Türkiye'deki İlkokul Matematik Ders Kitaplarındaki Etkinliklerin 21. Yüzyıl Becerileri Bağlamında İncelenmesi

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Öz

Çalışmanın amacı, Türkiye'de okutulmakta olan ilkokul Matematik ders kitaplarında yer alan etkinlikleri 21. yüzyıl becerilerine göre incelemektir. Çalışma nitel araştırma yöntemi doküman incelemesi desenine uygun olarak tasarlanmış, verilerin analizinde betimsel analiz yöntemi kullanılmıştır. Çalışmada, Millî Eğitim Bakanlığı (MEB) Talim ve Terbiye Kurulu Başkanlığı (TTKB) tarafından onaylanmış 2019-2020 eğitim öğretim yılından itibaren tüm Türkiye'de ilkokul 1., 2., 3. ve 4. sınıflarında okutulan matematik ders kitaplarındaki etkinlikler 21. Yüzyıl becerilerine göre incelenmiş, etkinliklerin P21'de belirlenen becerilerden hangileri ile ilişkili olduğu tespit edilmiştir. Çalışmanın sonucunda en fazla "öğrenme ve yenilikçi becerilere" sonra "yaşam ve kariyer becerileri" ne yer verildiği görülmüştür. Ders kitaplarındaki etkinlikler incelendiğinde bütün sınıf düzeylerinde etkinliklerin "öğrenme ve yenilikçilik becerileri" ile "yaşam ve kariyer becerileri" temaları ile ilişkili olduğu sonucuna ulaşılmıştır. Matematik ders kitaplarında "bilgi, medya ve teknoloji becerileri" teması ile ilişkili etkinliklere ulaşılamamıştır. Elde edilen bulgulara göre matematik ders kitaplarının yazım sürecinde etkinliklerin geliştirilmesinde 21. yüzyıl becerilerinin tamamının göz önünde bulundurulması ve beceriler ile etkinliklerin ilişkilendirilmesi gerektiği söylenebilir.

Anahtar Kelimeler: İlkokul, matematik ders kitapları, 21. Yüzyıl becerileri

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GENİŞLETİLMİŞ ÖZET

Giriş

Her yüzyıl önceki yüzyıllara göre çeşitli yeniliklerle karşımıza çıkmaktadır, bu nedenle de farklı gereklilikleri beraberinde getirmektedir. Örneğin, içinde bulunulan 21. yüzyıl teknolojik gelişmelerin önceki yüzyıllara göre oldukça fazla yaşandığı bir dönemdir. 21. yüzyıl becerilerinin farklı dersler ile ilişkisinin olduğu bilinmektedir. Bu dersler arasında matematik dersinin ayrı bir öneme sahip olduğu ifade edilebilir. Bu durumun nedeni ise 21. yüzyılda önem kazanan iletişim, ilişkilendirme, problem çözme, akıl yürütme gibi üst düzey düşünme, teknolojiyi etkin kullanma, iletişim kurma becerileri [Millî Eğitim Bakanlığı (MEB), 2018] gibi çeşitli becerilerin matematik dersinde etkin bir şekilde vurgulanamsıdır. Özellikle matematik dersinde problem çözme, teknolojiyi etkin kullanma, iletişim kurma gibi becerilere başvurma ile okul ve günlük hayat ilişkilendirmesinin önemli olduğu okul kademesi ilkokul düzeyidir. Çocuklar zorunlu eğitim sürecine ilkokul ile başlamasından dolayı bu becerilerin planlı olarak bu eğitim kademesinde kazandırılmaktadır. Öğrencilerin gelecekteki yaşamlarında kullanacakları bilgi ve becerilerin temelleri ilkokullarda atılmaktadır (Temur, Özyeğit, Divrengi, Özkara & Ayyıldız, 2012). Belirtilen nedenler ile alanyazında bir eksiklik olduğu düşüncesinden hareketle ilkokul matematik ders kitaplarında 21. yüzyıl becerilerine ne kadar yer verildiğinin tespit edilmesinin önemli olacağı düşünülmektedir.

Amaç

Araştırmanın amacı, Türkiye'de okutulmakta olan ilkokul (1- 4. sınıf) düzeyindeki matematik ders kitaplarında yer alan etkinliklerin 21. yüzyıl becerilerini içerme durumlarını incelemektir. Araştırmanın amacı doğrultusunda, araştırmanın problem durumu "21. yüzyıl becerileri ilkokul (1- 4. sınıf) düzeyindeki Matematik ders kitaplarında yüzde kaç olarak yer almaktadır?" şeklinde oluşturulmuştur.

Yöntem

İlkokul (1.-4. sınıf) düzeyindeki Matematik ders kitaplarında yer alan etkinliklerin 21. yüzyıl becerilerini içerme durumlarını belirlemek amacıyla gerçekleştirilen bu çalışmada nitel araştırma yöntemleri arasında yer alan doküman incelemesi kullanılmıştır. Millî Eğitim Bakanlığı (MEB) Talim ve Terbiye Kurulu Başkanlığı (TTKB) tarafından onaylanmış 2019-2020 eğitim öğretim yılından itibaren tüm Türkiye'de ilkokul 1., 2., 3. ve 4. sınıflarında okutulan matematik ders kitaplarındaki etkinlikler incelenerek analiz edilmiştir. İlkokul matematik ders kitaplarında yer alan etkinliklerde 21. yüzyıl becerilerinin incelendiği bu araştırmada öncelikli olarak etkinliklerin künyesi belirlenmiştir. Etkinliğin künyesinde sınıf düzeyi, etkinliğin bulunduğu öğrenme alanı, alt öğrenme alanı ve etkinliğin bulunduğu sayfa numarası yer almaktadır. İlkokul matematik dersinde kullanılan ders kitaplarındaki etkinliklerin künyesinin bulunduğu tablolar araştırmacılar tarafından oluşturulmuştur. Araştırma çerçevesinde Türkiye'de ilkokul düzeyinde hazırlanmış olan 2018 yılından beri okullarda kullanılan İlkokul Matematik ders kitaplarında yer alan etkinlikler 21. yüzyıl becerilerine göre betimsel analiz yöntemi kullanılarak analiz edilmiştir.

Bulgular

İlkokulda kullanılan ders kitaplarında yer alan etkinliklerin 21. yüzyıl becerilerini bulundurma durumu incelendiğinde, "sayılar ve işlemler" öğrenme alanında %34.08 ile en yüksek oranda üçüncü sınıf, %9.99 ile en düşük oranda birinci sınıf düzeyinde bulunmaktadır.

