

TÜRKİYE'DE MATEMATİK ÖĞRENME ORTAMLARINDA DERS KİTAPLARININ KULLANIMI

TEXTBOOK USE IN MATHEMATICS LEARNING ENVIRONMENTS IN TÜRKİYE

Selen Galiç¹, Selin Urhan², Şenol Dost³

ÖZ: Matematik ders kitapları, bir ülkenin matematik kültürünü ve matematiğe yaklaşımını yansıtan ve sınıflarda etkili kullanılması beklenen en temel öğretim materyalidir. Bu çalışmada, Türkiye'de öğrenme ortamlarında öğretmenlerin ortaokul ve ortaöğretim matematik ders kitaplarını dersin hangi aşamalarında ve hangi nedenlerle kullandıklarını/kullanmadıklarını belirlemeye yönelik nitel bir araştırma yapılmıştır. Veriler Türkiye'de aktif olarak görev yapan 174 ortaokul öğretmeni ve 104 ortaöğretim matematik öğretmeninden çoktan seçmeli ve açık uçlu sorulardan oluşan bir anket aracılığıyla toplanmıştır. Sonuçlar, matematik öğretmenlerinin ders kitaplarını daha ziyade öğretim programındaki kazanımları takip etmek ve ödev vermek amacıyla kullandıklarını; çoğunlukla ders planı hazırlama ve dersin değerlendirme aşamasında ders kitaplarından yararlandıklarını göstermektedir. Mevcut matematik ders kitaplarının öğretmenlerin görüşleri doğrultusunda gözden geçirilmesi önerilmiştir.

Anahtar sözcükler: Matematik ders kitapları, ders kitabı kullanımı, matematik sınıfları, matematik öğretmenleri

ABSTRACT: Mathematics textbooks are basic instructional material that reflect a nation's mathematical culture and approach to mathematics and expected to be used actively in classes. The present qualitative study was conducted to determine the intended use of middle school and high school mathematics textbooks by the teachers in learning environments in Türkiye. The data were collected from 174 middle school and 104 high school mathematics teachers with a questionnaire that included multiple choice and open-ended questions. The findings demonstrated that mathematics teachers predominantly used the textbooks to monitor and follow the order of the curricular outcomes and assign homework, revealing that they mostly employed the textbooks to prepare the lesson plans and in evaluation of students. It was suggested that the current mathematics textbooks should be revised based on the views of the teachers.

Keywords: Mathematics textbooks, textbook use, mathematics class, mathematics teachers

Bu makaleye atf vermek için:

Galiç, S., Urhan, S. ve Dost, Ş. (2024). Türkiye'de matematik öğrenme ortamlarında ders kitaplarının kullanımı, *Trakya Eğitim Dergisi*, 14(3), 1945-1964.

Cite this article as:

Galiç, S., Urhan, S., & Dost, Ş. (2024). Textbook use in mathematics learning environments in Türkiye. *Trakya Journal of Education*, 14(3), 1945-1964.

GENİŞLETİLMİŞ ÖZET

Giriş

Öğretim sürecinde ders kitaplarının oynadığı rol, öğretmenlerin ders kitaplarını kullanımı ile yakından ilişkilidir (Fan vd., 2021). Türkiye'de matematik öğretmenlerinin ders kitaplarını en fazla değerlendirme (Isik, 2008; Kocak ve Karaca, 202; Kocak ve Simsek, 2022; Korkmaz, Tutak & İlhan, 2020; Ulusoy ve İncikabi, 2020) amacıyla kullandıkları görülmektedir. PISA'da üst sıralarda yer alan Çin'de ise matematik öğretmenleri ders kitaplarını en fazla öğretimi planlamak için derse hazırlık aşamasında en az ise değerlendirme aşamasında kullanmaktadırlar (Fan vd., 2021). Pepin ve Haggarty (2001) İngiliz, Fransız ve Alman matematik ders kitaplarının genellikle alıştırmalar ve etkinlikler için kullanıldığını ancak bu

¹ Doktora Öğrencisi, Hacettepe Üniversitesi, Ankara/Türkiye, selengalic@hacettepe.edu.tr, 0000-0002-3524-6428

² Doç. Dr., Hacettepe Üniversitesi, Ankara/Türkiye, selin.urhan@hacettepe.edu.tr, 0000-0002-1665-7643

³ Prof. Dr., Hacettepe Üniversitesi, Ankara/Türkiye, dost@hacettepe.edu.tr, 0000-0002-5762-8056

kullanımların ülkelerin matematik sınıflarının kültürüne göre değişkenlik gösterdiğini belirtmişlerdir. Finlandiya’da ders kitapları alıştırmalar için önemli bir kaynak olarak kullanılırken, Estonya ve Norveç’te ders kitaplarının yanı sıra farklı kitap kullanımının yaygın olduğunu ifade eden Lepik, Grevholm ve Viholainen (2015), ders kitabı kullanımının geleneklerden etkilendiğini ifade etmişlerdir.

Matematik ders kitapları öğretim programlarının öğrenme ortamlarında rol almasına aracılık ederken aslında bir ülkenin matematik kültürünün öğrenme ortamlarına yansımaları sağlar (Harries ve Sutherland, 1998). Bu bağlamda, matematik ders kitaplarının öğrenme ortamlarında kullanılması, matematik kültürünün öğrenme ortamlarında içeriğe ve öğretim stratejilerine aktarılması açısından önemlidir. Bu nedenle, matematik ders kitaplarının öğretmenler tarafından öğrenme ortamlarında kullanılıp kullanılmadığını belirlemek, kullanılmıyorsa bu durumun nedenlerini ortaya çıkarmak bir ülkenin matematik kültürünün öğrenme ortamlarına yansımaları değerlendirmek bağlamında önemli sonuçlar ortaya koyabilir.

Matematik ders kitaplarının öğretmenler tarafından öğrenme ortamlarında kullanımına ilişkin güncel durumun belirlenmesinin, öğretim programındaki değişikliklere bağlı olarak güncellenen ders kitaplarının matematik kültürünü öğrenme ortamlarına taşıma rolünün hayata geçip geçmediğini ortaya koymak adına önemli ve gerekli olduğu düşünülmektedir (Kocak ve Karaca, 2021). Bu konuya ilişkin yapılacak nitel araştırmaların öğretmenlerin ders kitaplarını öğrenme ortamlarında kullanma durumlarına ilişkin detaylı ve derin sonuçlar sunacağı belirtilmiştir (Kocak ve Simsek, 2022). Bu amaçla nitel bir araştırma olarak tasarlanan bu çalışmada, Türkiye’de matematik öğretmenlerinin ders kitaplarını öğrenme ortamlarında kullanma durumları incelenmiştir. Ortaokulda (5-8. sınıflar) ve ortaöğretimde (9-12. sınıflar) aktif olarak görev yapan matematik öğretmenlerinin ders kitaplarını kullanma/kullanmama nedenleri ortaya çıkarılmıştır. Bu doğrultuda, çalışmanın araştırma problemleri şöyledir:

1. Matematik öğretmenlerinin ders kitaplarını kullanma amaçları nelerdir?
2. Matematik öğretmenleri ders kitaplarını dersin hangi aşamasında ve neden kullanmaktadır?
3. Matematik öğretmenlerinin ders kitaplarını kullanmama ve alternatif kaynak tercih etme nedenleri nelerdir?
4. Matematik öğretmenlerinin öğrencileri ders kitaplarına yönlendirme nedenleri nelerdir?

Yöntem

Bu çalışmada, nitel araştırma yöntemlerinden durum çalışması deseni kullanılmıştır. Durum çalışması, bir durumu etkileyen faktörlerin ne olduğunun ve bu faktörlerin ilgili durumu nasıl etkilediğinin derinlemesine incelendiği bilimsel araştırmalardır (Yin, 2009). Çalışmada ortaokulda görev yapmakta olan 174; ortaöğretimde görev yapmakta olan 104 matematik öğretmeninden veri toplanmıştır. Katılımcıların 196 tanesi eğitim fakültesi ve 82 tanesi fen-edebiyat fakültesi mezunudur. Katılımcıların 175 tanesi lisans mezunu, 41 tanesi yüksek lisans öğrencisi, 52 tanesi yüksek lisans mezunu, dokuz tanesi doktora öğrencisi ve bir tanesi doktora mezunudur. Katılımcılar çalışmaya gönüllü olarak katılmışlardır. Matematik öğretmenlerinin ders kitaplarını kullanma durumlarının ortaya çıkarılması amacıyla yazarlar tarafından çoktan seçmeli ve açık uçlu sorulardan oluşan çevrimiçi bir anket formu hazırlanmıştır. Anket formunun ilk bölümünde katılımcılara ait demografik bilgiler; ikinci bölümde ise katılımcıların öğrenme ortamlarında ders kitabı kullanımına yönelik sorular yer almaktadır. Ankette çoktan seçmeli sorulardan elde edilen verilerin çözümlenmesinden elde edilen bulgulara ilişkin frekans ve yüzde değerleri okuyucuya grafiklerle sunulmuştur. Açık uçlu sorulardan elde edilen verilerin analizinde tümevarımcı analiz yöntemi benimsenmiştir. Bu yöntemde verilerden çıkarılan kavramlara göre kodlar ve temalar belirlenmektedir (Merriam ve Tisdell, 2015). Açık uçlu sorulardan elde edilen tema ve kodlar katılımcıların örnek söylemleriyle birlikte tablolar halinde okuyucuya sunulmuştur.

