a better level of knowledge about probability of various methods in scientific inquiry, preservice science teachers in Turkey have a lack of knowledge on this issue. Furthermore, many preservice science teachers participated in the

study in Turkey cannot discriminate between experiment and observation. The preservice science teachers have been noticed to usually consider that science will not be possible without experiment and experiment must certainly be conducted to prove accuracy of information. It has also been determined that these preservice science teachers have a false opinion about observation is not being adequately scientific. One of the reasons of this false opinion is that experimental approach is often explained as "scientific method" in textbooks and implementation classes as stated by Schwartz, Lederman and Lederman (2008) and thus, students have adopted the concept of "experiment" as scientific method. Similar conclusions have also been emphasized in other studies. (Palmquist & Finley, 1997; Doğan, 2010; Abd-El-Khalick & BouJaude, 1997; Dickinson, Abd-El-Khalick & Lederman, 2000; Abd-el-Khalick & Akerson, 2004; Aslan, Yalçın & Taşar, 2009; Arı, 2010; Doğan, 2010; Karaman & Apaydın, 2014; Dursun, 2015; Öztürk, 2015; Bayır 2015; Ogochukwu, 2016; Yenice & Atmaca 2017; Adisendjaja, Rustaman, Redjeki & Satori 2017). Another reason is that experimental researches are given as examples of scientific inquiry and taught in lessons and experimental studies are mostly conducted while the students learn steps of a scientific inquiry. In implementation classes, preservice science teachers have opportunity to experience practically that scientific observations are conducted in a way that an observer watches natural phenomena carefully without any intervention, which leads the phenomena to be comprehended as scientifically reliable. The other conclusion of the study is that research process is conducted with questions.

The research question asked in a scientific inquiry is the most important element for defining the methods and techniques to be applied. The way of asking questions may even cause to change the research method. In this respect, teachers and students should be aware of the importance of relation between question and research. In analysis of this study, it is inferred that a great majority of preservice science teachers both in Turkey (65.9%) and Taiwan (70%) has a "scientific" view about research question is directing research process. As based on this inference, we can conclude that most of preservice science teachers in both countries are aware of the fact that scientific inquiry process can change according to the research question. As emphasized in studies of Karışan, Şenler and Bilican (2017) who have received similar findings, lessons given to preservice science teachers are effective in helping them have a scientific view of the fact that scientific inquiry is guided by questions.

As scientists work in a social, cultural, historical and political environment, science is a social activity and is influenced by values. Personal attitudes, values, opinions, thoughts, judgement,

creativity and imagination of the scientists play a quite important role in their doing science. More than half of the preservice science teachers in Turkey (56.8%) and Taiwan (55%) have "informed" view about that the scientists who follow the same method in a scientific inquiry can reach different results. As similar to the conclusions of this study, Liang, Chen, Chen and Kaya conducted a study with Turkish, Chinese and American preservice teachers in 2006 and found that although these preservice teachers are from different countries, they have the scientific view of the fact that the scientists may reach different results even if they use the same methods. On the other hand, it is indicated in analysis of results of many researches (Çelikdemir, 2006; Arı, 2010; Bayır, 2016) that teachers and preservice teachers are not knowledgeable enough about explaining social and cultural factors in formation of scientific inquiry. For instance, unlike the findings of this study, Aydemir, Uğraş, Cambay and Kılıç (2017) have observed that preservice teachers have a false notion about that scientists who research the same questions must not reach different conclusions for reliability of the research. In the research conducted by Çavuş (2010), he has also found that preservice teachers think science is objective and scientists reach scientific information in the light of data and perceptible information and without including their subjective opinion.

In scientific inquiry, data is not the only distinctive factor of the research question. Interpretation of data and reaching different results indicate creative aspect of science (Osborne, Collins, Ratcliffe, Millar and Duschl, 2003). The scientists, who ask similar questions, follow similar methods and even use the same data, can reach different but acceptable results because the scientists can comprehend the same data diversely and focus mainly on one part of the data (Schwart, Lederman & Lederman, 2008). The preservice teachers, who state that scientists work in a social community and are aware of this feature, are able to educate students who are open-minded about different ideas and can make original researches. According to conclusions of the research in this respect, more than half of preservice science teachers in Turkey (54.5%) and Taiwan (62.5%) have "informed" view. However, it is seen that more preservice science teachers have "informed" level-view in Taiwan when compared to the numbers in Turkey. The reason for the difference can be that implementation classes in the curriculum of science teacher education are more than the ones in Turkey within the context of number and duration.

The conclusion of the research based on that scientific inquiry results must be consistent with the collected data and be supported by evidences obtained by the collected data indicates that the majority of preservice science teachers in Turkey (79.5%) and Taiwan (72.5%) have

"informed" view. This conclusion of the research has similarity with the study conducted by Karışan, Bilican and Şenler (2017). It may have helped the preservice science teachers contribute to having informed level view as they have opportunity especially to compare the results of their own studies, which they have carried out during practices in laboratory classes, with the collected data and thanks to experiences they gain about science. However, 40.9% of preservice science teachers in Turkey and 53.7% of preservice science teachers in Taiwan have the informed view about the fact that the results of scientific inquiries are formed by interpretation of research data and current knowledge. In fact, the percentages in both countries are not very satisfying and it may be resulted from inefficient concentration of preservice science teachers on the process while they explain the results they obtain in laboratory practices, their inefficient questioning about cause and effect relation.

Another conclusion of the research indicates that most of preservice science teachers in Turkey (%42) and Taiwan (58.7%) cannot discriminate between data and evidence. In addition, a great majority of preservice science teachers (65%-75%) stated that data and evidence are different but it has been observed that they cannot define the concepts properly or have misconception. As based on the conclusion found in many researches ((Abd-El-Khalick; 2005; Tuncel, 2012; Karaman & Apaydın, 2014; Öztürk, 2015; Aydemir, Uğraş, Cambay & Kılıç, 2017), it is likely to underline that curriculums of science teacher education should mostly be based on case study or discussion and there should be more activities to identify the relation between data and evidence.

As all the conclusions are evaluated in general, it can be inferred that preservice science teachers in Taiwan have more informed view than those in Turkey among five of eight aspects of the scientific research. These preservice science teachers are more willing to use information, which they get in the lessons on scientific inquiry, and to take education approach they have adopted (Haefner & Zembal-Saul 2004, Kim & Chin 2011), which results from the difference between curriculums of science teacher education in Turkey and Taiwan and the classes in both program do not have the same effects.

It is obvious if teachers do not know about the concepts and views, they will not be able to convey them to their students. That preservice teachers have an adequate view on scientific inquiry plays a major role in development of professional experience in future (Gess-Newsome, 2002; Lederman, 1998, 2007). The conclusions of the research indicate that faculties of

education are incapable of having preservice teachers to adopt these views on scientific inquiry and cannot meet preservice science teachers' needs in this field. Therefore, it is a need to restructure teacher education system and to form a new theoretical frame in training of teachers for science education. Nevertheless, preservice science teachers' opinions on scientific inquiry should initially be identified for this new restructure and the foundation needs to be laid by considering these conclusions.

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Research Article

Independent Living Needs of Young Adults with Intellectual Disabilities[1][2]

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Abstract

The aim of this study was to determine the independent living needs of young adults with intellectual disability (YAID) in preparing for adulthood and work life. This study was conducted using the phenomenological design, which is one of the qualitative research methods. 10 YAIDs were observed, their skills were evaluated, and semi-structured interviews were conducted with a total of 30 individuals consisting of 10 individuals from each group, with their parents, employers, and teachers regarding the employment education course. The results of the study indicated that YAIDs had difficulties in independent living skills and adaptation to work rather than employment skills while preparing for adulthood and work life and that those difficulties were mostly due to the lack of knowledge and skills. It was revealed that the needs of YAIDs in preparing for work life were primarily personal care and hygiene, interpersonal skills and self-determination, employability skills, sexual education, and safety skills.

Keywords: *Young adults with intellectual disabilities, independent living, determination of needs.*

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2 On 10.10.2016 ethical committee approval numbered 105775 was obtained from Anadolu University Ethics Committee.

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Zihin Yetersizliği Olan Genç Yetişkinlerin Bağımsız Yaşam Gereksinimleri

Öz

Zihin yetersizliği olan bireyler örgün eğitimlerini tamamladıktan sonra gençlik ve yetişkinlik dönemlerinde okul sonrası eğitimlere katılabilmektedirler. Bu süreçte okuldan mezuniyet ve çalışma yaşamına hazırlanma gibi geçiş dönemleri bireylerin bağımsızlığa adım attığı ve desteğe gereksinim duyduğu dönemlerdir. Bu çalışmanın amacı zihin yetersizliği olan genç yetişkinlerin (ZYOGY) yetişkinliğe ve çalışma yaşamına hazırlanmalarındaki bağımsız yaşam gereksinimlerini belirlemektir. Araştırma, bu amacı gerçekleştirmek üzere nitel araştırma yöntemlerinden fenomenolojik desen ile yürütülmüştür. Çalışmaya amaçlı örneklemeyle 10 ZYOGY, 10 ebeveyn, 10 işveren ve 10 öğretmen olmak üzere toplam 40 kişi katılmıştır. İşveren, öğretmen ve ebeveynlerden oluşan 30 kişiyle yarı yapılandırılmış görüşmeler yapılmış, 10 ZYOGY ise gözlenerek beceri kontrol listesi aracılığıyla beceri ve davranışları değerlendirilmiştir. Gerçekleştirilen yarı yapılandırılmış görüşmelerden elde edilen veriler tümevarım analiziyle, kontrol listesinden elde edilen veriler betimsel analizle analiz edilmiştir. Araştırma bulguları ZYOGY'lerin yetişkinliğe ve çalışma yaşamına hazırlanmada bağımsız yaşam becerilerinde güçlük yaşadıkları bu nedenle okul sonrasında bir bağımsız yaşam eğitimine gereksinim olduğunu göstermiştir. ZYOGY'lerin bu dönemde yoğunlukla kişisel bakım ve temizlik, kişilerarası beceriler, güvenlik ve sağlık becerileri ve istihdam edilebilirlik becerilerine gereksinim duydukları görülmüştür.

Anahtar Sözcükler: *Zihin yetersizliği olan genç yetişkinler, bağımsız yaşam, gereksinim belirleme.*

Introduction

Some individuals are affected by intellectual, physical or psychological differences more than others and can complete their development by needing special arrangements beyond the norms. The group that differs in terms of intellectual developmental characteristics among these individuals is called individuals with intellectual disability (IID). Intellectual disability is a disability characterized by significant limitations in both intellectual functioning and adaptive behavior, which includes several everyday social and practical skills (Schalock et al., 2010).

In Turkey, IIDs can start formal education until the age of 27 and can benefit from special education services (Ministry of National Education, 2018). After the completion of formal education, they can participate in post-secondary education and informal education during youth and adulthood. In this period including the transition to the adulthood period, new stages such as graduation from school, work life, and marriage appear for IIDs. In the transition to the adulthood period, a more independent and individual life begins for IIDs along with the fact that their attachment to their parents decreases and that they grow mature physically, psychologically, cognitively, emotionally, and socially (Belva & Matson, 2013; Faloon & Rehfeldt, 2008). This period corresponds to the period after 18 years of age with the end of the school. Arnett (2007) discussed the age between 18 and 25 years as a significant period of development covering the period between adolescence and adulthood. IIDs in this period can be expressed as young adults with intellectual disability (YAID) (Harris, 2006; Sabornie & deBettencourt, 2009; Wehman, 2013).

It appears that many independent living skills that are necessary throughout life play a significant role in the period of preparation for adulthood (Steere, Rose, & Cavaiuolo, 2007; Wehman, 2013). In the Life Centered Education (LCE) Program, which was first developed by Brolin and then revised and extended in 2012, it is indicated that individuals with special needs are required to have competence in three main areas in order to live independently. These key areas are (a) daily living skills, (b) self-determination and interpersonal skills, and (3) employment skills (Wandry, Wehmeyer, & Glor-Scheib, 2013).

YAIDs may have difficulty in exhibiting these independent life skills (Alwell & Cobb, 2009). When the studies evaluating YAIDs' independent living needs are examined, it appears that these individuals need support on daily life skills (Hilgenkamp, Wijck, & Evenhuis, 2011; Lane, 2012; Sunder, 2007), the skills necessary to live in a separate home, personal care and hygiene skills, money management, friendship and neighbor relations (Luthra, Högdin, Westberg, & Tideman, 2018; Mueller & Stack-Dunne, 1989; Sunder, 2007; Thoma et al., 2016; Yuan Ru, 2015), domestic skills, self-care skills, community adaptive skills (Belva & Matson, 2012; Kaya 2017; Mansell, Ashman, McDonald, & Beadle-Brown, 2002), leisure time activities (Kaya, 2017), shopping, home management, transportation and self-determination (Lane, 2012), travelling skills, employment skills, self-defence, and avoidance of abuse (Sunder, 2007). In the investigations conducting the validity and reliability studies of the Supports Intensity Scales-Adult Version (SIS-A), it was indicated that IIDs above 16 years of age mainly needed lifelong education support and also supports in behavioral problems, the field of health, social and community life, daily life, work life, communicating and stress management (Chou, Lee, Chang, & Pei-Lung, 2013; Harries, Guscia, Kirby, Nettelbeck, & Taplin, 2005; Lamoureux-Hebert, Morin, & Crocker, 2010; Thompson et al., 2009; Wehmeyer et al., 2009).

Folk, Yamamoto and Stodden (2012) emphasized that there were three main transition areas after school that interacted with each other, including independent living, employment, and community & social engagement and that basic life skills, employability skills, and academic skills should be acquired to succeed in these areas. In another study, it was stated that social skills such as taking responsibility, getting along with people, adapting, and establishing appropriate communication-interaction were more important rather than employment or daily life skills in work life (Agran, Hughes, Thoma, & Scott, 2016). In the report published by the Council for the Education of Exceptional Children (CEC) (2011), it was emphasized that the fact that individuals with disability had difficulty in participating in the workforce was due to the lack of knowledge and skills related to independent living and that these skills should be studied for sustainable employment.

In other studies, it was indicated that women with ID were less employed and lived independently than men with ID, and social disadvantages of being a woman were emphasized as one of the reasons for it (Hsieh, Rimmer, & Heller, 2012; Nye-Lengerman, Narby, &

Pettingell, 2017). In parallel to them, other studies concluded that women with ID were more vulnerable to physical and sexual abuse compared to men with ID, and therefore, these individuals needed intensive support in self-defense (Gil-Llario, Morell-Mengual, Diaz-Rodriguez, & Ballester-Arnal, 2018; Gimenez-Garcia, Gil-Llario, Ruiz-Palomino, & Diaz-Rodrigez, 2017). In the study carried out by Hickson, Khemka, Golden and Chatzistyli (2008), it was reported that women with ID who were abused had more difficulties in participation in work life, decision making, and community participation compared to women with ID who were not abused. Similarly, it was indicated that YAIDs had significant difficulties due to their lack of knowledge and skills in sexuality and self-determination, and they did not manage relationships and needed sexual education in preparing for independent living (Brown & McCann, 2018; Healy, McGuire, Evans, & Carley, 2009; Lumley, Miltenberger, Long, Rapp, & Roberts, 1998; Tice & Harnek, 2008). As it is seen, YAIDs need support in many different independent living areas, from personal care to social skills, from employment skills to sexual education.

In studies in Turkey, it was indicated that YAIDs experience difficulties on getting into a job, doing the job as it should be, sustained employment, adaptation to work (Cosgun Basar, 2010), and YAIDs need to gain responsibility, quick thinking, technology skills, adaptation, teamwork, communication, academic process, vocational skills, and self-management skills in order to have a job (Baran & Cavkaytar, 2007; Gunes & Akcamete, 2014). Also, teachers and counselors said that there were shortcomings in the job preparation training process of students (Ozbek, Girli, & Ozturk, 2017). The reasons for the low employment rates of YAIDs; it is stated as the lack of experience, knowledge, self-confidence, responsibility, self-management and communication, and difficulties in adapting to work (Gundogdu, 2010; Gursel, Ergenekon, & Batu, 2007; Hasircioglu, 2006; IPA, 2018; Ozbey, 2015).

In the literature, there are studies that had difficulties were emphasized, and the needs for support in the independent living area were revealed. However, there were limited studies on YAIDs' post-secondary needs, especially independent living needs in work life, were determined by consulting the relevant stakeholders and by directly monitoring YAIDs. The aim of this study was to determine the needs of YAIDs in preparing for adulthood and work life based on the observed performance of YAIDs and the opinions of parents, teachers, and employers.

Methodology

This study was conducted using the phenomenological research design, which is one of the qualitative research methods. Semi-structured interviews were conducted with 30 individuals consisting of employers, teachers, and parents, and 10 YAIDs were observed through the Skill Control List.

Participants

Participants were determined by criterion sampling, which is one of the purposeful sampling types. The criteria for each group of participants were as follows:

- *Teachers;* being special education teachers covering workshop courses in vocational training and employment education centers,
- *Employers;* being the authorized person to recruit individuals in the workplace where YAIDs are still employed,
- *Parents;* having a child with ID over the age of 18,
- *YAIDs;* being an individual over the age of 18, working or continuing to receive work education, with a diagnosis of intellectual disability, and a graduate from formal education.

In phenomenological studies with purposeful sampling, it is stated that the sample size may be between three and 10 (Creswell, 2014). In this study, 10 individuals were reached for each group determined.

The *parents* consisted of one male and nine females, the age range was 40-74 years. Among the parents, all mothers were housewives, and the father was a retired worker. The *teachers* consisted of four males and six females, the age range was 25-48 years. 50% of them graduated from mentally disabled teaching, 30% of them graduated from hearing and visually impaired teaching, 10% of them graduated from primary school teaching, and 10% of them graduated from weaving teaching. The *employers* consisted of two females and eight males, the age range was 25-65 years. The employers were working in the food, service, imports, and electronics sectors, in director position.

YAIDs consisted of five females and five males, the age range was 21-36 years. While 50% of the YAIDs were third-degree graduates, the other 50% of them were first-degree graduates, and all of them were continuing work education. The whole data collection process was carried out by the first author. The interview data were coded by another independent expert.

Settings

Semi-structured interviews were conducted in a quiet room suitable for interviews with parents in their homes, with employers in their workplaces, and with teachers in their schools. YAIDs were observed in workshops and workplaces where they continued their work education.

Data Collection and Instruments

Semi-structured interviews (30 individuals consisting of employers, teachers, and parents) and (10 YAIDs) observation techniques, which are qualitative data collection techniques, were used in the study.

Semi-structured interviews

A data collection tool was developed by the researcher. Interview forms containing eight open-ended questions aimed at determining the independent living needs of YAIDs were prepared for each group of participants. The interview questions were submitted to expert opinion to test the validity. Then, a pilot interview was conducted from each group. Furthermore, according to information expressed by Rubin and Rubin (2005) for the semi-structured interviews conducted in this study and Creswell's (2008) principles of interviewing, an interviewer's guide specific to this study was prepared by the researcher. Thirty interviews were completed in two months (January-February, 2017) and all of them were recorded.

Skill control list

In addition to the interviews, 10 YAIDs were observed, and the skills and behaviors they could and could not exhibit were marked on the skill control list. The skill control list can be expressed as an assessment and evaluation instrument in the form of a checklist to determine to what extent the observed performance complies with the performance criteria by observing

whether individuals exhibit certain skills and behaviors (Barkley & Major, 2016; Creswell, 2014). The skill control list used in this study is a data collection tool developed by the researcher. The skill control list was prepared for YAIDs over the age of 18 who had completed formal education. The list, which was finalized by receiving the opinions of twenty domain experts, has three main skill areas and the relevant skills and behaviors under them. They consist of a total of 573 items, including a) 358 items for daily life skills, b) 156 items for self-determination and interpersonal skills, and c) 59 items for employment skills. The skill control list was organized by receiving the opinions of five domain experts. The implementation of the checklist was carried out by an independent expert, and feedback was received regarding the process of using the tool.

The researcher had previously given on-the-job training to the group she would observe. Since the researcher was acquainted with the target group, the sincerity desired before the observation was provided as much as possible. Although this situation allowed individuals to act naturally, the researcher paid attention to taking the necessary measures for it. In the list, observable items were marked by observing young adults for an average of 20 days in the environments where individuals were educated and working, while unobservable items were marked by asking parents/teachers/employers of individuals. Ten YAIDs were observed in their workplaces for a month, and their knowledge and skill needs were evaluated.

For all interviews and observations, the approval forms created by the researcher were used by utilizing the World Health Organization's approval form, and all participants' written permissions and voice-recorded verbal permissions were obtained. And also on 10.10.2016 ethical committee approval numbered 105775 was obtained from Anadolu University Ethics Committee. All stages of the study were followed in accordance with research and publication ethics.

Data Analysis

The data obtained from semi-structured interviews were analyzed by content analysis, and the data obtained from the skill control list were analyzed by descriptive analysis. The content analysis of the interview data was performed using NVivo 11 software. The shortest interview

lasted 10.07 min, the longest one lasted 41.02 min. The average duration of all interviews is 18.92 min.

Validity-Reliability

For validity and reliability in qualitative research, credibility, transferability, consistency and conformability studies were conducted (Guba & Lincoln, 1989; Merriam, 2013).

Credibility

In this study for credibility, (a) peer debriefing, expert opinion was received in the stages of developing data collection tools, transcription and analysis of data, and the presentation of findings, (b) persistent observation, the researcher conducted in-depth interviews and observations with a total of 30 people from four different data sources (young adults, parents, employers, and teachers) to ensure the adequacy of the data they collected, and the results were compared and the patterns were revealed, (c) member checks, in the interview process after creating the themes, a parent, a teacher, and an employer providing the richest data from each group were interviewed again, and feedback on the findings obtained was required, (d) data collection from four different data sources, including employers, teachers, parents, and YAIDs, using two different data collection techniques, including observation and interviewing, served triangulation, and (e) prolonged engagement, the researcher had long-term interactions by spending about two months in order to make observations about the research problem in the environments where YAIDs worked and received education.

Transferability

Appropriate and adequate participation strategies were used with (a) rich and thick description and (b) purposeful sampling to demonstrate transferability. Rich and thick description; all processes, from the development of data collection tools to data collection techniques, from data analysis to the presentation of results, were described in detail in the study. Various and adequate participation with purposeful sampling; 40 individuals selected by purposeful sampling participated in the study. YAIDs, each of which consisted of groups of 10 individuals, and their parents, employers, and teachers served both quantitative and qualitative transferability by enabling the diversification of the sample.

Consistency

For consistency feedback was received by the members of the thesis committee (three Ph.D. experts) and an independent domain expert with Ph.D. in order to examine whether the researcher conducted this research in the same approach (conducting a consistent study) in the process of data collection, data analysis, and presentation of findings.

Conformability

For conformability study, the "intercoder agreement" study was conducted in the data analysis process by another independent expert. Afterward, the researcher and the independent expert came together to check the matching of the codes and non-matching codes were discussed, and an agreement was reached. Miles, Huberman, and Saldana (2014) calculated the consistency coefficient between coders before the agreement with the formula "(agreement/agreement+disagreement)x100" and stated that there should be at least 70% consistency. The findings on intercoder reliability the agreement was 83% before the agreement and increased to 100% after the independent coder and researcher agreed. In the reliability study for the data obtained from the Skill Control List, the data obtained were analyzed by descriptive analysis by both the researcher and independent expert, and the frequencies of the resulting items were compared.

Findings

Interviews were based on confidentiality, and the code names consisting of the initials and sequential numbers of each group were used instead of the real names of the participants. Accordingly, employers were named as E1, E2, E3,…, E10, teachers were named as T1, T2, T3,…, T10, and parents were named as P1, P2, P3,…, P10.

Six important themes selected from the themes obtained from the interviews were decisive in determining the needs of YAIDs. These themes are presented in Table 1. The sub-themes within the themes were listed by frequency, and only high-frequency sub-themes were quoted in the presentation of findings.

Table 1
Themes from Interviews

Themes
1. Difficulties of YAIDs in Preparing for Adulthood and Work Life
2. Causes of Difficulties of YAIDs in Preparing for Adulthood and Work Life
3. After-School Independent Life Experiences of YAIDs
4. Reasons for the Need for an Independent Life Education Program
5. Topics Needed in the Independent Life Education Program
6. The Priority of the Topics Needed in the Independent Life Education Program

Difficulties of YAIDs in Preparing for Adulthood and Work Life

In Figure 1, it appears that the difficulties of YAIDs were collected under three main headings, including difficulties in daily life, self-determination and interpersonal skills, and preparation to employment, and divided into various sub-themes.

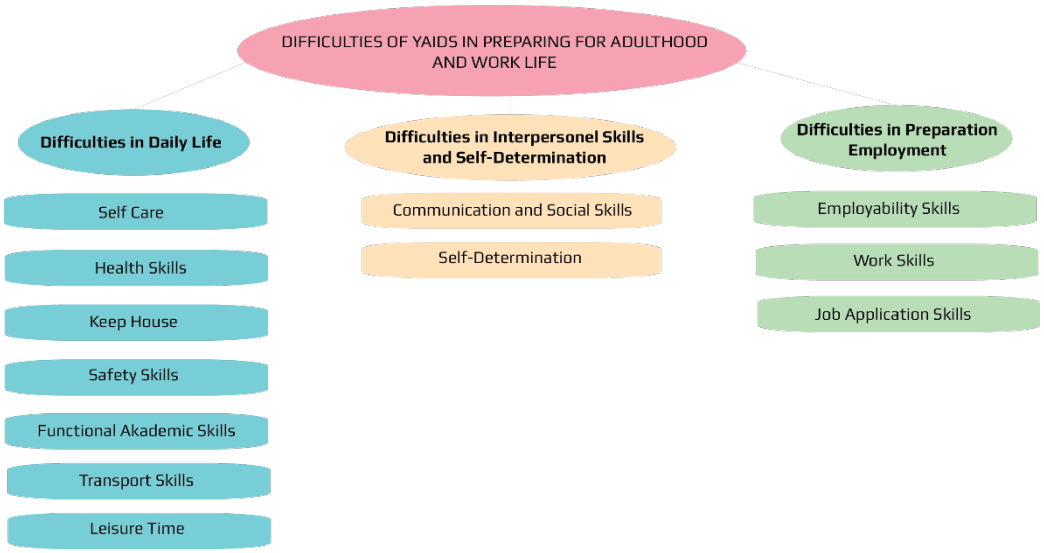

Figure 1. Difficulties of YAIDs in preparing for adulthood and work life

With respect to the difficulties in self-care in the field of daily life, T3 stated that *"...I think the biggest difficulty is in self-care, I mean, it is the most necessary issue for the child to exist independently in life..."*. About difficulties in health skills, E6 stated that *"...we realize that he cannot understand himself about sexual life ..."*.

The difficulties in self-determination and interpersonal relations emerged in communication and social skills. The majority of the participants stated that YAIDs could not express

themselves. The views of the participants *were "...employers mainly prefer people who can express themselves well ..."* (T10) and *"...the primary reason why these students cannot get into a job is the weakness of communication skills ..."* (T4).

YAIDs had difficulties in employability skills, work skills, and the job application process in preparation for employment. About on employability skills, E2 stated that *"...they don't know how to talk to the boss... especially interaction with customers can be very troublesome..."* and indicated that these individuals had difficulty in establishing a relationship in accordance with the hierarchy. T5 indicated that they could not comply with the working discipline by stating that *"...it is necessary to ensure that these children gain working discipline..."*.

According to these findings, it appeared that they had difficulties mostly in daily life skills. It is remarkable that the most challenging issues in daily life were concentrated in self-care, health, and safety skills. Also there were difficulties in self-determination and interpersonal relationships, employability skills.

Causes of Difficulties of YAIDs in Preparing for Adulthood and Work Life

As is seen in Figure 2, the reasons why YAIDs had difficulties in adulthood and work life were gathered under six themes. Almost all participants (f=24) indicated that the lack of knowledge and skills played a significant role in the difficulties of YAIDs in adulthood and work life. With respect to the opinions on it, P6 stated that *"...they need to be guided problems are caused by the lack of knowledge ..."*.

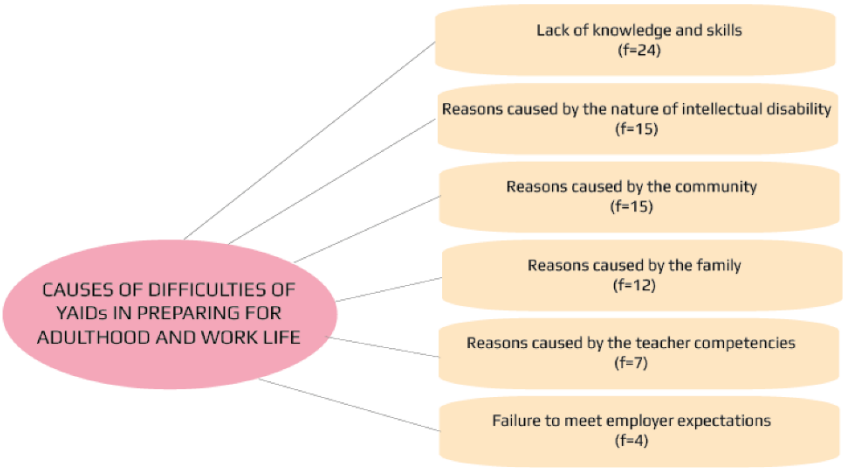

Figure 2. Causes of difficulties of YAIDs in preparing for adulthood and work life

After-School Independent Life Experiences of YAIDs

According to the findings, almost all of the YAIDs did not attend any post-secondary education after completing formal education. According to Figure 3, it appeared that there were very few participants indicating that they had education on after-school independent life experiences. Participants stated that the post-secondary education was vocational education in which only work skills were taught, rather than comprehensive independent life education.