Geometri öğrenme alanında 21. yüzyıl becerini içeren etkinlikler incelendiğinde en yüksek oran %75.67 ile dördüncü, en düşük oran %18.96 ile birinci sınıf düzeyinde bulunduğu belirlenmiştir. Ölçme öğrenme alanında yer alan etkinliklerin 21. yüzyıl becerilerini içerme durumları incelendiğinde en yüksek oran %48.34 ile dördüncü, en düşük oran %23.59 ile birinci sınıf düzeyindeki matematik ders kitaplarında olduğu görülmektedir. Veri işleme öğrenme alanında yer alan etkinliklerin 21. yüzyıl becerileri içerme durumları sınıf düzeylerine göre incelendiğinde en yüksek oran %52.93 ile üçüncü sınıf, en düşük oran %15.38 ile ikinci sınıfta ortaya çıkmıştır. İlkokulda kullanılan matematik ders kitaplarında yer alan etkinliklerin 21. yüzyıl becerileri içerme durumları dikkate alındığında birinci ve ikinci sınıfta düşük oranda, üçüncü ve dördüncü sınıfta daha yüksek oranda etkinliklere yer verilmiştir.

Tartışma ve Sonuç

İlkokul (1-4 sınıf) matematik ders kitabında yer alan etkinlikler P21'e (Partnership for 21st Century Learning) göre incelendiğinde, etkinliklerin "öğrenme ve yenilikçilik becerileri" ile "yaşam ve kariyer becerileri" temaları ile ilişkili olduğu sonucuna ulaşılmıştır. Matematik ders kitaplarında "bilgi, medya ve teknoloji becerileri" teması ile ilişkili etkinliklere ulaşılamamıştır. Teknolojinin yoğun bir şekilde kullanıldığı ve hızla ilerlediği bir çağda, somutlaştırmanın bir gereklilik olduğu matematik dersi için kitaplarda bilgi, medya ve teknoloji becerileri temasının yer bulmaması büyük bir eksiklik olarak değerlendirilebilir. Ayrıca teknoloji temasının eksikliği matematik dersi öğretim programında yer alan ve öğrencilerin sahip olmaları hedeflenen dijital yetkinliğe yönelik etkinliklerin de bulunmadığını göstermektedir (MEB, 2018). Çalışmanın bulgusunu destekler nitelikte Türkiye' de uygulanmakta olan matematik dersi öğretim programının P21 becerilerine göre incelendiği bir araştırmada programdaki kazanımların "öğrenme ve yenilikçilik becerileri" ile "yaşam ve kariyer becerileri" temalarına yönelik olduğu ancak "bilgi, medya ve teknoloji becerileri" temasına yönelik kazanım bulunmadığı tespit edilmiştir (Yorulmaz, Çekirdekci & Önal, 2021). Ders kitaplarında bilgi, medya ve teknoloji becerilerinin ele alınışının yetersiz olması, kitapların tasarım sürecinde öğrencilerin gerçek yaşam durumlarının göz ardı edildiğini işaret etmektedir. Ders kitaplarındaki etkinliklerin ilişkili olduğu alt temalar incelendiğinde öğrenme ve yenilikçilik becerileri teması altında yaratıcı düşünme, eleştirel düşünme ve problem çözme, iletişim ve işbirliği; yaşam ve kariyer becerileri teması altında ise esneklik ve uyum yeteneği, üretkenlik ve hesap verebilirlik ile liderlik ve sorumluluk alt temalarının bulunduğu görülmektedir. Ancak bu tema altında "girişimcilik ve öz-yönetim" ile "sosyal ve kültürlerarası beceriler" alt temaları ile ilişkili etkinliklerin bulunmaması dikkat çekmektedir. Bu iki alt temanın etkinliklerde vurgulanmaması matematik dersi öğretim programında kişilerarası ve kültürlerarası yetkinlikleri içeren sosyal ve vatandaşlıkla ilgili yetkinlikler ile girişimciliğin geliştirilmesinin hedeflendiği inisiyatif alma ve girişimcilik yetkinliklerine de ders kitaplarında yer verilmediğini göstermektedir (MEB, 2018).

Investigation of Activities in Primary School Mathematics Textbooks in Turkey within the Context of 21st Century Skills

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Abstract

The purpose of the current study is to investigate activities in primary school mathematics textbooks in Turkey according to 21st century skills. The study employed the document analysis design, one of the qualitative research methods and in the analysis of the data, the descriptive analysis method was used. In the study, the activities in the mathematics textbooks approved by the Ministry of National Education (MoNE) Board of Education and Discipline (BoED) to be taught in the 1st, 2nd, 3rd and 4th grades of primary schools in Turkey as of the 2019-2020 school year were examined according to 21st century skills, and it was determined which of the skills identified in P21 the activities were related to. As a result of the study, it was seen that "learning and innovation skills" were given the most place, followed by "life and career skills" in the textbooks. When the activities in the textbooks were examined, it was concluded that the activities at all grade levels were related to the themes of "learning and innovation skills" and "life and career skills". No activities related to the theme of "information, media and technology skills" could be found in the mathematics textbooks. In light of the findings, it can be said that in the development of activities in the writing process of mathematics textbooks, all of the 21st century skills should be taken into account and that skills and activities should be related to each other.

Keywords: Primary school, mathematics textbooks, 21st century skills

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Investigation of Activities in Primary School Mathematics Textbooks in Turkey within the Context of 21st Century Skills

Each century comes with various innovations compared to previous centuries, and therefore brings different requirements. For example, the 21st century is a period in which technological developments are experienced considerably more than in previous centuries. Laar, Deursen, Dijk and Haan (2020) state that in the 21st century, when technology has come to the fore, information and communication technologies have become widespread in occupational fields, and therefore individuals having the mastery of information-communication technologies are preferred. According to Dündar and Polat (2021), while being literate, using reading and writing functionally, and having simple arithmetic knowledge were sufficient in the 20th century, these are not sufficient in the 21st century, and it is necessary to gain knowledge and transfer or apply this knowledge to new situations. Therefore, the 21st century requires the acquisition of many and complex skills.

The skill set consisted of many skills, such as life skills, occupational skills, interpersonal skills, hands-on skills and non-cognitive skills is expressed as 21st century skills (Silva, 2009). 21st century skills contribute to the accomplishment of many objectives, such as the acquisition of creative and critical thinking skills by helping students to actively participate in society and solve their problems in a scientific way, the development of students' association skills to understand academic issues and to construct new ideas and the utilization of information and technological tools to continue their lifelong learning (Al-Harbi & Jaber, 2016; Griffin & Care 2014).