Bulgular

Matematik öğretmenlerinin ders kitaplarını genellikle öğretim programında yer alan kazanımların sırasını takip etmek ve ödev vermek amacıyla kullandıkları belirlenmiştir. Özel okul öğretmenleri matematik ders kitaplarını daha ziyade öğretim programında yer alan kazanımların sırasını takip etmek; devlet okulu öğretmenleri ise ödev vermek için kullanmaktadır. Matematik öğretmenleri genellikle ders planı hazırlama ve dersin değerlendirme aşamasında ders kitaplarını kullanmayı tercih etmektedir. Ders planı hazırlama sırasında öğretmenler, sadece öğrenme ortamını tasarlamayı değil aynı zamanda eğitim hedeflerini gerçekleştirmeyi amaçladıklarını belirtmişlerdir. Bu bağlamda öğretmenler, matematik ders kitaplarını bakanlık tarafından onaylandığı ve müfredatla tutarlı olduğu için kullandıklarını belirtmişlerdir.

Diğer yandan, çoğu devlet okulu matematik öğretmeni ders planı hazırlama konusunda ders kitaplarının yeterli olmadığını, ders kitaplarının içeriğinin güncel olmadığını ve öğrencileri keşfetmeye teşvik etmediğini belirtmiştir. Benzer şekilde, çoğu özel okul matematik öğretmeni de ders planı hazırlama sırasında ders kitaplarının kendilerine yeterince destek sağlamadığını ifade etmiştir. Öğretmenler ders kitaplarında içeriğin kapsamlı olmadığını, problemlerin ve etkinliklerin sayısının ve çeşitliliğinin yetersiz olduğunu belirtmişlerdir. Matematik öğretmenlerinin derslerinde kitapları diğer aşamalara kıyasla derinleştirme aşamasında daha az kullandığı ve öğrencilerini ünite sonu değerlendirme sorularını çözme ve proje yapma bağlamında ders kitaplarını kullanmaya yönlendirdikleri saptanmıştır.

Sonuç ve Tartışma

Alan yazında Türkiye’de matematik öğretmenlerinin ders kitaplarını kullanmadaki öncelikli amaçlarının ödev vermek olduğu (Isik, 2008) ve matematik öğretmenlerinin ders kitaplarını öğretim programını takip etmek için bir araç olarak kullandığı belirtilmektedir (Baser, 2012; Tasdemir vd., 2018). Çalışmamızda matematik öğretmenlerinin ders kitaplarını kullanma amaçlarına ilişkin elde edilen sonuçların alan yazında sunulanlar ile paralellik gösterdiği görülmektedir. Ek olarak çalışmamız, matematik öğretmenlerinin ders kitaplarını dersi planlama ve değerlendirme aşamasında kullanmasının Türkiye’de bir gelenek haline geldiğine ilişkin görüşleri (Isik, 2008; Kocak ve Karaca, 2021; Kocak ve Simsek, 2022; Korkmaz vd., 2020; Ulusoy ve İncikabi, 2020) desteklemektedir. Matematik öğretmenlerinin ders kitaplarını kullanma/kullanmama nedenlerinin çeşitlilik göstermesinin, öğretmenlerin matematiği öğrenme ve öğretme sürecine bakış açılarının, görev yaptıkları kurumun sosyo-kültürel yapısının ve benimsediği eğitim felsefesinin öğretmenlerin ders kitaplarını kullanmaları üzerinde etkili olduğunu düşündürmektedir.

INTRODUCTION

Mathematical competencies of individuals have changed due to technological advances and social needs (National Council of Teachers of Mathematics [NCTM], 2000), which has been reflected in educational paradigms. Mathematics education perspectives and mathematics curricula have been revised accordingly (Dayak, 1998). Mathematics textbooks that are instructional materials that provide a framework for what, when and how to teach (Nicol & Crespo, 2006), have been directly affected by curricular revisions. Thus, it could be argued that textbooks play a key role in mediating curricular revisions in learning environments (Munby, Russell & Martin, 2001) and changes in educational policies into pedagogy (Pepin, Gueduet & Trouche, 2013). In this respect, textbooks were defined as a mediator for the instruction of mathematics curriculum content and influence teacher decisions about classroom practices (Porter, 2002), instructional strategies (Yoshikawa, 2008), and the selection of classroom activities (Stylinaidis, 2009).

The role that textbooks play in instruction is closely associated with the use of textbooks by the teachers (Fan et al., 2021). It was reported that mathematics teachers in Türkiye predominantly used textbooks for evaluation (Isik, 2008; Kocak & Karaca, 2021; Kocak & Simsek, 2022; Korkmaz, Tutak & İlhan, 2020; Ulusoy & İncikabi, 2020). In China, a high-ranking in PISA, mathematics teachers were reported to use textbooks at most in preparation of lesson plan and the least in evaluation (Fan et al., 2021). Pepin and Haggarty (2001) reported that English, French and German mathematics textbooks were generally used for exercises or in activities. Lepik et al. (2015) stated that textbooks were an important resource for exercises in Finland, different books are commonly used in Estonia and Norway in addition to the textbooks, concluding that textbook use was influenced by traditions.

Mathematics textbooks mediate curricular functions in learning environments, they actually reflect a nation’s mathematics culture in learning environments (Harries & Sutherland, 1998). Thus, the use of mathematics textbooks is important for the transfer of mathematics culture to content and instructional strategies. Therefore, the use of mathematics textbooks by teachers should be determined, and in cases where they do not use textbooks, the reasons should be clarified to elucidate the reflection of the nation’s mathematics culture on learning environments.

Most studies conducted on mathematics textbooks in Türkiye focused on the investigation and analysis of textbook content. These studies analyzed the mathematics textbooks based on their suitability for national exams (Sahin & Turanli, 2005), curricula (Tan Sisman & Akkaya, 2017), 21st century skills (Sarigoz, 2023), or learning environment technologies (Sevimli & Kul 2015). Furthermore, other studies investigated the role and significance of the history of mathematics (Mersin & Durmus, 2018), mathematical modeling (Yanik, Bagdat & Koparan, 2017), proof (Zeybek, Ustun & Birol, 2018), or values

education (Teker & Ellez, 2022) in mathematics textbooks. It was determined that mathematics teachers generally preferred to use different resources (Katipoglu & Katipoglu, 2016; Korkmaz et al., 2020; Ozmantar, Dapgin, Cirak Kurt & Ilgun, 2017) since they think that textbooks were not suitable for national exams (Altun, Arslan & Yazgan, 2004; Isik, 2008; Korkmaz et al., 2020), included limited number of problems (Katipoglu & Katipoglu, 2016; Ozmantar et al., 2017; Tutak & Guder, 2012), had inadequate content (Ozmantar et al., 2017), and were unsuitable for student level (Arslan & Ozpinar, 2009; Ozmantar et al., 2017). Indeed, it was observed that national exam problems aimed to measure advanced thinking skills when compared to those included in the textbooks in Türkiye (Tutak & Farimaz, 2022).

The determination of the current use of mathematics textbooks by teachers in learning environments may be important and necessary to identify the role of the textbooks revised based on curricular changes (Kocak & Karaca, 2021). It was reported that qualitative research on this topic would lead to comprehensive and profound findings on the use of textbooks by the teachers (Kocak & Simsek, 2022). Thus, the present qualitative study aimed to investigate the use of textbooks by mathematics teachers in Türkiye. Thus, reasons why mathematics teachers use or do not use textbooks were determined considering the following research problems:

1. For which purposes the mathematics teachers use textbooks?
2. At which phase of the course and why do mathematics teachers use textbooks?
3. Why do mathematics teachers use textbooks or prefer alternative resources?
4. Why mathematics teachers suggest textbooks to the students?

Mathematics Textbooks

Due to the centralized structure of the Turkish education system, both public and private schools are affiliated to the Ministry of National Education (MoNE), and adopt the curricula approved by the ministry, and receive free textbooks from the ministry in every academic year. Textbooks are defined as the books, supplements, models or prototypes in printed or digital media that are prepared based on the curricula for formal and non-formal education institutions by the MoNE (2021a).

Türkiye adopted a 12-year compulsory education system that included three levels starting from the 2012-2013 academic year. The first level includes four years of primary school (Grade 1-4), the second level includes four years of middle school (Grade 5-8), and the third level includes four years of high school (Grade 9-12). The educational content is standard for all primary and middle schools. Although the situation is similar for high school, Science High Schools, where students with high academic achievements could attend, use a specific and advanced curriculum. Thus, different textbooks are developed for Science High Schools.

