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Examination of middle school mathematics textbooks in terms of values

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ABSTRACT

The aim of the study is to determine the extent to which the root values were included in the middle school mathematics textbooks that were recommended in the 2018 middle school mathematics curriculum by Ministry of National Education (MoNE). In this study, mathematics textbooks were assumed to be an important material in terms of development of students' intention to use root values. The data were collected from ten mathematics textbooks, including two fifth grade, three sixth grade, two seventh grade, and three eighth grades, recommended by MoNE for use in middle schools in the 2019-2020 academic year. A basic qualitative research design was used in the study. To analyze the data a content analysis process was implemented. As a result, it was found that while the values of friendship, self-control, responsibility, patriotism, and benevolence were used in the textbooks in detail and with their first meanings, there was not enough content about the values of justice, honesty, respect, and love and these values were being used differently from their first meanings. It is recommended that the content involving root values should be distributed more homogeneously to the grade levels and values should be used with their first meaning in mathematics textbooks. In addition, there should be more specific information in mathematics textbooks about how to integrate root values into a mathematics classroom.

Keywords: mathematics textbooks evaluation, value, root values, values education

INTRODUCTION

Values, which are believed to constitute the basis of human behavior by guiding people's feelings and thoughts, play crucial roles in helping people, distinguish between right and wrong, shaping their attitudes, behaviors, and even affect personal preferences (Bacanli, 2006; Dede, 2007; Mutlu & Dinc, 2019; Schwartz, 1992; Yaman, 2012). There are various definitions about value concept from different perspectives in the literature (Clarksson et al., 1999; Dede, 2007; Grootenboer, 2003; Hallstead, 1996; Hill, 1991; McConatha & Schnell, 1995; Seah & Bishop, 2000; Southwell, 1995; Tan, 1997). Groontenboer (2003) claimed that the variables of affective domain such as belief, value, attitude, and feeling/emotion are closely related to each other, and this relationship brings about the emergence of different definitions for values. In this sense, it can be said that the definition of values is related to beliefs, attitudes, experiences, preferences, and behaviors. According to Southwell (1995), the definition of value is personal, and it varies mainly based on individuals' beliefs. Clarkson et al. (1999) state that, unlike beliefs, values should be observed in a person's behaviors in society, verbal expressions are not enough to be sure that a person has that value. Accordingly, McConatha and Schnell (1995) define values as a reference point for perceiving and organizing experiences and making a choice among alternatives. According to Hill (1991), individuals so precisely give importance to the values that they shape their lives based on these values. Another example might be giving considerable importance to the ability to see (Seah & Bishop, 2000). Values are the reference points for the evaluation of beliefs and actions; principles, core beliefs, ideals, and standards that guide their personal behavior in general (Hallstead, 1996). Values are defined by Turkish Language Association (TLA) (2019), as "an abstract measure used to determine something's significance, adequate return, or worth; a person with superior and advantageous qualities; and the collection of material and moral elements that encompass a nation's social, cultural, economic, and scientific elements."

Values are the structures that guide the behavior of the people in a society that they are part of the culture of a society (Tan, 1997). In this context, it is possible to define values as personal preferences made by considering the importance of an idea or action or the goals in order to be adopted as a member of the society (Dede, 2007). Values are the key concepts that make social life simpler by keeping people together in the society. Values are not constant across time and culture (Aydin & Akyol-Gurler, 2012;

Celikkaya, 1996). Therefore, it may be claimed that a society needs fundamental values on its own to preserve its existence in their era (Sayin et al., 2019).