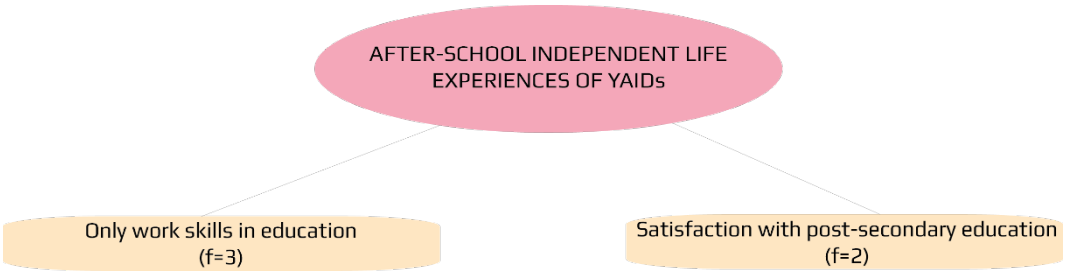

Figure 3. After-school independent life experiences of YAIDs

Reasons for the Need for an Independent Life Education Program

All of the participants interviewed (f=30) stated that there was a need for an education program to design independent living skills for YAIDS in preparing for adulthood and work life. As is seen in Figure 4, the participants stated that the reasons why they needed such education were that individuals had difficulties in organizing their own lives and living independently and that there was a need for qualified education requiring expert knowledge.

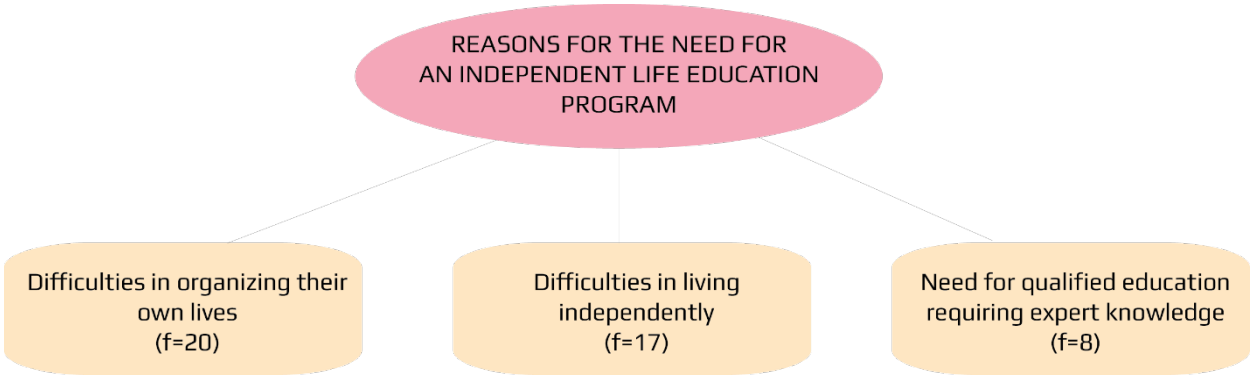

Figure 4. Reasons for the need for an independent life education program

With respect to difficulties in independent living, P8 stated that *"...such education should be provided so that he would be self-sufficient and can continue his life without needing anybody ..."*. Regarding the fact that the education to be provided should be qualified and requires expert knowledge, E6 expressed his opinions by stating that *"...his employer and his workmates do not have to take care of him, they do not have to educate him, when we look at it, it should be done professionally, that education should be provided professionally ..."*.

Topics Needed in the Independent Life Education Program

The topics that should be included in the independent life education program to be provided for YAIDs' preparation for adulthood and work life were collected under three main headings, including the topic in *daily life, *self-determination and in interpersonal relations, and *preparation to employment. As is seen in Figure 5, the topics that were most needed in daily life were expressed as self-care (fsum=26) and health (sexuality) skills (fsum=22). It was indicated that education was needed on self-determination (fsum=52) and communication and

social skills (fsum=38) in interpersonal relations. Employability skills (fsum=29) were the most frequently mentioned topic in the process of preparation for employment.

With respect to self-care in daily life, E5 stated that *"...the care of staff is very important in a place where people work intensively ..."*. Sexuality came to the forefront with regard to health skills, and in this regard, T1 stated that *"...there is an approach to the opposite sex, the adult individual will approach the opposite sex but does not know how, how much he should protect his personal boundary ..."*.

In the self-determination theme, T3 stated that *"... we have problem in ensuring the person's self-control..."* in the sub-theme of thinking the things to do spontaneously. With respect to interpersonal relations related to communication and social skills, E5 stated that *"...communication with other individuals should be the most important issue in education program..."*. With respect to self-expression, E9 stated that *"...at first, these youngs should be taught on how to express themselves ..."*.

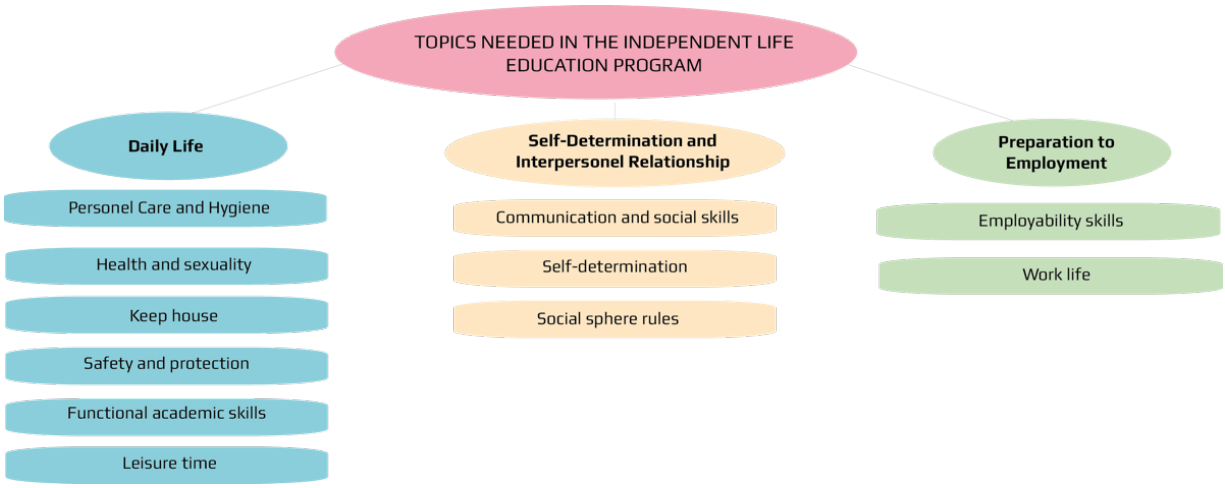

Figure 5. Topics needed in the independent life education program

In preparation for employment, all of the participants emphasized employability skills. With respect to following work discipline and workplace rules under the heading of employability, E10 stated that *"...when we look at an individual, we first look at whether he is able to follow the rules of the company's procedures and really has reached the level to receive this information ..."*. With respect to the opinions on establishing a relationship in accordance with

the hierarchy, T5 stated that *"...it is very important for an individual to know the person to whom he is responsible and to know that he is a superior ..."*.

The priority of the Topics Needed in the Independent Life Education Program

When the participants were asked to prioritize the topics they needed, while protection from abuse, security, and personal care and hygiene were of first priority regarding daily life, it was indicated that the establishment of interpersonal relations was the highest priority in interpersonal skills. Among the topics of top priority, no opinion on employment skills was expressed.

Findings from the Skill Control List

At first, the most frequently stated items in the skill control list were determined. Afterward, among these items, the items compatible with the interview findings were included in the needs of YAIDs. The criteria for determining the most frequently expressed item was being marked for at least seven of the 10 YAIDs observed. Accordingly, findings from the skill control list, most frequently expressed items are *prevention of neglect and abuse, *healthy sexual development, *interpersonal skills, *safety skills in community settings, *self-determination, *prevocational skills, *care of clothes, *self-expression, *employability skills, *personal care and hygiene, *time management, *community use.

It appeared that the findings obtained from the interviews (Figures 5) and the skill control list were largely compatible. When the interview and observation findings were examined together, the needs of YAIDs in preparing for adulthood and work life could be listed as personal care and hygiene, interpersonal skills, self-determination, health and sexual education, security, using community resources, and preparing for work life. Functional academic skills are embedded in these topics.

Discussion and Conclusion

YAIDs' independent livings needs and post-secondary needs refer especially employment and work life. This study examined the needs of YAIDs in in preparing for adulthood and work life by semi-structured interviews with parents, teachers, employers and by observations with YAIDs. Results indicated that YAIDs could not use independent living skills in organizing their own lives, that they did not live independently without any support. Providing some information about independent living at home or at work was not sufficient and required expert knowledge. Based on the difficulties of YAIDs, it was concluded that these individuals needed post-secondary independent life education and that personal care and hygiene, self-determination and interpersonal skills, employability skills and sexual education and safety skills should be primarily included in the content of this education.

In this study, it was revealed that YAIDs had difficulties in independent living skills in adulthood and work life (Figure 1), the main reason for these difficulties was the lack of knowledge and skills (Figure 2), they needed independent life education in this process (Figure 4), and this education should be provided by an expert within a comprehensive and systematic program (Figure 4). Similarly, in the studies, it was revealed that YAIDs had difficulties in exhibiting independent living skills after school (Luthra et al., 2018), that post-secondary education aimed at improving independent living skills of YAIDs was inadequate due to the lack of effective programs (Alwell & Cobb, 2009; Bouck, 2010), and that the existing programs should be provided by special education experts (Bouck, 2010; Kaya, 2017; Ruteere et al., 2015).

The findings indicated that the topics in which YAIDs had difficulty (Figure 1) were compatible with the topics needed in the independent life education program (Figure 5). Also, the findings obtained by the observation of YAIDs and the findings obtained from parents, teachers, and employers indicated that the topics in which YAIDs had difficulties were similar. Accordingly, it can be said that the findings obtained from the interviews and observations supported each other.

In this study, the most difficult topics among independent living skills of YAIDs were daily life skills, self-determination, and interpersonal skills and employability skills. In the other

studies, it was also revealed that YAIDs frequently had difficulties in daily life, interpersonal skills, and employability skills (Alwell & Cobb, 2009; Baran & Cavkaytar, 2007; Cosgun Basar, 2010; McLaughlin, 1995; Mueller & Stack-Dunne, 1989; Sunder, 2007; Thoma et al., 2016; Yuan Ru, 2015). The biggest reason for difficulties in the relevant skills was found to be YAIDs' lack of knowledge and skills related to independent living. The studies in the literature also indicated the lack of knowledge and skills while explaining the reasons for difficulties in the participation of these individuals in work life (Agran et al., 2016; CEC, 2011; Folk et al., 2012; Luthra et al., 2018; Ozbek et al., 2017; McLaughlin, 1995; Yuan Ru, 2015). Therefore, is is thought that YAIDs need pre-employment independent life education.

In the relevant studies, it was emphasized that the priority needs of YAIDs were personal care, self-care, and health, communication skills, adaptation, appropriate interaction skills, employability skills, use of community resources, just like the results in this study (Agran et al., 2016; Belva & Matson, 2012; Chou et al., 2013; Folk et al., 2012; Harries et al., 2005; Hilgenkamp et al., 2011; Kaya, 2017; Lamoureux-Hebert et al., 2010; Lane, 2012; Mansell et al., 2002; Mueller & Stack-Dunne, 1989; Sunder, 2007; Thompson et al., 2009; Wehmeyer et al., 2009; Yuan Ru, 2015). In another group of studies, independent living needs of YAIDs appeared in self-determination, self-command, time management, decision making, making choice, stress management, and behavior management (Harries et al., 2005; Lamoureux-Hebert et al., 2010; Lane, 2012; Sunder, 2007; Thompson et al., 2009; Wehmeyer et al., 2009). Furthermore, studies revealed that these individuals needed support in the self-defense and avoidance of abuse (Gil-Llario et al., 2018; Gimenez-Garcia et al., 2017; Hickson et al., 2008; Sunder, 2007), and sexual education (Brown & McCann, 2018; Healy et al., 2009; Lumley et al., 1998; Tice & Harnek, 2008). Consequently, it can be said that results of the relevant studies quite similar to results of this study.

The need for sexual education that emerged in those studies can be explained by the fact that women are more vulnerable to abuse than men and that those with disabilities are more vulnerable to abuse than those without disability (Brown & McCann, 2018; Gil-Llario et al., 2018; Gimenez-Garcia et al., 2017; Hickson et al., 2008; Hsieh et al., 2012; Nye-Lengerman et al., 2017; Tice & Harnek, 2008). According to these results, it can be said that safety and sexual education are important for work life.

As can be seen, the results of other studies that determined the independent living needs of YAIDs are compatible with the needs determined in this study. It can be said that the topics needed in independent life were concentrated in the main headings of daily life skills, personal-social skills, and employability skills. This result reveals the importance of employability skills rather than vocational skills in preparing for working life. Working life requires gaining independent life skills related to the occupation. Accordingly, it is recommended to organize independent life education for adults before employment. While preparing the independent life education to be provided to these individuals, it is of great importance to determine the needs of the target group and to develop education programs based on these needs (Eisenman et al., 2014; Onukwube, 2010). In this respect, it is considered that the present study will shed light on the planning of independent life education of YAIDs.

Post-secondary education in Turkey is planned in the form of short-term courses or trainings in projects focusing on occupational skills. I can be said that post-secondary education in Turkey is insufficient for sustainable employment. To support the sustainable employment of YAIDs, comprehensive independent life education that work on employability skills should be organized.

The main conclusion of the study was that it was needed that YAIDs should be provided with the acquisition of knowledge and skills related to adulthood and work life. In future research, education programs that take into account the needs determined in this study should be designed, and the effect of the programs should be examined. Similarly, a similar study can be planned to determine the needs of young adults with autism. In this study, the target group was YAIDs, and qualitative studies can be planned to examine the needs of elderly people with intellectual disabilities. In future research, it is recommended that studies should be carried out to determine the needs before organizing education for IIDs.

Statements on ethics and conflict of interest

On 10.10.2016 ethical committee approval numbered 105775 was obtained from Anadolu University Ethics Committee. All stages of the study were followed in accordance with research and publication ethics.

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Research Article

Investigating the Factors Affecting Students' Satisfaction in a Programming Course Designed in 3D Virtual Worlds[1][2]

Ali Battal[3] and S. Tuğba Tokel[4]

Abstract

The main purpose of this study is to understand the satisfaction level of students to teach the basics of programming in 3D virtual worlds and investigate the factors affecting their satisfaction. Multiple case study with three cases were conducted in three different educational programs: as curricular (Case-1), extra-curricular (Case-2) and after-school (Case-3). Satisfaction scale adopted from previous study was used to understand current level of satisfaction and semi-structured interviews were conducted with participants to reveal factors affecting satisfaction. Descriptive analysis of quantitative data showed that that the most satisfied students were those from Case-1 (M = 4.35), Case-3 (M = 4.28) and Case-2 (M = 3.99), respectively. Single case analysis of qualitative data revealed the factors increasing and decreasing satisfaction of the students. Apart from the story about the tasks, group study, object construction, having tasks, off-task activities, 3D environment and tour in the environment emerged as an increasing factor across all three cases at different ratios. Technical problems, studying alone, difficulty of the tasks, and avatar-related problems were the factors stated by some of the students across all cases as decreasing factors. Cross-case analysis provided a table which shows the similarities and differences among the cases.

Keywords: *3D Virtual Worlds, factors affecting satisfaction, satisfaction, programming for children*

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[1] This article is a part of the doctoral dissertation of the first researcher and it was presented at the 6th International Instructional Technologies and Teacher Education Symposium (ITTES-2018).

[2] Applied Ethics Research Center of the university granted permission to conduct this study with a document number "28620816/341" on 09.09.2015.

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3B Sanal Dünyalarda Tasarlanan Bir Programlama Dersinde Öğrencilerin Memnuniyetine Etki Eden Faktörlerin İncelenmesi

Öz

Bu çalışmanın amacı 3B sanal dünyalarda programlamanın temellerini öğretmeyi amaçlayan bir derste öğrencilerin memnuniyet seviyelerini ortaya çıkarmak ve öğrencilerin memnuniyetine etki eden faktörleri belirlemektir. Bu amaçla araştırma yöntemi olarak üç farklı eğitim programında uygulanmış çoklu durum çalışması seçilmiştir. Bu durum çalışmaları sırasıyla müfredata entegre (Durum 1), müfredat dışı (Durum 2) ve okul sonrası (Durum 3) şeklinde eğitim programlarında uygulanmıştır. Alanyazındaki çalışmalardan faydalanılarak uyarlanan memnuniyet ölçeği ile öğrencilerin memnuniyet düzeyi ölçülerken, öğrenci ve öğretmenler ile yapılan yarı yapılandırılmış görüşmeler ile memnuniyete etki eden faktörler ortaya çıkarılmıştır. Nicel verilerin analizinde betimsel analiz yöntemleri kullanılmış olup Durum 1 (M = 4.35), Durum-3 (M = 4.28) ve Durum-2'nin (M = 3.99) öğrencileri sırasıyla, bu ortamlarda verilen programlama dersinden en çok memnun olan öğrenciler olarak belirlenmiştir. Nitel verilerin tekli durum analizi sonuçları memnuniyeti artıran ve azaltan faktörleri ortaya çıkarmıştır. Görevlerin hikayesi dışında, grup çalışması, obje oluşturma, görevlerin olması, görev dışı aktiviteler, 3B ortam ve ortamda gezinme her üç durum çalışmasında da değişken oranlarda memnuniyeti artıran faktörler olarak bulunmuştur. Teknik problemler, yalnız çalışma, görevlerin zorluğu ve avatar ile ilgili problemler her üç durum çalışmasının öğrencileri tarafından memnuniyeti azaltan faktörler olarak ortaya çıkmıştır. Durumlar arası analiz sonuçları ise her üç durum çalışması sonuçlarının benzerlik ve farklılıklarını belirten bir tablo ile sunulmuştur.

Anahtar kelimeler: *3B sanal dünyalar, memnuniyeti etkileyen faktörler, memnuniyet, çocuklar için programlama*

Introduction

Programming is a well-known term nowadays which is considered as essential for anyone at any age from primary school up to university level (Sauppé, Szafir, Huang, & Mutlu, 2015). Therefore, many countries and schools have been trying to introduce concepts related to programming to children in different ways (Kafai & Burke, 2014). There are numerous efforts to integrate programming into school curriculum by updating current courses as well as developing new standalone courses such as "Computer Science." Extra-curricular activities have been trying to be implemented into school settings such as establishing programs for software and game design projects. Such kinds of program are important since they are good examples of how programming could be contextualized in a program independently of curriculum. Besides, after-school programs out of school settings are offered to introduce learners to programming in different contexts.

Learning programming is generally considered difficult by learners of any age (Guzdial, 2004). Therefore, there is a need to use tools or environments as an aid to making programming easier to grasp (Gomes & Mendes, 2007). In their study, Kelleher and Pausch (2005) reviewed nearly 80 tools and categorized them according to their mechanical and motivational process benefits. Tools in the mechanical process category focused on making the mechanics of programming more manageable such as removing unnecessary syntax, designing languages closer to spoken language, introducing programming in visible context, and finding alternatives to typing programs. These kinds of tools allow learners to focus on the logic and underlying structures of programming rather than becoming overwhelmed with all the other issues associated with programming. Tools in the motivational process category were aimed at increasing learners' motivation during learning by offering a social and motivating context through designing activities that draw learners' attention such as moving cars, or the construction of objects. These kinds of tools are also important since programming is considered a solitary activity (Brennan, 2013; Rosenbaum, 2008).

VWs offers different types of opportunities to educators such as immersive 3D environment, avatars and multiple users, and multiple communication forms (Dickey, 2005a, 2005b); interaction with objects and other avatars (Hew & Cheung, 2010); persistence of objects,

immersive environment through the use of realistic 3D graphics (Dalgarno & Lee, 2010; Delwiche, 2006; Dieterle & Clarke, 2006); and object construction and manipulation (Dawley & Dede, 2014; Messinger et al., 2009).They allow educators to incorporate a large variety of learning options and strategies into their teaching. Dreher, Reiners, Dreher and Dreher (2009) advocated the use of virtual worlds in learning programming since they would allow direct visualization of the outcome, which could be seen animated virtually, and would provide learners with quick and concrete feedback. In addition, learners are able to test their code by applying it in a certain context and social environment. It is also possible to study in groups thanks to the multiuser capability of VWs, which might promote group or pair programming (Beck, 2000). Teaching programming in virtual worlds could motivate learners intrinsically and offer them a range of benefits when compared to teaching with traditional methods. Virtual worlds with their various features could be used as a tool in the teaching of programming. They offer exciting new environment for learners to engage in programming through the construction of meaningful 3D artefacts within group studies; something that is arguably difficult to achieve with other programming environments (Pellas & Vosinakis, 2017).

The use of VW with its features has a positive effect on students' satisfaction in general (Hew & Cheung, 2010), and in programming education (Buffum et al., 2015; Girvan, Tangney, Savage, 2013; Hulsey, Pence, Hodges, 2014). Hulsey et al. (2014) organized a weeklong camp named "Camp CyberGirls" in order to introduce the basic concepts of programming to 16 female high school students. In doing so, they prepared a virtual environment consisting of 10 tasks including modeling and scripting activities; for example, modeling and scripting a sliding door. Modeling and scripting were performed using the environment's functions such as writing scripts in LSL. Results of the study indicated that although it was more complicated for students to complete tasks compared to other programming tools such as Alice or Scratch, students had the chance to perform a wide variety of learning activities. Moreover, studying and completing tasks in VW was a source of motivation for the students and they realized a high degree of satisfaction. In another study by Girvan, Tangney, and Savage (2013), an exploratory case study was conducted with 24 graduate students with little or no programming experience. The participants studied in pairs for a period of four weeks and constructed interactive objects such as a playable piano. The study's results showed that students gained a high sense of satisfaction with the use of VW since studying in VW was funny and helpful in engaging them with the learning objectives. Enabling group study is one of the characteristics of VWs since they allow learners to perform tasks together rather than just communicate (Dalgarno & Lee, 2010;

Duncan, Miller, & Jiang, 2012). There is evidence in the literature that shows group study has a positive effect on students' learning and satisfaction (Sajjanhar & Faulkner, 2014), engagement to perform activities (Pellas & Peroutseas, 2016), and enjoyment (Buffum et al., 2015) in programming education. Rosenbaum (2008) argued in his study that the ease of being able to create scripts in LSL by using a Scratch-like tool, Scracth for Second Life (S4SL) made the students satisfied.

Previous studies used VWs in teaching programming to students from high schools though to postgraduate by using Linden Scripting Language (LSL), the language of VWs (e.g., Girvan et al., 2013; Hulsey, Pence, & Hodges, 2014; Pellas, 2014; Seng & Edirisinghe, 2007). However, studies concerned with the use of VWs in teaching programming have been limited and scarce for children. Besides, studies examining its use in different educational programs and comparing and contrasting the results have not been found in the literature; therefore, there is a need to understand the use of virtual worlds in teaching the basics of programming to children through different educational programs. The aim of this study is to address the satisfaction of participants and to reveal factors affecting satisfaction across the different educational programs.

The research questions of this study are as follows:

- How the students' satisfaction who were taught programming via VWs in different contexts changed?
- What factors affected their satisfaction?

Method

Multiple case study research was conducted due to various reasons. Firstly, too little information about the use of virtual worlds in programming education for children was known, and therefore it needs to be explored in a more detailed way. Secondly, case study provides much detailed information about the phenomenon being studied in its context and offers a more complete picture of what happened and why (Neale, Thapa, & Boyce, 2006). Merriam (2009) added that case study is useful when studying educational innovations. Lastly, it is possible to show different perspectives on the phenomenon by analyzing multiple cases (Creswell, 2007).

3.1 Selection of Cases and Participants

Two levels of sampling are followed in multiple case studies (Merriam, 1998), with cases selected in the first level and participants selected for each case in the second level. Purposeful sampling is used when the researcher "wants to discover, understand and gain insight and therefore must select a sample from which the most can be learned" (Merriam, 1998, p. 61) and when the researcher wants to reach information-rich cases (Patton, 1990). At this point, the researcher selects the most appropriate cases which provide the most available data (Stake, 2005). Building a rationale or criteria for purposeful sampling strategy is the next step (Creswell, 2007; Merriam, 1998; Stake, 2005; Yin, 2003). In the current study, the primary criteria was to understand the use of virtual worlds in programming education offered to children in different settings. Previous studies showed that introductory level programming education for children has been offered (Kafai & Burke, 2014) in three educational programs; curricular, extra-curricular and after-school programs. Therefore, the cases selected for the current study were based on these three educational program types: curricular, extra-curricular and after-school programs.

The first case was a curricular program in which programming education was adopted from the current curriculum of an existing ICT course in a school setting. This case took place in a private school located in Ankara. The implementation phase for this case lasted for a period of eight weeks during the spring semester of the 2015-2016 academic year. The first part of the study (activities on the first island) was conducted in the school's laboratory, whilst the second part (activities on the second island) was conducted in the CEIT laboratory at the researcher's university due to technical issues. The second case was an extra-curricular program held in club, named "Game Programming", of a private school located in Ankara. Attending the club was optional and only students from the 5th and 6th grades participated in the club voluntarily. Club participants met for one and half lesson hours per week throughout the semester. Implementation in this case lasted for 10 weeks during the spring semester of the 2015-2016 academic year. The third case was an after-school program held in an informal learning environment occurring outside of the school. This case was conducted on a course offered at the Continuing Education Center of a public university. The course lasted for a period of five weeks during May and June of 2016, with one class lasting three lesson hours per week.

Table 1
Characteristics of participants

	Curricular		Extra-Curricular		After-School	
	n	*%*	*n*	*%*	*n*	*%*
Gender						
Female	6	50.00	2	10.00	2	25.00
Male	6	50.00	18	90.00	6	75.00
Age						
10	3	25.00	1	5.00	2	25.00
11	8	66.7	15	75.00	4	50.00
12	1	8.30	3	15.00	2	25.00
13	-	-	1	5.00	-	
Mean	10.83		11.20		11.00	

The number of students in Case-1 were 12, consisting of six females and six males. In Case-2, there were two female and 18 male students with a total of 20. The number of students in Case-3 is eight, consisting of two females and six males. Students in Case-1 were between the ages of 10 and 12 years, with a mean age of 10.83 years. Participants of Case-2 were also aged between 10 and 13 with a mean age of 11.2 years. Participants of Case-3 were aged between 10 and 12 years, with mean age of 11 years.

3.2 Data Collection Methods

In qualitative studies, data are collected from participants via different forms (Creswell, 2012; Merriam, 1998; Stake, 2006; Yin, 2003). Creswell (2012) defined different kinds of data forms as observations, interviews, documents, audiovisual materials and so on. Yin (2003) also proposed six different types of data forms; documents, archival records, interviews, direct observations, participant-observations, and physical artifacts. Two data collection forms were used in the current study: semi-structured interviews, and two questionnaires. Semi-structured interviews were conducted with the participant students as well as the teachers. Two separate semi-structured interview forms were developed after examining the related literature. In order to finalize the interview forms, a three-step method was employed. Firstly, the interview forms were applied as part of the pilot study. Pilot study was conducted within a voluntary organization with a group of students aged between 10 to 13 years. Some enhancements were applied to the 3D environment and the interview forms after the pilot study. Some questions were consequently revised in terms of their comprehensively and some questions were also

added to the forms. In a second step, the interview forms were examined by five experts in terms of language, clarity, potential for misunderstandings or ambiguities. The experts consisted of one faculty member and three PhD students at CEIT, in addition to one teacher of Turkish language. Based on the experts' feedback, some questions were enhanced and refined with respect to their clarity and grammar. In the final step, the "think aloud" method was conducted with a student who was not a participant of the main study, but had a similar background to the participants. The final version interview forms were then formed following completion of the review processes mentioned.

Two questionnaire forms are also used to gather information from participants. One is for demographic information, and the other is for satisfaction levels. Merriam (1998) placed questionnaires into documents as a data collection form and defined these kinds of forms as "researcher generated documents." She defined questionnaires as "documents prepared by the researcher … [in order] to learn more about the situation, person, or event being investigated" (Merriam, 1998, p. 119). Quantitative data collected by way of questionnaires can be used to support qualitative data collected through interviews (Merriam, 2009). Contrary to common belief, quantitative data can also be collected and integrated within case studies (Merriam, 2009; Woodside, 2010; Yin, 1981) in order to increase the credibility of the findings by employing multiple data sources. Therefore, questionnaires were used as a data collection form in the current study. Two questionnaires were employed in the study; the first being a demographic questionnaire, which was developed by the researcher based on the purpose of study. The second questionnaire consisted of a scale adopted from Chou and Liu (2005). This scale consisted of four Likert-type items ranging from (1) *completely disagree* to (5) *completely disagree*. It is used for measuring the satisfaction level of students about programming education in a virtual world. The adopted scale was written in English, and translated into Turkish by the researcher and an expert with prior translation experience. After the translation, draft versions of the questionnaires were sent to a Turkish teacher to check for clarity, grammatical errors, and for the appropriateness of the language used considering the age group of the current study's participants. Final versions of the questionnaires were achieved after revising the draft based on the feedback received. The necessary permissions were granted before starting to collect data from the participants. The research proposal and data collection instruments were submitted to the Institutional Review Board (IRB) of the university. The METU Ethics Committee examined the documents and sanctioned the study with a document number "28620816/341" on 09.09.2015.