A textbook for each grade is developed based on the curriculum by a commission appointed by the MoNE. Each textbook covers mathematical outcomes in all related topics as specified by the curriculum. Furthermore, textbooks published by private publishers are also evaluated and could be approved by the commission. Therefore, one book could be recommended for certain grades, while more than one book could be recommended for others. Textbooks are approved by the commission for a maximum of five years and are distributed free of charge at the beginning of each academic year.

As of the 2018-2019 academic year, one MoNE publication and one private publication are recommended (Özgün Publishing in 5th grade, Koza publishing in 6th and 8th grades, Berkay Publishing in 7th grade) for each middle school grade. Hence, eight mathematics textbooks were approved as mathematics textbooks by the Board of Education. The sections and content of these textbooks are as follows:

- a) Unit cover page – It includes the name of the unit and topics in the content.
- b) Keywords – The concepts related with the unit outcomes are listed.
- c) Introduction – It introduces the topic with interesting real-life narratives and problems.
- d) Are we ready? – Problems are included to check prerequisite knowledge of the students.
- e) Let's Remember – It reminds the knowledge learned in previous years.
- f) Let's Try This – It includes individual work or teamwork activities.
- g) Let's Solve Together – It includes problems with solutions.
- h) Information Boxes – The definitions are presented in the text boxes throughout the unit.
- i) Research/Reflect – It includes problems that students could solve via research.
- j) It's Your Turn – Open-ended questions related with the content are presented throughout the unit.

- k) Unit Evaluation – The section is located on the last page of each unit and includes various types of problems (filling the blanks, true-false, open-ended, multiple choice, etc.) or past paper questions of the national exams.
- l) Self-Assessment of Knowledge – It includes a self-assessment form to allow the students to evaluate themselves.
- m) Do you know these? – It includes interesting information about the concepts related with the content and/or famous mathematicians at the end of the unit.
- n) Mathematical Games – It includes mathematical games to develop reasoning and problem-solving skills of the students.
- o) Project Directive – It includes general mathematical projects and instructions and a project evaluation scale that teachers could use to evaluate students.

In high school, one MoNE publication, one private publication (Pasifik Publishing in 9th grade, Anka Publishing in 10th and 11th grades, and Tutku Publishing in 12th grade), and one textbook for Science High Schools, a total of twelve textbooks are available as of the 2018-2019 academic year. The sections and content of these textbooks are as follows:

- a) Unit cover page – It includes name of the unit and its topics.
- b) Symbols and Notations – It includes symbols and notations associated with the content of the unit.
- c) Terms and Concepts – It includes terms and concepts associated with the content of the unit.
- d) Example and Solution – It includes problems and their solutions.
- e) QR Code – It includes a QR code to access digital resources that include related pictures, videos, animations, problems and solutions.
- f) I Reflect – It includes interesting and useful information about the content of the unit.
- g) Knowledge – It includes information, definitions, the proofs of the theorems.
- h) Warning – It emphasizes the things that students should pay attention to.
- i) Activity – It includes activities to trigger the exploration.
- j) Information and Communication Technology – It includes activities that require graphics drawing via the use of information and communication technologies.
- k) In-Classroom Activities – It includes activities that could be implemented in the classroom.
- l) Exercises – It includes open-ended questions that students could use to practice.
- m) Unit Evaluation – It is located on the last page of each unit and includes various types of problems (filling the blanks, true-false, open-ended, multiple choice, etc.) to evaluate the learning of the students.
- n) History Corner – It includes historical information related with the content of the unit.
- o) Interesting Facts – It includes interesting details about the content of the unit or famous mathematicians.

Interactive textbooks were published in 2020 for 9th, 10th and 11th grades and in 2021 for the 12th grade (MoNE, 2020; 2021b). These textbooks include skill-based practices and activities related with various topics. Some of the activities emphasize technology use and the problems are associated with daily life scenarios. The interactive books are available at “ogmmaterial.eba.gov.tr” web site published by the General Directorate of High School. The same web site also includes a mathematical modeling activity book for 9th grade. The book includes 47 modeling activities developed for 9th grade topics, and a sample solution is presented for each activity at the end of the book.

Every year, students must take a central exam called High School Entrance Examination to attend high school in Türkiye. The exam aims to measure verbal and numerical skills of the students. Students must take a two-tier central exam called Higher Education Institutions Exam to attend a college in Türkiye. The MoNE approved mathematics textbooks also aim to prepare students for national exams.

METHOD

Research Design

The current study is conducted with the case study approach, a qualitative research method. Case studies aim to investigate the factors that affect a phenomenon and how these factors affect the phenomenon in depth (Yin, 2009).

Participants

The data were collected from 174 middle school and 104 high school mathematics teachers who were voluntarily participated. 241 (86%) participants were employed at public-schools and 37 (14%) were employed at private schools. The participants were distributed as follows: 175 had a Bachelor's degree, 41 had completed a Master's programme, 52 had attained a Master's degree, nine enrolled a PhD programme, and one had already completed a PhD degree.

Data Collection Tool

An online questionnaire that included multiple-choice and open-ended questions was developed by the authors to determine the use of textbooks by mathematics teachers. Multiple choice questions were prepared to determine the gender, seniority, active teaching status of the participants, and the school type of employment, school level and grade they instructed, which mathematics textbooks they used at which phase(s) of the course and how often, alternative resources they preferred (if any), and whether they suggested the textbooks to the students. In all multiple-choice questions, participants were allowed to select more than one option, and to add their own respond by selecting the "other" option. The open-ended questions for mathematics teachers aimed to determine the purposes of using textbooks and the reasons for using/not using the textbooks in learning environments, and the reasons for suggesting/not suggesting the students to use the textbooks. An extra multiple-choice question was asked particularly to high school mathematics teachers to determine the frequency of the use of interactive textbooks and an extra open-ended question was asked to determine why they used/did not use the interactive textbooks. Two faculty members in the field of mathematics education reviewed the questionnaire to determine its suitability for the aim of the study, and it was confirmed that the questionnaire was adequate.

Data Analysis

The frequencies and percentages of the findings from data obtained from multiple-choice questions are presented in graphs. The inductive analysis method was adopted to analyze the data obtained from open-ended questions. Codes and themes were determined based on the concepts identified in the qualitative data (Merriam & Tisdell, 2015). The themes and codes derived from the open-ended questions were presented to the reader in tables, accompanied by illustrative discourse samples from the participants. Codes were determined by the two authors independently and they were compared by the authors. Then the themes were determined and named based on the codes. The reliability of the coding was determined with intercoder reliability. The internal consistency formula proposed by Miles and Huberman (1994) was used and intercoder reliability was calculated as 90%. The authors re-analyzed the inconsistent findings and reached an agreement on all issues

RESULTS AND DISCUSSION

In this section, the results on the use of textbooks by mathematics teachers are presented in separate titles dedicated to each research problem.

For Which Purposes the Mathematics Teachers Use Textbooks?

Within the scope of the first research problem, mathematics teachers were asked for which purposes they used textbooks in learning environments. The findings are presented in Figure 1.