The formation of value perceptions begins in the family; however, the adoption of socially accepted values is feasible through systematic education (Bishop et al., 2006; Kurtdede Fidan, 2019). One of the professional ways to transmit basic values to the next generation is educating children (Sayin et al., 2019). Therefore, educational institutions have a significant responsibility in terms of values education, given that their ultimate objective is to cultivate well-equipped individuals who will exhibit positive human behavior, have a desired moral standard, and make the right decisions when making significant life decisions (Akbaba Altun, 2003; Hokelekli, 2013; Keskin, 2008). By associating the development of affective skills in the curriculum with values education, it is emphasized that students should give importance to, gain, and develop moral values; be willing to behave in accordance with positive values and get to know different cultures; take responsibility for protecting and developing values that support individuals' coexistence; take care to live in a friendly and welcoming manner; be sensitive to people's needs; be able to control emotions, thoughts, and behaviors. Through instructional activities in schools, it is possible for students to develop positive perspectives of values and internalize the desired ideals (Akbaba Altun, 2003; Bishop, 2001; MoNE, 2018a). Within this mind, some countries, such as Australia, Sweden, the Philippines, and Türkiye (Benitez, 2022; Thornberg, 2013; Thornberg & Oguz, 2016; Tudball, 2007), are actively working to integrate the teaching of values into their educational systems. Especially in Türkiye, this issue is addressed in the curriculum with the emphasis on the importance of growing the individual in a multi-faceted approach within the education system and acquiring knowledge, skills, and behaviors integrated with values (MoNE, 2018a, 2018b).

The first course that integrated values into the educational program was social studies in 2005 in Turkiye. Later, it was revised in 2017 and values were integrated into the social studies curriculum by specifying grade level and subjects (Yildirim & Demirel, 2019). Value education has become a central part of the learning experience for students of all ages and all grade levels. Other programs also included values into their curricula, however there was not specific information about grade levels, subjects and how to integrate these values to the education system (Yildirim & Demirel, 2019). Mathematics program was also revised in the 2018-2019 academic year, and ten root values were firstly included in the program. However, there is also not enough information in the program about grade level, learning outcomes, units, or teaching methods.

Mathematics Education, Values, and Root Values

The lesson objectives are mainly related to cognitive domain when it is compared to the affective domain in the mathematics curriculum (Main, 1993). Studies indicated that affective domain is also as important as cognitive domain to achieve quality and success in mathematics education (Bishop et al., 1999; Grootenboer & Marshman, 2016; Leder & Forgasz, 2002). The focus of the studies in affective domains are commonly belief, attitude, motivation, and values. Studies related to value education are relatively few (Seah & Bishop, 2000).

However, studies in the literature of mathematics education over the past 25 years have argued that mathematics, due to its axiomatic and abstract form, should not be seen independently from culture and values (Bishop, 1988, 2002; Clarkson et al., 1999; Dede, 2007; Seah, 2002). In light of this, it is essential to assess this aspect of the values attributed to mathematics and viewed as a way to improve the quality of mathematics instruction and learning (Seah, 2002). As a result of this need, studies (Kalogeropoulos & Clarkson, 2017; Seah et al., 2001; Seah et al., 2017; Shimada & Baba, 2015; Zhang & Seah, 2015) including classifications for mathematics-specific values have evolved. These investigations rely heavily on a categorization, however, and that classification was developed by Bishop (1988). Accordingly, Bishop (1988) viewed values as profound affective qualities that underpin mathematics education, and he analyzed them under three classifications: mathematical values, mathematics education values, and general educational values. Thus, the values that mathematicians from various cultural backgrounds develop to describe the essence of mathematical knowledge are referred to as "mathematical values" (Bishop et al., 1999). Mathematics education values are reflected in and shape the things one can see, such curricula, textbooks, classroom procedures, and so on (Bishop, 1998). On the other hand, general educational values are values that are taught in mathematics classrooms with the assistance of mathematical knowledge and that mathematical knowledge is used as a tool. Researchers define general educational values as those imparted to students by society, culture, schools, and teachers (Bishop et al., 1999; Dede, 2006a, 2007). In this direction, general educational values contribute to the development of social structure by emphasizing moral values such as good behavior, honesty, and justice (Bishop et al., 1999; FitzSimons et al., 2000). The formation of communities and the development of individuals are both aided by this. Therefore, this study focuses on the indicated general educational values.