There are various definitions of 21st century skills, as well as different classifications made by various institutions and organizations. Some of these classifications belong to ATCS (Assessment and Teaching of 21st Century Skills), OECD (Organization for Economic Co-operation and Development), ASIA Society (Asia Society Partnership for Global Learning), ISTE (International Society for Technology in Education), NCREL (North Central Regional Educational Laboratory), EU (European Union) and P21 (Partnership for 21st Century Learning) (Anagün, Atalay, Kılıç & Yaşar, 2016). According to P21, 21st century skills are defined as skills that enable the development of the knowledge and understanding of critical thinking and effective communication and are addressed in three themes: "Life and Career Skills", "Learning and Innovation Skills" and "Information, Media and Technology Skills" (Partnership for 21st Century Learning, 2009). The 21st century skills framework for 21st century learning (P21) was developed with input from educators, education professionals and business leaders to identify and demonstrate the skills, knowledge, expertise, and support systems students need to succeed in business, life and citizenship (Partnership for 21st Century Learning, 2015). Among the classifications in the literature, P21 was developed by a well-known educational institution that pioneered innovative education movements and includes not only life skills (e.g., flexibility, adaptability, leadership, responsibility) but also learning skills (e.g., critical thinking, creativity, problem solving, communication, collaboration) (Rinekso, 2021).

21st century skills prepare students to become efficient workers and efficient citizens in the future (Ananiadou & Claro, 2009). Developing students' 21st century skills is essential to create the labor market needed by the economy of a country and to support long-term sustainability (Rios, Ling, Pugh, Becker & Bacall, 2020). In order to meet this need, individuals with required qualifications should be trained through education. Education systems; however,

must keep up with rapid changes in order to prepare students for new life situations (Lemke, Coughlin, Thadani & Martin, 2003). Students in the kindergarten have the ability to conceptually activate their newly acquired cognitive skills. In addition, the developmental capacity of children is from perceptual to conceptual change (İnan& Erkuş, 2019).

Children can use their reasoning skills and make conceptual analyzes. However, many students graduate without some basic skills such as communication, critical thinking, collaboration, technology and leadership (Trilling & Fadel, 2009). However, the success of students today is judged by their ability to adapt to new situations by demonstrating how innovative and creative they are, as well as demonstrating their mastery of various information and communication technologies that have become inevitable in the world of the 21st century (National Education Association [NEA], 2012). Since education is of great importance in developing students' knowledge, skills, and attitudes, 21st century skills should be imparted to students through schools (Organization for Economic Cooperation and Development [OECD], 2018).

The people who direct the learning-teaching process in schools are teachers and they are one of the stakeholders of education. It can be said that teachers have a great importance in addressing 21st century skills in schools. Therefore, teachers are responsible for training students who can adapt to the 21st century. In the learning-teaching process, teachers use teaching materials to fulfil this task (Ait Bouzid, 2016). Textbooks are the most preferred material by teachers in classrooms compared to other teaching materials (Rakhmawati and Priyana, 2019). A textbook is a systematically arranged set of subject materials that provides integrity in the learning activities that students are expected to be engaged in (Röder and Welfle, 2019). Textbooks make a great contribution to the success of teaching activities (Rinekso, 2021). In this respect, textbooks are at the centre of the teaching-learning process (Ayu, 2020). Textbooks are not only a guide for teachers and students, but also serve as a tool that enables them to participate in learning activities. Therefore, textbooks are a guide for well-organized teaching practices (Margana & Widyantoro, 2017). Accordingly, textbooks should have content and activities that can shape the learning-teaching process (Byrd, 2001). Textbooks gain more value through evaluation, as the usefulness, relevance and effectiveness of textbooks can be achieved through systematic evaluation (Ait Bouzid, 2016).

When studies in which 21st century skills that support students' lifelong learning (Masino & Niño- Zarazúa, 2016) and textbooks that have a key role in transferring these skills are examined together, it is seen that there are studies conducted on Turkish textbooks (Bal, 2018; Gültekin, 2019; Kayhan, Altun & Gürol, 2019), English textbooks (Akçay, 2019; Rakhmawati & Priyana, 2019; Rinekso, 2021; Wahono, NengahSuandi, LuhPutuArtini & Sutama, 2021), social studies textbooks (Demir & Özyurt, 2021), science textbooks (Al-Rubaie & Al-Saadi, 2021) and mathematics textbooks (Al-Harbi, 2019; Alkhatatneh, 2022). When the studies are examined in general, it is seen that the relationship between 21st century skills and different courses has been examined. Among these courses, it can be stated that mathematics has a special importance, because one of the courses in which various skills such as communication, association, problem solving, reasoning, effective use of technology and communication skills are addressed effectively [Ministry of National Education (MEB), 2018] is mathematics.

Especially in mathematics, at primary school level, using skills such as problem solving, using technology effectively and communicating and relating school to daily life are of vital importance. The foundations of knowledge and skills that students will use in their future lives are laid in primary schools (Temur, Özyeğit, Divrengi, Özkara & Ayyıldız, 2012). Given that there is a gap in the literature, it is thought that it will be important to determine how much 21st century skills are included in primary school mathematics textbooks. Therefore, the purpose of the current study is to examine the extent to which 21st century skills are addressed in the activities in the primary school (1st-4th grade) level mathematics textbooks in Turkey. In line with this purpose of the study, the problem statement of the current study is worded as follows: "What is the extent to which 21st century skills are addressed in the primary school (1st-4th grade) mathematics textbooks?"

Method

Research Model

Document analysis, which is one of the qualitative research methods, was used in the current study, which was carried out to determine the extent to which 21st century skills are addressed in the activities in the primary school (1st-4th grade) mathematics textbooks. A qualitative research method was chosen, because document analysis is the most suitable tool for the purpose of identifying 21st century skills. The study was carried out by using the case study design, one of the qualitative research designs. Yin (1998) defines case study as a type of research in which a current phenomenon is studied in its own real-life context, the boundaries between the phenomenon and the content are not clearly defined and multiple evidence or data sources are used. In this context, the state of 21st century skills in primary school mathematics textbooks will be revealed based on the documents. Document analysis is used to analyze documents systematically and to reveal semantic inferences about the subject being researched (Corbin & Strauss, 2008; Wach & Ward, 2013). By using the activities in primary school mathematics textbooks as documents, semantic inferences about 21st century skills in the activities were revealed.

Study Group

The study employed the convenience sampling method. In this sampling method, the study group is determined according to the criteria of proximity and accessibility, taking into account the important criteria in line with the research questions (Luborsky & Rubinstein, 1995). It was thought that it would be more appropriate to include textbooks in the study because they are widely accessible and easily obtainable. The activities in the mathematics textbooks approved by the Ministry of National Education (MoNE) Board of Education and Discipline (BoED) and used in primary school 1st, 2nd, 3rd and 4th grades all over Turkey as of the 2019-2020 school were determined as the study group. In this context, one mathematics textbook for the 1st grade, two for the 2nd and 3rd grades each and one for the 4th grade were recommended by the Ministry of National Education, and a textbook from each grade level was included in the study. It was determined that there are 303 activities in the 1st grade, 464 activities in the 2nd grade, 371 activities in the 3rd grade and 345 activities in the 4th grade mathematics textbooks. Thus, the study group is comprised of 1483 activities.