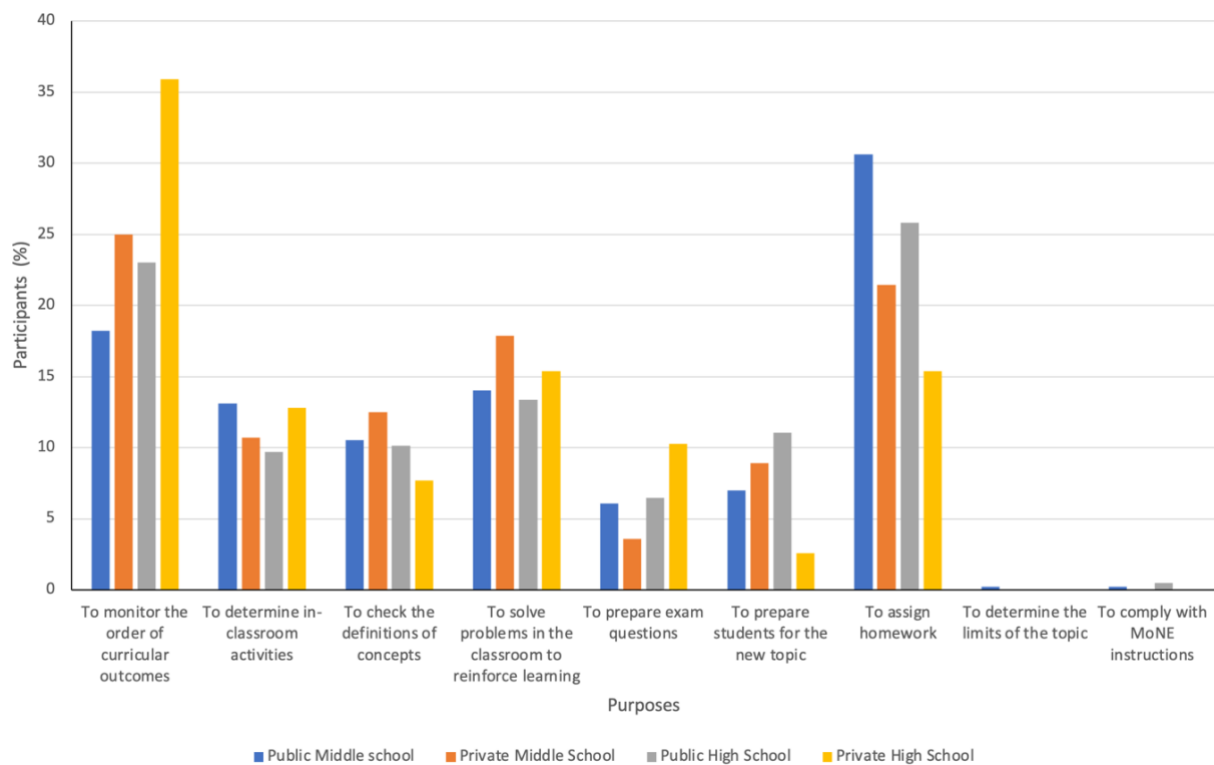


Figure 1. *Purposes of mathematics teachers to use textbooks*

As seen in Figure 1, the intended use of the textbooks by mathematics teachers in general was to monitor the order of curricular outcomes and to assign homework. The teachers considered the textbooks as course preparation material for themselves and study material for the students. When compared to public-school teachers, the private school teachers used the mathematics textbooks to monitor the order of curricular outcomes more. This category was the most popular among the private school teachers, especially in high schools. This result is consistent with the previous studies in the literature (Baser, 2012; Tasdemir et al., 2018). Homework assignments was the most common in the intended use of textbooks among public-school teachers. As mentioned in the literature, teachers use textbooks to assign homework (Isik, 2008; Katipoglu & Katipoglu, 2016; Korkmaz et al., 2020; Ulusoy & Incikabi, 2020). Similar number of private and public-school mathematics teachers used the textbooks to determine in-classroom activities, check concept definitions, reinforce learning, and prepare exam questions.

At which phase of the course and why do mathematics teachers use textbooks?

Within the context of the second research problem, the participants were asked at which phases of the course they used/did not use the textbooks and to explain the reasons. Their responses are presented in Figure 2.

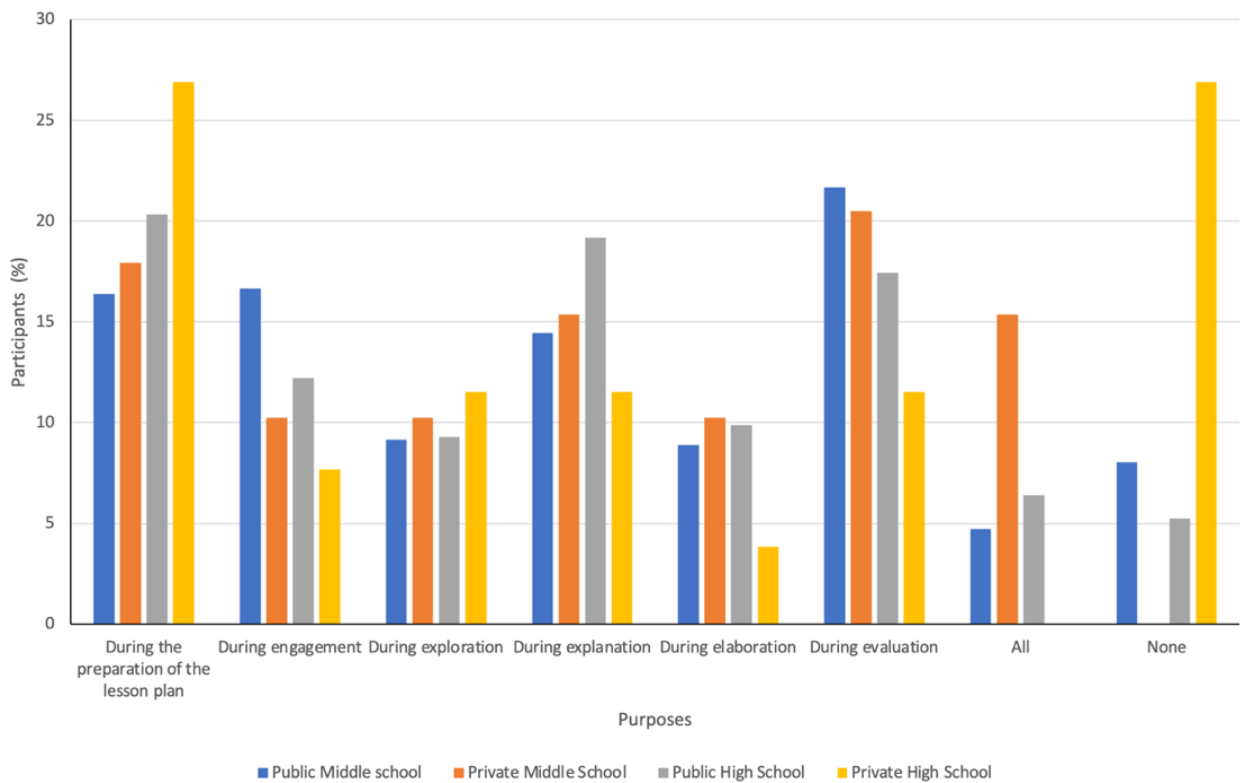


Figure 2. Phases where mathematics teachers used textbooks

The preparation of the lesson plan mentioned in Figure 2 refers to the phase where teachers check the current unit, included topics and outcomes before the class. As seen in Figure 2, mathematics teachers mostly used the textbooks during preparing lesson plan and in the evaluation. This finding was consistent with the results in national literature (Isik, 2008; Kocak & Karaca, 2021; Kocak & Simsek, 2022; Korkmaz et al., 2020; Ulusoy & Incikabi, 2020) and indicated that it became a tradition in Türkiye.

Why do mathematics teachers use textbooks or prefer alternative resources?

The reasons provided by the mathematics teachers for using the textbooks are presented in Table 1 and 2. The reasons provided by public-school mathematics teachers were categorized under the themes of "preparation of lesson plan", "usability" and "enriched content".

Table 1.

The reasons why public-school mathematics teachers use textbooks

Theme	Code	Middle School		High School	
		f	Quote	f	Quote
Preparation of Lesson Plan	To remind prerequisite knowledge		"I use (them) to support pre-learning." (T185)	0	-
	For exploration	1	"I use (them) in exploration phase of the lesson." (T8)	0	-
	To check the definitions	6	"I use the textbook to check the definitions of the concepts." (T176)	4	"I check how the definitions are expressed (in the textbook)." (T202)
	Instruction		"I check whether MoNE included certain properties in certain topics. I examine the level of detail in topics." (T214)		
	To examine the content	13		1	"I use (them) to help me to decide about the content." (T96)

	To provide examples	13	<i>"I use certain examples in the textbook so that the students could see them." (T146)</i>	5	<i>"I use (them) to help me to find examples during instruction." (T96)</i>
	To solve different types of problems	15	<i>"I use (them) to see problem types." (T165)</i>	7	<i>"I use (them) to solve different types of problems." (T261)</i>
	Implementation of activities	13	<i>"I use the "are we ready?" activities in the textbooks as an engagement activity in the class." (T59)</i>	5	<i>"I use GeoGebra activities." (T67)</i>
	To assign homework	54	<i>"I use (them) to reinforce learning when the students do homework at home." (T75)</i>	14	<i>"I use (them) to assign homework so students can solve more difficult problems." (T225)</i>
	To fulfill educational goals	MoNE regulation	14	<i>"We are not allowed to use resources other than those by MoNE. I also use (them) because they are checked by field experts." (T7)</i>	2
To monitor the order of outcomes		23	<i>"I use (them) to monitor the order of outcomes." (T11)</i>	26	<i>"I use (them) because the textbook content is organized by the order of the outcomes." (T23)</i>
Usability	Accessibility	10	<i>"I use it because it is the only printed resource available to all students." (T17)</i>	1	<i>"I use it at every phase because students could not afford additional books." (T88)</i>
	Saving time	2	<i>"It is practical since it prevents the students to write down the problems." (T59)</i>	1	<i>"During the activities, it saves time since students could follow the flow on the textbook." (T77)</i>
	Adequate for student level	1	<i>"I use it because it is suitable for the beginner student level." (T42)</i>	0	-
Enriched content	Associated with daily life	4	<i>"I use the examples that reflect daily life events in textbook." (T222)</i>	1	<i>"I examine daily-life examples." (T275)</i>
	Mathematical history elements	1	<i>"I think that the history of mathematics in the textbook will be of interest to children." (T215)</i>	0	-

The reasons provided by private school mathematics teachers for using the textbooks in learning environments are categorized into "preparation of lesson plan" and "saving time" themes.