3.3 Data Analysis

The analysis of qualitative data is the process of transforming data into meaningful explanations (Creswell, 2012; Merriam, 1998). Although scholars have provided many different descriptions and used many different terms for the processes of data analysis in their studies, the general process consists of three steps (Creswell, 2007). The first step includes the preparation and organization of data to be analyzed. In the second step, the data is reduced and condensed into themes and sub-themes by means of a special process called "coding." In the final step, the themes and sub-themes that emerged are presented through figures, tables and narrative text. Creswell (2012) extended these processes into six steps, which were followed during the analysis phase of this current study. In the first step, data collected through the forms were prepared for analysis. All the interviews records were transcribed verbatim. Then, all the information must be organized in a way so that it is easily accessible and "retrievable" (Merriam, 1998, p. 194). In the current study, a Computer Assisted Qualitative Data Analysis Software (CAQDAS) was utilized to analyze the qualitative data. As the next step, the coding processes was applied. Miles, Huberman, and Saldana, (2014) described code as labels assigned to a segment of information. Those labels are then used to categorize similar segments of information. At this point, the researcher needs to use an effective coding strategy that is appropriate to the data (Yıldırım & Şimşek, 2013) and to develop meaningful and manageable coding schema (Patton, 2002). In order to achieve these, data were read several times by the researcher and then in doing so, the code emerged and evolved throughout the analysis. After the data were reduced into a code list, the themes and sub-themes were created based on the similarity of code aggregating in parallel with the research question of the study. Analysis of each single case (within-case analysis) were finalized by the steps previously mentioned. For detecting the reliability of the study, intercoder agreement strategy was applied. Descriptive statistics was used for the quantitative data obtained from the satisfaction scale. Scores obtained from the scales were presented descriptively, with no statistical analysis applied.

Cross-case analysis is another type of analysis that starts right after the completion of within-case analysis (Merriam, 1998). While within-case analysis enables the researcher to understand and explain each case separately (Miles et al., 2014), cross-cross analysis enables the researcher to spot similarities and differences across the cases (Stake, 2005). After the analysis of each single case was completed, cross-case analysis was applied in order to compare and contrast

the emerging themes and sub-themes across the cases. Yin (2003) suggested using a table in order to present data from each case in a separate column in order to best exhibit the researcher's understanding of what differences and similarities were seen among the cases. Therefore, in the next section the findings revealed at the end of each within-case analysis are reported, and then findings of the cross-case analysis present the overall findings in tabular format, consecutively. Lastly, issues related to the credibility of the findings are addressed in the final part of this section to follow the last step of Creswell (2012).

Various strategies, as triangulation, prolonged engagement, peer debriefing, thick description and intercoder agreement, were used for assessing the accuracy of findings since each researcher is expected to assess the accuracy of their findings with the application of appropriate strategies and the reporting of them (Yıldırım & Şimşek, 2013), they need to persuade the wider academic community that their findings are indeed trustworthy (Merriam, 2009). For triangulation, different data collection forms, different interviewee (students and teacher), and different data analyst were used. Prolonged engagement was met since the researcher participated in all sessions of each case as a facilitator throughout the implementation. The researcher actively sought out interaction with both the students and the teachers in each case for this purpose. Peer debriefing strategy was employed by the researcher via consulting colleagues of the researcher who was were familiar with the research process followed. Thick description was achieved by providing detailed information about the participants and each of the cases, and providing direct quotations of the participants while presenting the findings. For intercoder agreement, two intercoders analyzed some parts of the data in addition to the researcher. Firstly, the researcher explained the purpose of the current study, the research question, the data collection procedure and the overall research design of the study in a detailed way in order to inform the intercoders about the study. Then, the researcher analyzed one of the student interviews with each coder separately in order to inform them about the themes and sub-themes developed by the researcher. After that, each intercoder independently analyzed a different student interview. Lastly, the researcher and the intercoders discussed any differences and tried to form a consensus about them.

3.4 Programming Environment: SDP

SDP refers to Sanal Dünyada Programlama which means Programming in Virtual World. It was comprised of two components; 3D learning environment including a number of

programming activities, and the Scratch for OpenSim (S4OS) program that is used for building code to complete activities in the 3D environment. Topics to be covered to teach basics of programming were specified by inspecting academic studies and educational textbooks prepared for teaching children programming. The activities were designed in OpenSim virtual world application based on an instructional theory, Goal Based Scenario (GBS).

3.4.1 Scratch for OpenSim (S4OS)

This program is used for creating code in the "Linden Scripting Language" (LSL), which is the original programming language of OpenSim. It is a modification of the original Scratch software that was modified by Rosenbaum (2008), a member of the MIT Lifelong Kindergarten team. In S4OS, users can build code by dragging and dropping known code blocks of the original Scratch program onto the 3D object being constructed. Unlike Scratch, S4OS does not produce any output of built code itself, but it is only used for creates LSL code based on the code blocks by the user. After building the code on this program, users then need to click the "Sanal Dünya Kodunu üret" (Generate Virtual World Code) button in order to translate the pseudocode of Scratch into LSL. After the translation process, learners attach the LSL code to an object or robots offered to them within the 3D environment in order to see the output of their code. Transferring code from S4OS to the virtual world is very easy and can be achieved simply through double-clicks by the user. Pellas (2014) argued that it could therefore be used easily by learners from primary school through to university level in order to create a wide range of 3D virtual artefacts in OpenSim.

The user language of the software's interface was English, but the researcher translated much of the interface into Turkish after obtaining the necessary permissions from the software's author. The S4OS interface is very similar to Scratch, except for stage and sprites. A screenshot of the S4OS programming environment is shown in Figure 1. As seen in Figure 1, the interface consists of four parts. There are eight code categories (top-left), with the relevant code blocks for each chosen category listed on the left. The area in the right-middle is used for dragging and dropping code blocks. Lastly, there is a button used for translating the code into LSL, labeled "Sanal Dünya Kodunu üret" (Generate Virtual World Code), and another button for translating the code from LSL to Scratch, labeled "kodu yapıştır" (paste code), which are both positioned at the top-right of the screen.

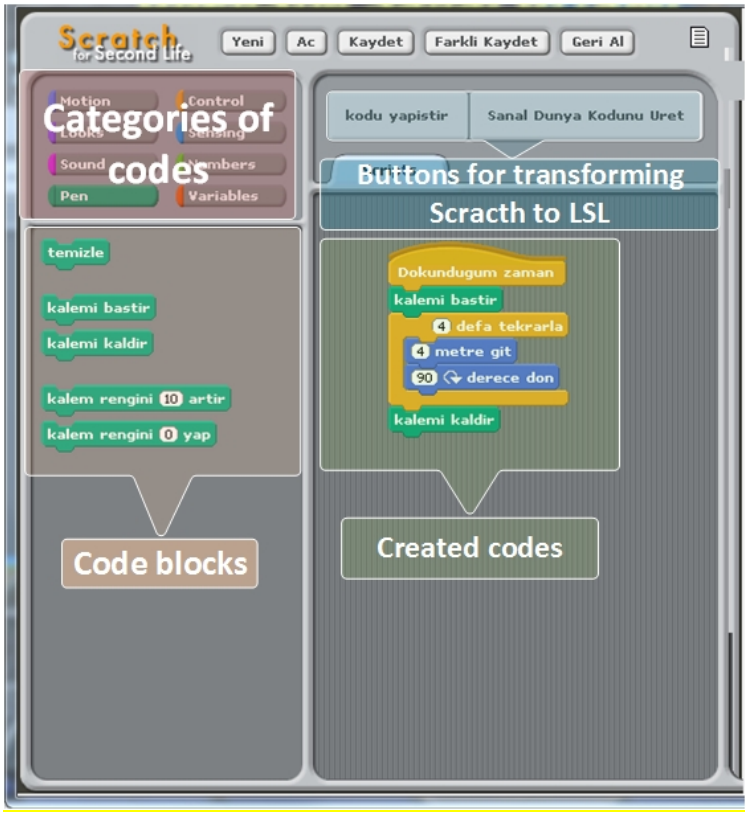

Figure 1. S4OS programming environment

3.4.2 3D Learning Environment

A 3D virtual learning environment was designed and developed based on a platform called OpenSim since it allows developers to customize and develop their virtual worlds based on their specific needs. Participants used a 3D viewer for connecting, navigating, and building objects in a 3D virtual world. In this current study, the Imprudence viewer was used due to its extensive support available for LSL (Choudhury & Banerjee, 2012), stability, and Turkish language support. Figure 2 shows a screenshot of the Imprudence viewer. Movement control, different forms of communication and customizing avatar appearance was possible via the components of viewer.

Figure 2. Screenshot of Imprudence viewer

The virtual learning environment was developed and built by the researcher in collaboration with experts. It was composed of two regions, named islands in OpenSim. The first island is for the orientation of students to the virtual world. The aim of this island is to introduce students to the generic skills of the VW including navigation within the environment, the creation of basic 3D robots and shapes, and the attachment of code required in order to keep them progressing on their chosen routes. The second is called "Sorunlu Kasaba," and was designed based on the theory of GBS. Students worked together on this island in pairs. There were a total of 24 tasks for each team and therefore each team member had 12 tasks to complete on the island. Each task was numbered from 1 to 12 and colored as either red or blue. A color was assigned to each student at the start of the study and they were tasked with completing all of the tasks with their corresponding assigned color. Each task was designed for the achievement of a specific learning goal.

The implementation phase of the study in each case consists of two parts taking place within two islands of 3D environment. The first part took place in the first island, which served as the

orientation of students to the virtual world. Students were introduced how to use the generic VW skills including navigation within the environment, creation of basic 3D robots and shapes, and the attachment of code to the objects created. The second part of the study took place in the second island. Students completed 12 tasks in this part one by one along with their teammate.

Results

Satisfaction could affect students' approach to course in a positive or negative way. Participants' satisfaction level in the current study was measured via the application of a questionnaire. In addition, qualitative data were gathered via interview questions in order to determine the factors affecting student satisfaction. In this section, firstly, the status of satisfaction level is presented based on the descriptive analysis of the quantitative data, and the results are also supported with qualitative data. Then, the factors according to increasing and decreasing satisfaction of the participants are addressed, respectively.

4.1 Current Status of Satisfaction

The satisfaction questionnaire was adopted from Chou and Liu (2005), and consisted of four items. Descriptive results of the questionnaire are given in Table2. As can be seen, the students' scores were generally high for each item for Case-1. The total mean scores (M = 4.35) were moderately high. This could be interpreted as students having been generally satisfied from the study. The qualitative results supported the quantitative results. However, in this case, there were some factors of decreasing students' satisfaction scores from the outset of the study since students experienced some problems. Those problems were overcome during the second part of the study. One of the students commented about this, "I did not expect something like this, but I am satisfied at the end. However, I was not satisfied at the beginning."

The overall mean score of Case-2 (M = 3.99) was moderately high. Only two items relating to VW benefits learning achievement (M = 3.70) and satisfaction of overall learning effectiveness (M = 3.75) were lower when compared to the other two items. Qualitative results indicated that the expectation of most of the students were met by the end of the study, except for only two students argued the opposite in Case-2. For example, CS2-STUDENT5 argued that the study met his expectations more than he thought; because he thought he would learn programming in the club from a simple programming tool such as Lightbot;

INTERVIEWER- So do you think this training met your expectations about programming?

CS2-STUDENT5- Yes but I wasn't expecting it to be like a virtual reality.

INTERVIEWER- So you were expecting something simpler?

CS2-STUDENT5- Exactly. I thought they would be simpler things like Lightbot for example.

Table 2
Satisfaction questionnaire results

	Case-1		Case-2		Case-3	
	M	*SD*	*M*	*SD*	*M*	*SD*
I was satisfied with SDP learning experience.	4.33	0.78	4.40	0.68	4.38	0.74
I think this SDP benefit my learning achievement.	4.17	1.19	3.70	0.80	4.38	0.92
I was satisfied with SDP.	4.50	0.52	4.10	0.85	4.13	0.83
I was satisfied with the overall learning effectiveness.	4.42	0.51	3.75	0.91	4.25	0.89
Total	4.35		3.99		4.28	

Descriptive results of the satisfaction questionnaire for Case-3 were similar to those of Case-1, and are presented in Table 2. As can be seen, the students ranked each item higher than four points. The overall mean (*M* : 4.28) was quite high compared to Case-2. Moreover, the mean of each item was higher than four points. The qualitative results revealed from the interviews supported the descriptive results. Most of the students mentioned that the overall lesson met their expectation and that they enjoyed the study. CS3-STUDENT3 assumed that the lesson would similar to a traditional lesson in which PowerPoint presentations were used. On the contrary, she argued that it was more than what she had expected;

INTERVIEWER- And did this training meet your expectations?

CS3-STUDENT3- Yes, it did. It was even better than I'd expected. I thought we would do it after learning some more things from the presentations. I did not know there would be games or something like that.

4.2 Factors increasing satisfaction

Factors causing increase in students' satisfaction level were investigated through interview questions. Emerging factors based on the results were group study, object construction, tasks, off-task activities, 3D environment, story of tasks and touring in the 3D environment. The most-cited factor increasing the satisfaction of the students in Case-1 was group study. Most of the

students (n = 6) argued that being together in groups and doing tasks together was a satisfying factor. Students really liked being a member of a group and to do the tasks together. CS1-STUDENT2 commented on group study as, "Being together was the thing I liked the most." The other increasing factor stated by five of the students was regarding the tasks. Students mentioned that they liked the tasks that needed to be completed. Another factor was object construction, as stated by two students. The students liked to build 3D objects such as bridges, turtles, and walls of a shelter, and to code them. Other factors stated by one student were off-task activities, the 3D environment and tour of the environment. Students did not like to build objects related to tasks, but also they did like off-task activities. Moreover, traveling in the 3D environment as they wished was seen as a satisfying factor for one student.

The factors increasing the satisfaction of students in Case-2 were similar to those of the first case. There was only one emerging factor that was different from the first case, which was about the story of tasks. The most-cited factor increasing the satisfaction of students in this case were object construction, 3D environment and off-task activities, which were each stated by six of the students. For example, CS2-STUDENT2 highlighted his greatest liked as, "It is possible to build and program what you want." Off-task activities and the 3D environment were the other emerging factors. Students liked to do extra things that were not related to the tasks they had been assigned in their free time. CS2-STUDENT2 and his teammate liked to resize the objects they constructed as an off-task activity in their free time after having finished their tasks and while waiting for the others to complete their own tasks;

> *CS2-STUDENT2- But when my teammate and I were waiting for others to finish after we were done with ours, we were creating more complicated stuff like houses with the things we used for other tasks, which we liked more.*

Group study and tasks were the other emerging factors, with group study cited by five of the students, and tasks cited by four of the students. Similar to students in Case-1, students liked to be in a group and defined the group study as having been enjoyable. For example, CS2-STUDENT2 defined this issue as studying in a group and being able to receive help were enjoyable and fun. Stories about each task was another emerging factor, which is different from Case-1. The teacher of Case-2 and three of the students mentioned this factor. The students stated that stories about the tasks provided them with a mission, a reason to complete the tasks and the stories were creative, funny, and exciting. The teacher of this case also argued that the

stories were helpful since they drew the students' attention to the tasks and it was a satisfying factor for the students to complete the tasks;

> *INTERVIEWER- And Madam, every task had a story. What do you think about those stories?*
>
> *CS2-TEACHER- This is what we always do also in our lessons. I mean it definitely should have a story or a scenario and the kid should concentrate on that scenario so that s/he would feel enthusiastic while completing the tasks. I think it's satisfactory.*

The last factor that emerged was touring in the 3D environment, which was mentioned by two of the students who liked to travel in the 3D environment by way of walking, flying, and driving cars.

Results showed that the emerging factors for Case-3 were similar to those ones of Case-2, but with different frequencies. The major increasing factor in the satisfaction of the students (n = 6) was object construction. All of the students in this case mentioned this issue as a satisfying factor. CS3-STUDENT6 expressed her feeling as, "I most liked being able to build objects, which does not happen so fast in real life." The other most satisfied factor was group study, as stated by five of the students. In this case, the students liked being in a group as much as the students in the other cases. They expressed their feelings about group study as more enjoyable and fun. Off-task activities were the third major factor, which was stated by four of the students. In this case, the students liked to do off-task activities such as playing in the 3D environment with their friends, chatting in the breaks and so on; similar to the students of the other cases. The other factors were tasks, 3D environment and story of tasks, which were each stated by three students. The students stated that they liked the tasks and their stories as well as the 3D environment. For example, one of the students, CS3-STUDENT4, mentioned that the 3D environment was fascinating and had a well-planned story and that they all had a good rapport with each other. The last factor stated was touring the 3D world. Traveling by car was stated by one of the student as the most enjoyable;

> *CS3-STUDENT4- The story was well-matched with the island too. The island was planned very well, the story and everything were perfect. Actually the tasks, story and the island matched together very well.*

4.3 Factors decreasing satisfaction

Some factors revealed from the interview responses led to a decrease in the students' satisfaction. Those were technical problems, difficulty of task, avatar-related problems, difficulty of use and rearranging the code for the students of Case-1. Students studied alone in the first part of the study, and then studied alongside a teammate in the second part. Studying alone was the most-cited (n = 3) factor decreasing satisfaction of the students. Being alone was considered as boring and undesired for the students. For example, CS1-STUDENT2 expressed her feeling about studying alone as it being rather boring. Other decreasing factor was the technical problems encountered by two of the students. Technical problems were inevitable; however, they need to be limited to a minimal level. In this case, the students experienced some technical difficulties in the first part of the study due to poor computer hardware issues and weaknesses related to the infrastructure. One of the students highlighted that the technical problems he had faced decreased his satisfaction;

> *INTERVIEWER- ... Did any difficulty you had with computer affect your satisfaction?*
>
> *CS1-STUDENT3- Sometimes I was upset because I couldn't. Because once, it just skipped… My computer was shut down and I couldn't complete the tasks. And I am also stressed out when it slows down. So all these affected my satisfaction badly.*

Other factors were difficulty level of tasks and difficulty of use. Two students mentioned that difficulty of some tasks were above their level of capability. Difficulty of use was the other factor decreasing satisfaction. Of the total students, two claimed that it was difficult to use the programs and that this led to them to disliking the VW experience. The most problematic structure of the program was the inventory. CS1-STUDENT7 mentioned that she did not like to use the VW due to difficulty using its inventory and the complex structure;

> *INTERVIEWER- So was there anything that you didn't appreciate?*
>
> *CS1-STUDENT7- The inventory was a bit complicated. It was difficult to move it from left to right. And I also failed at drag and dropping them [from inventory]. They were the difficulties that I faced.*

Other factor was about the avatar that was stated by two of the students. It was not possible to move avatars when they became jammed in some parts of the 3D environment. Two students defined this situation as annoying. The last factor stated by one of the students was the need to rearrange code when they were wrong. CS1-STUDENT7 described this situation as frustrating;

explaining that she tried to rebuild the code when she got it wrong, however, in this situation; she became bored and thought about just giving up;

> *CS1-STUDENT7- ... Once you build the wrong code, you try to do it again but this time it gets boring, you think "Should I do it again, or not…"*

The factors decreasing the satisfaction of the students in Case-2 were quite similar to those in Case-1. A less than realistic environment and difficulty of use were the two most-cited factors decreasing satisfaction. Four of the students found the environment less than realistic and the graphics of the objects were defined as low. CS2-STUDENT5 commented on this issue as, "It seems that the 3D environment was less than realistic and the graphics of the 3D objects were low." Difficulty of use was cited by four of the students as another factor. The inventory and arranging the pop-up screen were stated as complex and also less liked. It was mentioned that it could be easier to use and thereby simpler to cope with. Being left to work alone in the 3D environment, technical problems encountered and the difficulty of the tasks were stated by three of the students as the least-liked. CS2-STUDENT3 mentioned about the difficulty of tasks; adding that he would be more satisfied if they could have been made easier. Technical problems encountered were considered as annoying situations for some of the students. CS2-STUDENT7 pointed to a technical problem as, "I did not like it when the computer froze." Issues related to the avatars such as getting jammed in the environment and not being able to change accessories were other factors stated by two of the students. Being alone was another factor that also decreased satisfaction. Students generally studied with their peers; however, they were alone in some situations. One of the students mentioned about studying alone as;

> *CS2-STUDENT6- As I said, it was boring when we were on our own, we couldn't do anything. Go there, put it, make this, turn it, and the task is over. But now that we have our friends, we go to the task, and do it together. I mean we help each other.*

The results of Case-3 showed that technical problems, studying alone, a less than realistic 3D environment, the difficulty of the tasks and avatar-related problems were all factors decreasing the satisfaction of the students in this case. Technical problems were the most-cited, as mentioned by four of the students. For example, one of the students mentioned this as;

> *INTERVIEWER- And what was the thing that you did not like in this environment?*
>
> *CS3-STUDENT3- [computer] froze once in a while, it was continuing on its own and it was not very good.*

The other factors were only stated by one of the student in this case. While one stated that being alone would be boring for him, another found the use of the VW hard. These were stated as annoying factors which caused them to be less satisfied. Moreover, one of the students compared the VW with the real world and commented that the VW was less than realistic. CS3-STUDENT6 explained this issue with an example, arguing that although it was possible to understand the direction of a ball in the real world, it was not possible to realize this in the VW; adding that this was so frustrating for her;

> *CS3-STUDENT6- ...For example if I [had] a ball in real life, I would know where it would go. However [in virtual world] you have to change the direction of the ball all the time because you do not know the direction [that the ball would go to]. It really upset me.*

4.4 Cross-Case Analysis

The students' satisfaction level was measured via a questionnaire in each of the three cases. The students' overall mean satisfaction scores for each case were just higher than four points. The descriptive results of the quantitative data show that the most satisfied students were from Case-1 (M = 4.35), Case-3 (M = 4.28) and Case-2 (M = 3.99), respectively. Students of Case-1 were not so satisfied in the first part of study due to the technical and infrastructural problems that they experienced. However, those problems were overcome in the second part of the study, which could be why their scores were higher than others in the end. It seems that the least satisfied students were those from Case-2. This might due to fact that they were in a more crowded class and it was impossible therefore for the teacher to deal with all the students to the same extent as the other cases. Moreover, some of them had high expectations from the club. Using VW in the club was unknown to the students before joining the club and it might therefore not have met their expectations as a whole. Students of Case-3 knew that the VW would be used to teach the basics of programming, having been informed and volunteered to take part in the course. This may explain why their satisfaction scores were above four points, almost to the level of the students of Case-1.

Increasing factors in the satisfaction of the students were determined in all three cases. Apart from the story about the tasks, other factors emerged across all three cases at different ratios (see Table3). Story of the tasks was not stated as an increasing factor by the participants of Case-1. This may be due to the students in that case either disliking or having ignored the stories. The most satisfied factor stated by the students across all cases was group study. Building and

programming objects together, off-task activities and the 3D environment were stated as the most satisfying factors for both Case-2 and Case-3, but they were not found so satisfying by the students of Case-1. However, Case-1 was applied as a more formal class exercise than the other cases. Due to timetabling problems in this case, students did not have so much free time to do off-task activities and explore the 3D environment on their own.

Table 3
Frequencies of Factors Increasing Satisfaction across the Cases

	Case-1		**Case-2**		**Case-3**	
	n	***%***	***n***	***%***	***n***	***%***
Group study	6	86	5	50	5	83
Object construction	2	29	6	60	6	100
Having tasks	5	71	4	40	3	50
Off-task activities	1	14	6	60	4	67
3D environment	1	14	6	60	3	50
Story of tasks	-	-	3	30	3	50
Tour in the 3D environment	1	14	2	20	1	17

As to the factors that decreased the students' satisfaction levels; technical problems, studying alone, difficulty of the tasks, and avatar-related problems were all factors stated by some of the students across all cases (see Table 4) that decreased their satisfaction. However, a less than realistic 3D environment was not found as a decreasing factor for the students from Case-1, but was found to be the most decreasing factor in Case-2 and less so in Case-3. This implies that while the students of Case-2 had a high expectation about the reality of the 3D environment, it appears that the students from Case-1 had no concerns about this issue. On the other hand, the students from Case-3 found the system easy to use and no student from this case not mentioned any difficulty of use as a decreasing factor.

Table 4
Frequencies of Factors Decreasing Satisfaction across the Cases

	Case-1		**Case-2**		**Case-3**	
	n	***%***	***n***	***%***	***n***	***%***
Technical problems	2	29	3	30	4	67
Studying alone	3	43	3	30	1	17
Difficulty of tasks	2	29	3	30	1	17
Avatar-related problems	2	29	2	20	1	17
Less than realistic environment	-	-	4	40	1	17
Difficulty of use	2	29	4	40	-	-

Discussion

Results of the students' satisfaction questionnaire across the three cases were almost all in excess of four points; with only the mean score in Case-2 slightly lower, but quite acceptable. One possible explanation for this might be that the class was more crowded and it was therefore more difficult for the teacher to deal with all the students. Another possible explanation might be that some of the students had high expectations from the club and using the VW might not have satisfied their expectations as a whole. Similar to this situation, the findings of Case-1 corroborate the second explanation because the students in Case-1 had low expectations from the current study and their satisfaction level was the highest. The overall results of each single case are consistent with previous studies, showing that the use of VW with its distinctive features has a positive effect on students' satisfaction in general (Hew & Cheung, 2010), and in programming education (Buffum et al., 2015; Girvan et al., 2013; Hulsey et al., 2014; Pellas & Kazanidis, 2014). Factors affecting the students' satisfaction are discussed in the following part. While designing VWs for programming education, these issues should be kept in mind.

4.5 Factors increasing satisfaction

Factors affecting students' satisfaction were revealed in the current study. Group study, object construction, tasks, their stories, off-task activities, the 3D environment and touring the environment were found as factors that increased the satisfaction level of the students. Group study and tasks were the most-cited in all three cases. Findings of the literature review are also in line with the findings of the current study. These results validate the findings of previous studies, arguing that having a partner and tasks that draw the attention of learners are factors associated with increasing the satisfaction of leaners (Bishop-Clark, Courte, & Howard, 2006; Buffum et al., 2015; Crellin, Duke-Williams, Chandler, & Collinson, 2009; Girvan et al., 2013; Rico, Martínez-Muñoz, Alaman, Camacho, & Pulido, 2011).

There were no major differences among the factors except for the story of the tasks across the cases. The story of the tasks was not found as a factor in Case-1. Object construction, off-task activities, and the 3D environment were not mentioned as increasing factors by the students of Case-1 as much as in the other two cases. Differences across the cases may therefore be due to timetabling issues associated with Case-1, where students did not have so much free time to do any off-task activities or explore the 3D environment at will. Results of the single cases are

therefore in line with the literature review, showing that generic features of VWs such as the ability to move around freely (Hew & Cheung, 2010), being able to create 3D objects and code them without difficulties (Girvan et al., 2013), and the existence of fun activities (Esteves, Fonseca, Morgado & Martin, 2009) made the learning process enjoyable for the students. Additionally, "Working with peers on something meaningful is usually significantly more engaging and fun" (Berland, 2017, p. 140).

4.6 Factors decreasing satisfaction

Technical problems, studying alone, difficulty of tasks, and avatar-related problems were the least-liked factors stated by some students across all three cases and caused a decrease in the students' satisfaction. Previous studies found that technical problems were the biggest obstacle to student satisfaction in the use of VWs for educational purposes (Dawley & Dede, 2014; Hew & Cheung, 2010; Rosenbaum, 2008). The literature review shows that challenging tasks could lead students to Paper's (n.d.) "hard fun"; however, it might also lead them to frustration and getting stuck when the difficulty of tasks increased beyond their ability or comfort level (Brennan, 2013). The difficulty of tasks emerged as a factor that decreased satisfaction in the current study, which seems to be concerned with the latter argumentation of Brennan (2013). This finding suggests that there should be adequate support available for the students in order to prevent this situation from occurring.

Difficulty of use was also stated as a decreasing factor for student satisfaction. Some complex structures of the VW were mentioned in the first research question that could be the cause of this situation. Surprisingly, a less than realistic environment was not found as a factor decreasing satisfaction in Case-1, but it was found as the most decreasing factor in Case-2 and less so in Case-3. This shows that while students of Case-2 had high expectation about the realism of the 3D environment, students of Case-1 did not have any concerns about this issue.

Conclusion and Recommendation

VWs could be used as a programming environment for children. The multiuser nature of VWs, code visualization in 3D format, contextualization of what was learned in real life, and providing multifaceted feedback allow children to better understand the basics of programming. Findings showed the satisfaction level of children enrolling in each particular educational

program and the factors affecting satisfaction. Those factors and issues should kept in mind while using VWs to teach programming for children. Similarities and differences among educational programs were revealed, which might be important for educators, school management and other stakeholders wanting to teach programming.

This study was conducted in a physical environment, with students participating in virtual learning activities within a computer laboratory. They interacted with each other in both the real world and the virtual world. Real world interaction could affect children's virtual world interaction. Therefore, similar studies could be conducted with participants physically separated by location to investigate the dynamics of the virtual environment. Multiple dedicated servers were used in the current study. However, only one dedicated server could be used by eliminating bandwidth and server problems. The OpenSim application was used in the current study as a VW application. Further research could be conducted with applications with different features to investigate their effects on programming education.

Statements on ethics and conflict of interest

The necessary permissions were granted from the Applied Ethics Research Center of the university with a document number "28620816/341" on 09.09.2015. Signed consent forms of both the parents and students were taken before starting to collect data. Ethical issues were considered throughout the study. There is no conflict of interest in this study.