Data Collection Tool and Process

In the current study, in which 21st century skills in the activities in the primary school mathematics textbooks were examined, tags of the activities were determined first. The tag of an activity includes the grade level, the learning area where the activity is located, the sub-learning area and the page number of the activity. For example, the name 1E1 for the first activity in the first grade and the name 2E1 for the first activity in the second grade were given. The tables with the tags of the activities in the textbooks used in primary school mathematics lessons were created by the researchers. From these tables, the activity tag of the first grade primary school mathematics textbook is given in Table 1 as an example.

Table 1

Activity Tag of the Primary School First Grade Mathematics Textbook

Grade level	Learning area	Sub-learning area	The number of activities in total	Sample activity name
1st grade	Numbers and operations	Natural numbers	53	1E1, …. , 1E150
		Addition in natural numbers	44	
		Subtraction in natural numbers	41	
		Fractions	12	
	Geometry	Geometric objects and shapes	22	1E151, … , 1E208
		Geometric patterns	10	
		Spatial relationships	26	
	Measurement	Measuring length	24	1E209, … , 1E297
		Measuring weight	16	
		Measuring liquid	13	
		Measuring time	23	
		Turkish money	13	
	Data processing	Data collection and evaluation	6	1E298, … , 1E303

In Table 1, there is an example of an activity tag in the 1st grade. For example, activity numbered 1E151 is related to the “Geometric Objects and Shapes” sub-learning area in the 3rd unit of the “Geometry” learning area of the 1st grade mathematics textbook. The tags of the activities belonging to other grade levels were prepared similar to the table in the example and the activities were analyzed in accordance with the purpose of the study. The study was completed in accordance with scientific research and publication ethics.

Data Analysis

Within the framework of the current study, the activities in the Primary School Mathematics textbooks, which have been taught at primary school level in Turkey since 2018, were analyzed according to 21st century skills using the descriptive analysis method. Descriptive analysis is a qualitative analysis method based on summarizing and interpreting the obtained

data according to previously determined categories (Yıldırım & Şimşek, 2016). The obtained descriptive analysis results were quantified and then converted into percentages. The classification for 21st century skills made by the Partnership for 21st Century Learning (2009) was taken into account in the analysis of the activities in the primary school mathematics textbooks. According to this classification, 21st century skills are listed under three main headings: learning and innovation skills, life and career skills, information, media and technology. Learning and innovation skills consist of creative thinking, critical thinking and problem solving, communication and collaboration skills. Life and career skills include flexibility and adaptability, entrepreneurship and self-management, social and intercultural, productivity and accountability, leadership and responsibility skills. Information, media and technology skills consist of information literacy, media literacy and information and communication technologies literacy skills. Each skill expressed as a 21st century skill was used as a subcategory. It was decided in which category each activity would be placed in accordance with its content. The category that each activity would or would not be included in was recorded in the activity evaluation form. An example for an activity in the "Numbers and Operations" learning area, which is in the sub-category of critical thinking and problem solving skills among 21st century skills, is given in Figure 1.

Figure 1

A Sample Activity from the Primary School 1st Grade Mathematics Textbook (MoNE, 2018, p. 59)

Game Time

Sudoku

How to play Sudoku?

The numbers 1, 2, and 3 are placed side by side once.

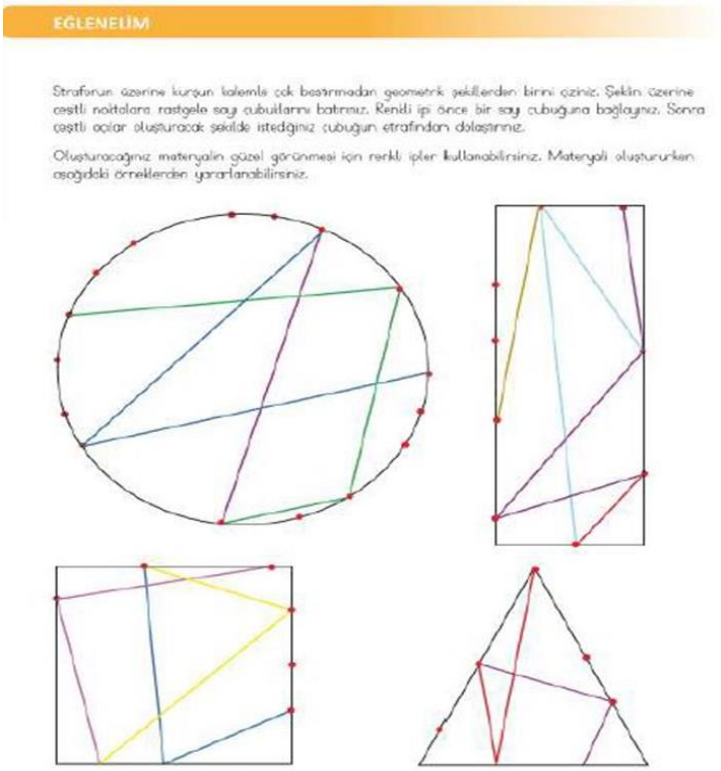
The numbers 1, 2 and 3 are placed vertically once.

"According to the rule above, complete the missing numbers as in the example. (The game can be diversified with different numbers.)"

An a sample activity in the "Geometry" learning area, which is in the creative thinking skill sub-category among 21st century skills, is given in Figure 2.

Figure 2

A Sample Activity from the Primary School 4th Grade Mathematics Textbook (MoNE, 2018, p. 216)



Let's Have Fun

Draw one of the geometric shapes lightly with a pencil on the styrofoam. Press various number sticks randomly onto the shape. Tie the colored string to one of the number sticks first. Then, form different angles by looping the string around the desired stick.

You can use colored strings to make the material look beautiful. You can take inspiration from the examples below while designing the material.

Since it is thought that subjectivity will be dominant in the collection and processing of data in studies carried out using document analysis, the validity and reliability of the analysis process were given great importance by conducting a meticulous study. First, the tags of the activities in the primary school mathematics textbook according to the grade level were formed, and the activities were confirmed by other researchers in order to prevent activities from being overlooked. The activities determined at each grade level were analyzed separately by three researchers simultaneously, and the sub-categories of the activities were finalized by coming together in the virtual environment. In order to prove the accuracy of the categories created by the researchers for the activities, three experts who worked in the fields of classroom teaching, mathematics education, curricula and instruction were consulted for their opinions. Inter-expert reliability value was calculated to reveal the coding reliability. The intercoder reliability value was calculated by using the formula proposed by Miles and Huberman (1994), and this value was found to be 89.3%. It is seen that this value obtained is at an acceptable level for reliability, and an agreement was reached by reviewing the relevant sub-categories of activities on which the coders had disagreed. The reason for not reaching a common decision in the categories is that the activities are categorized under different skills. This situation was concluded by discussing and consulting the opinions of different experts in the field. In addition, one of the researchers took a one-month break and re-examined all the activities in the primary school mathematics textbooks and gave their final form. In addition, examples of the skills addressed by the activities are given in order to make the analyses provable.