Table 2.

The reasons why private school mathematics teachers use textbooks

Theme	Code	Middle School		High School		
		f	Quote	f	Quote	
Preparation of Lesson Plan	The design of learning environment	To examine the content	1	"I use (them) to review content as I prepare myself for the class." (T24)	1	"I check the content when I prepare the lesson plan." (T110)
		To provide examples	1	"I use (them) to solve examples in the class." (T99)	0	-
		To solve different types of problems	3	"I use (them) to show students different problem types." (T50)	1	"I use the textbook to show them various problem types." (T62)
		To assign homework	5	"I use (them) to assign homework." (T206)	2	"I use (them) to assign homework." (T104)
	To fulfill educational goals	MoNE regulation	0	-	1	"I use the textbook so that students could see the problems in the textbook approved by the MoNE." (T62)
		To monitor the order of outcomes	4	"I review (them) to monitor the order of outcomes." (T45)	5	"I use (them) to monitor the outcomes." (T106)
	Saving Time	1	"I use the textbook since taking notes is a waste of time." (T20)	0	-	

The study findings interestingly demonstrated that the reasons why mathematics teachers used or did not use textbooks were categorized in similar themes. In other words, one teacher's reason for using the textbooks was another teacher's reason for not using them. It was determined that the public-school mathematics teachers considered the textbooks inadequate for "preparation of lesson plan" and "usability" (Table 3).

Table 3.

The inadequacies of the textbooks according to public-school mathematics teachers

Theme	Code	Middle school		High school		
		f	Quote	f	Quote	
Preparation of lesson plan	The design of learning environments	Content	15	"I use a different resource that includes clearer content." (T231)	3	"I consider content inadequate for instruction." (T263) "Other resources provide more current content." (T89)
		Number and variety of problems	80	"I use a different publication to solve more problems and see different problem types." (T27) "I use a different resource to help students	29	"I find the number and varieties of problems in the textbook inadequate." (T88)

To fulfill educational goals			<i>learn different problem-solving methods.” (T85)</i>		
	Implementation of activities	8	<i>“There are not enough activities in textbooks.” (T59)</i>	0	-
	Reinforcement	11	<i>“They are not adequate to reinforce student knowledge.” (T201)</i>	5	<i>“There are several problems with solutions, but not enough to reinforce learning.” (T103)</i>
	Institutional decision	0	-	1	<i>“We jointly decide which book to use in institution.” (T202)</i>
	Skill-based questions	15	<i>“Since the textbook does not include new generation questions, I use additional resources.” (T33)</i> <i>“I use different resources to familiarize students with skill-based questions and new generation problems.” (T85)</i>	2	<i>“I prefer different resources since they include skill-based questions.” (T90)</i>
Preparation for national exams	11	<i>“I use the different resources to prepare students for national exam.” (T42)</i>	2	<i>“I prefer different sources because they aim for the national exam.” (T271)</i>	
Usability	Adequate for student level	4	<i>“I use different resources considering the students academic level.” (T60)</i>	15	<i>“Since the academic level of my students is quite low, I prefer different resources.” (T275)</i>
	The order of problems from simple to difficult	4	<i>“Problems are not ordered from easy to hard.” (Ö155)</i>	3	<i>“Suddenly there are complex problems; students give up when they cannot solve them.” (T114)</i>
	Book design	9	<i>“There are no empty spaces to solve the problem in the textbooks.” (Ö172)</i>	2	<i>“In textbooks, the problems and topics are not associated. Problems should follow the instruction.” (T102)</i>
	Interactive content	4	<i>“Interactive classes could be instructed with interactive whiteboard applications available in different sources. But textbooks do not have this feature.” (T19)</i> <i>“I prefer another resource to allow the students watch videos and conduct interactive activities.” (T58)</i>	3	<i>“Since they have interactive whiteboard applications, I prefer other publications.” (T89)</i>

Considering the textbooks inadequate for "preparation of lesson plan" and "usability", private school mathematics teachers did not use them (Table 4).

Table 4.

The inadequacies of textbooks according to private school mathematics teachers

Theme	Code	Middle school		High school			
		f	Quote	f	Quote		
Preparation of lesson plan	The design of learning environments	Content	1	"I find MoNE textbook content inadequate." (T87)	0	-	
		Instruction	Number and variety of problems	5	"I use different resources so that students could see different types of problem." (T26)	4	"I use different resources to show students different types of problems." (T107)
				1	"I cannot find adequate number of activities in the textbooks." (Ö203)	0	-
		Reinforcement		1	"Since other resources include more examples, children have further reinforcement opportunities." (ÖT3)	0	-
	To fulfill educational goals		Institutional decision	5	"We only use the resources that are allowed to be used by the institution." (T29)	4	"The institution requires the use of the resources that they had an agreement with." (T23)
			Skill-based questions	1	"Since MoNE textbooks do not include skill-based questions, we use resources with new generation questions." (T87)	0	-
			Preparation for national exams	2	"I do not prefer the textbooks since they are not suitable for the national exams." (T90)	1	"MoNE textbooks are inadequate, and do not include detailed content for the exams." (T37)
	Usability		Adequate for student level	0	-	1	"I select different resources adequate for different students' levels of understanding." (T182)
			Interactive Whiteboard Apps	1	"Instead of textbooks, I use books with interactive whiteboard apps and include plenty of activities." (T20)	0	-

Mathematics teachers used textbooks to review content, find examples and different problem types in the design of the learning environment during the preparation of lesson plan. However, some of the public and private school mathematics teachers considered the number and variety of problems in textbooks inadequate and preferred to use alternative resources. This finding was consistent with the previous reports that teachers considered the number and variety of problems available in textbooks inadequate (Cakir, 2009) and preferred alternative resources (Kocoglu Er, 2016; Kocak & Karaca, 2021; Kocak & Simsek, 2022). It was observed that mathematics textbooks did not meet expectations of some teachers in terms of the availability of diverse problems.

Both private and public-school mathematics teachers used textbooks because these books were approved by the ministry and to monitor the order of curricular outcomes. Monitoring the order of outcomes was one of the main reasons for using textbooks, independent of school type. This was consistent with teacher responses for their purposes for using textbooks. However, teachers considered mathematics textbooks inadequate in skill-based questions developed for these outcomes and in preparation for national

exams. Teacher views on instruction are directly affected by the problems associated with national exams (Au, 2011). The present study findings were consistent with that finding. Middle school mathematics teachers (Korkmaz et al., 2020) and high school mathematics teachers (Altun et al., 2004) did not consider the textbooks adequate for national exams. It could be deduced that teacher views on the role of mathematics textbooks in the preparation for national exams have not changed. Actually, the results that show that the problems included in the national exams and mathematics textbooks did not have the same cognitive load (Tutak & Farimaz, 2022) justifies the view of the mathematics teacher.

Teachers considered taking notes on a notebook a waste of time and expected the students to follow the content from textbooks during the instruction. They complained that there was not enough space on the textbooks to solve problems and take notes. As Kosko (2016) mentioned in the literature, teachers in mathematics classrooms prevent students from engaging in the act of writing. In the present study, it was observed that teachers restricted writing to taking notes on textbooks. However, the continuous and systematic use of writing in mathematics learning contributes to the academic achievements of the students (Ntenza, 2006).

The public-school teachers stated that they used textbooks because they were accessible by all students. However, parents expect private schools to improve the variety of course material (Nartgun & Kaya, 2016). Since the private school students come from families with a certain socio-economic level (Gurler, 2020), these schools could meet parental expectation for material diversity. Thus, the accessibility of the textbooks was not a determining factor in the use of textbooks in private schools.

Especially certain public high school teachers considered the textbooks inadequate for the student level and preferred to use alternative resources instead of the MoNE approved textbooks (Table 3). Inadequacy of the textbooks for the student level has been an ongoing problem in Türkiye (Dayak, 1998; Korkmaz et al., 2020). A textbook is adequate only if it could be used by the students (Altun et al., 2004). Thus, since the textbooks were inadequate for the student level, inability of the teachers to use these is a serious problem that await a solution.

Teachers stated that mathematics textbooks were not usable since they did not include an interactive whiteboard application. MoNE provided an interactive whiteboard for each classroom since 2012. However, due to test anxiety and intense curriculum, mathematics teachers could not use these interactive whiteboards properly (Turel, 2012). The mathematics teachers considered the interactive whiteboard an instruction tool to easily solve problems and draw geometric figures, preventing the students to take notes (Basibuyuk, Erdem, Sahin, Gokkurt & Soylu, 2014). Interactive whiteboards are mostly used as a presentation tool in mathematics courses in Türkiye. However, interactive whiteboards contribute to the concretization of mathematical content, increasing the retention of learning and comprehension of the concepts (Tatar, Zengin & Kagizmanli, 2013). Thus, teachers' view should be improved on the use of interactive whiteboards in mathematics. Hence, teachers would have more rational expectations from the textbooks, including interactive whiteboard applications.