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Research Article

Views on Interactive E-Book Use in Science Education of Teachers and Students Who Perform E-book Applications[1][2]

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Abstract

In parallel with the development in information and communication technologies, technology integration has been initiated in science education programs and lesson environments, and educational e-contents have been created by National Education and related institutions by making the books compatible with technology supported education. In parallel with this situation, the aim of the study was to obtain the interactive e-book views of the teachers and students performing the applications. This research, conducted in accordance with the case study, was carried out with three teachers working in three different secondary schools in Bursa and 71 students studying in their classrooms. Interactive e-book prepared in HTML format was developed by the researcher. The student opinion form, student interview form and teacher interview form were used as data collection tools. The data obtained were analyzed in accordance with the content and descriptive analysis. In the findings obtained from the teachers, it was understood that the teachers liked the interactive e-book and found it useful. The main reason for this is thought to be that the interactive e-book was prepared as a progressive system in line with the regular, systematic and curriculum objectives. In addition, students stated that they liked the interactive e-book and found it beautiful. In this context, it can be said that similar interactive e-book examples can be created in different science subjects.

Keywords: *Interactive e-book, view, secondary school student, science teacher, science education.*

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Uygulamaları Gerçekleştiren Öğretmen ve Öğrencilerin Fen Eğitiminde Etkileşimli E-Kitap Kullanımına İlişkin Görüşleri

Öz

Bilişim ve iletişim teknolojilerinde gelişime paralel olarak fen bilimleri öğretim programlarına ve ders ortamlarına teknoloji entegrasyonu yapılmaya başlanmış ve kitapların teknoloji destekli öğretime uyumlu hale getirilerek Milli Eğitim ve ilgili kuruluşlar tarafından eğitsel e-içerikler oluşturulmaya başlanmıştır. Bu duruma paralel olarak yapılan çalışmada, uygulamaları gerçekleştiren öğretmen ve öğrencilerin etkileşimli e-kitaba ilişkin görüşlerinin alınması amaçlanmıştır. Durum çalışmasına uygun olarak gerçekleştirilen bu araştırma, Bursa ilindeki üç farklı ortaokulda görev yapan üç öğretmen ve onların sınıflarında öğrenim gören 71 öğrenci ile sürdürülmüştür. Çalışmada HTML formatında hazırlanan etkileşimli e-kitap araştırmacı tarfından geliştirilmiştir. Veri toplama aracı olarak öğrenci görüş formu, öğrenci görüşme formu ve öğretmen görüşme formu kullanılmıştır. Elde edilen veriler içerik ve betimsel analize uygun olarak analiz edilmiştir. Öğretmenlerden elde edilen bulgularda; etkileşimli e-kitabın öğretmenler tarafından beğenildiği, faydalı bulunduğu anlaşılmıştır. Bu durumun temel nedeninin; etkileşimli e-kitabın düzenli, sistemli ve kazanımlara paralel olarak aşamalı bir sistem şeklinde hazırlanmasından kaynaklandığı düşünülmektedir. Bununla birlikte yapılan çalışmada öğrencilerin etkileşimli e-kitabı beğendikleri ve güzel bulduklar ifade etmişlerdir. Bu bağlamda farklı fen konularında benzer etkileşimli e-kitap örneklerinin oluşturulabileği söylenebilir.

Anahtar Sözcükler: *Etkileşimli e-kitap, görüş, ortaokul öğencisi, fen bilimleri öğretmeni, fen eğitimi.*

Introduction

In parallel with the rapid increase in information and the development in technology, there have been changes in the features that individuals should have. Turkish Industry and Business Association (TUSIAD) (2017) in particular, stated that Turkey needs to create a workforce that is creative, innovative, interdisciplinary thinking and has the necessary skills in technology and digitization by providing a strong STEM infrastructure to its young population in order to realize its potential. Similarly, in Science Education, individuals are expected to be inquiring, critical thinking, problem-solving and decision-making skills, lifelong learners, and have the science-related skills, attitudes, values and understandings necessary to understand nature (Çepni & Çil, 2009). At this point, learners need to be equipped with 21st century skills for their future academic, professional and personal success, and to this end, the development of information and communication technologies (ICT) literacy becomes an important function of educational institutions (Doğan, Murat & Seferoğlu, 2016).

In parallel with the developments in information and communication technologies, technology integration has gained importance in teaching environments. It can be said that one of them is the science course, technology integration is done to the course environments and books are started to be adapted to technology-supported teaching. At this point, the creation of e-content, e-books and especially e-books compatible with the program in science education has become important for the literature. Interactive e-books, unlike e-books, contain multimedia objects (audio, video, animation) and interaction (such as touch, drag). Interaction is seen as the center of an educational experience and is positioned as the main focus of online learning (Garrison & Cleveland-Innes, 2005). In this way, content and books will be enriched and students' participation in classes will be increased in parallel with their interest in technology. As stated by Bozkurt (2013), interactive e-books have started to attract attention due to the flexible and easy use of the content with its enriched environment options and easy-to-use presentation and access options.

It is thought that there is a need to discover new ways to support new digital technologies such as interactive e-books and e-contents (Barate, Ludovico & Mangione, 2014). In this context, while developing an interactive e-book has an important place in the field, it can be said that

there is a lack of interactive science teaching material for technology integration in our country. At this point, when we look at the studies on interactive e-books in the literature, it can be said that studies on the subject have started (Baughman, Ehmann & Vilcheck, 2013; Erdoğdu, 2016; Erişti, Uluuysal & Dindar, 2013; Gebya Oktammeria & Novita, 2012; Hakkari, Yeloğlu, Tüysüz & İlhan, 2017; Laili & Novita, 2014; O'Mahony, 2014; Önder & Sılay, 2016; Soga, Nakahara, Kawana, Fuse & Nakamur, 2015; Tania & Fadiawati, 2015). However, many of the studies on interactive e-books are theoretical. In this context, it can be said that interactive e-book applications are carried out and studies are needed to obtain teacher and student opinions.

In the study, while developing interactive e-book, it was aimed to use both ICT tools such as interactive board and animation and to use the inquiry based learning approach suggested by the program. As the guided inquiry method is recommended at the sixth grade level, this was taken into account in the study. Inquiry-based learning is used in teaching programs and can be included in an interactive e-book. It is thought that it will contribute to the students in terms of involving the situations related to daily life in inquiry, finding and solving the existing problems by themselves, and using the skills required in addition to the knowledge in this process. The inquiry approach is a recommended approach to use in our country, and with the development of technology, the importance given to web-supported materials is increasing. In this study, a guided inquiry approach enriched with an interactive e-book enriched with information and communication technologies such as interactive board, Animation, animated concept caricature, and an interactive e-book were created. In this context, it is aimed to obtain the interactive e-book views of the teachers and students performing the applications.

Conceptual Framework

The addition of multimedia features such as video, audio, animation, game, and animated command to e-books has enabled interactive e-books to be more preferable than printed interactive books (Kara & Keş, 2016). New generation smartphones, tablet computers and other mobile devices have already opened the way for the development of interactive e-books with their powerful hardware features (Bozkurt & Bozkaya, 2013a). Similarly, it is aimed to turn the books used by the Ministry of National Education into enriched books (interactive e-books), to design interactive videos and course materials under the name of e-content and to share them from the website to be established (MoNE, 2010). In this context, all these developments began to necessitate the conversion of books into interactive e-books. The visual of the book, e-book

and interactive e-book interactions with the user is given in Figure 1. When the figure is analyzed, it is understood that the interaction and diversity increased from the traditional book to the interactive e-book.

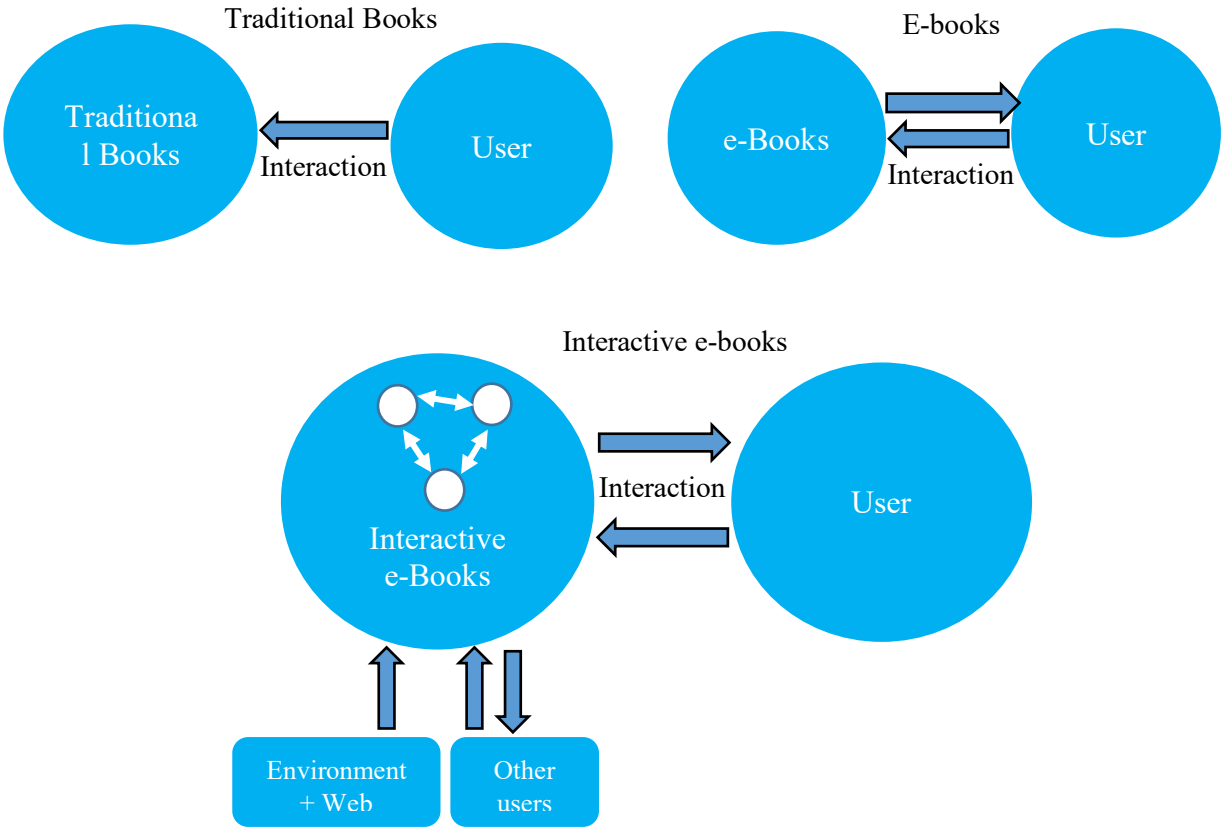

Figure 1. Book, e-book and interactive e-book interactions with the user (Bozkurt & Bozkaya, 2013b)

Enriched e-book, also known as interactive digital book is a digital version of the book (printed or e-book) digitally equipped with various elements such as videos, photographs, animations, mini-tests, maps and special symbols (Arslan, 2014). In other words, interactive e-books (iBook) are e-books enriched with various features where interactive experiences such as audio narration, embedded media and hyperlinks are presented to the user (Belveal, 2016). Interactive e-books are a type of e-books that contain and support multimedia content (Alfrijat, Al-Msie'deen & Alhalhouli, 2010). With these added multimedia objects, books turn into interactive e-books (Gümüş, Güler, Güler & Erorta, 2012). Text, audio video, image, figure, table, chart, graphic, model, dictionary, self-assessment studies, surveys, activities, research activities, problem situations, reviews, concept map, presentation files, demonstration, videos and similar resources, digital sources (Gasouka, Kapaniaris, Arvanitidou, Foulidi & Raptou,

2013). In this context, it can be stated that multimedia objects have an important place in interactive e-books. In addition, another important feature of interactive e-books is that it contains interaction. The ability of the student to perform actions such as selecting, marking, changing, stopping by touching the interactive e-book, in other words, interfering with the content makes these books more attractive (Özer & Türel, 2015). As Phadung (2015) states, the design principles of the interactive e-book include multimedia (image, animation, video etc.), interaction and learning design.

The widespread use of mobile devices and the internet has also changed the e-book approach (Özoğlu, Kaysi & Özoğlu, 2014). In other words, many applications or programs started to be used in the interactive e-book development process. According to Gümüş et al. (2012), common e-book formats are “(.pdf) - PDF (Portable Document Format) - Adobe”, “(.djvu) - DjVu - AT&T Lab.”, “(.Epub) - ePub (Electronic Publication) - International Digital Publishing Forum (IDPF) ”,“ (.prc, .mobi) - Mobipocket ”,“ (.azw) - Kindle - Amazon ”,“ iBook- Apple ”,“ Microsoft LIT - Microsoft ” Are "(.txt) - Platin text", "(.html) - HTML". In this context, many applications are used in the development of interactive e-books, and HTML is among them. Especially HTML5 web technology is adopted in e-books in order to meet the need for multimedia and rich user interaction (Choi, Lee & Kim, 2014). In this study, all these applications were examined, and HTML format was preferred because of the large size of the material and to increase its sustainability.

The approach based on interactive e-book is inquiry-based learning, which is also included in science curricula. Inquiry-based learning can be expressed as the whole of the knowledge, skills and attitudes that individuals acquire while having questions about the world and answering the questions with scientific studies (Karakuyu, Bilgin & Drive, 2013; Kızılaslan, Sözbilir & Yaşar, 2012). In guided inquiry used in the study, the teacher only gives the problem and materials to be investigated, and the students follow their own procedures to solve the problem (Colburn, 2000; Colburn, 2004; Nivalainen, Asikainen & Hirvonen, 2013). In the study, guided inquiry based learning approach is based on interactive e-books and different teaching techniques are used to enrich. In this study, it was tried to enrich the interactive e-book by using experimental learning, web supported learning, animations, animated concept cartoons and interactive whiteboard by considering the content and scope of the unit. Experiment method is the way students learn by researching teaching subjects in laboratories or private classrooms, individually or in groups, such as observation, experiment, hands-on learning (Karakuş, 2006).

Parallel to the experiments and activities taking place in science education, the use of experiments was deemed appropriate. Another technique is concept cartoons. Concept cartoons include discussions about a scientific concept from a daily situation or daily life in a particular branch of science (Steininger & Lembens, 2012; Stephenson & Warwick, 2002). In line with the fact that the discussion environment has an important place in research-based learning, the use of concept cartoons has been deemed appropriate. It has been deemed appropriate to turn concept cartoons into animated concept cartoons in order to provide technology support and to be used more effectively. In addition, the animation used in the study can be defined as moving pictures that depict the movement of drawn objects (Mayer & Moreno, 2002). In parallel with the whole process taking place on HTML, it can be stated that it is web supported learning. Web-assisted learning is a hypermedia-based curriculum that uses www's attributes and resources to create a meaningful learning environment in which learning is supported (Khan, 1997). In addition, interactive whiteboards, which have gained importance in recent years with their interaction feature, are also included in the enrichment process. Interactive whiteboard is a large touch screen electronic board that works by establishing a computer and projection connection (Akbaş & Pektaş, 2011; Campbell & Martin, 2010). In this context, enrichment was provided with both teaching methods and ICT tools, and the structure of the interactive e-book sample was tried to be created.

Methodology

In this study, the case study was used as it was aimed to apply the interactive e-book sample and to get the opinions of the students and teachers regarding this process. Case study is a method that explains the very fine details of an event, person or group, and the interrelationships of cause-effect and variables (Çepni, 2018). In the research, it was thought to be suitable for the case study since a situation was determined and a deep understanding was provided.

Study Group

The study group consists of three teachers working in three different secondary schools in Bursa and their classes. Research permit numbered 86896125-605.01-E.9113990 was obtained

within the scope of the study. While choosing schools in the study, the physical conditions of the schools have been taken into account as interactive e-books will be implemented and interactive board and internet connection are needed in the process. Purposeful sampling was chosen in this study. Three teachers participated in the study, teacher A has about 10 years of experience, teacher B has about 20 years of experience, and teacher C has about 30 years of experience. Before starting the study, teachers were observed for a certain period of time and course processing processes were recorded with the help of an observation form. The teaching features of teachers are classified based on the data obtained from observations. Teacher A is a teacher who tries to use laboratory and active learning approaches effectively in her lessons. Teacher B, on the other hand, uses the science laboratory even though it is not very active, pays attention to the use of computers and interactive boards. Teacher C occasionally takes place in active learning approaches and use of technology, and continues her classes in accordance with a more classical understanding. However, all teachers are willing to continue their lessons through interactive e-books. When we look at the students participating in the study, a total of 71 sixth grade students, 22 from secondary school A, 26 from secondary school B, 23 from secondary school C participated. 33 of the students are female and 38 are male.

Data Collection Tools

In the study, opinion questionnaire and semi-structured interviews were used to get student opinions, while semi-structured interviews were used to get teacher opinions.

Student opinion survey: In the study, opinion questionnaire was used in order to obtain student opinions on web-supported science material in accordance with the guided inquiry approach. At this point, it was decided that the opinion questionnaire consisting of open-ended questions was appropriate since it was difficult to analyze the questions by applying semi-structured interview questions to all of the students in the study and to reach the opinions of all students. While creating the opinion questionnaire in the study, first of all the questions were formed in parallel with the main purpose. It was then submitted to the expert's opinion for content and facial validity. As a result of the examinations of two experts in the field of science education, the opinion survey was finalized in parallel with the suggestions and corrections. However, for the comprehensibility of the questionnaire, it was checked by a person with a feature parallel to the study group and its understandability was checked. Opinion questionnaire focused on students' opinions about the material developed, the effects of the material, pros and cons.

Student interview form: In addition to the opinion questionnaire, a semi-structured interview form was also used to obtain student views. In the development of the form, a process similar to the opinion form has taken place. Semi-structured interviews were conducted with 25 students, including nine from secondary school a, eight from secondary school B, and eight from secondary school C. When selecting students, consideration was given to the selection of students who are at different levels in terms of their demographics, science achievement and participation in the course, taking into consideration the basis of volunteerism. Interviews were conducted separately with each student and each interview was recorded with a voice recorder. The names of the students interviewed were kept secret and the students were named with codes such as SA1 (Student A school 1), SA2 (Student A school 2), SB1 (Student B School 1), SC1 (Student C school 1)…

Teacher interview form: In the study, semi-structured interviews were used to obtain teachers' opinions on the use of web-supported science material in accordance with the guided inquiry approach. While preparing the semi-structured interview form, first of all the studies in the literature were examined and the first questions were given. The questions were then examined by two science education experts and the questions were analyzed in terms of content and face validity. Experts stated that a question should be added about what the teachers liked and disliked on the website, and sub-questions such as cognitive effects and affective effects of the method should be added to the questions related to the effects. As a result of the arrangements, the final form of the form was given. Semi-structured interviews were conducted with three teachers after the applications. One of the teachers is woman and two are men. Interviews were conducted individually with each teacher and recorded in sound. Then, the interviews were listened one by one and transcribed. The names of the teachers interviewed were kept secret and the teachers were coded as A, B and C.

Material Development Process

In this study, interactive e-book was prepared by the researcher in HTML format. The content of the interactive e-book was developed in accordance with the web-supported guided inquiry approach. The guided inquiry approach used the steps of the research cycle developed by Llewellyn (2014). The process started with a research question in the first step, the inquiry step. In this process, animated concept cartoons, an event or animations from daily life were used.

In this context, it can be stated that multimedia objects are frequently used in the query step. In the section of revealing the existing information, which is the second step, brainstorming and open-ended questions were used to examine the students' prior knowledge. Students were asked to establish a prediction sentence or hypothesis to find an answer to the research question during the prediction. Since the guided inquiry approach was used in planning and making the application, the teacher planned the activity, prepared the objectives and materials. Then, students were asked to perform the experiments or activities sometimes individually and sometimes as a group. However, some experiments and activities were carried out as a demonstration experiment due to lack of material. At this stage, the material or process is supported by multimedia objects. In the next step, commenting, students were asked to analyze their observations and data and come to a conclusion. In this section, students can make the necessary calls using the Internet. In the presentation of the results, the students share their findings and information in the classroom. In this part, theoretical information is given as the course is summarized. Then, evaluation activities were initiated. In this process, multimedia objects (audio, video, visual animations, simulations, etc.) are integrated into all steps where necessary. In this context, it can be stated that the interactive e-book contains both multimedia objects and includes interactive features. The material was applied by the teachers throughout the sixth grade "Systems in Our Body" unit in middle school. Some images related to the material are given in Figure 2 and the entire material can be accessed at http://www.ummuhanormanci.com/zkitap/.

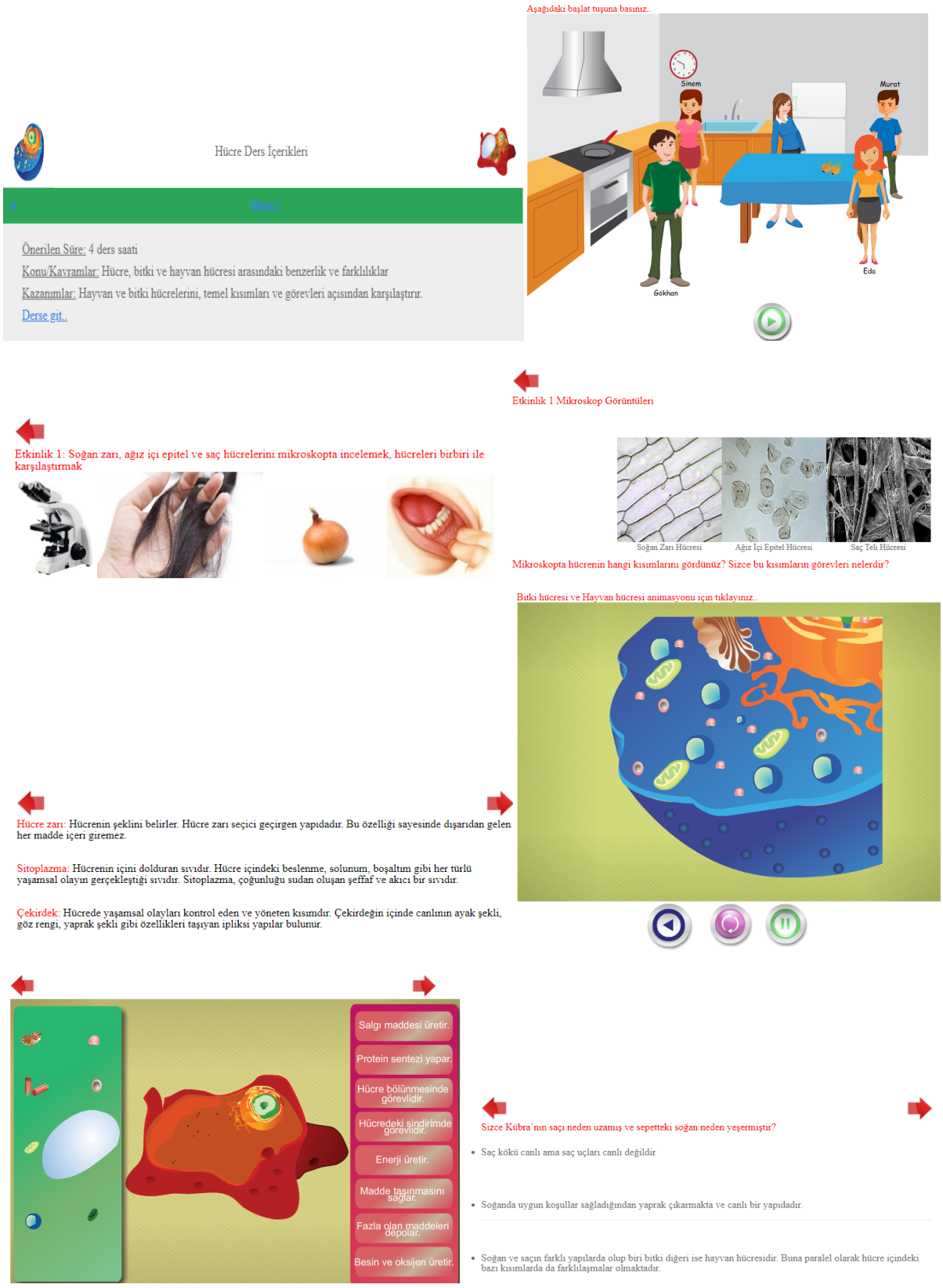

Figure 2. Examples of interactive e-book pages

Data Analysis

While the data obtained from the opinion questionnaire was analyzed with content analysis for the students, some of the data obtained from the interviews were used to support content analysis and some were used to support the data obtained from the opinion survey. The data obtained from teacher interviews were subjected to descriptive analysis.

Findings

In the study, student opinion questionnaire and student interviews were used to determine student views regarding the interactive e-book. Teacher interviews were used to determine teachers' opinions. In the study, findings regarding the opinions of students and teachers about the material are given separately.

Findings Regarding Students' Opinions About Interactive E-Books

In the data obtained from the opinion survey, the opinions of the students about the teaching of the "systems in our body" unit on the website are given in Table 1.

Table 1
Students' Views on Teaching the Course Through the Interactive E-Book

Category	Code	f	%	f	%
Features of the material	Having a good website	21	21.0	57	57.0
	Being beautiful	14	14.0		
	Using interactive boards	7	7.0		
	Being fun	6	6.0		
	Having animations	3	3.0		
	Having videos	2	2.0		
	Having educational / instructive content	2	2.0		
	Providing clearer information	1	1.0		
	Having pictures	1	1.0		
Learning features	Providing better understanding	17	17.0	38	38.0
	Assisting in lessons	6	6.0		
	Providing learning	6	6.0		
	Keeping in mind	2	2.0		
	Providing reinforcement	2	2.0		
	Having positive effects on learning	2	2.0		
	The process being more efficient	1	1.0		
	Providing benefiting from different sources	1	1.0		
	Being informative	1	1.0		
Negative features	Having no effect	2	2.0	5	5.0
	Not liking the website	2	2.0		
	Some points being insufficient	1	1.0		
Total		100	100.0	100	100.0

As can be seen in Table 1, students' opinions about teaching lessons from the website were gathered in three categories: features of the material, learning features and negative features. The students stated that the interactive e-book prepared was 21.0% often a good website and 14.0% often a beautiful one. However, students stated that 17.0% of the interactive e-books provide better understanding, 6.0% of them said they assist in lessons and 6.0% of them stated that they provide learning. On the other hand, 2.0% of the the students stated that the interactive e-book had no effect and 2.0% of them did not like the website. In this context, it can be stated that students generally like the interactive e-book / website. In the interviews, this question has been examined in more detail and it has been tried to focus on the features that make up the material. Students' opinions about the properties of the material related to this situation are given in Table 2.

Table 2
Students' Opinions About Interactive Interactive E-Book Features

Category	Sub-category	Code	f	%	f	%
Interactive whiteboard	Individual effect	Providing better understanding	4	2.0	15	7.5
		Being useful	3	1.5		
		Providing support with visuals	3	1.5		
		Increasing curiosity	2	1.0		
		Being entertaining	1	0.5		
		Motivating the lesson	1	0.5		
		Being clear and understandable	1	0.5		
	Technically	Being beautiful	10	5.0	21	10.5
		Preventing time loss	2	1.0		
		No glare	2	1.0		
		Being bigger	2	1.0		
		Having a touchscreen	2	1.0		
		Not requiring writing on the board	1	0.5		
		Providing instant access to content	1	0.5		
		Easy to enter	1	0.5		
	Negative	Being unnecessary	1	0.5	1	0.5
Animation	Cognitive	Providing better understanding	9	4.5	24	12.0
		Being more real	5	2.5		
		Being useful	3	1.5		
		Providing detailed learning	3	1.5		
		Providing to reinforce the subject	2	1.0		
		Making the lesson more efficient	1	0.5		
		Ensuring persistence	1	0.5		
	Affective	Being beautiful	6	3.0	20	10.0
		Being good	6	3.0		
		Being visual	4	2.0		
		Having both audio and video	2	1.0		
		Appro	2	1.0		
Animated concept cartoon	Affective	Being beautiful	13	6.5	25	12.5
		Being good	7	3.5		
		Being fun	5	2.5		

	Cognitive	Providing understanding of true-false	5	2.5	22	11.0
		Being useful	4	2.0		
		Providing understanding	4	2.0		
		Being thought-provoking	3	1.5		
		Providing pretending to be characters	2	1.0		
		Enabling animation	2	1.0		
		Being both fun and instructive	1	0.5		
		Introduction to the topic	1	0.5		
Drag and drop animation	Affective	Being beautiful	11	5.5	21	10.5
		Being fun	5	2.5		
		Being good	4	2.0		
		Being remarkable	1	0.5		
	Cognitive	Testing if we understand the issue	7	3.5	18	9.0
		Contributing to learning	3	1.5		
		Enabling to see shapes / places	3	1.5		
		Being informative	2	1.0		
		Enabling to use interactive board	1	0.5		
		Ensuring participation	1	0.5		
		Enabling animation	1	0.5		
Research questions	Cognitive	Provides better understanding	5	2.5	23	11.5
		Introducing the topic	5	2.5		
		Providing information	4	2.0		
		Being thought-provoking	3	1.5		
		Improving forecasting	3	1.5		
		Making sure to listen to the lesson	1	0.5		
		Providing discovery	1	0.5		
		Ensuring participation	1	0.5		
	Affective	Being good	6	3.0	10	5.0
		Being beautiful	2	1.0		
		Being interesting	2	1.0		
Total			200	100.0	200	100.0

As can be seen in Table 2, the students interviewed gave opinions about interactive board, animation, animated concept cartoon, drag and drop animations and research questions. The students stated that the interactive board is 5.0% often beautiful and 2.0% often provides better understanding. Regarding the animations, students reported that they 4.5% often provided better understanding, 2.5% often more real, 3.0% often beautiful, and 3.0% often good. In animated concept cartoons, students stated that they are 6.5% often beautiful and 2.5% often provided understanding of true or false. Drag-and-drop animations have been expressed by students that 5.5% are often beautiful and 3.5% often helps to test whether they understand the subject. Finally, it was stated that the research questions used during the process were effective in providing 2.5% more comprehension, 2.5% frequently in introducing the topic and 3.0% frequently. In this context, it was understood that the interactive e-book and its features were emphasized by the students and many positive opinions were expressed about their contributions on the students. In the study, opinions about the contributions of the application on the students are given in Table 3.