Findings

The findings that were obtained in relation to the purpose of the current study are given below according to the primary school grade levels. In this connection, the findings regarding the distribution of the activities in the primary school first grade mathematics textbook across 21st century skills is given in Table 2.

Table 2

Distribution of the Activities in the Primary School First Grade Mathematics Textbook across 21st Century Skills

21st Century Skills	Numbers and Operations (%)	Geometry (%)	Measurement (%)	Data Processing (%)
Learning and innovation skills	9.33	18.96	23.59	33.33
Creative thinking	2.66	1.72	-	-
Critical thinking and problem solving	4.66	6.89	13.48	16.66
Communication	2.00	10.34	10.11	16.66
Cooperation	-	-	-	-
Career and life skills	0.66	-	-	-
Flexibility and adaptability	-	-	-	-
Entrepreneurship and self-management	-	-	-	-
Social and intercultural skills	-	-	-	-
Productivity and accountability	0.66	-	-	-
Leadership and responsibility	-	-	-	-

As can be seen in Table 2, when the activities in the mathematics textbook used as the teaching material at the first grade level of primary school are examined in terms of including 21st century skills, it is seen that they include “learning and innovation skills” and "life and career skills”. The distribution of the activities involving learning and innovative skills across the learning areas is ranked from high to low as follows; data processing (33.33%), measurement (23.59%), geometry (18.96%), numbers and operations (9.33%). It is seen that there are activities related to critical thinking and problem solving and communication skills in the learning areas of data processing and measurement. Of the activities in the learning area of geometry, 10.34% include communication, 6.89% critical thinking and problem solving and 1.72% creative thinking skills. It is seen that the activities in the geometry learning area of the first grade of primary school contain communication skills the most. It is seen that the activities in the learning area numbers and operations include critical thinking and problem solving (4.66%), creative thinking (2.66%), and communication (2.00%) skills. It was determined that the activity that includes life and career skills in the primary school first grade mathematics textbook is only in the learning area of numbers and operations. It is seen that the determined activity is related to the productivity and accountability (0.66%) skill, which is one of the life and career skills.

The findings regarding the distribution of the activities in the primary school second grade mathematics textbooks across 21st century skills is given in Table 3.

Table 3

Distribution of the Activities in the Primary School Second Grade Mathematics Textbooks across 21st Century Skills

21st Century Skills	Numbers and Operations (%)	Geometry (%)	Measurement (%)	Data Processing (%)
Learning and innovation skills	11.15	29.03	18.60	15.38
Creative thinking	2.30	9.67	1.55	7.69
Critical thinking and Problem solving	3.84	11.29	8.52	-
Communication	5.00	4.83	3.10	-
Cooperation	-	3.22	5.42	7.69
Life and career skills	2.69	8.06	6.97	-
Flexibility and adaptability	0.76	-	0.77	-
Entrepreneurship and self-management	-	-	-	-
Social and intercultural skills	-	-	-	-
Productivity and accountability	1.92	8.06	5.42	-
Leadership and responsibility	-	-	0.77	-

As can be seen in Table 3, when the activities in the mathematics textbooks used as the teaching material at the second-grade level of primary school are examined in terms of including 21st century skills, it is seen that they include “learning and innovation skills” and "life and career skills”. The distribution of the activities involving learning and innovative skills across the learning areas is ranked from high to low as follows; geometry (29.03%), measurement (18.60%), data processing (15.38%), numbers and operations (11.15%). Of the activities in the learning area of geometry, 11.29% include critical thinking and problem solving, 9.67% creative thinking, 4.83% communication and 3.22% cooperation skills. When the distribution of the activities in the learning area of measurement is examined, it is seen that 8.52% include critical thinking and problem solving, 5.42% cooperation, 3.10% communication and 1.55% creative thinking skills. In the learning area of geometry and measurement in the second grade of primary school, there are activities that include critical thinking and problem-solving skills the most. It is seen that the rates of the inclusion of the activities related to creative thinking and cooperation (7.69%) in the learning area of data processing learning are the same. When the learning area of numbers and operations was examined, it was determined that 5% of the activities include communication, 3.84% critical thinking and problem solving and 2.30% creative thinking skills. It was determined that the activities involving life and career skills in the primary school second grade mathematics textbooks are ranked from high to low as follows; geometry (8.06%), measurement (6.97%), numbers and operations (2.69%) learning areas. It is seen that the rate of the activities including productivity and accountability skills accounts for the 8.06% of all the activities in the learning area of geometry. Of the activities in the learning area of measurement, 5.42% include productivity and accountability, 0.77% flexibility and adaptability, and leadership and responsibility skills. When the activities in the learning area of numbers and operations are examined in terms of including life and career skills, it is seen that 1.92% of them include productivity and accountability and 0.76% include flexibility and adaptability skills.

Table 4

Distribution of the Activities in the Primary School Third Grade Mathematics Textbooks across 21st Century Skills

21st Century Skills	Numbers and Operations (%)	Geometry (%)	Measurement (%)	Data Processing (%)
Learning and innovation skills	24.43	40.81	22.48	41.17
Creative thinking	4.54	6.12	3.10	11.76
Critical thinking and Problem solving	18.18	18.36	18.60	29.41
Communication	-	12.24	-	-
Cooperation	1.70	4.08	0.77	-
Life and career skills	9.65	16.32	11.62	6.65
Flexibility and adaptability	1.70	4.08	1.55	5.88
Entrepreneurship and self-management	-	-	-	-
Social and intercultural skills	-	-	-	-
Productivity and accountability	7.95	12.24	9.30	0.77
Leadership and responsibility	-	-	0.77	-

As can be seen in Table 4, when the activities in the mathematics textbooks used as the teaching material at the third-grade level of primary school are examined in terms of including 21st century skills, it is seen that they include “learning and innovation skills” and "life and career skills”. The distribution of the activities involving learning and innovative skills across the learning areas is ranked from high to low as follows; data processing (41.17%), geometry (40.81%), numbers and operations (24.43%), measurement (22.48%). Of the activities in the learning area of data processing, 29.41% include critical thinking and problem solving and 11.76% include creative thinking skills. When the distribution of the activities in the learning area of geometry is examined, it is seen that 18.36% of them include critical thinking and problem solving, 12.24% communication, 6.12% creative thinking and 4.08% cooperation skills. It is seen that 18.18% of the activities in the learning area of numbers and operations include critical thinking and problem solving, 4.54% creative thinking and 1.70% cooperation skills. When the learning area of measurement is examined, it is seen that 18.60% of the activities include critical thinking and problem solving, 3.10% creative thinking and 0.77% cooperation skills. In the third grade of primary school, critical thinking and problem-solving skills are addressed at the highest rate in the activities in all the learning areas. In the primary school third grade mathematics textbooks, it was determined that the learning areas having activities involving life and career skills are ranked from high to low as follows; geometry (16.32%), measurement (11.62%), numbers and operations (9.65%), data processing (6.65%). When the rate of the activities in the learning area of geometry is examined, it is seen that they are related to productivity and accountability skills to the greatest extent with 12.24%, followed by flexibility and adaptability skills with 4.08%. It was determined that 9.30% of the activities in the learning area of measurement include productivity and accountability, 1.55% flexibility and adaptability, 0.77% leadership and responsibility skills. When the activities in the learning area of numbers and operations are examined in terms of including life and career skills, it is seen that 7.95% of

them include productivity and accountability and 1.70% flexibility and adaptability skills. Of the activities in the learning area of data processing, 5.88% include flexibility and adaptability, while 0.77% include productivity and accountability skills.