The reasons why public high school mathematics teachers used interactive textbooks were categorized in three themes: "preparation of lesson plan", "usability" and "enriched content" (Table 5).

Table 5.

The reasons why public high school mathematics teachers use interactive textbooks

Theme	Code	Middle school	
		f	Quote
Preparation of lesson plan The design of learning environments	To reinforce the learning	45	<i>"I use (them) when solving problems to reinforce learning." (T202)</i> <i>"I use (them) for repetition." (T262)</i> <i>"I use (them) to improve permanence of learning." (T90)</i>
	To solve different types of problems	17	<i>"I use (them) because I want students to solve different types of problems." (T18)</i>
	To prepare exam questions	4	<i>"I use the problems in these books to prepare exam questions." (T17)</i> <i>"I review the problems in these books when preparing exam questions." (T95)</i> <i>"I use these books when searching for problem types for the exam." (T103)</i>

To fulfill educational goals	National exams	4	<p>“These books include problems similar to those in the national exams.” (T97)</p> <p>“I use these books to allow the students to see the problems that they may encounter in the national exam.” (T218)</p>
	Skill development	3	<p>“I use (them) to help students consider different perspectives, improve their skills, and solve daily life problems.” (T103)</p>
Usability	Easy access	1	<p>“I prefer (them) because, with the popularization of the internet, problems and resources could be accessed easily, and problems that are not found in the textbooks could be accessed more easily on digital platforms.” (T211)</p>
	Adequate for student level	1	<p>“I use (them) to improve the achievements of diligent students.” (T246)</p>
Enriched content	Associated with daily life	2	<p>“I use (them) to solve daily life problems.” (T103)</p>
	Interesting parts	3	<p>“I use these books due to the interesting engagement parts.” (T97)</p>

The reasons why private high school mathematics teachers used interactive textbooks were categorized in two themes: "preparation of lesson plan" and "usability" presented in Table 6.

Table 6.

The reasons why private high school mathematics teachers use interactive textbooks

Theme	Code	High school	
		f	Quote
Preparation of lesson plan	To reinforce the learning	7	“I use (them) as an alternative resource to reinforce learning after instruction.” (T64)
	To solve different types of problems	2	“I use (them) to see different types of problems.” (T65)
	To examine activities	1	“I use the activities and instructions in these books for in-classroom activities.” (T62)
	To be prepared for national exams	2	“I use these books because they include similar problems to those in the national exams.” (T111)
Usability		1	“I prefer (them) because it is both easier to access them online and they are simpler to use.” (T107)

The public and private high school mathematics teachers used interactive textbooks primarily in "preparation of lesson plan". Teachers stated that they used these books to reinforce learning after instruction, allow students to see different types of problems and their solutions, and to find in-classroom activities in private school while public-school teachers used these books during designing of the learning environment to reinforce the learning, solve different types of problems and prepare exam questions. Certain private high school teachers stated that these books included problems that were similar to those found in national exams and allowed students to practice.

The teachers also used interactive textbooks due to usability. Similar to public high school teachers, private high school teachers stated that these resources were easy to access online and simple to use.

Certain public-school mathematics teachers stated that they used interactive textbooks due to being associated with daily life and having interesting parts. Teachers used the interesting content in these books in the engagement phase of the lessons in order to increase students' motivation and used problems associated with daily life to teach mathematics in the context of daily life and to provide students with the opportunity to solve modelling problems.

The views of the public high school mathematics teachers related to the reasons why they did not use interactive textbooks are presented in Table 7.

Table 7.

The reasons why public high school mathematics teachers did not use interactive textbooks

Theme	Code	High School		
		f	Quote	
Usability	Technical problems	3	"I do not use (them) because they are waste of time due to internet connection problems." (T46) "Interactive whiteboard is always problematic." (T91)	
	Above student level	2	"I do not use (them) because the problems are above the student level." (T268)	
	Time	Intense curriculum	1	"There is no time to conduct the textbook activities due to the intense curriculum." (T6)
		Class environment	1	"It takes too much time to conduct these activities in crowded classrooms." (T6)

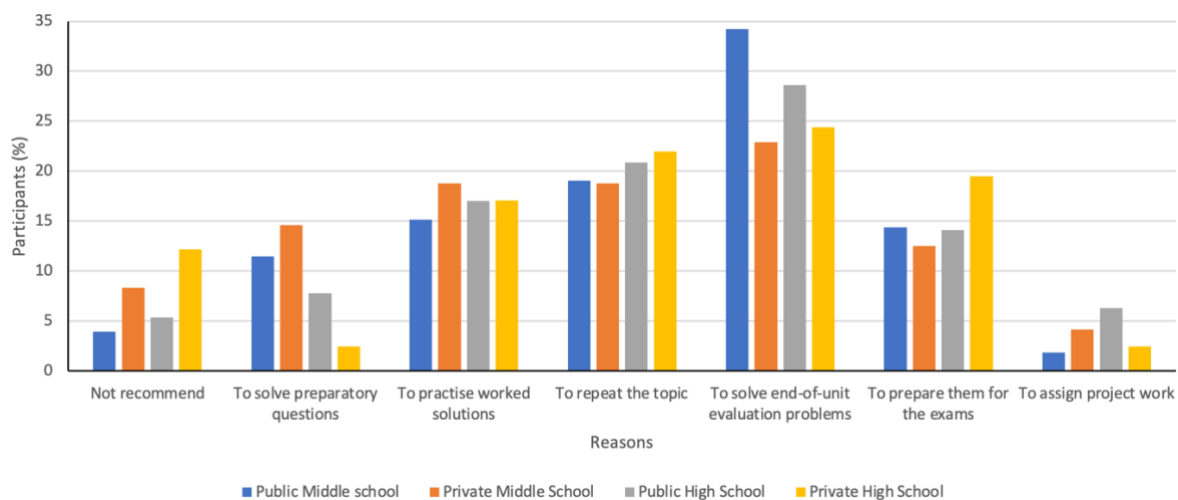
The public high school mathematics teachers did not use interactive textbooks since these resources were unusable. Teachers stated that experienced problems when using these textbooks due to internet connection problems and/or technical problems with the interactive whiteboard. Since technological facilities are better in private schools (Unsal & Cetin, 2019), these problems are not experienced. The advanced technological infrastructure in private schools and smaller class size minimize technical and temporal problems.

It is known that public-school classes are crowded in Türkiye when compared to private schools (Calik, Tabak & Tabak, 2019). Mathematical activities require student responsibility and use of tools and equipment during the instruction (Bozkurt, 2012). Thus, the inability of the public high school teachers to use interactive textbook problems and activities due to crowded classes was justified. The public high school teachers stated that the high number of curricular goals led to time problems, preventing the teachers from enriching the course content and using interactive educational materials. The public-schools in Türkiye implement the curriculum approved by the MoNE, which could be different for private schools (Gurler, 2020). Private schools could implement international programs such as IB and Cambridge IGCSE instead of the MoNE curricula and revise the mathematics curriculum based on the rules determined by the MoNE.

Three of the private high school mathematics teachers stated that they did not use interactive textbooks in their lessons, but did not provide any explanation for this. Therefore, the reasons for private high school mathematics teachers not using interactive textbooks could not be included in our study.

Why mathematics teachers suggest textbooks to the students?

The fourth research problem aimed to determine why mathematics teachers suggested textbooks to students. While 218 (79%) teachers recommended mathematics textbooks to their students, 58 (21%) did not. The reasons why mathematics teachers recommended textbooks to their students according to school level and type is presented in Figure 3.

Figure 3. *Mathematics teachers' reasons to suggest textbooks to students*

Public-school mathematics teachers suggested the textbooks more (91%) when compared to private school teachers (79%) (Figure 3). Independent of school level and type, mathematics teachers mostly asked students to solve end-of-unit evaluation problems and to fulfill assigned projects in textbooks. It was observed that the reasons why the mathematics teachers suggested the textbooks to the students were similar and included repetition of topics, practice worked solutions, preparation for the exams, and to solve the preparatory questions at the beginning of the units. The number of mathematics teachers who did not recommend the textbooks to students was higher among the private high school teachers (13%) when compared to those employed in other school types and levels.

Pepin and Haggarty (2001) reported that the use of textbooks by the students depended on the recommendation of teachers. Since teachers generally allow the students to use textbooks for homework assignments, students generally use textbooks for exercises and solving problems (Ulusoy & Incikabi, 2020). A similar finding was determined in our study that most Turkish mathematics teachers recommended textbooks to students to solve end-of-unit evaluation problems, repeat the topic, and peruse problems with solutions (Figure 3).