Table 3
Opinions of the Students About the Contributions of the Interactive E-Book

Category	Code	f	%	f	%
Effect in terms of skill	Being able to establish relationship between topics	11	8.5	17	13.2
	Reflecting on daily life	3	2.3		
	Understanding your friends better	2	1.6		
	Doing group work	1	0.8		
Contribution to the emotional domain	Being more fun	4	3.1	6	4.7
	Being beautiful	2	1.6		
Effect on cognitive domain	Providing better understanding	23	17.8	70	54.3
	Providing better learning	15	11.6		
	Reinforcing what has been learned	7	5.4		
	Ensuring permanent learning	6	4.7		
	Contains different / many examples	4	3.1		
	Learning detailed information	4	3.1		
	Providing easy learning	2	1.6		
	Being useful	2	1.6		
	Being more efficient	2	1.6		
	Repetition	2	1.6		
	Providing answers to questions	1	0.8		
	Providing research	1	0.8		
	Getting new information	1	0.8		
Effect in terms of technology	Providing visuality	8	6.2	36	27.9
	Ability to use the website	7	5.4		
	Enabling to use interactive whiteboard	5	3.9		
	Providing seeing live	4	3.1		
	Providing better understanding with videos	4	3.1		
	Animations having a positive effect	3	2.3		
	Ability to use the Internet	2	1.6		
	Containing sound	2	1.6		
	Offering an active environment	1	0.8		
Total		129	100.0	129	100.0

As can be seen in Table 3, the responses of the students to the opinion survey were collected in four categories: the effect of the interactive e-book used in the cognitive domain, the effect in terms of technology, the effect in terms of skill and the effect in the emotional area. The students stated that the interactive e-book provides 17.8% better understanding and 11.6% often better learning. At this point, the sample of student interviews is as follows: "*I did not understand the blood groups. Those experiments were there to differentiate blood groups. I got it with it. It had a lot of impact on my understanding.*" (SA8). In the opinion survey conducted, students showed that 6.2% of them thinks they provide visuals and 5.4% of them use the website as benefits. During the interviews, SC4 said, "*In fact, we did not see such very visual things out of the book last year. There are more visual videos in what you showed this year. It*

had a beneficial effect on me.". In addition, in the opinion survey, it was stated by the students that the material enables to establish a relationship between the subjects 8.5% and 3.1% is more fun. At this point, SA1 said, "*It had an impact on the relationship between the subjects. For example, in circulation, blood goes to the lungs, and the respiratory system and carbon dioxide come out of the lungs. I came to my mind while watching the animation on the subject.*" In addition, different opinions were expressed in the interviews that it contributed to loving science lessons. In this regard, SB3 "I did not like last year, but this year I got used to it, I love science lesson." They expressed their opinion. The opinions about the activities / animations liked by the students in the opinion survey are given in Table 4.

Table 4
Opinions on Activities / Animations Most Admired by Students

Code	f	%	Student Expressions
The structure of the heart	5	10.6	"*The one we watched about the heart, explaining the structure of the heart*." (SA1)
Circulation	5	10.6	
Respiratory	5	10.6	
3d animations	5	10.6	
Blood circulation	4	8.5	*"What I like the most is blood groups, which blood group we were putting, matching. Matching is good, you do it yourself, there is no difficulty."* (SA3)
All	3	6.4	*"Three-dimensional ones. For example, while telling the veins, it enters the vein, and I like it because the blood circulating in it is dirty or not."* (SB1)
Blood cells	3	6.4	
Cell	2	4.3	
Interview with the doctor	2	4.3	*"Blood circulation, big and small circulation. Because I couldn't quite understand, thanks to those animations, I could understand. More has happened, there was explanatory narration."* (SC3)
Blood group determination test	2	4.3	
Alveoli	2	4.3	
Circulation and breathing	2	4.3	
Animated concept cartoon	2	4.3	*"I like the speeches, the children talk. If someone has more ideas, someone bigger, we may not care more about it. But it gets more attention when it comes to animation like our age. It allowed us to put ourselves in their shoes."* (SC4)
Bone / skeleton	2	4.3	
Experiments	1	2.1	
Drag and drop animations	1	2.1	
Muscles	1	2.1	
Total	47	100.0	

As seen in Table 4, 10.6% of the students who filled the opinion survey liked the animation related to the structure of the heart, 10.6% liked all animations in the circulatory system, 10.6% all animations in the respiratory system and 10.6% three dimensional animations. Data similar to these results were obtained in student interviews. In the student interviews, it was understood that the blood circulation (large and small blood circulation), animated concept cartoons, blood cells, bone, cell, structure of the heart and three-dimensional animations were liked. In the opinion survey applied, 54 of the students stated that there was no activity or animation they did not like throughout the unit. Only two students stated that there were parts they did not like. In the interviews, all 25 students stated that there was no activity they did not like. However,

in the interviews, the opinions of the students in the parts that they consider missing while processing the systems unit in our body are given in Table 5.

Table 5
Students' Opinions Regarding the Missing Sections While Processing the Unit

Code		**f**	**%**
None		20	80.0
Partially	Sound should be added to silent animations	2	8.0
	It should be a sentence instead of words	1	4.0
	Test should be added at the end of the subject	1	4.0
	Lymph circulation should be added	1	4.0
Total		25	100.0

As can be seen in Table 5, the students stated that 80.0% is not a place they see missing throughout the process. The opinion of SA3 regarding this situation is as follows: "*No, all is well. We do the experiments. Animations are good, there is no missing animations.*" In addition, five students emphasized some shortcomings. Students stated that 8.0% of them should add sound to silent animations and 4.0% of them should say sentences instead of words. SC8 commented, "*There were some quiet places, it would be better if someone narrated. Other than that, I think everything was ok, there was nothing missing.*"

Findings Regarding Teachers' Opinions About Interactive E-Books

Teacher A said that the interactive e-book prepared in the systems unit of the science course in our body is very useful with the statement of "It was very useful. They were all compiled and collected. So, we did not have to research from different places. It was all in one. It was very easy to use. There are all the instructions and stuff there, respectively. There was no problem." Similarly, teacher C stated his positive opinions as "Now, the website is prepared very well, the topics are well explained, we did not encounter any problems ...". On the other hand, teacher B said: "The website was beautiful and could be improved further. I can say that, but having such websites is awesome, visually." While expressing his positive opinion, he also stated that the website should be improved. In this context, it can be said that the interactive e-book is liked by the teachers for reasons such as combination of subjects, instructions, visuals.

In interviews, teachers were asked if they wanted similar websites to be prepared or not. In this regard, all three teachers stated the idea that similar websites should be prepared. The reason

for this situation, teacher A said, “Yes, I have talked to you before. I think it will be very useful especially for the students who are preparing for the exam. Because there are very abstract concepts in that class… We draw our dreams, but it is better when there is animation. Our drawing is only two-dimensional. It gets more permanent in animation.”. Teacher B supported that idea by saying "Visualization is a beautiful thing. The more visual is available, the better it is for us.” It was understood that teachers wanted websites to be prepared for other units for reasons such as embodying abstract concepts, having animations and images, and providing permanent learning.

Teachers stated that interactive e-book has many positive effects on students. Teacher A said, “The students were more active, they actively participated in the lesson… Their attention was always focused on science lesson. They very much enjoyed group work, they loved those drag and drop animations. We ultimately did group work and asked for products. We wanted to study poetry and write stories. We had skeleton competition with skeleton. It is always marketing. Of course, this situation has increased entrepreneurial spirits… Or, in the exchange of materials, the increase of tolerance to each other is also very important socially…” when expressing his/her views on its contributions to the students. The B teacher said, “… We ask the student about the location of the heart, it is between the two lungs. The child does not know what the lung is and where it is lest seeing it. First you will show the lung, you will show to which side the heart between the lungs tend to be, a phenomenon will occur in the child's head. You say that the rib cage bones protect the lung, protect the heart, and when you visually show it, it fits more into the child's mind, but if else it just stays in the air.” expressing the importance to conceptual understanding with his statements. In this context, teachers stated that the interactive e-book improves the students' conceptual understanding, group work, entrepreneurship skills, interest in the lesson, and skills associated with daily life.

In the interviews, teachers stated that the interactive whiteboard is beneficial and has a positive effect on the students. Teacher B commented, “The use of interactive whiteboards is fine, I wish it had been set up before. So, I have nothing about it, technology is always beautiful. It's a great event, I love using it.” In interviews, teachers were asked questions of inquiry. Teacher A said, expressing the importance of inquiry questions, "We have been teaching the lessons according to 5E theory before. It looks like the 5E system, I'm very happy with it. I think it provides motivation first. The student says "aha" or something, which makes her curious throughout the lesson. In the end, the same question comes up again and getting the answers

makes us very happy. We get feedback. For example, there are answers that are not from daily life at first, wrong answers. But then they give much more realistic answers."

The teachers stated that in the interactive e-book used, there was no place they saw missing. However, a teacher states that it is beautiful, but some additions can be made. Teacher C expressed his/her positive opinions on this issue: "I have not seen much missing; you are prepared very well. We have benefited quite a lot." stating, B teacher: "How can something be done; we started from the cell or at the very beginning, we can make the cell interactive. We can make the two larger cells interactive. When you touch it, it says, 'I am the nucleus of the cell' and introduces itself. The other introduces itself, the other introduces itself or misrepresents it, the student tries to find it in the question and answer part. Throughout the unit, teachers B and C stated that the activities and animations were very good. Teacher A also stated that the e-book is very good and explained with examples as follows: "The blood group, circulation chart that I like the most. Actually, it was all very nice. We made a skeleton and had a lot of fun doing it. Then the completion with animation, the ones that drag. There were matching exercises in the organelles, it was very good. They liked all of them and also your video with that doctor from the beginning ... They were very surprised when the children watched your interview with the doctor at that moment. It was very effective for the students to watch by saying 'Ooo is our teacher'. But one-to-one doctor's presentation and speech there. Also, it was a speech appropriate for their level. The doctor speaks, but it doesn't match the level of our class. It's always Latin, it's repulsive. In other words, it was described very well in accordance with their curriculum." In addition, all three teachers stated that they could not distinguish the most liked feature throughout the interactive e-book, and that it was good as a whole. However, teacher A opened an extra parenthesis to the research questions and said the following sentences: "The questions in the introduction are very well-thought-out questions, like onion-hair analogy, how the drugs circulate in our body. Where did I like the most, questions in the introduction. Because it was a lot of questions in life that would have made me wonder why I hadn't thought of it before." In addition, teachers made some suggestions for interactive e-books. Teacher B said, "A little more can be corrected. The sound system could be better." addressing the lack of sound. Teacher A said, "Video support can be a little more. We watched the heart in three dimensions, video support could be like that… Or even direct link can be directed." and referred to three-dimensional animations. In addition, the teachers were lastly consulted about what could be added to the website and good suggestions were received from the teachers. Teacher A expressed his/her thoughts as: "Just like this, the website

can be prepared. In addition, poems and photographs made by students can be added. Sometimes maybe there can be a forum about it ... Or teachers can add the material they find there. You may evaluate it and take it. Or it could be a forum for teachers, where we have difficulties or where we like it to be discussed, something like that." Teacher B said, "… At the end of these websites, entertaining games can make children understand the achievements better. And I think they should be in a place where every student can reach them."

Discussion, Conclusion and Suggestions

In the study, students stated that it is nice, good and fun to process the systems unit in our body via interactive e-book. Similar practices in the literature have been reported to be beneficial, motivating and positively effective (Eristi et al., 2013; Ourania, Symenon, Ioannis, George & Spyridoula, 2014). The main reason for this situation is thought to be due to the fact that the material contains multimedia objects and interaction. Interactive learning can already increase the motivation and interest of learning and takes the teaching activity from teacher-centered to student-centered learning (Chen & Chen, 2011). In parallel with this situation, the lessons that are given as student-centered become more fun. In addition, students stated that the interactive e-book provides a better understanding, reinforces what is learned and helps the process of teaching the course. Similarly, in the study conducted by O'Mahony (2014) in the literature, it was understood that some widgets provided participants to remember better because of their superior presentation styles and interaction features. The interactive electronic book that can be learned from Lego simple power machine sets has been determined to make learning easier and faster than the traditional book (Shih, Chen, Cheng, Chen & Chen, 2013). It is thought that there are positive effects on students' learning in parallel with the variety of interactive e-books that will appeal to many senses. In the study, students stated that among the benefits of the material is that it provides visuals, enables them to use the website, and makes it more fun. In the study carried out by Varol, Özer, and Türel (2014), prospective teachers stated sound, visual, video, animation, content, originality, remarkable elements, page design, interaction, evaluation and motivation elements among the powerful features related to interactive e-books. In addition, it has been understood that web / technology-based inquiry-based learning in science education is fun (Sing & Chew, 2009, Türkmen, 2009) and children between the ages of seven and nine find the interactive e-book fun and impressive (Zhang-Kennedy & Chiasson, 2016). In this context, it can be said that the interactive e-book contains visual elements and contains the interaction feature, and it is found to be fun by the students.

In the study, the students stated that the interactive board is beautiful in parallel with the interaction feature and provides a better understanding of the subject. In the studies in the literature, the participants stated that the use of interactive boards in science contributes to their understanding of the subject (Akbaş & Pektaş, 2011; Emron & Dhindsa, 2010; Yang, Wang & Kao, 2012). In addition, the participants stated that the lessons became more fun / enjoyable thanks to interactive board applications (Hall & Higgins, 2005; Kırbağ Zengin, Kırılmazkaya & Keçeci, 2012; Sarı & Güven, 2013) and interesting (Hennessy, Deaney, Ruthven & Winterbottom, 2007). When we look in general, interactive boards attract attention due to reasons such as having the latest features of technology, enabling interaction environment and it is easier for students to understand the subject. In the study, sixth grade students expressed their opinions about the animations that they provide better understanding, that they are more real, beautiful and fun. In studies conducted in science education in the literature, animations have been found to increase success / learning (Daşdemir, Uzoğlu & Cengiz, 2012; Kwasu, Yalams & Ema, 2016; O'Mahony, 2014). In addition, Yakışan, Yel and Mutlu (2013) stated that students in biology teaching liked the teaching with animations and learned that they learned the subjects and events they could not understand more easily because they were able to animate them better through animations. In this context, as stated by the students in the study, it is understood that animations have an interesting aspect in parallel with both students' understanding and visual and animation features. It was stated that the animated concept cartoons used in the study were beautiful and good by the students, they helped to understand the truth / wrong, they were helpful and helpful to understand. It has been understood in the literature that animated concept cartoons increase success / understanding (Aydın, 2015; Dalacosta, Kamariotaki-Paparrigopoulou, Palyvos & Spyrellis, 2009), students enjoy (Aydın, 2015) and think more comprehensively (Başarmak & Mahiroğlu, 2015). As it is known, concept cartoons are loved by students and it has been determined that they have positive effects on their learning. In addition to this, it can be said that transferring and animating the concept cartoons to the computer environment increases these effects in parallel with the results obtained from both the study and the studies in the literature.

In the study, the students stated that in the interviews, different from the opinion survey, the interactive e-book contributed to the love of science lesson. In the literature, it can be stated that students using interactive books in biology lessons have higher motivation (Baughman et al., 2013), that is, ibooks / interactive e-books increase student motivation (Al-Qassabi & Al-

Samarraie, 2013; O'Mahony, 2014). In addition, it is determined that inquiry based learning based on the material improves students' attitudes, motivations and interests in science positively (Gibson & Chase, 2002; Tatar & Kuru, 2009; Wu, Wu, Shih & Wu, 2014). It can be said that with the application made in this context, students' views against science, which is perceived as a difficult lesson, have changed and they started to love science more. It is thought that this situation has developed in parallel with the students' liking of the subject and the understanding of the lesson.

In the study, animation related to the structure of the heart, all animations in the circulatory system, all animations in the respiratory system, animated concept cartoons and three-dimensional animations are among the most liked activities / animations. In fact, it can be said that students like animation, activity and multimedia objects in almost all subjects. The fact that all of the students stated that there is no activity or animation they dislike is another support for this situation. Similarly, in the interviews, the majority of students stated that there is no place that they see missing when processing the systems unit in our body. Only five students dwelled on some shortcomings such as adding sounds to silent animations and having sentences instead of words. As a result of the study carried out in this context, it can be said that the students liked the interactive e-book and enjoyed the activities throughout the process.

As a result of the study, teachers stated that the interactive e-book prepared in the systems unit in our body is useful. The teachers stated that the interactive e-book is useful because of its features such as being compact, planned, with lesson duration and time, easy to use, clear instructions, and visuality. Similarly, in the study carried out by Baughman et al. (2013), teachers stated that the amount of material and the speed of the program's progress in interactive books in the biology lesson were correct, the program was easy to implement, and it was a valuable teaching resource, improving student participation and understanding of students. Özöğüt Erorta and Kayabaş (2015) stated that interactive e-books are always ready for the use of learners in every environment. In this context, it can be stated that the interactive e-book was liked by the teachers for reasons such as being organized and planned and easy to use. In this context, it is thought that interactive e-books contain many features and offer them collectively are positively received by teachers.

In the study, teachers stated that similar websites should be prepared due to features such as embodying abstract concepts and visualization in parallel with animations in the interactive e-

book. This may be due to the increased interest in interactive materials, interactive e-books, e-books in parallel with the development of technology (Brajković, 2014). When we look at the benefits of the interactive e-book applied, the teachers stated that the material improved its features such as students' conceptual understanding, group work, entrepreneurship skills, interest in the lesson, and skills associated with daily life. In the literature, science teacher candidates state that technology-based inquiry-based learning enables them to create student-centered, motivating and participatory learning opportunities (Hakverdi-Can & Sönmez, 2012). In addition, they stated that they preferred the pre-service teachers of information technologies for reasons such as interactive books, written text, entertaining, making learning more meaningful and ensuring their active participation in the process (Özer & Türel, 2015). In this context, the results obtained from these studies support our results. As a result, it is thought that teachers prefer a material that will improve students' cognitive characteristics such as success, understanding, and skills such as group work and entrepreneurship.

As a result of the study, the teachers stated that the interactive whiteboard is beneficial and has positive effects on the students. In the literature, teachers stated that the interactive board has a positive effect on the learning environment (Erduran & Tataroğlu, 2009; Sweeney, 2013) and is useful in accessing information (Gadbois & Haverstock, 2012). As stated by the students, this situation can be said to be parallel to the latest features of technology. However, in the study conducted, teachers stated that the inquiry questions were good, that they provided motivation first, contributed to learning, and were useful in establishing a relationship with daily life. In this context, it can be said that the teachers liked the research-inquiry questions. In fact, as Songer, Lee & Kam (2002) stated in their study, teachers find research and inquiry pedagogy both convenient and challenging. Because it can be said that research-based learning is one of the most difficult parts in terms of both practice and preparation. Similarly, in the study of Bayram (2015), preservice teachers stated that they were trying to create a problem area that reflects the real world, especially about daily life, while designing science activities based on guided inquiry. In this context, preparation of research questions is an important point, but it is thought that this point should be given importance while developing the material.

In the study, teachers stated that they did not have a place in the interactive e-book used, that they liked the material and that the prepared material (animation, activity) was beautiful. In the first experiences of WebQuest, science pre-service teachers stated that they are a valuable teaching tool despite the limitations and disadvantages, and they will use it as a teaching-

learning tool (Hakverdi-Can & Sönmez, 2012). In addition, in another study, most of the participants stated that they have positive opinions about the use of e-books in science classrooms and are willing to overcome the difficulties they face (Luaran, Rom, Nadzri & Jain, 2016). In addition, in some studies in the literature (Choiriyah, 2015; Tania & Fadiawati, 2015; Wirawan & Unesa, 2012), interactive e-book has been developed and it is concluded that it is appropriate. In this context, in our study, it was understood that the interactive e-book developed was suitable and liked by the teachers.

In the study, teachers stated that there were some deficiencies in the interactive e-book and made some suggestions to solve them. Teachers made interactive e-book developer suggestions that the audio system can be edited, the number of videos can be increased, three-dimensional animations can be linked, student materials can be added to the website later, entertaining games can be added, and the website is accessible to every student. Songer et al. (2002) stated that the obstacles encountered in the study were the availability of insufficient space and materials in a few cases, insufficient time, low content knowledge among teachers, large class capacities, limited teaching freedoms and unreliable internet connection. However, given the difficulties of the interactive e-book development process; it is usual to have such minor disruptions. Similarly, Bozkurt & Bozkaya (2013a) interactive e-book design process prepared as a learning material; It states that it is a comprehensive process in which different designs, expertise and disciplines are put to work. In this context, it is clear that interactive e-books to be prepared interdisciplinary will make great contributions to the field.

As a result, the students stated that they liked the features such as interactive whiteboard, animations, research questions, interactive objects, and website in the interactive e-book material. In this way, they stated that the lessons became more beautiful and fun, they understood the subject better, they could associate it with daily life, and they learned it permanently. In fact, it is expected that students will learn better in line with the features they have stated in the material. When we look at the general results obtained from the teachers, it was understood that the interactive e-book was liked and found useful by the teachers. It has been stated that the main reason for this situation is that it is a regular, systematic and progressive system parallel to the gains. Although there are many materials related to science subjects in the literature, they are generally scattered. When teachers want to use these materials, they need to research for a long time before starting the topic or which one they will use in the process. In this case, teachers have great responsibilities and it is very easy to use

these materials effectively. It is thought that this situation is corrected with the material developed and used in this study and it provides convenience for teachers. In addition, teachers stated that the interactive e-book embodies the abstract concepts on the subjects for students and provides positive understanding as well as understanding. It is thought that this situation is caused by situations such as method, interactive board and multimedia objects in the material. In this process, although the teachers liked the interactive e-book, they made some suggestions. In particular, they made suggestions such as increasing the sound feature of the animations, adding three-dimensional animations and increasing the number of videos. These suggestions are considered to be good suggestions for the development of the interactive e-book, and making these arrangements is important for the development of the interactive e-book.

Suggestions

Considering that the interactive e-book developed in the study has many positive effects on students, it is considered that interactive e-books for other units in science education should be developed and introduced to teachers. It is thought that the focus should be especially on the subjects where the students have more problems or on subjects that contain alternative concepts. In the study, it is seen that in the animations in the interactive e-book (website), the process related to an event or concept is processed with sound or silent. As the students and teachers stated in the interviews, it is thought that some animations should be added to the sound, or a description of what happened in the animation should be added to a page after the animations. Also, in terms of animations, it can be suggested that some animations in the literature can be linked to three-dimensional animations, in particular.

Statements on ethics and conflict of interest

Research permit numbered 86896125-605.01-E.9113990 was obtained within the scope of the study. Ethical issues were considered throughout the study. There is no conflict of interest in this study.

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Research Article

Using Draw-Write-Tell Technique to Explore Middle School Students' Conceptions of the Social Studies Course[1]

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Abstract

The current research aims to use the 'draw-write-tell' method to explore middle school students' conceptions of the social studies course. The study group of this qualitative research consists of 200 middle school students attending public middle schools in the city center of Gaziantep. The study was carried out in three stages. In the first stage, to determine the participants' overall conceptions of the social studies course, they were asked to draw the first five things that the course evoked in them. In the second stage, the participants were asked to pick one drawing among the five, which they most identified with the social studies course, and write down why they picked that drawing. In the third stage, in-depth unstructured interviews were conducted with eight volunteering students. Results of the content analysis showed that students' overall conceptions of the social studies course could be gathered under 10 themes. Also, drawings related to human geography and history were identified most with the social studies course. Besides, the reasons behind students' conceptions of the social studies course were gathered under 12 themes. Our findings reveal that middle school students' conceptions of the social studies course are very diverse and complex, but consistent with the general objectives of the social studies curriculum.

Keywords: *Social studies, draw-write-tell technique, middle school students, phenomenology, drawings*

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Ortaokul Öğrencilerinin Sosyal Bilgiler Algılarının Çiz-Yaz-Anlat Tekniğiyle İncelenmesi

Öz

Bu araştırmanın amacı, ortaokul öğrencilerinin sosyal bilgiler algılarını çiz-yaz-anlat tekniğiyle incelemektir. Nitel araştırma yönteminin benimsendiği araştırmanın çalışma grubunu Gaziantep il merkezindeki kamu ortaokullarında okuyan 200 ortaokul öğrencisi oluşturmaktadır. Çalışma üç aşamada gerçekleştirilmiştir. Birinci aşamada ortaokul öğrencilerinin genel sosyal bilgiler algılarını tespit edebilmek için onlardan sosyal bilgiler deyince akıllarına gelen ilk beş şeyi çizmeleri istenmiştir. Araştırmanın ikinci aşamasında bu beş çizim arasından sosyal bilgiler ile en çok özdeşleştirdikleri bir tanesini seçerek bu çizimi seçme nedenlerini ayrıntılı bir şekilde yazmaları istenmiştir. Üçüncü aşamada çalışma grubu içerisinden seçilen gönüllü sekiz öğrenciyle derinlemesine yapılandırılmamış görüşmeler yapılmıştır. İçerik analizi sonuçları, öğrencilerin genel sosyal bilgiler algılarının 10 farklı tema altında toplandığını göstermiştir. Sosyal bilgiler ile en çok beşerî coğrafya ve tarih içerikli çizimlerin özdeşleştirilmiştir. Öğrencilerin sosyal bilgiler algılarının arkasında yatan nedenler 12 farklı tema altında toplanmıştır. Sonuçlar, ortaokul öğrencilerinin sosyal bilgiler algılarının çok çeşitli ve karmaşık bir yapıda olduğunu ortaya koymakla birlikte sosyal bilgiler öğretiminin genel amaçlarıyla uyumludur.

Anahtar Sözcükler: *Sosyal bilgiler, çiz-yaz-anlat tekniği, ortaokul öğrencileri, fenomenoloji, çizimler*

Introduction

The social studies course help students better understand the society and the world they live in by teaching about humans, a social entity, and their cultural products (Acun, 2009). It also allows students to gain knowledge and experience regarding the relationship between humans and society, as well as providing a suitable learning environment for them to discover themselves, their values, and thoughts. To this end, while providing information about geography, history, and other social sciences, the social studies course also focuses on the behaviors that students can exhibit in the face of situations that may be encountered in real life (Kabapınar, 2009). Hence, in this globalizing world, the main objective of the social studies course is to assist students in developing the ability to make informed decisions for the well-being of the general public as members of a democratic society that contain many cultural differences (National Council for the Social Studies [NCSS], 2010).

Social studies were defined as a new field for the first time in 1916 by the NCSS. The introduction of the social studies course into the American education system was a result of the interaction of seeking solutions to important problems such as urbanization, industrialization, migration, racism, public order, and citizenship awareness caused by the great transformation in the social, economic, and cultural fields that the U.S. was undergoing and the efforts to build a united American nation (Kaymakcı & Ata, 2012). In addition, the Progressive Movement's "raising citizens for a democratic society" was effective in the emergence of social studies as a course (Ata, 2009; Erden, 1996; Safran, 2008). Highlighting the teaching of the knowledge, skills, attitudes, and values that students need while adapting to social life and producing solutions to social problems, the social studies course aims mainly at raising effective citizens (Ata, 2009; Öztürk, Keskin & Otluoğlu, 2012). From this perspective, the social studies course has an important place in raising democratic citizens who think, inquire, research, and reason (Doğanay, 2009). The course helps students develop an awareness of their duties and responsibilities towards themselves and their community. Also, it teaches individuals how to be useful to society as well as provides necessary knowledge and skills related to environment and everyday life. Therefore, the social studies course aims not only to raise good and effective citizens but also to facilitate the individual's adaptation to the environment and society. With

this feature, the social studies course is a course that guides people throughout their lives (Ata, 2009; Çetin & Dinç, 2017).

Due to the interdisciplinary approach it adopts, the social studies course covers many social sciences. The knowledge generated by social sciences is transferred to students through the social studies course. Thanks to the social studies classes, students have the opportunity to better know and make sense of their community, society, environment, and culture. Furthermore, the social studies course enables students to recognize the characteristics of their society as well as to realize their personal and social responsibilities. This realization is also effective in finding solutions to the social problems they face (Deveci & Bayır, 2011; Çetin & Dinç, 2017; Farris, 2004). Effective citizenship refers to citizens who properly fulfill their role as a citizen to improve the democratic process. In this regard, the social studies curriculum aims to provide students with democratic citizenship values and skills. The citizen profile highlighted by the social studies course is a knowledge-based citizen with reasoning skills, who has developed an understanding of local and national values as well as respects universal values (Kabapınar, 2009). Effective citizens are aware of their duties and responsibilities and are informed of what is happening in their social environment (Sözer, 1998).