Table 5

Distribution of the Activities in the Primary School Fourth Grade Mathematics Textbooks across 21st Century Skills

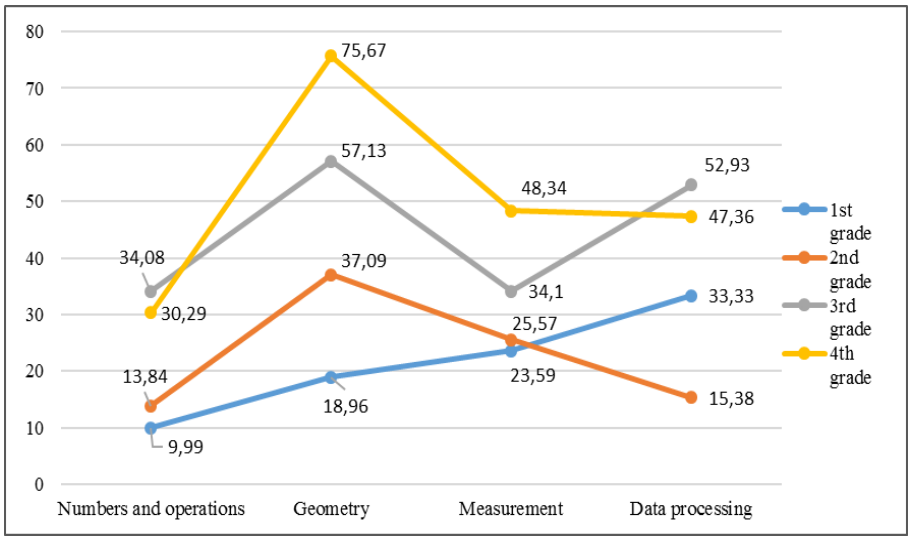
21st Century Skills	Numbers and Operations (%)	Geometry (%)	Measurement (%)	Data Processing (%)
Learning and innovation skills	21.71	54.05	31.86	36.84
Creative thinking	4.04	8.10	4.39	10.52
Critical thinking and Problem solving	16.16	24.32	26.37	26.31
Communication	-	16.21	-	-
Cooperation	1.51	5.40	1.09	-
Life and career skills	8.58	21.62	16.48	10.52
Flexibility and adaptability	1.51	5.40	2.19	5.26
Entrepreneurship and self-management	-	-	-	-
Social and intercultural skills	-	-	-	-
Productivity and accountability	7.07	16.21	13.18	5.26
Leadership and responsibility	-	-	1.09	-

As can be seen in Table 5, when the activities in the mathematics textbooks used as the teaching material at the fourth grade level of primary school are examined in terms of including 21st century skills, it is seen that they include “learning and innovation skills” and "life and career skills”. The distribution of the activities involving learning and innovative skills across the learning areas is ranked from high to low as follows; geometry (54.05%), data processing (36.84%), measurement (31.86%), numbers and operations (21.71%). It is seen that 24.32% of the activities in the learning area of geometry include critical thinking and problem solving, 16.21% communication, 8.10% creative thinking and 5.40% cooperation skills. It was determined that 26.31% of the activities in the learning area of data processing involve critical thinking and problem solving, and 10.52% creative thinking skills. When the learning area of measurement is examined, it is seen that 26.37% of the activities include critical thinking and problem solving, 4.39% creative thinking and 1.09% cooperation skills. When the learning area of numbers and operations is examined, it is seen that 16.16% of the activities include critical thinking and problem solving, 4.04% creative thinking and 1.51% cooperation skills. In the fourth grade of primary school, critical thinking and problem solving skills are addressed at the highest rate in the activities in all the learning areas. In the primary school fourth grade mathematics textbook, the learning areas having the activities involving life and career skills are ranked from high to low as follows; geometry (21.62%), measurement (16.48%), data processing (10.52%), numbers and operations (8.58%). When the rate of activities in the learning area of geometry is examined, it is seen that they are ranked as activities related to productivity and accountability with 16.21% and flexibility and adaptability skills with 5.40%. It was determined that 13.18% of the activities in the learning area of measurement include productivity and accountability, 2.19% flexibility

and adaptability, 1.09% leadership and responsibility skills. The activities in the learning area of data processing include flexibility and adaptability and productivity and accountability skills at equal rates (5.26%). When the activities in the learning area of numbers and operations are examined in terms of including life and career skills, it is seen that 7.07% of them include productivity and accountability, 1.51% flexibility and adaptability skills.

Figure 3

Distribution of the Activities in the Primary School Mathematics Textbooks across 21st Century Skills



As can be seen in Figure 1, when the activities in the primary school mathematics textbooks are examined in terms of their inclusion of 21st century skills, it is seen that the learning area of "numbers and operations" includes the highest rate of activities at the third grade level with 34.08% and the lowest rate of activities at the first grade level with 9.99%. When the activities including 21st century skills in the learning area of geometry are examined, it is seen that the highest rate is at the fourth grade level with 75.67%, and the lowest rate is at the first grade level with 18.96%. When the activities in the learning area of measurement are examined in terms of their inclusion of 21st century skills, it is seen that the highest rate is at the fourth grade level with 48.34%, and the lowest rate is at the first grade level with 23.59%. When the activities in the learning area of data processing are examined in terms of their inclusion of 21st century skills, the highest rate was found at the third grade level with 52.93%, and the lowest rate was found at the second grade level with 15.38%. When the findings related to the inclusion of 21st century skills in the activities in the mathematics textbooks used in primary school are considered, it can be said that the number of activities is low at the first and second grade levels while the number of activities is relatively high at the third and fourth grade levels.