In both public and private schools, textbooks were rarely recommended by teachers for project assignments. However, interactive textbooks developed by the MoNE include problems and activities to improve reasoning, communication, association and questioning skills of the students (MoNE, 2020; 2021b). Furthermore, the 9th grade mathematics modeling activity book includes activities that will allow student involvement in mathematical modeling. These books provide opportunities for teachers to assign project homework to the students. Since the use of textbooks is directly dependent on teacher attitudes (Fan et al., 2021), when the teacher does not recommend these books, the student would not be aware of them, which in turn would prevent the accomplishment of the objectives of the interactive textbooks and modeling activity books.

CONCLUSION

Textbooks are primary instructional mediators that are developed based on the national curricula, revised based on technological advances, and serve as a learning guide for teachers and students (Reichenberg, 2021). Textbooks are a reflection of a nation's educational culture and allow the exposure of the students at a certain grade to the same content, activities and practices at similar times in learning environments, leading to a common instructional perspective and culture. Teachers play a key role in the introduction and employment of textbooks in the classroom (Fan et al., 2021). The first step to determine whether the textbooks achieve the learning goals is the determination of whether the textbooks were preferred by teachers (Kocak & Karaca, 2021; Kocak & Simsek, 2022; Ulusoy & Incikabi, 2020). This study provides a general summarizing of using mathematics textbooks by teachers in Türkiye. It is aimed to examine the current status of textbook use in terms of purposes, teaching phases, reasoning to use or prefer alternative materials, and reasons to suggest mathematics textbooks to the students.

The intended use of the textbooks by mathematics teachers in general was to monitor the order of curricular outcomes and to assign homework. When compared to public-school teachers, the private school teachers used the mathematics textbooks to monitor the order of curricular outcomes more. This category was the most popular among the private school teachers, especially in high schools. Homework assignments was the most common in the intended use of textbooks among public-school teachers.

Mathematics teachers mostly used the textbooks during preparing lesson plan and in the evaluation. During the preparation of lesson plan, teachers do not only design the learning environment but also try to fulfill educational goals. Teachers stated that they used textbooks because they were approved by the ministry and were consistent with the curriculum. On the other hands, most public-school mathematics teachers stated that the textbooks were not adequate for preparing lesson plans. The teachers stated that the textbook content was not current and did not encourage students to explore further knowledge. Similarly, most private school mathematics teachers stated that the textbooks did not support them during preparing lesson plan adequately. Teachers stated that they did not use textbooks because the content was not comprehensive, the number and variety of problems were inadequate, and it was not possible to find activities and help students reinforce learning. It was also determined that mathematics teachers used the textbooks less during elaboration when compared to other phases. Mathematics teachers mostly suggested mathematics textbook to student to solve end-of-unit evaluation problems and assigned projects in textbooks.

RECOMMENDATIONS

Instructional material reflects the impact of the curriculum on course planning and classroom applications (Tarr, Chaves, Reys & Reys 2006), and in recent years, certain models were developed to determine the teacher-material interaction (Gore et al., 2017). It could be recommended that studies on curricular reasoning, defined by Breyfogle, Roth McDuffie and Wohlhuter (2010) as "thinking processes that teachers adopt as they work with curricular material to plan, implement, and reflect on instruction" (p. 308), should be conducted in Türkiye to reveal the use of textbooks, and to determine the advantages and limitations of the textbooks, and hence their impact on instructional strategies of the teachers.

The mathematics classroom culture is affected by the student and teacher views on mathematics and mathematics education, and the pedagogical approach adopted by the teacher. In our study, the reasons why some teachers used textbooks were the same as who others did not use the textbooks, confirming this statement. It was observed that the use of textbooks in learning environments was affected by the mathematics classroom culture, necessitating the inclusion of the classroom culture in future studies on the use of textbooks. These studies could verify or revise the findings reported in the present study on the use of textbooks in learning environments based on teacher views.

REFERENCES

- Altun, M., Arslan, C., & Yazgan, Y. (2004). Lise matematik ders kitaplarının kullanım şekli ve sıklığı üzerine bir çalışma. *Journal of Uludag University Faculty of Education*, 17(2), 131-147. <https://acikerisim.uludag.edu.tr/server/api/core/bitstreams/4180a9c9-9656-4d92-9efc-dd233162b12b/content>
- Arslan, S., & Ozpinar, I. (2009). Evaluation of 6th grade mathematics textbooks along with the teacher opinions. *Dicle University Journal of Ziya Gokalp Education Faculty*, 12, 97-113. <https://dergipark.org.tr/tr/download/article-file/787134>
- Au, W. (2011). Teaching under the new Taylorism: High-stakes testing and the standardization of the 21st century curriculum. *Journal of Curriculum Studies*, 43(1), 25-45. <https://doi.org/10.1080/00220272.2010.521261>
- Baser, N. (2012). *A case study of elementary mathematics teachers' views of their and students textbook usage and of mathematics textbooks' characteristics* (Master's Thesis). Retrieved from National Thesis Center (321085).
- Basibuyuk, K., Erdem, E., Sahin, Ö., Gokkurt, B., & Soylu, Y. (2014). Opinions of teachers and students about use of smart board in mathematics courses. *Adiyaman University Journal of Educational Sciences*, 4(2), 72-97. <https://doi.org/10.17984/adyuebd.78901>
- Bozkurt, A. (2012). Mathematics teachers perceptions of mathematical activities. *Education and Science*, 37(166), 101-115. <https://egitimvebilim.ted.org.tr/index.php/EB/article/view/1367/444>
- Breyfogle, M. L., Roth McDuffie, A., & Wohlhuter, K. A. (2010). Developing curricular reasoning for grades pre-K-12 mathematics instruction. In B. Reys, R. E. Reys, & R. Rubenstein (Eds.), *Mathematics curriculum: Issues, trends, and future directions* (pp. 307-320). Reston, V.A: National Council of Teachers of Mathematics.
- Cakir, I. (2009). *The evaluation of the fifth grade mathematics textbooks of the primary education according to the views of the teachers and students* (Master's thesis). Retrieved from National Thesis Center. (228935).
- Calik, T., Tabak, H., & Tabak, B. Y. (2019). Evaluation of the in terms of Planning Class Size in Education System: Evidence from Ankara. *Gazi University Journal of Gazi Educational Faculty*, 39(3), 1581-1599. <https://www.acarindex.com/pdfs/1243720>
- Dayak, E. (1998). *Evaluation of the suitability of primary 5th grade mathematics coursebooks for education* (Master's Thesis). Retrieved from National Thesis Center (71860).
- Fan, L., Cheng, J., Xie, S., Luo, J., Wang, Y., & Sun, Y. (2021). Are textbooks facilitators or barriers for teachers' teaching and instructional change? An investigation of secondary mathematics teachers in Shanghai, China. *ZDM Mathematics Education*, 53, 1313-1330. <https://doi.org/10.1007/s11858-021-01306-6>
- Gore, J., Lloyd, A., Smith, M., Bowe, J., Ellis, H., & Lubans, D. (2017). Effects of professional development on the quality of teaching: Results from a randomised controlled trial of quality