Whether middle school students' conceptions of the social studies course are compatible with the objectives specified in the social studies curriculum has long been aroused curiosity. As it is known, a person's conceptions are affected by his/her personal traits, expectations, and motivation. In fact, a conception is the experience that occurs after the brain translates thousands of independent and meaningless senses into a meaningful pattern or image (Plotnik, 2009). Considering students' conceptions of the social studies course, which has a very important place in the socialization of the individual, there is a huge gap between the actual importance of the course and the importance attached to the course by students. It has been found that a great number of students perceive the course as a boring subject based on memorization, that has no relevance to the real life (Alazzi & Chiodo, 2004; Ata, 2009; Byford, 2002; Çetin & Dinç, 2017; Dinç & Üztemur, 2017; Özkal, Güngör & Çetingöz, 2004). Many variables are effective in the emergence of these conceptions of students; however, teachers' behavioral patterns also play a big role (Alazzi & Chiodo, 2004; Ata, 2009; Byford, 2002; Çetin & Dinç, 2017). On the other hand, in order for all the objectives of the social studies curriculum to be achieved, using effective teaching techniques is of utmost importance. And, in order to

achieve effective teaching of the course, it is necessary to reveal students' conceptions of the course. The determination of students' conceptions of the social studies course and the meanings they attach to it also has special importance in terms of demonstrating whether they have acquired and related to their everyday life the knowledge presented to them in the course. Taking these as a starting point, the current research aims to explore middle school students' conceptions of the social studies course using the 'draw-write-tell' technique. To this end, answers to the following questions were sought:

- What are middle school students' conceptions of the social studies course and what are the reasons behind these conceptions?
- How effective is the draw-write-tell technique in revealing middle school students' conceptions of the social studies course?

Methodology

Design

Seeking to explore middle school students' conceptions of the social studies course, the study was carried out in three stages. The qualitative research method was used in the first and second stages. In the third stage, the phenomenological model was used to analyze the participants' conceptions of the social studies course with a holistic approach. Phenomenology aims to obtain a rich understanding of the meaning or meanings that one or more people attribute to a concept or phenomenon (Creswell, 2013). Phenomenological research seeks to describe the studied concept or phenomenon by focusing entirely on the individual's conceptions and experiences (Smith & Osborn, 2009). In this study, the subject to be explored in depth is middle school students' conceptions of the social studies course.

Participants

The study group consists of 200 middle school students from each grade level attending public schools in Gaziantep, Turkey, in the first semester of the 2019-2020 academic year. Phenomenology studies enroll a small number of participants in order to analyze the studied

phenomenon in depth. Since the first stage of the present study sought to reveal the participants' overall conceptions of the social studies course, the number of participants was relatively high. However, in the third stage, at which interviews were held, the number of participants was reduced to eight (four males, four females) on the basis of voluntariness. The ethics committee approval was obtained from Usak University with a document number of "28620816/341" on 06.03.2020.

Data Collection Process

Aiming to reveal middle school students' conceptions of the social studies course, the study was carried out in three stages. In the first stage, each student was handed a blank A4 paper and asked to draw five things that the social studies course evoked in them. The students were also asked to have no aesthetic worries in their drawings since their drawing skills were not being measured.

In the second stage, the participants were asked to pick one drawing among five, which they most identified with the social studies course, and write down why they have picked up that drawing. They were asked to explain in detail the connections of their chosen drawings with the social studies course and how they identified this drawing with the course. Therefore, the second stage aimed to reveal the motives underlying the students' conceptions of the social studies course. The first and second stages of the data collection process were carried out simultaneously.

In the third stage, unstructured interviews were held with eight volunteering students. The starting point of the interviews was the compositions written by the students in the second stage. The interviews not only enabled the control of data obtained in the second stage but also allowed a detailed examination of the students' conceptions of the social studies course. The first and second stages of the research took 40 minutes. In the third stage, each interview took an average of 30 minutes.

Data Analysis

In order to get an overall picture of the participants' conceptions of the social studies course, the drawings obtained in the first stage were subjected to content analysis. A total of 1000 drawings were categorized into certain themes with an inductive approach. Then, the data obtained in the second and third stages were subjected to content analysis to obtain codes. While coding, the participants' expressions were used as much as possible. Following this, similar codes were gathered under the same theme (Giorgi, 2009; Punch, 2005). Each student was given a code according to their gender and grade level. For example, the student coded 6M2 represents the second (2) male (M) student in the sixth grade (6). To increase the credibility of the research, excerpts from the interviews with the students were included. Also, to increase the internal consistency, coding was performed by researchers at different times, who later on came together to discuss and make necessary revisions on the codes and themes.

Findings

The findings are interpreted under two headings. The first one 'Drawings' includes the findings from the drawings while the second 'Compositions and Interviews' heading includes the findings from the compositions and interviews.

Drawings

In the first stage of the research, drawings were used to reveal students' conceptions of the social studies course. In order to determine how students' conceptions of the social studies course were reflected in their drawings, the drawings were subjected to content analysis. As a result of the analyses, ten themes emerged (Table 1).

As can be inferred from Table 1, the drawings of about a third of students fall under the theme of "human geography." One drawing that was most frequently observed among the participants' drawings was of the world map (f: 118). Considering the drawings in this theme, students mostly identified the course with human and economic activities. "

Under the theme of "history", students identified the social studies course with historical events, historical states, historical figures, historical places, historical objects, and historical concepts. The drawings gathered under this theme mostly depicted battle scenes (f: 105). The high number of students who identified the social studies course with battle scenes can be attributed to the weight of history in the multi-disciplinary structure of the course and its reflection in the students' conceptions.

Table 1.
Students' Overall Conceptions of the Social Studies Course

Categories	Drawings and Frequency Values	%
Human Geography (302)	• Map: Map of Turkey (114), Map of the World (118), Legend (5) Location (2), Compass (7) • Settlement Units: Village (1), District (1), Province (1) • Human Activities: Agriculture (8), Livestock (16), Economy (1), Tourism (1), Industry (3), Migration (3), Human Elements (2), Social Organizations (18), Observatory (1)	30.2
History (271)	• Historical Events: Conquest of Istanbul (2), National Struggle Congresses (1), French Revolution (2), Geographical Discoveries (1) • Historical States: Sumerians (2), Ottoman State (15), Asian Hun Empire (1), Kayı Tribe (2), Civilizations (6) • Historical Figures: Atatürk (50), Mehmet the Conqueror (2), İsmet İnönü (1), Metehan (2) • Historical Places: Ataturk's Mausoleum (9), Silk road (4), Spice Road (3), Thessaloniki (1), "Göbeklitepe" (1), Ziggurat (2) • Historical Objects: Orkhon Inscriptions (2), Sculpture (2), Historical Artifact (21), Alms Stone (2) • Historical Concepts: War (105), History (14), Epic (1), "Nutuk = Mustafa Kemal's notable Speech at the Parliament" (1), Islam (1), Sultan (5), Age of Enlightenment (1), Commander (1), Text (8)	27.1
National Identity (131)	Flag (102), Martyr (9), National Anthem (1), Soldier (13), Nation (4), Homeland (2)	13.1
Individual and Society (72)	Role (10), Right (29), Aid (14), Responsibility (7), Identity (2), Respect (2), Differences (1), People (1), Family (3), Friendship (3)	7.2
Communication and Interaction (59)	Social Networks (26), Telephone (12), News (1), Empathy (3), Prejudice (1), Computer (9), Television (2), Socialization (5)	5.9
Physical Geography (59)	Nature (23), Mountain (9), Natural Disaster (15), Sun (4), Cave (2), Seas (1), Planets (1), Poles (1), Landforms (1), Weather (1), Cappadocia (1)	5.9
Social Studies as a Lesson (31)	School (12), Book (12), Teacher (7)	3.1
Cultural Elements (27)	Folk Dances (10), Values (7), Carpet (4), Holiday (3), Local Food (3)	2.7
Law and Politics (26)	Justice (9), Parliament (8), Law (1), Treaty (5), Politics (3)	2.6
Science and Technology (22)	Technological Tools (14), Science (5), Scientist (3)	2.2

Under the theme of 'historical figures,' the drawings of "Ataturk" were most frequent. Under the theme of "national identity," most of the students identified the course with the Turkish flag. Other drawings under this theme highlighted national values and patriotism.

The drawings gathered under the theme of "individual and society" underline the contribution of social studies course to the socialization of students. The participants' drawings of interpersonal relations in everyday life and social structures that hold an important place in social life can lead us to the interpretation that students better learn about social life in the social studies course.

The drawings under the theme of "communication and interaction" emphasize technological innovations. The link established by students between social networks and the social studies course is particularly striking. Based on these findings, we can argue that students benefit significantly from the social studies course in their everyday life. Under the theme of "physical geography," drawings of landforms attract the most attention. This finding not only is consistent with the scope of the course but also points to the importance that the course attaches to use of visuals.

Three drawings were collected under the theme of "social studies as a course." Students whose drawings were collected under this theme identified the social studies course with the components of the school and the classroom environment. The drawings under the theme of "culture" mostly depicted elements that represent Turkish culture and traditions. Based on these findings, we can argue that the social studies course helps students learn about their own culture and traditions.

Under the theme of "law and politics," students identified social studies with legal and political concepts. This finding is important in that it points to the interdisciplinary approach of the course that covers all social sciences. The theme of "science and technology" mostly contains drawings of technological devices. Based on these findings, we can argue that the course covers not only the past but also the present time.

In the second stage, the participants were asked to pick one drawing among five, which they most identified with "social studies," and write down why they picked that drawing. The drawings that the participants most identified with social studies are given in Table 2.

Table 2.
The Drawings the Participants Most Identified with the Social Studies Course

Categories	Drawings and Frequency Values	%
History (81)	• Historical Events: Conquest of Istanbul (1) • Historical States: Ottoman State (4), Civilizations (1) • Historical Figures: Atatürk (16), Metehan (1) • Historical Places: Ataturk's Mausoleum (1), Ziggurat (2) • Historical Objects: Historical Artifact (3) • Historical Concepts: War (39), History (9), Islam (1), Sultan (1), Text (2)	40.5
Human Geography (43)	• Map: Map of Turkey (23), Map of the World (15), Compass (1) • Human Activities: Agriculture (1), Livestock (1), Industry (1), Social Organizations (1)	21.5
National Identity (26)	Flag (23), Soldier (2), Nation (1)	13
Communication and Interaction (14)	Social Networks (7), Socialization (3), Computer (3), Telephone (1)	7
Individual and Society (12)	Role (10), Family (2)	6
Physical Geography (10)	Nature (5), Natural Disaster (5)	5
Cultural Elements (9)	Folk Dances (4), Values (5)	4.5
Social Studies as a Lesson (3)	School (1), Book (1), Teacher (1)	1.5
Law and Politics (2)	Parliament (1), Politics (1)	1

As can be inferred from Table 2, the students mostly identified the social studies course with history and geography. Based on this finding, we can argue that students' selective conceptions of the social studies course are consistent with their overall conceptions. The drawings that fall under the theme of history mostly depict "battle scenes." This finding is important in terms of revealing students' conceptions of history. On the other hand, the drawings that fall under the theme of "geography" mostly depict Turkey and world maps. Students' identifying the course with maps is a valuable finding indicating the importance of using visuals like maps or graphs in social studies classes.

The drawings collected under the theme of "national identity" mostly depict the Turkish flag. This finding can be regarded as a reflection of the importance attached to citizenship awareness in the social studies curriculum. When the drawings that fall under the themes of "communication and interaction" and "individual and society" are examined, it is seen that the individual's activities in the process of socialization were identified with the social studies

course. The link students established between the Turkish culture and the social studies course is consistent with the general objectives and learning outcomes of the social studies curriculum.

Compositions and Interviews

This part of the study focuses on students' reasons behind their decisions to pick up one drawing out of the five that they did at the second phase and the links they established between their drawings and the social studies course. As a result of the analysis of the data obtained from the compositions and interviews, the themes and sub themes shown in Figure 1 emerged.

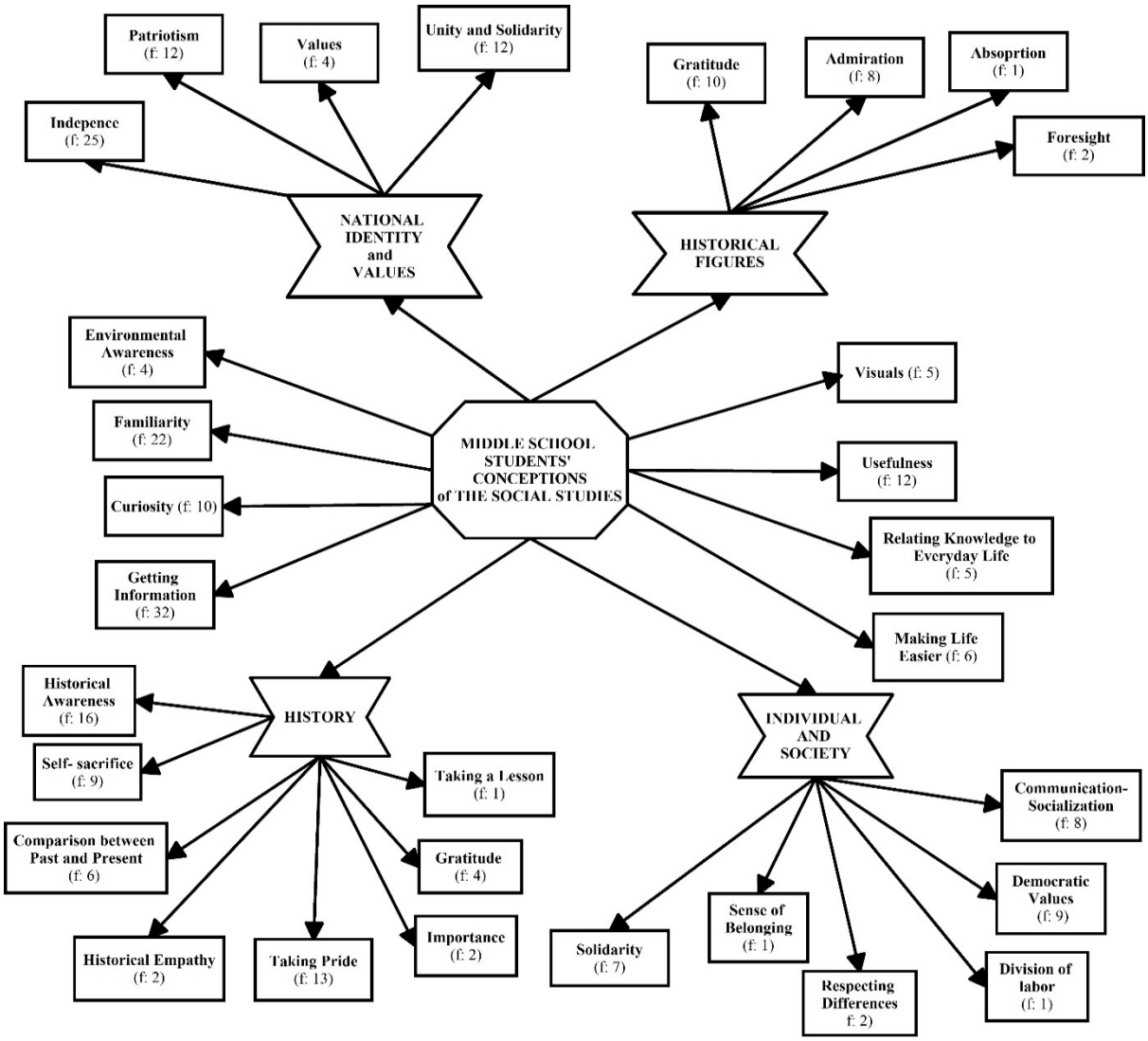

Figure 1. The Themes That Emerged as A Result of The Analysis of Compositions and Interviews

As can be inferred from Figure 1, the reasons behind the participants' decisions to pick up one drawing were categorized into 12 themes. The drawings that fell under the theme of "national identity and values" were categorized into four sub-themes: "independence, patriotism, values, and unity and solidarity." The students whose drawings fell under the sub-theme of "independence" stated that they were influenced by the Turkish nation led by Ataturk winning the War of Independence. They also said that they should be grateful to the soldiers who self-sacrificed for Turkey's independence. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 7F6 is presented below:

> "We are grateful to our martyrs who fought for the Turkish flag. They saved us and our future. We are grateful to our soldiers who sacrificed their lives for us. We may not be able to satisfactorily express our gratitude. Anyone traveling to Canakkale should visit them (martyr's cemetery). As Mehmet Akif said, "May God never let this nation write the national anthem again." So, we (today's children and youth) must work in this direction." (7F6).

This excerpt shows that students are instilled with a sense of independence and patriotism in social studies classes. The students whose drawings fell under the sub-theme of "patriotism" mentioned the soldiers who left their families to fight for their country. Also, they reminded Ataturk's patriotism and his deeds for the Turkish nation, emphasizing that they should be proud of Turkish history. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 6M12 is presented below:

> *"Many soldiers were martyred. They left their families to fight for their country; although they felt thirst and hunger, they didn't leave their posts and they defended this country. Our soldiers, who loved this country and nation, fought to save our country without asking 'What will happen to me?'; I'm proud of them."* (6M12).

Looking at the above excerpt, we can argue that historical awareness and national values are properly learnt by students. The fact that the students mentioned some major events (like the War of Independence) in Turkish history and that they said that they are proud of the history of the Turkish nation is important in terms of showing the contribution of social studies classes in developing historical awareness in students. The students whose drawings fell under the sub-theme of "values" identified the social studies course with everyday values, culture, and the Turkish lifestyle. Emphasis on cultural elements and the Turkish lifestyle is important in terms

of demonstrating that the social studies course helps students learn about certain cultural elements inherent in the Turkish nation. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 6M16 is presented below:

> *"Social studies classes ensure social unity by teaching us to respect the elderly, love those younger than us, and to be respectful to each other."* (6M16).

The above excerpt highlights the structure of social information, covering the rules of social life and values in everyday life. The students whose drawings fell under the sub-theme of "unity and solidarity" frequently mentioned social cohesion, coexistence, and social consciousness. Also, they referred to the contribution of historical events to develop national consciousness as well as underlined the concept of 'division of labor' in everyday life.

The theme of "historical figures" consists of four sub-themes: "gratitude, admiration, foresightedness, and absorption." Under the theme of 'historical figures,' the drawings of "Ataturk" were most frequent. Under the sub-theme of "gratitude," the students mentioned the sacrifices made by important names in Turkish history. They also stated that today's independent and modern Turkish society is a result of the determination and efforts of historical figures (e.g., Ataturk). To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 6F4 is presented below:

> *"Had it not been for Fatih Sultan Mehmet (Mehmed the Conqueror), Istanbul would not be (a part of Turkey) now. Had it not been for Ataturk, we would not be (living) now; thanks to him, we can live freely."* (6F4).

Looking at the above excerpt, we can argue that historical events (or figures) shape today's political and social structure, which is reflected in students' conceptions. Looking at the views of the students in the "admiration" sub-theme, students expressed their admiration for Ataturk's leadership in the wars, his speeches, his signature, his courage, and his efforts to save the country. In addition, students expressed their admiration for "Seyid Onbasi" (Corporal Seyid), who made great efforts and showed determination in the Battle of Canakkale. The views of the student coded 8M7 are as follows:

> *"The first historical figure that comes to my mind is Ataturk. Because he engraved his name on the history of Turkish Revolution and he won many wars. Besides the*

> *battles he won, he always uttered good ideas. He did good work; for example, "Ataturk Forest Farm and Zoo" is a very good idea. He is a leader whose example we should follow."* (8M7).

The above excerpt shows that the students identified the social studies course with Ataturk. Also, based on this finding, we can argue that the social studies course has an important place in students' following the example set by historical figures. In the sub-theme of "foresightedness", the students mentioned Ataturk's foresightedness. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 8F13 is presented below:

> *"In (social studies) classes, we learn about Ataturk's personal traits. Thanks to his revolutionary ideas and foresightedness, we saved our country. After the war, he implemented many reforms with his foresightedness and revolutionary ideas."* (8F13).

The above excerpt not only underlines Ataturk's foresightedness and revolutionary ideas but also emphasizes the contribution of his personal traits to the Turkish nation. In the sub-theme of "absorption," the students stated that they appreciate Ataturk's reforms and that they follow the example set by Ataturk. They also noted that Ataturk is present in every aspect of their lives. The views of the student coded 5F10 are as follows:

"Ataturk is present in every aspect of my life." (5F10).

The above excerpt indicates that the student has Ataturk at the center of her life. The theme of "individual and society" consists of sub-themes of "communication-socialization, solidarity, respecting differences, labor of division, sense of belonging, and democratic values." The students in the sub-theme of "communication-socialization" identified the social sciences course with communication tools that connect people and enable socialization. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 6F2 is presented below:

> *"If people cannot communicate with each other, there is no such thing as social life. People use different ways to communicate throughout their lives."* (6F2).

The above excerpt emphasizes the importance of communication, identified with the social studies course, for people. The students in the sub-theme of "solidarity" stated that solidarity among people is attached great importance in social studies classes and that the course evokes examples of solidarity in society. The views of the student coded 7F2 are as follows:

"We must help poor people materially and spiritually. This will make people very happy. In this way, people understand each other's worth." (7F2).

The above excerpt shows that helping those in need has an important place in ensuring unity and solidarity among people. The student coded 5M1 in the "Sense of Belonging" sub-theme emphasized that our cultural characteristics connect us and that the social studies course makes individuals develop a sense of belonging to the society they live in. The students in the sub-theme of "respecting differences" stated that there are many differences among people and that the most important requisite for living together is to accept everyone as they are and see the differences as a wealth. The views of the student coded 6F1 are as follows:

> *"People should be respectful to each other. People should respect the characteristics and behaviors of others."* (6F1).

As can be inferred from the above excerpt, the first condition for living together in harmony in society is to show respect to others and fulfill social responsibilities and duties. The fact that the students identified the value of "respecting differences" with the social studies course shows that the course helps students learn to be respectful of others. The students in the "division of labor" sub-theme stated that people work in different jobs and that everyone has different duties in these jobs, highlighting the importance of division of labor in social life. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 7M3 is presented below:

> "*In everyday life, we, humans, need each other."* (7M3).

As can be seen in the above excerpt, there should be a division of labor in social life as a necessity to live in harmony. Emphasis on the division of labor in social studies classes is important for students to adapt to society and develop citizenship awareness.

In the sub-theme of "democratic values" under the theme of "Individual and Society", it was observed that the students emphasized fundamental rights and freedoms. The students also gave examples of the violations of rights and antidemocratic practices they faced. To give an example to the views of the students in this sub-theme, excerpts from the interviews with the students coded 7F7 and 6M5 are given below:

> *"In ancient times, women were not given human rights; girls were killed or buried alive. Now, men and women are equal."* (7F10).

> *"Democracy brings equality, justice, rights, and law to my mind. In our classes, we always see the concepts of equality and justice. When we say justice, we expect people to be fair in everything they do; but some people are not fair at all."* (6M5).

It can be inferred from the above excerpts that students gain a democratic perspective in social studies classes. In this respect, the emergence of the sub-theme of "democratic values" in students' conceptions of the social studies course, which plays a major role in helping students become aware of democratic values, is important.

It is seen that the students in the sub-theme of "historical awareness" under the theme of "history" have an awareness of important events in history. According to students, the first thing needed to build a solid future is to know and take lessons from the past. Indeed, students frequently emphasized the concept of historical awareness. The views of the student coded 8M3 are as follows:

> "Turkish states in history inspire me. The valor and epics of our ancestors inspire me. Those who were martyred for our country left this flag to us; we must protect our country like them. We must do our best to protect this country; we are willing to give our lives for our country if necessary." (8M3).

Looking at the above excerpt, we can argue that historical events (or figures) directly affect students' feelings, thoughts, and behaviors and shape their lifestyles. It can be said that history is seen not only as a course but as a dynamic process affecting students' lives. Considering the views of the students in the sub-theme of "taking a lesson," they stated that they should take lessons from historical events taught in social studies classes. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 7M2 is presented below:

> "We must learn from the wars in which Ataturk took part and the things that major Turkish statesmen in history did and learn how they saved us. We must think about the self-sacrifices of our ancestors and learn from their examples. We must understand well what we did and what we experienced to come to these days. We must learn about our history and when other people ask (about our history), we must be able to answer." (7M2).

As can be seen in the above excerpt, the students emphasized how the past shapes the present and the future. When we examined the compositions in the sub-theme of "gratitude", the students stated that they were impressed by the sacrifices their ancestors made in the past and therefore they were grateful to them. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 8F1 is presented below:

> "We are grateful to our soldiers who fought for the Turkish flag on the east, south, and west fronts in the War of Independence. They saved us and our future; we can't express our gratitude enough. We are grateful to everyone who sacrificed themselves in the War of Independence for our country and for our freedom." (8F1).

From the above excerpt, it can be inferred that students have an awareness of historical events. The students in the sub-theme of "importance" stated that they picked drawings of historical events because these events were turning points in the history of the Turkish nation. The drawings that fall under this sub-theme generally depict some major historical events in the history of Turkey (Turkish War of Independence, the establishment of the Turkish Grand National Assembly, and etc.).

Looking at the sub-theme of "taking pride," it was observed that the students were proud of the past and history of the Turkish nation. These findings can be considered as a reflection of the role that the social studies course plays in developing historical awareness in students. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 7M8 is presented below:

> "I feel proud of the Ottoman era about which we learn in social studies classes. As I learn how the Turkish nation lived in the past, our past wars and achievements, I feel proud of our ancestors. I am proud of our soldiers who sacrificed themselves for this country." (7M8).

As can be inferred from the above excerpt, the social studies course and history education play a key role in creating a national identity. The students in the sub-theme of "historical empathy" expressed their empathy with the harsh conditions of the past by considering some major historical events. The views of the student coded 5F6 are as follows:

> *"The suffering caused by wars and the situation of orphans is a very bad thing. In social studies classes, we understand how our ancestors lived and the difficulties they experienced and learn how we have come to these days."* (5F6).

As can be inferred from the above excerpt, by developing historical empathy, students better understand the decisions, actions, and experiences of historical figures. This indicates the importance attached to affective domain in social studies education. The students in the sub-theme of "comparison between past and present" stated that they have the opportunity to compare past practices with current practices in social studies classes. To give an example to the views of the students in this sub-theme, an excerpt from the interview with the student coded 6F6 is presented below:

> "Thanks to geography, we compare the population of the 2000s with today's population. We find out when and where people migrated. In the past, people used to live shorter lives. Because there was no cure for many diseases in the past. Scientists made our lives easier by making new inventions." (6F6).

It can be inferred from the above excerpt that the social studies course helps students develop a conception of change and continuity and a conception of time and chronology. Thanks to social studies classes, students gain a versatile perspective on social phenomena by comparing past, present, and future. Looking at the views of the students in the "self-sacrifice," they expressed their gratitude to those who self-sacrificed in difficult times the Turkish nation underwent. The views of the student coded 5M4 are as follows:

> *"Our flag was created with the blood of our soldiers. Thanks to the help of our mothers to our soldiers in harsh conditions, this country was saved. Our soldiers fearlessly and bravely threw themselves in front of the bullets."* (5M4).

As can be inferred from the above excerpt, the students are aware of the self-sacrifices of the people in the past and they identify this with the social studies course. Looking at the views of the students in the theme of "making life easier," they emphasized the aspect of the social

studies course that facilitates the lives of individuals in everyday life. The students in this theme stated that compasses, maps, and other writing and communication tools make life easier. In the theme of "relating knowledge to everyday life," it was emphasized that the knowledge acquired in social studies classes can be used in everyday life. To give an example to the views of the students in this theme, an excerpt from the interview with the student coded 6M3 is presented below:

> "Thanks to what we learn in social studies classes, we know what to do in case of a natural disaster such as earthquakes, floods, landslides. We learn about economic activities such as agriculture, trade, and industry. Similarly, we learn about our citizenship rights and exercise them in our lives. Social studies classes help (us) in many areas." (6M3).

As can be inferred from the above excerpt, the social studies course has content that facilitates the lives of students in many areas. In the theme of "visuals," the students stated that the information they learn through visuals in social studies classes sticks better in their minds. The students in this theme placed more emphasis on the visuals and maps in textbooks. In the theme of "getting information," the students stated that with the information they learn in social studies classes, they can make sense of the world around them. They also said that they can learn about the wars in world history. Besides, they underlined the importance of the course in the socialization process. In the theme of "usefulness," the participants highlighted the contributions of social studies classes to everyday life and cultural development. The views of the student coded 6F9 on this subject are as follows:

> "Thanks to the education we receive in social studies classes, we learn things we can use to help our family. Apart from some of the products we use in everyday life, we learn about different products. By applying what I learn in this course, I will grow these products in the future." (6F9).

As can be inferred from the above excerpt, the social studies course broadens students' horizons with new and useful information. In the theme of "curiosity," the students expressed their curiosity about certain historical and natural phenomena. In addition to the students who are curious about past events, those who are curious about the formation of landforms are also included in this theme. To give an example to the views of the students in this theme, an excerpt from the interview with the student coded 7F11 is presented below:

> "I am very curious about historical artifacts. I am very curious about how ancient people's belongings have survived to the present day. I am very curious about the makers of historical artifacts. I want to go to museums because there are many historical artifacts in our country and I am curious about them." (7F11).

As can be inferred from the above excerpt, the social studies course stimulates students' curiosity. In the theme of "familiarity," the students mentioned the topics that they always encounter in social studies classes. The students in this theme stated that the social studies course evokes in them concepts such as maps, teachers, books, and wars. With regard to why they think so, they stated that the same concepts are addressed in almost every social studies class.

In the theme of "environmental awareness," the students stated that humans should not harm trees, plants, animals, in short, the whole nature. They also said that the social studies course helps them develop environmental awareness. The views of students coded 7M7 are as follows:

> "We constantly pollute our nature. People throw their trash on the streets, not in trash cans. They are not aware that we harm ourselves when we harm nature. Not only people but also animals are badly affected by environmental pollution. Industrial waste flows into the sea and kills fish. I'm calling out to all people. Let's not pollute our nature, let's protect it; if we protect our nature, we protect ourselves." (7M7).

As can be inferred from the above excerpt, the students identify the social studies course with environmental awareness and respect for nature. These findings reveal the multidimensional and interdisciplinary structure of the social studies course.