Discussions and Conclusions

Textbooks are resources that provide reinforcement and enrichment of the learned knowledge and skills. In addition, textbooks are used by teachers to help students learn 21st century skills that are appreciated in the globalizing world (Rakhmawati & Priyana, 2019). When the activities in the primary school (1-4 grades) mathematics textbook were analyzed according to P21, it was concluded that the activities were related to the themes of "learning and

innovation skills" and "life and career skills". Activities related to the theme of "information, media and technology skills" could not be found in the mathematics textbooks. In an age where technology is used intensively and progresses rapidly, it can be considered as a major deficiency that the theme of information, media and technology skills is not included in the textbooks for the mathematics course where concretization is a necessity. In addition, the lack of the theme of technology shows that there are no activities in the mathematics curriculum for the development of digital competence in students (MEB, 2018). Similar to the findings of the current study, in a study in which the mathematics curriculum applied in Turkey was examined according to P21 skills, the objectives set in the curriculum were found to be related to the themes of "learning and innovation skills" and "life and career skills", but there were no objectives related to the theme of "information, media and technology skills" (Yorulmaz, Çekirdekci & Önal, 2021). As a result of the analysis of the three English textbooks used in the second year of the Baccalaureate in Morocco, it was found that there are very few activities that enable students to develop their information, media and technology skills, that the activities do not encourage students to think creatively, develop career and life skills, and that the textbooks tend to present these skills in a traditional manner far from addressing these skills in the 21st century context (Ait Bouzid, 2016). When Jordan's sixth grade mathematics textbook was analyzed in terms of its inclusion of 21st century skills, it was concluded that the rates of including 21st century skills are very low and the skills are not distributed evenly across the textbook (Alkhatatneh, 2022). The activities to be done in order to develop students' 21st century skills through textbooks should be compatible with the real life situations of the students (Rinekso, 2021). Today, real life situations of students are generally related to technology use, internet, social media, online games, digital reading and current news (Seemiller & Grace, 2016). Insufficient handling of information, media and technology skills in textbooks indicates that students' real-life situations are overlooked during the design process of textbooks.

When the sub-themes to which the activities in the textbooks are related were examined, it was found that the sub-themes of creative thinking, critical thinking and problem solving, communication and cooperation are under the theme of learning and innovation skills, that the sub-themes of flexibility and adaptability, productivity and accountability and leadership and responsibility are under the theme of life and career skills. However, it is remarkable that there are no activities related to the sub-themes of "entrepreneurship and self-management" and "social and intercultural skills" under this theme. The fact that these two sub-themes are not emphasized in the activities shows that social and civic competences including interpersonal and intercultural competences and initiative and entrepreneurship competences aimed at developing entrepreneurship are not included in the textbooks although addressed in the mathematics curriculum (MEB, 2018). Yorulmaz *et al.* (2021) examined the relationship between the objectives in the mathematics curriculum and P21 skills in their study and found that there were no objectives suitable for the sub-themes of "entrepreneurship and self-management" and "social and intercultural skills". In another study, the objectives of the fifth grade mathematics curriculum were examined according to the 21st century skills, and at the end of the study, it was concluded that there were no objectives related to the skill of "taking initiative and entrepreneurship" and that the skill of "cooperation" was inadequately addressed in the objectives (Vural, 2019). It has been found that although the themes of "critical thinking and problem solving", one of the 21st century skills, are addressed highly adequately in the third

grade mathematics textbooks of Saudi Arabia, the rate of inclusion of other themes is very low (Al-Harbi, 2019). Ait Bouzid (2016) states that the activities related to "social and intercultural skills" are not sufficient in the English textbooks used in Morocco. In the study examining the integration of a high school English textbook with 21st century skills, it was seen that a total of 11 skills were well integrated to the textbook: critical thinking and problem solving, communication, collaboration, creativity and innovation, information and communication technology (ICT), media literacy, leadership and responsibility, productivity and accountability, social and cross-responsibility, cultural, initiative and self-management, and flexibility and adaptability skills (Rakhmawati & Priyana, 2019).

Suggestions

In light of the results of the study, following suggestions can be made:

- ✓ By including all the themes and sub-themes of 21st century skills in mathematics textbooks, it can be ensured that students are exposed to these skills and encouraged activities to develop these skills.
- ✓ In today's world, where various computer software supporting the teaching of mathematics topics are prepared, online games are available to support teaching with games and technology is developing rapidly, various activities for the use of information, media and technology can be included in mathematics textbooks.
- ✓ In order to increase students' communication skills, the number of activities that support the expression of mathematical knowledge with different representations and the preparation of a discussion environment can be increased and the number of activities that encourage group work can be increased to improve students' cooperation skills.
- ✓ In order to increase students' entrepreneurial skills and social and intercultural skills, more real-life situations can be included in textbook activities.
- ✓ In the current study, only primary school level mathematics textbooks were examined. Considering that education is a whole, secondary and high school mathematics textbooks can be examined in the context of 21st century skills in future studies.
- ✓ Successful acquisition of 21st century skills by students is highly dependent on how relevant the content, methods, tools and classroom contexts are to the 21st century; any mismatch is likely to distort intended results (Ait Bouzid, 2016). For this reason, the contents of the mathematics textbooks should be designed to include 21st century skills. Furthermore, studies can be conducted on the extent to which teachers who direct the learning-teaching process in mathematics lessons posses 21st century skills.

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References

Akçay, A. (2019). *An analysis of ELT coursebooks in terms of 21st century skills: Communication, collaboration, critical thinking, creativity.* (Unpublished Thesis), Akdeniz University, Turkey.

Alkhatatneh, S. K. (2022). Inclusion of 21st century skills in mathematics textbook for the sixth grade in Jordan. *International Journal of Special Education, 37*(3). 10419-10444.

Al-Harbi, A. & Jabr bin M. (2016): *Science teachers 'awareness of the elementary stage in Al-Rass governorate of learners' skills for the twenty-first century.* College of Education, King Saud University, Kingdom of Saudi Arabia.

Al-Harbi, I. S. R. (2019). The extent to which twenty-first century skills are included in the mathematics textbook for the third intermediate grade. *Journal of the College of Education, Al-Azhar University, 183,* 513-554.

Al-Rubaie, S. H. H. & Al-Saadi, Y. F. M. (2021). The extent to which the 6th grade science textbook includes 21st century skills. *Turkish Journal of Computer and Mathematics Education, 12*(11). 358-368.

Anagün, Ş. S., Atalay, N., Kılıç, Z. & Yaşar, S. (2016). The development of a 21st century skills and competences scale directed at teaching candidates: Validity and reliability study. *Pamukkale University Journal of Education, 40,* 160–175.

Ananiadou, K. & Claro, M. (2009). 21st century skills and competences for new millennium learners in OECD countries. *Organisation for Economic Cooperation and Development.* Retrieved from http://files.eric.ed.gov/fulltext/ED529649.pdf.

Ait Bouzid, H. (2016). Boosting 21st century skills through Moroccan ELT textbooks. *Journal of English Language Teaching and Linguistics, 1*(2). 97-108. doi: http://dx.doi.org/10.21462/jeltl.v1i2.24

Ayu, M. (2020). Evaluation cultural content on English textbook used by EFL students in Indonesia. *JET (Journal of English Teaching), 6*(3). 183-192.