- teaching rounds. *Teaching and teacher education*, 68, 99-113. <https://doi.org/10.1016/j.tate.2017.08.007>
- Gurler, M. (2020). Differences between public school and private school. *Cappadocia Journal of Education*, 1(1), 1-6. <https://dergipark.org.tr/tr/download/article-file/2676523>
- Harries, A. V., & Sutherland, R. (1998). *Primary school textbooks: An international study*. London: QCA.
- Isik, C. (2008). The factors affecting the use of mathematics textbook of mathematics teachers at primary education (grades 6-8) and their expectations. *Kastamonu Education Journal*, 16(1), 163-176. <https://dergipark.org.tr/tr/download/article-file/819063>
- Katipoglu, M., & Katipoglu, S. N. (2016). Mathematics teachers' opinions about student course book. *International Journal of Education, Science and Technology*, 2(3), 156-165. <https://dergipark.org.tr/en/download/article-file/263143>
- Kocak, F., & Karaca, N. (2021). Ders kitaplarını değerlendirme raporu (Öğretmen görüşleri). Ministry of National Education [MoNE], Retrieved from https://ttkb.meb.gov.tr/meb_iys_dosyalar/2021_04/15195856_derskitaplarini_degerlendirmeraporu_ogretmengorusleri_2021.pdf
- Kocak, F. & Simsek, A. (2022). Öğretmenlerin ders kitabı kullanımı ile ilgili araştırma raporu. Ministry of National Education [MoNE], Retrieved from http://ttkb.meb.gov.tr/meb_iys_dosyalar/2022_12/27131608_derskitabi_arastirmaraporu.pdf
- Kocaoglu Er, F. S. (2016). *Primary education mathematic teachers' opinions on 5th and 6th grade course books* (Master's thesis) Retrieved from National Thesis Center (419339).
- Korkmaz, E., Tutak, T., & İlhan, A. (2020). Evaluation of secondary school mathematics textbooks by mathematics teachers. *European Journal of Science and Technology*. 18(2020), 118-128. <https://dergipark.org.tr/en/download/article-file/979084>
- Kosko, K. W. (2016). Writing in mathematics: A survey of K–12 teachers' reported frequency in the classroom. *School Science and Mathematics*, 116(5), 276-285. <https://doi.org/10.1111/ssm.12177>
- Lepik, M., Grevholm, B., & Viholainen, A. (2015). Using textbooks in the mathematics classroom—the teachers' view. *Nordic Studies in Mathematics Education*, 20(3-4), 129-156. https://ncm.gu.se/wp-content/uploads/2020/06/20_34_129156_lepik.pdf
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. New Jersey, USA: Jossey-Bass.
- Mersin, N., & Durmus, S. (2018). Place of mathematics history in middle school mathematics textbooks. *Bolu Abant İzzet Baysal University Journal of Faculty of Education*, 18(2), 997-1019. <https://doi.org/10.17240/aibuefd.2018..-400746>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Sage Publications, Inc.
- Ministry of National Education (2020). *Lise öğrencilerine beceri ve kazanım temelli kaynak desteği*. Retrieved from <https://www.meb.gov.tr/lise-ogrencilerine-beceri-ve-kazanim-temelli-kaynak-destegi/haber/21995/tr>
- Ministry of National Education (2021a). *Ders Kitapları ve Eğitim Araçları Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik*. Number: 31628. Retrieved from <https://www.resmigazete.gov.tr/eskiler/2021/10/20211014-1.html>
- Ministry of National Education (2021b). *12. Sınıf öğrencilerine yönelik beceri temelli etkinlik kitap seti yayımlandı*. Retrieved from <https://www.meb.gov.tr/12-sinif-ogrencilerine-yonelik-beceri-temelli-etkinlik-kitap-seti-yayimlandi/haber/23421/tr>
- Munby, H., Russell, T. & Martin, A. K. (2001). *Teachers' knowledge and how it develops*. Handbook of Research on Teaching, V. Richardson (Ed.) USA: American Educational Research Association.
- Nartgun, S., & Kaya, A. (2016). Creating school image in accordance with private school parents' expectations. *Journal of Research in Education and Teaching*, 5(2), 153-167. http://www.jret.org/FileUpload/ks281142/File/17b.senay_nartgun.pdf
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: NCTM.
- Nicol, C. C., & Crespo, S. M. (2006). Learning to teach with mathematics textbooks: How preservice teachers interpret and use curriculum materials. *Educational Studies in Mathematics*, 62(3), 331-355. <https://doi.org/10.1007/s10649-006-5423-y>
- Ntenza, S. P. (2006). Investigating forms of children's writing in grade 7 mathematics classrooms. *Educational Studies in Mathematics*, 61(3), 321-345. <https://doi.org/10.1007/s10649-006-5891-0>

- Ozmantar, M. F., Dapgin, M., Cirak Kurt, S., & Ilgun, S. (2017). Mathematics teachers' use of source books other than textbooks: reasons, results and implications. *Gaziantep University Journal of Social Sciences*, 16(3), 741-758. <https://doi.org/10.21547/jss.322750>
- Pepin, B., Gueudet, G., & Trouche, L. (2013). Investigating textbooks as crucial interfaces between culture, policy and teacher curricular practice: Two contrasted case studies in France and Norway. *ZDM Mathematics Education*, 45(5), 685-698. <https://doi.org/10.1007/s11858-013-0526-2>
- Pepin, B., & Haggarty, L. (2001). Mathematics textbooks and their use in English, French and German classrooms: a way to understand teaching and learning cultures. *Zentralblatt für Didaktik der Mathematik*, 33(5), 158-175. <https://doi.org/10.1007/BF02656616>
- Porter, A. C. (2002). Measuring the content of instruction: Uses in research and practice. *Educational Researcher*, 31(7), 3-14. <https://doi.org/10.3102/0013189X031007003>
- Reichenberg, M. (2021). Predictors of Swedish Teachers' Attitudes and Willingness towards Research-Based Teaching: Results of a Survey Study. *International Journal on Social and Education Sciences*, 3(3), 504-517. <https://doi.org/10.46328/ijoneses.191>
- Sahin, S., & Turanli, N. (2005). The evaluation of mathematics text books used for first year high school students. *Gazi University Journal of Gazi Educational Faculty*, 25(2), 327-341. <https://dergipark.org.tr/tr/download/article-file/77265>
- Sarigoz, O. (2023). Examination of secondary school mathematics curriculum in terms of 21st century skills. *E-International Journal of Educational Research*, 14(2), 1-16. <https://doi.org/10.19160/e-ijer.1200499>
- Sevimli, E., & Kul, U. (2015). Evaluation of the contents of mathematics textbooks in terms of compliance to technology: Case of secondary school. *Necatibey Faculty of Education, Electronic Journal of Science and Mathematics Education*, 9(1), 308-331. <https://doi.org/10.17522/nefefmed.11253>
- Stylianides, G. J. (2009). Reasoning-and-proving in school mathematics textbooks. *Mathematical Thinking and Learning*, 11(4), 258-288. <https://doi.org/10.1080/10986060903253954>
- Tan Sisman, G., & Akkaya, G. (2017). The appropriateness of the ninth grade mathematics textbooks regarding the high school mathematics curriculum. *Pamukkale University Journal of Education*, 42(42), 1-14.
- Tarr, J. E., Chavez, O., Reys, R. E., & Reys, B. J. (2006). From the written to the enacted curricula: The intermediary role of middle school mathematics teachers in shaping students' opportunity to learn. *School Science and Mathematics*, 106(4), 191-201. <https://doi.org/10.1111/j.1949-8594.2006.tb18075.x>
- Tasdemir, E., Tasdemir, F., Dagistan, A., Dagdelen, S., Sahin, C., & Kilic, E. (2018). Evaluation of 5th grade mathematics textbook of MoNE according to teachers' opinions. *Journal of Research in Education and Teaching*, 7(2), 68-79. http://www.jret.org/FileUpload/ks281142/File/08.mehmet_tasdemir.pdf
- Tatar, E., Zengin, Y., & Kagizmanli, T. (2013). The use of dynamic mathematics software and interactive whiteboard technology in mathematics teaching. *Turkish Journal of Computer and Mathematics Education*, 4(2), 104-123. <https://doi.org/10.17762/turcomat.v4i2.53>
- Teker, D., & Ellez, A. M. (2022). Analysis of High School Mathematics Textbooks in Terms of Values Education. *The Western Anatolia Journal of Education Sciences*, 13(2), 1083-1098. <https://doi.org/10.51460/baedb.1184216>
- Turel, Y. K. (2012). Teachers' negative attitudes towards interactive whiteboard use: needs and problems. *İlkogretim Online*, 11(2), 423-439. <https://dergipark.org.tr/en/download/article-file/90584>
- Tutak, T., & Farimaz, H. (2022). Comparative analysis of mathematics questions in high school entrance exams in 2018-2019 and mathematics questions in textbooks according to math taxonomy. *Journal of Anatolian Education Research*, 6, 15-35. <https://dergipark.org.tr/tr/download/article-file/2205240>
- Tutak, T., & Guder, Y. (2012). The opinions of the primary 5th grade school teachers 'views about mathematics textbook. *Dicle University Journal of Ziya Gokalp Education Faculty*, 19, 16-28. <https://dergipark.org.tr/tr/download/article-file/786958>
- Ulusoy, F., & İncikabi, L. (2020). Middle school teachers' use of compulsory textbooks in instruction of mathematics. *International Journal for Mathematics Teaching and Learning*, 21(1), 1-18. <https://doi.org/10.4256/ijmtl.v21i1.227>
- Unsal, S., & Cetin, A. (2019). Differences encountered by classroom teachers who worked at private and state schools in the implementation of the curriculum. *Kastamonu Education Journal*, 27(4), 1541-1551. <https://doi.org/10.24106/kefdergi.3131>

- Yanik, H. B., Bagdat, O., & Koparan, M. (2017). Ortaokul öğretmen adaylarının matematiksel modelleme problemlerine yönelik görüşlerinin incelenmesi. *Journal of Qualitative Research in Education*, 5(1), 80-101. <https://dergipark.org.tr/tr/download/article-file/366455>
- Yin, R. K. (2009). *Case study research: Design and methods*. Sage.
- Yoshikawa, S. (2008). Education ministry perspectives on mathematics curriculum in Japan. In Z. Usiskin, & E. Willmore (Eds.), *Mathematics curriculum in Pacific Rim countries – China, Japan, Korea, and Singapore* (pp. 9–22). Information Age.
- Zeybek, Z., Ustun, A., & Birol, A. (2018). The place of mathematical proofs in the middle grade mathematics textbooks. *İlköğretim Online*, 17(3), 1317-1335. <https://doi.org/10.17051/ilkonline.2018.466349>