Discussion, Conclusion and Suggestions

The current research tried to explore middle school students' conceptions of the social studies course in three stages. In the first stage, the students were asked to draw the first five things that the social studies course evoked in them. This allowed us to get an overall picture of the participants' conceptions of the social studies course. The drawings were categorized into 10 themes. The drawings mostly depicted maps of Turkey and the world. Based on this finding, we can argue that maps have an important place in students' conceptions of the social studies

course. Also, many drawings were collected under the theme of "history." The fact that the students identified the social studies course with history may be due to the fact that history occupies a lot of space in the social studies curriculum. In a study conducted by Cetin and Dinc (2017) to examine middle school students' conceptions of the social studies course, the students mostly identified the social studies course with history, which is consistent with our findings. In another study conducted by Dinc and Uztemur (2017) with prospective social studies teachers, the social studies course was mostly identified with history. Considering the students' overall conceptions of the social studies course, the drawings also depicted elements that represent the national identity, Turkish culture, and traditions. This finding is also consistent with the findings reported by previous studies (Deveci & Bayır, 2011; Çetin & Dinç, 2017; Gömleksiz, Kan & Öner, 2012). The drawings collected under the theme of "national identity" mostly depicted the Turkish flag. This finding is important in terms of showing the role of social studies classes in creating citizenship awareness in students. In the Turkish education system, there is no "citizenship" course at the middle school level; instead, the subject of citizenship is covered in the social studies curriculum. The social studies course makes important contributions in terms of developing citizenship awareness in middle school students and helping them adapt to the society they live in. In fact, the "communication-socialization" theme that emerged as a result of the analysis of the drawings proves this contribution of the course.

In the second stage, to find out about the participants' selective conceptions, they were asked to pick one drawing among five, which they most identified with "the social studies course," and write down why they picked that drawing. As a result of the analysis of the drawings picked in the second stage, students' conceptions of the social studies course were categorized into 9 themes. Also, it was observed that the themes obtained in the second stage were consistent with the themes obtained in the first stage. Similarly, the three themes that the students identified most with the social studies course are history, human geography, and national identity, respectively. To find out about the students' reasons behind their conceptions of the social studies course, compositions and interviews were also used. The reasons behind middle school students' conceptions of the social studies course were categorized into 12 themes. Considering the sub-themes of the theme of "history," it was found that the course develops historical awareness and empathy in students, which, in turn, helps them better understand historical events. It was seen that the students took lessons from historical events by making a comparison

between the past and the present. Sub-themes such as gratitude, self-sacrifice, and taking pride are important in terms of showing the importance of the social studies course in creating a national identity and raising good citizens. The drawings that fell under the theme of "history" mostly depicted "battle scenes." These results are consistent with the results of the related research (Altun, 2016; Çetin & Dinç, 2017; Dönmez & Yeşilbursa, 2014; Üztemur, 2020; Yılmaz, 2008; Yılmaz & Kaya, 2011). In a study conducted by Donmez & Yesilbursa (2014) with middle school students, the participants mostly identified history with wars and battles. Similarly, in the study conducted by Cetin and Dinc (2017) with middle school students, the participants mostly identified the social studies course with wars and battles. These findings can be attributed to the weight of history topics in the social studies curriculum and the weight of wars and battles in history topics. In the theme of "historical figures," students talked about major names like Ataturk that have an important place in Turkish history and stated that they follow their example. This finding shows that the social studies course not only teaches students about important historical figures but also develops historical and cultural awareness in them.

The theme of "national identity and values" consists of sub-themes of "patriotism, unity and solidarity, and the values inherent in Turkish culture." Based on this finding, we can argue that values taught in social studies classes are embraced by students. Students' identifying the social studies course with independence is valuable in terms of students' socialization process. When the sub-themes that fell under the theme of "individual and society" are examined, it can be said that the social studies course helps students develop a sense of belonging to the society in which they live. Sub-themes such as democratic values, division of labor, solidarity, and belonging show that the students have developed citizenship awareness and acquired social skills.

The students in the theme of "relating knowledge to everyday life" emphasized that they can relate to everyday life the knowledge they acquire in social studies classes. These results are consistent with previous studies in the relevant literature (Çetin & Dinç, 2017; Dinç & Üztemur, 2017; Gömleksiz et al., 2012; Mertol, Doğdu & Yılar, 2013). The students also stated that the social studies course contains content that facilitates their everyday lives. They said that they can use in real life what they learn in their social studies classes. On the other hand, some of the students were of the opinion that the social studies course is a boring course that always teaches about the same subjects (history subjects, wars, and etc.). In fact, when the

relevant literature is examined, it is possible to come across studies that reported that the social studies course has no relevance to real life (Alazzi & Chiodo, 2004; Ata, 2009; Byford, 2002; Çetin & Dinç, 2017; Özkal et al., 2004). These findings are valuable in that they show that the social studies course has a very broad and complex scope. For a thorough comparison of the results of relevant research, the social sciences that constitute the scope of the social studies course should be analyzed analytically. The current research aimed to explore middle school students' conceptions of the social studies course by using the 'draw-write-tell' method, which merges different data collection tools. Students' conceptions of a course certainly have a direct effect on their performance in that course. We hope that revealing middle school students' conceptions of the social studies course will contribute to all stakeholders in the education system, especially social studies teachers. Considering the fact that one's conceptions of a phenomenon or concept are influenced by place, time, and people, it is important to carry out studies with different samples and to compare the findings of such studies with the findings reported in this study.

Exploring students' conceptions of the social studies course in three stages using the draw-write-tell technique allowed different data collection techniques to be used together. This data triangulation technique also enabled the authors to examine the participants' conceptions of social studies as a course in depth. To the best of our knowledge, no study has so far been conducted to explore students' conceptions of the social studies course using the draw-write-tell method. This shows the strength of the current research. Future studies can adopt a longitudinal approach to reveal the change in students' conceptions of the social studies course over time.

Statements on ethics and conflict of interest

The ethics committee approval was obtained from Usak University with a document number of "28620816/341" on 06.03.2020. Ethical issues were considered throughout the study. There is no conflict of interest in this study.

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Research Article

Friendship Relationships between Turkish-French Children and Their French Peers [1,2]

Yasemin Güleç[3]

Abstract

This study aimed to examine the relationships between Muslim-Turkish children born in France and their French peers. 96 students aged 9-15 participated in the study. 60 of the students were girls, and 36 were boys. The drawings, interviews about the drawings and answers given to the open-ended questions were evaluated together. The data were analysed by the maxqda 2018 software. The study was designed with the research method of phenomenology and analysed by the induction method. The data were depicted in two main themes as tolerant and discriminatory relationships. Differences in terms of gender and age in these themes were examined. Girls made more friends with their French peers. The friendships with the peers increased from 9 years old to 10-12. However, this rate decreased at 13-15 years. Boys expressed that they were exposed to discriminatory attitudes and behaviours by their native friends more. There was an increase from 9 to 10-12 in perceived racial/ethnic exclusion. This decreased at 13-15 years of age. There was a continuous increase in perceived religious exclusion with increasing age.

Keywords: *Immigration children, host children, friendship relationships, tolerance, discrimination.*

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[2] This research titled "Friendship Relationships between Turkish-French Children and Their French Peers" was approved by Hacı Bektaş Veli University Ethics Committee with the number 08 meeting dated 12.03.2020.

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Türk-Fransız Çocuklar ve Fransız Akranları Arasındaki Arkadaşlık İlişkileri

Öz

Bu çalışmada Fransa'da doğan Müslüman-Türk çocukları ile Fransız akranları arasındaki ilişkiler incelenmiştir. Çalışmaya 9-15 yaş arasında 96 öğrenci katılmıştır. Öğrencilerin 60'ı kız, 36'sı erkektir. Öğrencilerin çizimleri, çizimlerle ilgili görüşmeler ve açık uçlu sorulara verilen yanıtlar birlikte değerlendirilmiştir. Veriler MAXQDA 2018 yazılımı ile analiz edilmiştir. Çalışma, nitel araştırma yöntemlerinden fenomenolojik araştırma yöntemi ile desenlenmiş ve tümevarım yöntemi ile analiz edilmiştir. Veriler, hoşgörülü ve ayrımcı ilişkiler olarak iki ana temada tasvir edilmiştir. Bu temalarda cinsiyet ve yaş açısından farklılıklar incelenmiştir. Çalışmanın bulgularına göre, kız çocukların Fransız akranlarını daha çok arkadaş edindikleri görülmüştür. Akranlarıyla olan dostluklar 9 yaşından 10-12 yaş aralığına doğru yükseldiği görülmüştür. Ancak bu oran 13-15 yaşlarında azalmıştır. Erkek çocuklar, kız çocuklara nazaran, Fransız akranları tarafından ayrımcı tutum ve davranışlara daha çok maruz kaldıklarını ifade etmişlerdir. Algılanan ırksal / etnik dışlanmada 9 yaşından 10-12 yaş aralığına doğru bir artış olmuş; bu artış 13-15 yaş aralığında azalmıştır. Artan yaşla birlikte algılanan dini dışlanmada sürekli bir artış olmuştur.

Anahtar Kelimeler: *Göçmen çocuklar, yerli çocuklar, arkadaşlık ilişkileri, hoşgörü, ayrımcılık*

Introduction

In formerly ethnically homogeneous Western European countries, the combination of a host majority and various immigrant minorities nowadays raised some difficulties for the natives and immigrants (McLaren, 2003). Children born in a country where their parents migrate face maintaining their religion and culture and protecting their identity and adaptation to the country's national identity and the host culture (LaFromboise, Coleman, & Gerton, 1993; Szapocznik & Kurtines, 1993; Verkuyten & Martinovic, 2012). This facing may result in different processes, such as losing their religious and ethnic identities altogether, with less emphasis on their identity, to a stronger commitment to national identity or to combining their identity and national identity in a healthy way.

Even though there are differences depending on location, second-generation Muslim immigrants usually gradually adapt to the country (Alba, 1999; Portes & Zhou, 1993), tend to attach less importance to their religious and ethnic identity and have a stronger sense of belonging (Maliepaard, Lubbers, & Gijsberts, 2010). In some cases, this situation may lead children to move away from their own culture and have some conflicts with their families.

The degree of tolerant or discriminatory relationships between immigrant and native children may differ based on social, historical and religious relations. Ethnic and racial majority and minority children may experience prejudice and exclusion in their relationships. However, minority children experience it more (Rosenbloom & Way, 2004). Even though the degree and effect of this perception may vary from child to child, it may still be stated that immigrant children have more difficulty in living in the host country, both psychologically and socially.

Most studies investigated the attitudes of natives towards immigrants and ethnic minorities. These studies often focused on the majority's attitude towards reducing prejudice and discrimination against minorities (Aboud, 1993; Bigler & Liben, 1993; Killen, 2007). After the first study on minority children (Clark & Clark, 1950), other studies were conducted with racial minority children (Bigler & Liben, 2007; Flanagan, Syvertsen, Gill, Gallay, & Cumsille, 2009) and ethnic minority immigrants (Alba, 2005; Leszczensky & Pink, 2016; Leszczensky, Stark, Flache, & Munniksma, 2016; Munniksma, Verkuyten, Flache, Stark, & Veenstra, 2015;

Sabatier, 2008; Stevens, Pels, Vollebergh, & Crijnen, 2004; Verkuyten, Thijs, & Stevens, 2012) in the last two decades.

There is more research focused on the perceptions of native children towards immigrants and ethnic minorities in comparison to research focused on the perceptions of immigrants on native children and friendship relationships. This study examines the perceptions of immigrants about natives and their friendship relationships with them. It uses children's drawings as a diagnostic method. To the best of our knowledge, no study has investigated the friendship relationships of Muslim-Turkish children living in Strasbourg and their native peers through drawings and semi-structured interviews. The focus of this study is to investigate forms of friendship relationships and whether these relationships vary by gender and age. The methodology of this study will contribute to the literature.

Tolerant Friendship Relationships between Immigrant and Native Children

Acculturation is a complex process that immigrants experience when they encounter new cultural values. As most exposure to a new culture occurs at school and in peer interactions (Shih, 1998), peer interactions may affect acculturation of migrant children and adolescents, and likewise, the level of acculturation may affect friendship models (Ting-Toomey, 1981). There are four general implications of acculturation on how immigrants identify as a sub-group of the larger society: Children who assimilate to the host culture and often identify with mainstream friends, those who associate themselves with friends from their own culture or ethnicity, those who successfully integrate the two cultures with their friends from two cultures, and those who are marginalised or alienated to both cultures (Berry, Kim, Power, Young, & Bujaki, 1989; Phinney, 1990).

Positive friendships between minority and native children play an important role in minority students' feelings of being a part of the host society (Reitz, Asendorpf, & Motti-Stefanidi, 2015) and understanding the majority (Feddes, Noack, & Rutland, 2009; Jugert, Noack, & Rutland, 2011; Kawabata & Crick, 2008; Munniksma et al., 2015). Positive friendships -ignoring the group norms of children (identity, beliefs, norms and social status of a group)- are often possible through moral reasoning, concerns for the welfare of others, justice and empathy (Hitti, Mulvey, & Killen, 2017; Malti, Killen, & Gasser, 2011).

In some cross-sectional studies, immigrants who felt more connected to the country showed less intra-group bias (Nier et al., 2001; Pfeifer et al., 2007). Native children may notice immigrants who are closer to the host society's culture and have similar values to themselves, and they may include these immigrants more easily and evaluate them more positively (Schaafsma, Nezlek, Krejtz, & Safron, 2010; Van Oudenhoven, Prins, & Buunk, 1998; Verkuyten & Thijs, 2010; Verkuyten, Thijs, & Sierksma, 2014; Zagefka, Tip, González, Brown, & Cinnirella, 2012).

A longitudinal survey of ethnic minority adolescents in the Netherlands (12-13 years) indicated that friendship with majority peers was related to stronger identification with the host society. Ingroup friendships or ingroup identification was unrelated to outgroup attitudes. The relationship between host society identification and majority friendships was bidirectional (Munniksma et al., 2015)

A cross-sectional study (Leszczensky et al., 2016) found no bidirectional relationship between national identity and native friendships. Native students preferred to befriend immigrants who had a strong national identity. However, neither did immigrants prefer to be similar to the national identification of their friends, nor did having many native friends increase their national identification.

Discriminatory Friendship Relationships between Immigrant and Native Children

Similarities in group norms are a key predictor of friendship choices (S. Smith, Maas, & van Tubergen, 2014; Stark, Flache, & Veenstra, 2013). This may be because interaction with similar people based on a mutual understanding is easier and more rewarding (Leszczensky & Pink, 2015; A. Smith & Schneider, 2000).

In multicultural societies, the coexistence of the majority and various immigrant minorities may highlight differences in group norms and create conflicts (Alba, 2005) where distinctions pile up. Minority children may be exposed to exclusion because of their ethnic origin, race and religion. This may occur through inequitable distribution of resources and in intergroup peer contexts. Social discrimination and exclusion may affect children's perceptions and judgments about peer relationships (Sabatier, 2008).

Discrimination is one of the biggest challenges faced by migrant youth (Wong, Eccles, & Sameroff, 2003). In developmental identity models (Phinney, 1989), perceived discrimination is considered an event that creates awareness among groups and ethnic origins. Perception of discrimination may strengthen the definition of ethnic groups and weaken their ties with the national group (Bourhis, Moise, Perreault, & Senecal, 1997). There is also evidence that perception as a target of ethnic discrimination causes negative consequences in adaptation of immigrant youth, including low academic success (Wong et al., 2003)

A study examining the link between peer preferences of immigrant adolescents and personal ethnic discrimination revealed that personal ethnic discrimination was a result, but a low number of peers was not preferential. If youths experience quality friendships on a bilateral level, they may look beyond the perceptions of discrimination on the macro level (Reitz et al., 2015). Even if there are differences among children, the perception of discrimination may continue to have devastating effects for adolescents' experiences of individual ethnic discrimination (Pascoe & Smart Richman, 2009).

Children who experience exclusion may be at risk for demonstrating prejudicial behaviour toward others and perpetuating a cycle of negative intergroup attitudes (Nesdale & Brown, 2004). Decisions on inclusion or exclusion of ethnic external group members emphasise tensions between moral decisions and other factors such as cultural norms, traditions, personal factors and privileges (Hitti et al., 2017).

Minority children's exclusion experiences may differ. While a Latin American child is subject to prejudice and exclusion based on race and ethnic origin, Arab Americans may be subject to discrimination based on religion, language and personal characteristics (Flanagan et al., 2009). Turkish children in the Netherlands were reported to experience greater perception of exclusion than Moroccan and Syrian children (Verkuyten & Kinket, 2000; Verkuyten & Thijs, 2002).

Racial and Ethnic Categorisation and Friendship Choices

Many studies have shown ethnic awareness in children (conscious recognition of race or ethnicity in individuals and groups, and the ability to label them correctly) increases with age, and this may be noticed between 3 and 5 years (Clark & Clark, 1950; Patterson & Bigler, 2006;

Ramsey, 1991; Ramsey & Myers, 1990). 7-8-year-old children can clearly categorise their national identities and prefer their own country (Murphy & Laugharne, 2013). After 7-8 years of age, children recognise that minority ethnic groups are associated with different stereotypes and there are differences in relative status among minorities (Davis, Leman, & Barrett, 2007; Lam & Leman, 2003).

As children grow up, information about group normativity becomes increasingly important in assessing others. However, it remains unclear how far ethnic group normativity influences children's friendship choices (Leman et al., 2013). Children have higher tendency to play and interact with the same ethnic group from preschool (Finkelstein & Haskins, 1983; Fishbein & Imai, 1993) to childhood (Boulton, 1996; Davey & Mullin, 1982; Leman & Lam, 2008; Leman et al., 2011). Peer relationships provide an important social context for adolescent development (Brechwald & Prinstein, 2011; Meeus, 2011). Intra-ethnic friendships show more intensity during adolescence (Kao & Joyner, 2004), and cross-friendships are seen as an exception (Aboud, Mendelson, & Purdy, 2003). It was also found that inter-ethnic friendships predict more positive group behaviours in middle childhood and adolescence (Vervoort, Scholte, & Scheepers, 2011).

Majority children in different cultures preferred the members of their own ethnic group more (Enesco, Navarro, Paradela, & Guerrero, 2005; Griffiths & Nesdale, 2006; Kowalski, 2003; Nesdale, Maass, Griffiths, & Durkin, 2003). However, minority children mostly paid more importance to social justice, empathy and fairness in friendships (Hitti et al., 2017). Minority children showed less intra-group bias compared to majority children (Griffiths & Nesdale, 2006; Leman & Lam, 2008; Vaughan, 1978; Verkuyten, 2007). In a study conducted with the 13-15 and 16-18 age groups, ethnic identity increased with age and predicted positive in-group attitudes- while these attitudes contributed to positive out-group attitudes (Phinney, Ferguson, & Tate, 1997).

Studies investigating the social networks of young immigrants and natives in countries showed that intra-group preferences play important roles in formation of friendship ties (Hallinan & Teixeira, 1987; Vermeij, van Duijn, & Baerveldt, 2009). Immigrant children from the preschool period (Leman et al., 2013) to childhood (Verkuyten & Kinket, 2000) and from adolescence to youth (Brüß, 2005; Phinney et al., 1997) tended to show stronger preferences for co-ethnic

peers than for interethnic friends. However, this ingroup bias might be less pronounced if migrants strongly identify with the host country (Nier et al., 2001; Pfeifer et al., 2007).

Religious Categorisation and Friendship Choices

Although religious groups are of great importance for supporting the development of both individual and group identity (Seul, 1999), studies on religious group categorisation and inter-group attitudes and friendships are far fewer than those on race and ethnic groups (Van der Straten Waillet & Roskam, 2012b).

Van der Straten Waillet and Roskam suggested that young children do not seem to be able to understand that their social environment could be categorised based on religious beliefs. This understanding is only reached in the middle of childhood at about 8 or 9 years of age, and while the vast majority of children growing up in a heterogeneous environment are likely to be aware of religious differences at 9 years of age, some children from religiously homogeneous environments do not acquire this until 11 years of age. Children younger than 9 may know about some religious labels, but their understanding of these is likely to be inaccurate probably because of their cognitive limitations. Most young children think religious groups, like social groups, are based on physical or behavioural qualities, rather than the shared belief of group members (Van der Straten Waillet & Roskam, 2012a). While religious discrimination is often seen in childhood, it decreases in pre-adolescence and adolescence (Van der Straten Waillet & Roskam, 2012b).

While ethnic homophily is a factor in the friendship ties of children, religious homophily may worsen the problem of ethnic segregation. This is especially true if large groups of immigrants come from countries where the dominant religion is different (Windzio & Wingens, 2014). Intergroup studies (Leszczensky & Pink, 2016; Verkuyten & Thijs, 2010) on how religion and religiosity affect child and youth friendship choices in Western Europe are fewer than in-group studies (S. Smith et al., 2014; Windzio & Wingens, 2014) that examined whether youths prefer having friends of the same religion. Religion might affect not only adolescents' preferences on whom to befriend but also whom not to befriend.

Understanding how religious diversity affects inter-group friendship preferences is particularly important in adolescence. Religious identities are quite stable in adolescence (Lopez, Huynh,

& Fuligni, 2011). Early adolescents derive the most meaning from their religious group affiliations. Dutch early adolescents perceived Muslims as a threat and had a prejudiced perception against them (Velasco González, Verkuyten, Weesie, & Poppe, 2008; Verkuyten & Thijs, 2010). Christian and non-religious youth may be reluctant to be friends with their Muslim peers compared to peers from other religious groups (Windzio & Wingens, 2014). The reason may be anti-Muslim attitudes and prejudices in Europe (Foner & Alba, 2008; Strabac & Listhaug, 2008).

In a study focused on adolescents' friendship networks, how religion and religiosity affect intergroup and intra-group friendship choices, while Muslim youth preferred to be friend Muslim peers, Christian youth displayed no evidence of religious homophily. For Muslims, higher levels of religiosity increased this preference further. Regardless of their individual religiosity regarding inter-group friendships, Muslim youth were socially separated from their non-Muslim peers because of the reluctance of Christian and non-religious youth to befriend their Muslim peers (Leszczensky & Pink, 2016).

The aim of this study was to determine the perceptions and friendship relationships of second-generation Muslim-Turkish children born in Strasbourg about their native French peers. Research on the friendship relationships between immigrants and native children generally focused on adolescents and young people. This study examined the developmental and socio-cognitive relationships between immigrant children and native children from middle childhood to middle adolescence (9-15 years). The attempts of identifying friendship models between racial/ethnic and religious groups and efforts of understanding the causes of discriminatory behaviours in peer relationships could contribute significantly to developmental research in middle childhood and adolescence. Racial/ethnic and religious diversity experience in middle childhood could have a sustained impact on attitudes in youth and adulthood.

This study focused on peer relationships at school, an important context for socialisation, using children’s drawings, which are one of the best tools projecting the unconscious levels of the inner group of the individual more than verbal forms of expression (Abraham, 1990). Many other intercultural studies - although they used larger samples - generally used quantitative methods.

According to Muslim-Turkish children, friendship relationships in the context of school are mostly based on respect and love rather than discrimination and exclusion based on stereotypes and prejudices. In this study, the Muslim-Turkish children stated that they were exposed to racial/ethnic (being Turkish) and religious (being Muslim) discrimination and exclusion.

Method

Participants and procedure

The study was conducted with second-generation Muslim-Turkish children born in Strasbourg/France. They were studying Islamic religion on the weekends (two days a week) at the Strasbourg Yunus Emre Mosque. 96 students aged 9-15 years were included. 60 of the students were girls, and 36 were boys. Firstly, the students were seated in rows one by one to prevent them from being influenced by each other. A4 paper, 12-colored crayon boxes, pencils and erasers were distributed to each participant. Afterwards, the students were asked to draw a picture expressing friendship relationships with their French peers. Drawing time was not limited so that the children could draw freely. This time varied between 15 and 30 minutes. Afterwards, each child was interviewed individually about the drawings. This time ranged from 4 to 5 minutes. Afterward, semi-structured interviews were held about their drawings to understand their feelings, thoughts, and behaviors. Each student was asked three open-ended questions: i. Are you happy/unhappy with living together with different peer groups in the school context? Could you explain the reason for this? ii. Who are your best friends at school? iii. Are you or are you not exposed to discrimination and exclusion by your French peers? Could you explain the reason for this? The open-ended question time ranged from 7 to 9 minutes. In this study, 25-30 minutes were spent on average for each student.

In this study, the drawings, interviews about the drawings and answers given to the open-ended questions were evaluated together. The data were analysed with the maxqda 2018 software. This is a phenomenological study whose results were analysed by the induction method, which is a systematic content analysis method. In the phenomenology research design, data analysis is aimed at revealing experiences and meanings. Inductive content analysis aims to reveal the underlying concepts of data and the relationships between these concepts by coding (Strauss & Corbin, 1990). Inductive analysis steps may be listed as encoding data, defining themes, organising and defining themes according to codes and interpreting the findings (Yıldırım &

Şimşek, 2016). Initially, the data obtained from the students' drawings and interviews were coded, and themes were created by combining the relevant codes.

After this step, the data were reviewed 4 times to confirm the relationships of concepts to codes and the relationships of codes to themes. In this study, different data collection tools were used together as pictures, interviews and open-ended questions to strengthen the validity. The data were independently coded by two researchers, and the codes and themes that emerged were compared. The analyses were carried out by two different researchers who are experts in qualitative analysis in MAXQDA for the reliability of the study. Additionally, the qualitative categories that were obtained were digitised. Digitisation increases the reliability of qualitative research. This research titled "Friendship Relationships between Turkish-French Children and Their French Peers" was approved by Hacı Bektaş Veli University Ethics Committee with the number 08 meeting dated 12.03.2020.

The data were depicted in two main themes as tolerant and discriminatory relationships. Tolerant relationships were divided into four main codes: "Living together as a family", "there is no discrimination", "best friendships between groups", "Turkish-French peer relationships (minority-majority peer relationships as tolerant relationships)." Discriminatory relationships were divided into two main codes: "Turkish-French peer relationships (minority-majority peer relationships as discriminatory relationships)", “exclusion by some French teachers”. After this, the main codes and sub-codes were analysed considering gender and age.

Results

While the main aim of this study was to determine the friendship relationships of Muslim-Turkish children with their French peers, the students did not limit their peer relationships to their French peers in their drawings. The pictures also included relationships with other minority groups living in Strasbourg. As a result of coding, the main themes, codes and sub-codes were as given in the tables in the following sections.

Tolerant relationships

Tolerant Relationships included four codes as "Living together as a Family", "There is no Discrimination", "Best Friendships between Groups", "Turkish-French Peer Relationships".

The code "Best Friendships between Groups" consisted of four sub-codes. The code "Turkish-French Peer Relationships" consisted of three sub-codes (Figure 1).

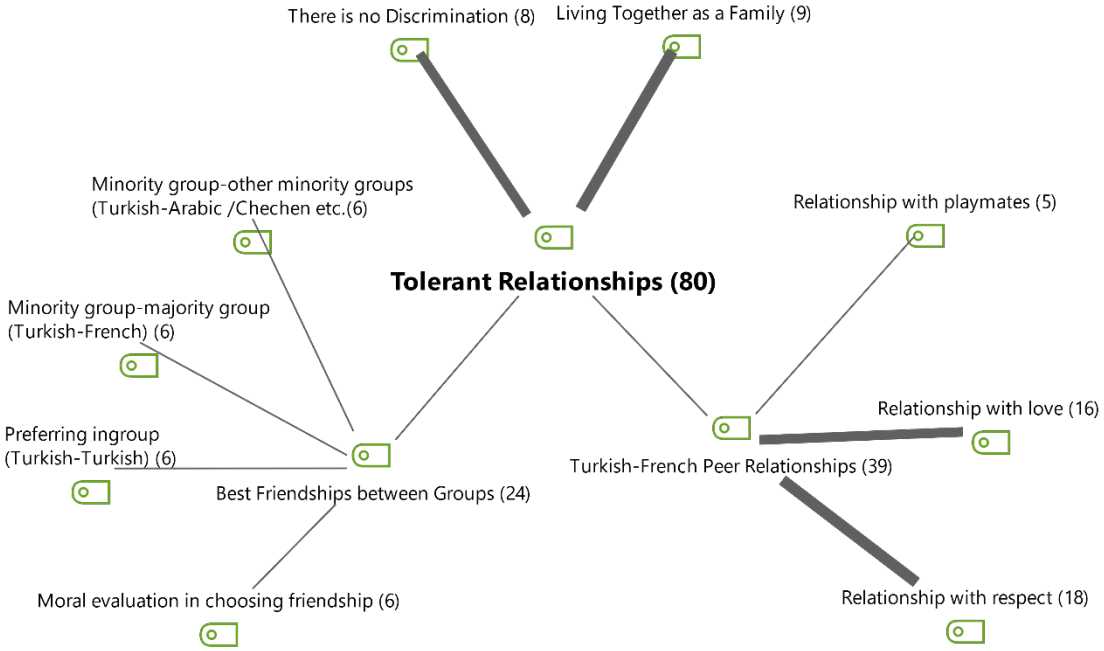

Figure 1. Tolerant relationships code theory model

33% of the boys and 68% of the girls thought they lived together with their peers in Strasbourg as families of different races, ethnicities and religions (Table 1). Similarly, respectively 38% and 63% of the respondents said no one was subjected to racial, religious or other social discriminatory attitudes and behaviours. In both episodes, the girls thought they had more relationships of tolerance in friendship than the boys. Some students in the paintings and interviews stated who their best friends were. The boys' best friends were mostly students in the majority group, French children. The girls preferred the majority group less in friendship. The boys and girls chose their best friends from other minority groups at the same proportion. The girls preferred own group in best friendships. Likewise, in choosing their best friends, only girls attached importance to their friends' moral attitudes and behaviour. Turkish-Muslim students in relationships with their French peers were communicating with respect, being playmates and love. The girls paid more importance to love and respect in their communication with the majority group. The boys preferred mostly playmate friendship with more superficial communication.