Bal, M. (2018). Investigation on the 21st century skills of Turkish language course. *Turkish Studies, 13*, 49–64.

Bellanca, J. & Brandt R. (Eds.). (2010). *21st century skills: Rethinking how students learn.* Solution Tree Press.

Corbin, J. & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks: Sage.

Demir, A. Y. & Özyurt, M. (2021). Sosyal bilgiler dersi öğretim programı ve ders kitaplarının 21. yüzyıl becerileri bağlamında incelenmesi. *İnönü Üniversitesi Eğitim Fakültesi Dergisi, 22*(2), 1254-1290. DOI:10.17679/inuefd.867905

Dündar, S. A. & Polat, A. (2021). Türkçenin yabancı dil olarak öğretimi programının 21. yüzyıl becerileri kapsamında incelenmesi. *Uluslararası Karamanoğlu Mehmetbey Eğitim Araştırmaları Dergisi, 2021 Yunus Emre ve Türkçe Yılı Türkçe Öğretimi Özel Sayısı,* 66-77. https://doi.org/10.47770/ukmead.99511

Griffin, P. & Care, E. (Ed.). (2014). *Assessment and teaching of 21st century skills: Methods and approach.* Springer.

Gültekin, H. (2019). *Türkçe dersi öğrenci çalışma kitaplarının 21. yüzyıl becerileri açısından incelenmesi.* (Yayınlanmamış yüksek lisans tezi), Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü.

İnan, C., & Erkuş, S. (2019). Analysis mathematical concept development in 3-6 years old children. *Marmara University Atatürk Education Faculty Journal of Educational Sciences, 50*, 1-14. https://doi.org/10.15285/maruaebd.586786

Kan'an, A. (2018). The relationship between Jordanian students' 21 st century skills (cs21) and academic achievement in science. *Journal of Turkish Science Education (TUSED), 15*(2), 82-94.

Kayhan, E. , Altun, S. & Gürol, M. (2019). Sekizinci sınıf Türkçe öğretim programı (2018)'nın 21. yüzyıl becerileri açısından değerlendirilmesi. *Adnan Menderes Üniversitesi Eğitim Fakültesi Eğitim Bilimleri Dergisi, 10*(2), 20-35.

Laar E., Deursen A. J. A. M., Dijk J. A. G. M. & Haan J. (2020). Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review. *SAGE Open, 10*(1), 1-14. https://doi.org/10.1177/2158244019900176

Larson, L. C., & Miller, T. N. (2011). 21st century skills: Prepare students for the future. *Kappa Delta Pi Record, 47*(3), 121-123.

Lemke, C., Coughlin, E., Thadani, V. & Martin, C. (2003). *En Gauge 21st century skills—literacy in the digital age*. Los Angeles, CA: Metiri Group.

Luborsky, M. R., & Rubinstein, R. L. (1995). Sampling in qualitative research: rationale, issues, and methods. *Journal of Aging Research, 17* (1), 89-113.

Margana, M., & Widyantoro, A. (2017). Developing English textbooks oriented to higher order thinking skills for students of vocational high schools in Yogyakarta. *Journal of Language Teaching and Research, 8*(1), 26-38.

Masino, S., & Niño-Zarazúa, M. (2016). What works to improve the quality of student learning in developing countries? *International Journal of Educational Development, 48*, 53-65. doi: https://doi.org/10.1016/j.ijedudev.2015.11.012

MEB (Millî Eğitim Bakanlığı) (2018). *Matematik dersi öğretim programı (ilkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar)*. Ankara: Millî Eğitim Bakanlığı.

National Education Policy. (2012). Preparing 21st Century students for a global society: An educator's guide to the 4Cs. Retrieved from http://www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf

OECD (Organization for Economic Cooperation and Development) (2018). The future of education and skills, Education 2030. Retrieved from https://perma.cc/72WR-NPKA

Partnership for 21st Century Skills. (2009). P21 framework definitions. Partnership for 21st Century Skills (P 21). https://files.eric.ed.gov/fulltext/ED519462.pdf adresinden edinilmiştir.

Partnership for 21st Century Learning (2015). P21 framework definitions. http://www.p21.org/our-work/p21-framework adresinden edinilmiştir.

Rakhmawati, D.M. & Priyana, J. (2019). A study on 21st century skills ıntegration in the english textbook for senior high school. *Journal of English Educators Society. 4*(1). doi: http://doi.org/10.21070/jees.v4i1.1873

Rinekso, A. B. (2021). The representation of 21st century skills in an Indonesian EFL textbook. *LLT Journal: A Journal on Language and Language Teaching 24*(1). 191-211.

Rios, J. A., Ling, G., Pugh, R., Becker, D. & Bacall, A. (2020). Identifying critical 21st-century skills for workplace success: A content analysis of job advertisements. *Educational Researcher, 49*(2), 80–89. https://doi.org/10.3102/0013189X19890600

Röder, M., & Welfle, A. (2019). Bioenergy. *In Managing Global Warming: An Interface of Technology and Human Issues* (pp. 379-398). Elsevier. https://doi.org/10.1016/B978-0-12-814104-5.00012-0

Seemiller, C., & Grace, M. (2016). *Generation Z goes to college.* San Francisco, CA: Jossey-Bass.

Silva, E. (2009). Measuring skills for 21st century learning. *Phi Delta Kappan, 90,* 630–634.

Temur, D. Ö., Özyeğit, D., Divrengi. M., Özkara, M. & Ayyıldız, Y. (2012). *Uyum ve hazırlık çalışmaları öğretmen kitabı ilkokul birinci sınıf.* (Birinci baskı), Ankara: Milli Eğitim Bakanlığı Matbaası.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times.* John Wiley & Sons.

Vural, Ö. F. (2019). 5. Sınıf Matematik programının 21. yüzyıl becerileri açısından incelenmesi. *V. Turkcess, Uluslararası Eğitim ve Sosyal Bilimler Kongresi,* 27-29 Haziran 2019, İstanbul.

Wach, E. & Ward, R. (2013). *Learning about qualitative document analysis.* Access address: https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/2989.

Wahono, S., NengahSuandi, I., LuhPutuArtini & Sutama, I, M. (2021) Developing English Textbook that Promotes the 21st Century Skills. *Review of International Geographical Education (RIGEO), 11*(7), 3807-3816.

Yıldırım, A. & Şimşek, H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri.* (10. Baskı). Ankara: Seçkin Yayıncılık.

Yin, R. K. (1998). *Case study research: design and methods.* Thousand Oaks: Sage Pbc.

Yorulmaz, A., Çekirdekci, S., & Önal, H. (2021). Examination of the primary school mathematics curriculum according to 21st century skills. *Yıldız Journal of Educational Research, 6*(2), 95–105.

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