Table 1
Tolerant Relationships by Gender

Tolerant Relationships	Boy	Girl	Total
Living together as a family	33,33	66,67	100,00
There is no discrimination	37,50	62,50	100,00
Best Friendships Between Groups			
Minority group-majority group (Turkish-French)	33,33	66,67	100,00
Minority group-other minority groups (Turkish-Arabic /Chechen et	50,00	50,00	100,00
Preferring own ingroup (Turkish-Turkish)	0,00	100,00	100,00
Moral evaluation in choosing friendship	0,00	100,00	100,00
Turkish-French Peer Relations			
Relationship with respect	38,89	61,11	100,00
Relationship with playmate	60,00	40,00	100,00
Relationship with love	25,00	75,00	100,00
SUM	31,25	68,75	100,00
N (Documents)	(36)	(60)	(96)
	%37,5	% 62,5	% 100

As shown in Table 2, the 9-year-olds had no idea about "Living together as a family". 67% of the 10-12-year-olds and 33% of the 13-15-year-olds thought all groups lived together as a family in Strasbourg. Similarly, the 9-year-olds did not express an opinion on "There is no discrimination". 50% of the 10-12-year-olds and 13-15-year-olds said there was no discrimination. In selecting the best friends, the 9-year-olds firstly made friends with the majority, secondly preferred their in-group, and other minorities the least. The 10-12-year-olds firstly made friends with other minority groups, secondly preferred their in-group, and the majority at the least. The 13-15-year-olds did not express an idea about choosing their best friend. Moreover, the 9-year-olds old said they firstly had respect-related relationships and secondly had love-related relations. The 10-12-year-olds were the age group that had the most contact with their French peers on every level as respect, playmates and love. The 13-15-year-olds also had relationships on every level, but there were less frequent contacts than the 10-12-year-olds. Only the 10-12-year-olds chose their best friends according to their moral attitudes and behaviours rather group norms. In this regard, the 9-year-olds and those in their middle adolescence did not make any comments regarding moral evaluation in choosing friends.

Table 2
Tolerant Relationships by Age

Tolerant Relationships	Age 9 years old	Age 10-12 years old	Age 13-15 years old	Total
Living together as a family	0,00	66,67	33,33	100,00
There is no discrimination	0,00	50,00	50,00	100,00
Best Friendships Between groups				
Minority group-majority group (Turkish-French)	50,00	50,00	0,00	100,00
Minority group-other minority groups (Turkish-Arabic /Chechen et	16,67	83,33	0,00	100,00
Preferring own ingroup (Turkish-Turkish)	33,33	66,67	0,00	100,00
Moral evaluation in choosing friendship	0,00	100,00	0,00	100,00
Turkish-French Peer Relations				
Relationship with respect	27,78	61,11	11,11	100,00
Relationship with playmate	0,00	80,00	20,00	100,00
Relationship with love	18,75	62,50	18,75	100,00
SUM	17,50	66,25	16,25	100,00
N (Documents)	(17) %17	(59) %61	(20) %20	(96) % 100

Discriminatory relationships

Discriminatory Relationships consisted of two main codes as "Turkish-French Peer Relationships" and "Exclusion by Some French Teachers". "Turkish-French Peer Relations" consisted of the codes "Exclusion" and "Prejudice and Stereotypes". The code "exclusion" included two sub-codes as "Religious exclusion against minority group" and "Racial exclusion against minority group". "Prejudice and Stereotypes" consisted of five sub-codes as "Religious prejudice against minority group", "Religious prejudice against majority group", "Racial prejudice against minority group", "Racial prejudice against majority group" and "Racial stereotypes against the majority group" (Figure 2).

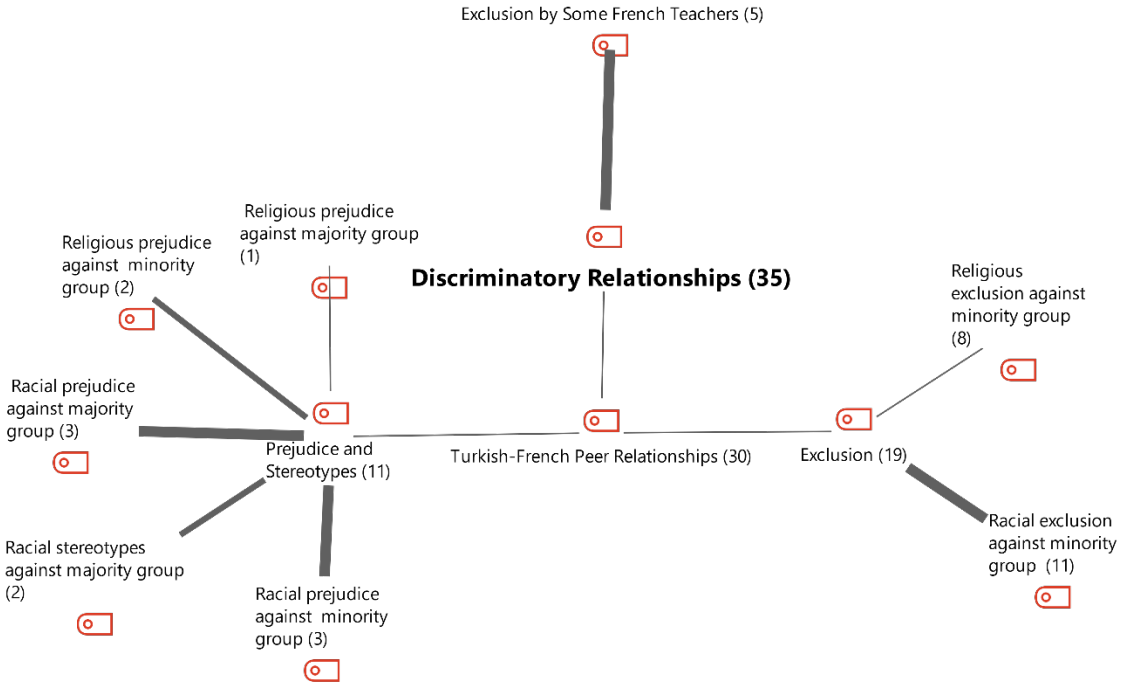

Figure 2. Discriminatory relationships code theory *model*

As seen in Table 3, the immigrant family children stated they were mostly exposed to religious exclusion by the native children. This exclusion was most often expressed by boys. According to the girls, the second most common type of exclusion among peers was racial exclusion. Visual indicators, signs and symbols related to religious or racial prejudice, discrimination and exclusion in some drawings of children were not one-sided but mutual between the majority and minority peers. The boys considered that there was no religious prejudice and racial stereotypes against the majority. The girls and boys considered that religious prejudice was in the same proportion against the minority. Although the research questions of this study were not directly related to this, some said discriminatory attitudes and behaviours were shown by French teachers rather than their peers. 60% of the boys and 40% of the girls expressed these attitudes against themselves in their drawings and interviews.

Table 3
Discriminatory Relationships by Gender

Discriminatory Relationships	Boy	Girl	Total
Turkish-French Peer Relations			
Exclusion			
Religious exclusion against minority group	87,50	12,50	100,00
Racial exclusion against minority group	36,36	63,64	100,00
Prejudice and Stereotypes			
Religious prejudice against minority group	50,00	50,00	100,00
Religious prejudice against the majority group	0,00	100,00	100,00
Racial prejudice against minority group	33,33	66,67	100,00
Racial prejudice against majority group	66,67	33,33	100,00
Racial stereotypes against the majority group	0,00	100,00	100,00
Exclusion of Some French Teachers	60,00	40,00	100,00
SUM	51,43	48,57	100,00
N (Documents)	(36) %37	(60) %62	96 %100

As seen in Table 4, the 13-15-year-olds said they were mostly exposed to religious exclusion. The 10-12-year-olds also stated this exclusion, while the 9-year-olds did not mention the concept of religious exclusion. The 10-12-year-olds mostly expressed racial exclusion. These were respectively followed by the children in middle adolescence and the 9-year-olds. The 13-15-year-olds said the exclusion shown against their minority group was mostly religion-based. They did not mention religious prejudice and stereotype. Both the 9-year-olds and 10-12-year-olds said minority group students had racial stereotypes about the majority group students. Likewise, both age groups expressed mutual racial prejudices between the groups. The 9-year-olds did not express religious prejudice and religious exclusion. Only one student stated she did not like French children because they are not Muslim. The 10-12-year-olds said they were exposed to religious prejudices by the native children.

Table 4

Discriminatory Relationships by Age

Discriminatory Relationships	Age 9 years old	Age 10-12 years old	Age 13-15 years old	Total
Turkish-French Peer Relations				
Exclusion				
Religious exclusion against minority group	0,00	37,50	62,50	100,00
Racial exclusion against minority group	18,18	54,55	27,27	100,00
Prejudice and Stereotypes				
Religious prejudice against minority group	0,00	100,00	0,00	100,00
Religious prejudice against the majority group	100,00	0,00	0,00	100,00
Racial prejudice against minority group	33,33	66,67	0,00	100,00
Racial prejudice against majority group	33,33	66,67	0,00	100,00
Racial stereotypes against the majority group	50,00	50,00	0,00	100,00
Exclusion of Some French Teachers	0,00	80,00	20,00	100,00
SUM	17,14	57,14	25,71	100,00
N (Documents)	17 (% 17)	59 (%61)	20 (%20)	96 (%100)

Discussion

Tolerant Relationships by Gender-Age

In this study, there were more tolerant relationships than discrimination (see and compare code theory models: (Figure 1 and Figure 2). There were 4 themes that were the most common in the context of tolerant relationships: Relationship with respect (18 codes), relationship with love (16 codes), living together as a family (9 codes), there is no discrimination (8 codes) (Figure 1).

The girls had more positive relationships with their peers than the boys. Some studies also reported that boys prefer more social distance (Verkuyten & Kinket, 2000) and being friends with ethnically similar peers (Shih, 1998).

The children had positive friendships with their host peers at most at the ages of 10-12, followed respectively by 9 and 13-15 (this age group did not mention their best friendships). Compared to the 10-12-year-old girls, the 9-year-olds and 13-15-year-old boys had more distant relationships with their French peers. The most common theme in friendship relationships with

French peers for the 9-year-old girls and the 10-12-year-old boys was "respect" (Figure 3). The 10-12-year-old girls preferred friendship based on "love" which requires closer and special relationships with their native peers. They also befriended other ethnic minorities. This is also the only age group that made moral assessments while choosing their friends. The 9-year-olds did not mention "together as a family" and “there is no discrimination." These were respectively mentioned by the 10-12-year-olds and the 13-15-year-olds. The 10-12-year-olds and 13-15-year-olds stated "there is no discrimination" in the same rate.

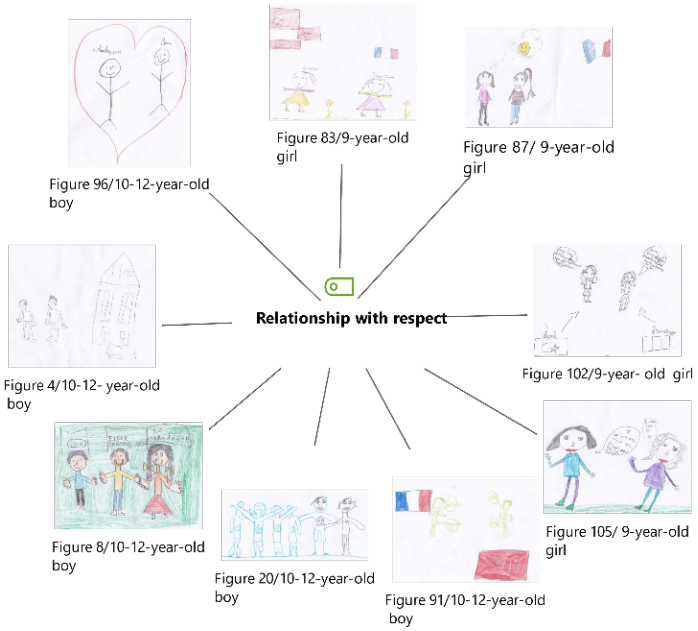

Figure 3. Relationship with respect single-code model for 9-year-old girls and 10-12-year-old boys

Each age group communicated with both their ethnic groups and other ethnic groups and native children. This study, therefore, did not correspond with the studies which showed immigrant children preferred their own co-ethnic friendships from pre-school (Finkelstein & Haskins, 1983; Fishbein & Imai, 1993; Leman et al., 2013) to childhood (Boulton, 1996; Leman & Lam, 2008; Verkuyten & Kinket, 2000) and from adolescence to youth (Brüß, 2005; Phinney et al., 1997) rather than inter-group friendships.

One may say the age group which was the most integrated with the host country was the 10-12-year-olds, especially the girls. The most common theme in the 10-12-year-old girls was

“relationship with love" (Figure 4). The only age group that made moral assessments in choosing friends was the 10-12-year-olds.

In the drawings of this age group, there was no distance between children, they were clearly in communication. Hands held, faces smiling, hearts, flowers, smileys, rainbows, heart-shaped Turkish and French flags. In the picture of a 12-year-old girl, there were two friends with French and Turkish flags on their skirts. French: "How are you, are you okay? You know I miss you so much?" Turk: "I'm fine, how are you? I missed you, too." French: “I am very happy to see you.” Turk: "Me, too". French: "I love you very much." Turk: "Me, too..."

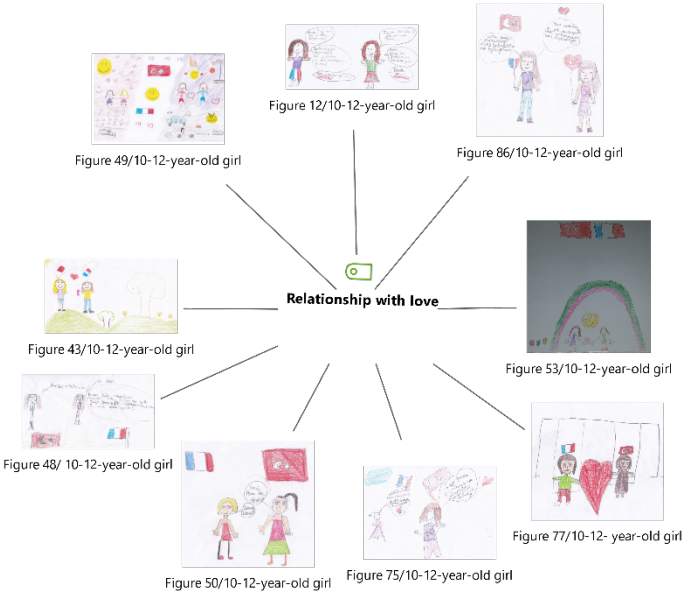

Figure 4. Relationship with love single-code model for 10-12- year-old girls

These results were similar to studies which reported that immigrants who feel more connected to the host country show less intra-group bias (Nier et al., 2001; Pfeifer et al., 2007) and those with a strong national identity may have more native friends (Agirdag, Van Houtte, & Van Avermaet, 2011; Leszczensky, 2013; Munniksma et al., 2015; Sabatier, 2008).The best friends of the age group of 10-12 were respectively other minority groups, own ethnic groups and native children.

10-year-old girl: "I don't like my French classmate,. Because they want to have a fight and swear." 10-year-old girl: "There are good people from both Turks and the French. However, there are also bad people." Accordingly, the 10-12 age group ignored group norms in their friendship relationships and was influenced more by the personality traits of their friends by

moral reasoning, justice and empathy. This result supported the statements of previous studies about minority children (Hitti et al., 2017; Malti et al., 2011; McGlothlin & Killen, 2005; Park & Killen, 2010; Turner & Brown, 2007; Verkuyten & Thijs, 2002)

The 9-year-olds did not mention “living together as a family" and "there is no discrimination." However, this age group had positive relationships with both their ethnic group and other ethnic groups and their native peers. Their lack of expressing these concepts related to coexistence may be related to their levels of cognitive development. The concepts "living together as a family" and "there is no discrimination" were said firstly by the 10-12-year-olds and then by the 13-15-year-olds. The 10-12- and 13-15-year-olds stated "there is no discrimination" in the same rate. This concept was the most common theme in the 13-15-year-old girls (Figure 5). In the drawings with the themes "living together as a family" and "there is no discrimination", there was no distance between children. There were children dressed in different colours and shapes. They were playing, smiling together holding hands in playgrounds and classrooms. There were hearts, flowers, rainbows, combinations of flags (Turkey, France, Switzerland, Algeria, Tunisia, Morocco). One may state that the children were integrated into French culture at different rates. The findings supported the view of multiculturalism that one's positive feelings about own group contribute to their positive emotions towards other groups (Lambert, Mermigis, & Taylor, 1986; Phinney et al., 1997).

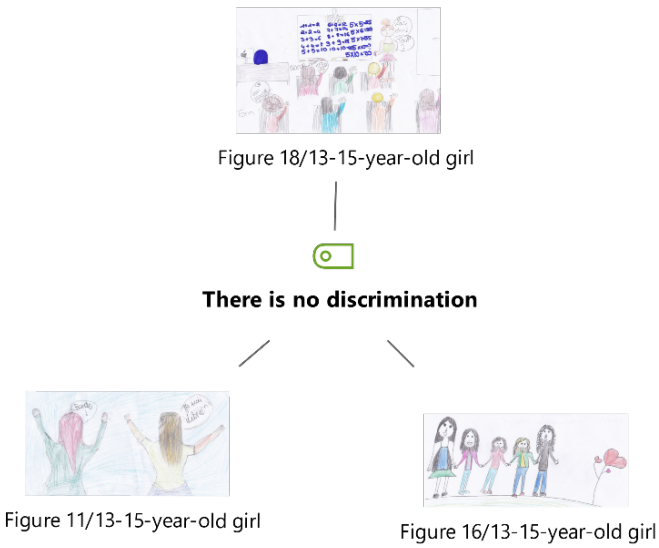

Figure 5. There is no discrimination single-code model for 13-15-year-old girls

Discriminatory Relationships by Gender-Age

There were 3 themes that were the most common in the context of discriminatory relationships: racial exclusions against minority groups (11 codes), religious exclusions against minority groups (8 codes), exclusion by some French teachers (5 codes) (Figure 2). Although the research questions of this study were not directly related to this, some students said discriminatory attitudes and behaviours were shown by French teachers rather than their peers. 60% of the boys and 40% of the girls expressed these attitudes against themselves in their drawings and interviews.

The boys expressed the discriminatory attitudes and behaviours of their native peers more than the girls did. This may be due to the fact that girls prefer to belong to very small groups based on interests and interpersonal attraction, while boys are more attentive in competitive activities based on group identities (Schofield, 1981). The perception of racial exclusion was 18.18% in the 9-year-olds, 54.55% in the 10-12-year-olds. There was a decrease in this perception with a rate of 27.27% at the ages of 13-15. This theme is the most common theme in discriminatory relationships for girls aged 10-12 (see Figure 6). Secondly, they stated that they were exposed to religious exclusion. This age group said they were mostly exposed to both religious and racial exclusion by French teachers rather than their French peers.

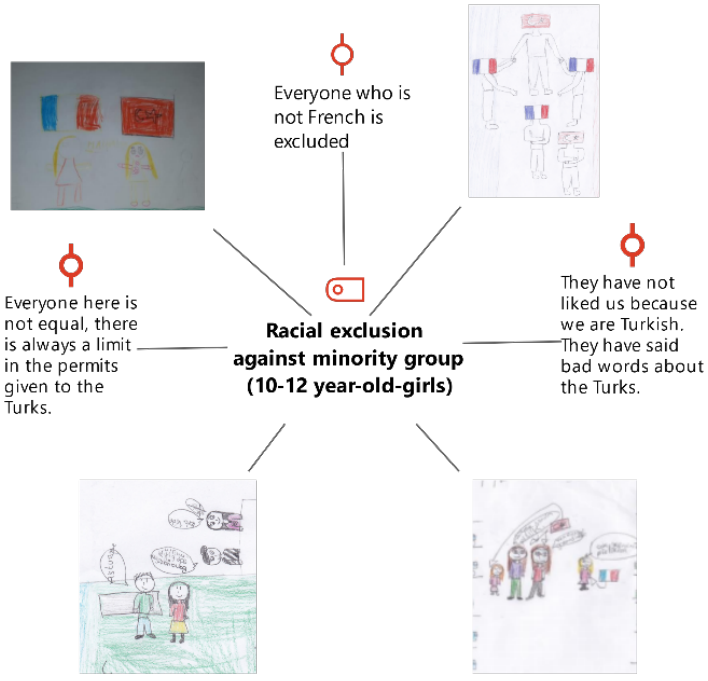

Figure 6. Racial exclusion against minority group single-code model for 10-12-year-old//7/

The perception of religious exclusion was not expressed by the 9-year-olds (but they were aware of religious differences), while the rates of stating this issue were 37.50% in the 10-12-year-olds and 62.50% in the 13-15-year-olds. The perception of religious exclusion was the most common theme for the boys at the ages of 13-15 (Figure 7). The second thing they expressed was racial exclusion. This age group also stated that they were excluded by French teachers.

Figure 7. Religious exclusion against minority group single-code model for 13-15-year-old boy

There was an increase in the perceived racial/ethnic exclusion from 9 years to 10-12 years of age, but in the 13-15 age group, there was a decrease. The children's paintings showed an increase in racial/ethnic prejudice and exclusion attitudes and behaviours in children of both minority and majority groups, from 9 to 10 years of age. On the contrary, in the pictures of the children aged 13-15 years, there was a mutual decrease in the attitudes and behaviours of racial/ethnic prejudice and exclusion. Considering research that found a positive correlation between perceived discrimination and ethnic discovery (Pahl & Way, 2006; Romero & Roberts, 1998), in terms of children aged 9-12 years and 10-12 years, this results was similar to those of studies reporting that ethnic awareness increases with age (Clark & Clark, 1950; Murphy & Laugharne, 2013; Patterson & Bigler, 2006), and children aged 7-8 understand that minority ethnic groups are associated with different stereotypes (Davis et al., 2007; Lam & Leman, 2003).

At 13-15 years of age, there is a decrease in mutual discrimination attitudes and behaviours (minority-majority), as well as the perception of racial/ethnic exclusion by immigrant children. Despite the increase in group normativity with age (Abrams, Rutland, & Cameron, 2003), friendship choices at the age of 13 may focus on intergroup dynamics (Leman et al., 2013). In a study conducted with the 13-15 and 16-18 age groups, ethnic identity increased with age, and positive attitudes were predicted within the group. These attitudes positively contributed to non-group attitudes (Phinney et al., 1997).

The majority of the students who stated that they were exposed to racial exclusion by their host peers stated that not all French children excluded Turks, and only some French children did so. Additionally, some Turkish children in the interviews stated the following: “If they (the French) exclude me, I exclude them, too. If they treat me well, I'm already playing with them. Some of my French friends are very good, we play with them all the time.” These expressions support the results of a study (Nesdale & Brown, 2004) which argued that children exposed to discrimination and feeling the perception of exclusion are at risk of exhibiting prejudiced behaviours and maintaining a negative attitude. Reitz et al. (2015) found immigrant youth could look beyond the perception of discrimination if they have quality in bilateral friendship relationships, and while personal ethnic discrimination is a consequence, a low number of peers is not preferential. These results were similar to the results of studies that found that minority children often show less intra-group bias than majority children (Griffiths & Nesdale, 2006; Leman & Lam, 2008; Phinney et al., 1997; Vaughan, 1978; Verkuyten, 2007).

In this study, religious prejudice and exclusion attitudes and behaviours increased as the ages increased in children's drawings. The number of the children who perceived religious exclusion also increased with age based on their statements in the interviews. Mostly, considering the positive correlation between perceived discrimination and ethnic discovery (Pahl & Way, 2006; Romero & Roberts, 1998), the results of this study were similar to those of van der Straten Waillet and Roskam (2012b). In another study by Roskam, religious discrimination was frequently seen in childhood but decreased in pre-adolescence and adolescence (Van der Straten Waillet & Roskam, 2012b).

In the pictures with the theme of religious exclusion, there was a distance between Turkish and French children, and there were no indicators, signs or symbols indicating positive communication. The ones who communicated, greeted and offered to play together were

Muslim children. However, they did not receive positive responses to these offers. In a picture of a 13-year-old student, Muslim child: "Hello." French child: "I don't like Muslims." (turning his back, he leaves). This student said in the interviews: “I like to live with other cultures in Strasbourg. I have little love for my French friends. Muslims here are mostly excluded by the French. It may be stated that religion is not an important factor for Muslim children in choosing friendships, but because they are excluded by some French friends, they mostly be friend Muslims. These results supported those of the studies showing that Christian and non-religious children have negative feelings towards Muslims and even perceive them as threats and are reluctant to befriend them (Leszczensky & Pink, 2016; Velasco González et al., 2008; Verkuyten & Thijs, 2010).

In this sample, some students stated that discriminatory attitudes and behaviours were shown by some French teachers rather than their peers. A boy aged 12: “Some French teachers discriminate against Muslims and exclude them. For example, they do not tell the history of Muslims in history classes. One time I asked my history teacher: ‘Why are we learning only Christians and Jews and other religions? Do you ever not talk about Muslims?’ I said. He said: "There are not just Muslims." In the picture of a 13-year-old girl in a math class, each student was painted with different colours and names that reflect ethnic and religious differences were written. This student spoke about her drawing in the interview: “I'm happy to live in Strasbourg. I love my French friends and I don't feel excluded. I have friends from various races and religions in the classroom. This is why I painted everyone in different colours. Our maths teacher equally treats Elanur who is Turkish and Tom who is French. He gives the right of speech to both.” Supporting these statements, in a study conducted with children aged 6-14, the fact that teachers had a pro-diversity belief ensured that students had low levels of intentions of social exclusion regarding disadvantaged children. Conversely, if teachers do not have pro-diversity beliefs, students may have more social exclusion tendencies in their friendship relationships. Teachers' perception of the differences in their classrooms to be valuable may encourage students to interact with their peers on the basis of individual differences and reduce their inter-group bias (Grütter & Meyer, 2014).

Limitation and Future Research Directions

Limitations of this study warrant attention. Firstly, since the study was cross-sectional, it could not provide precise information about the causal aspects of the relationships between variables.

As friendship relationships are dynamic processes that are affected by many factors and may change over time, to identify the causal aspects of relationships, there is a need for qualitative and longitudinal international studies. The second limitation of this study was that it was conducted in a unilateral manner (only Muslim children). To identify the models of friendship between immigrant and native children, according to a dynamic inter-group perspective (Brown & Zagefka, 2011), both groups should be involved in potential formation of friendships. The majority of the comparative studies in the literature are quantitative. Future research could be carried out in larger samples, using an intergroup and mixed research design. Thirdly, in terms of examining only the 9-15 years of age, our research was limited to this age group. There are different results at earlier and later ages. Fourth of all, peer relationships were analysed in terms of age and gender by considering only the context of school. It was aimed to obtain information about the racial/ethnic and religious composition of the classes with an open-ended question, but the effect of the class composition could not be included in the study because the students could not provide enough information. In future research, the racial/ethnic and religious composition of the school and class (Kistner, Metzler, Gatlin, & Risi, 1993; Pettigrew & Tropp, 2006; Van der Straten Waillet & Roskam, 2012b), parental ethnic and religious socialisation (Aronowitz, 1992; Sabatier, 2008; Spiegler, Güngör, & Leyendecker, 2016) and neighbourhood composition (Mouw & Entwisle, 2006) should be examined. Moreover, these second-generation culturing processes and their interrelationships are limited to the children of Muslim-Turkish families born in Strasbourg. Relationships between immigrant and native children may be different in terms of immigrant children's racial/ethnic, national and religious identity and the country they immigrate to. To determine the extent of generalisability of other immigration contexts, it is necessary to reproduce the samples on the international level.

Conclusion

This study examined friendship relationships between 9-15-year-old Muslim-Turkish children and their French peers. It tried to examine whether there were differences in terms of gender and age in these relationships. As a result of systematic inductive analysis of children's drawings and semi-structured interviews, two main themes emerged as tolerant and discriminatory friendship relationships.

In comparison to the boys, the girls made more friends from among their French peers. Friendships with native peers increased from the age of 9 to 10-12. However, this rate decreased

at the age of 13-15 years. Compared to the girls, the boys more frequently expressed that they were exposed to discriminatory attitudes and behaviours by their native friends.

In our study, the 9-year-old children were aware of racial/ethnic differences. However, they seemed to be unaware of religious differences (only one child mentioned religious differences). There was an increase from the age of 9 to 10-12 in terms of perceived racial/ethnic exclusion. This perception decreased in the age group of 13-15. There was a continuous increase in perceived religious exclusion with increasing age.

In this sample, the most frequent in-group and inter-group communication was in the 10-12-year-olds. The fact that intercultural education programs consider the readiness level of this age group could positively affect inter-group friendships. These positive effects could be lasting on attitudes in youth and adulthood. Furthermore, considering that the real judgments of children's friendship potentials are influenced by the similarities in personality traits, interests and activities of their peers rather than group norms, intercultural education, ethics, democracy and citizenship, and intercultural religious education curriculums should focus on intercultural similarities rather than differences.

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Statements on ethics and conflict of interest

This research titled "Friendship Relationships between Turkish-French Children and Their French Peers" was approved by Hacı Bektaş Veli University Ethics Committee with the number 08 meeting dated 12.03.2020. Ethical issues were considered throughout the study. There is no conflict of interest in this study.

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