Although different approaches to value education (Thornberg & Oguz, 2016), multiple categories of values and the existence of various values are known (Sayin et al., 2019), it is crucial to select which of these values will be highlighted. In light of this, the values intended to be incorporated into the mathematics curriculum were reduced to ten values named as justice, friendship, honesty, self-control, patience, respect, love, responsibility, patriotism, and benevolence in the program. These values were labeled as "root values" (MoNE, 2018a, 2018b) and can be considered in the category of general educational values. These values, which students in the program are expected to acquire, are among the ones that many cultures have accepted and have been around for a very long time (Topal, 2019). The acquisition of root values by students can only be accomplished by considering all aspects of the education program (curriculum, legislation, school atmosphere, course materials, etc.), which is stressed in the mathematics program (MoNE, 2018a). The root-values-related actions outlined by Ministry of National Education (MoNE) (MoNE, 2017, p. 24) as presented in **Table 1**.

Table 1. Root-values-related actions (MoNE, 2017)

Values	Actions
Justice	Being fair, equal treatment, fair share, giving one's right, …
Friendship	Altruism, trust, understanding, solidarity, loyalty, playing together, gifting, sharing, joint actions, …
Honesty	Being clear & understandable, being truthful, being neat & stable, being reliable, keeping one's word, …
Self-control	Controlling behaviors, taking responsibility for one's own behavior, having self-confidence, apologizing when necessary, …
Patience	Being perseverance, tolerating, knowing how to wait to get the desired result, being resilient, being persistent, …
Respect	Valuing, being humble, behaving others the way they would like to be treated, valuing other people's personalities, observing the position, characteristics, & situation of the addressee, …
Love	Expressing love, making sacrifices, giving importance to family unity, being loyal, gifting to close friends & family members, wasting time for somebody or something, …
Responsibility	Taking responsibility, sensitivity to rules/laws, paying bills/taxes, paying debts, participation in social responsibility activities, …
Patriotism	Being hardworking & productive, being loyalty to the country, being sensitive to historical & natural heritage, caring about society, …
Benevolence	Being generous, cooperating, being compassionate, hospitable, offering support, charity activities, …

As seen in **Table 1**, the "…" sign is used to show that these actions might be extended by the researchers. However, there is no specific information in the program about which value might be taught at which grade level, which unit is more applicable for values education, or which teaching methods might be used by teachers to integrate these values in mathematics classrooms, as mentioned above. In fact, it can be observed that in mathematics education programs (MoNE, 2018a, 2018b), under the heading "our values", no statement or justification is offered in the section where the values are expressed as the sum of the values that constitute the curriculum's perspective and specified for learning outcomes. For this reason, it is important to figure out how and in what ways to transfer general educational values to students. Studies on how to include broad educational ideals into mathematics courses have been encountered, however they are insufficient. Accordingly, one of the suggested ways is connected to teaching approaches (discussion, problem solving, drama, project-based learning, group studies, educational games etc.), while the other is associated with the contexts (environmental sensitivity, sensitivity to social events, great mathematicians and contributions, etc.) that will be tackled by these methods (Hallstead, 1996; Nakawa, 2019; Shimada & Baba, 2015; Taplin, 1998). For instance, Nakawa (2019), in their study, asked Japanese kindergarten children how to share five sweet potatoes between a moles and mice to have their opinion about equality and fairness and showed that these children noticed the difference between equality and fairness values in the mathematical problem-solving context. It is undeniable that textbooks, as one of the tools that mediate the use of educational activities in the classroom and help the instructor address the aforementioned teaching approaches and context, are quite valuable.

One of the tools that will guide the teacher in the planning and implementation of educational activities in the process of internalizing values by students is the students' textbook (Seah & Bishop, 2000). For the curriculum to reach its goals in terms of values development, the content of textbooks must contain enough information about values (Cao et al., 2006; Clarkson et al., 1999; Dede, 2007). Considering that textbooks are delivered free of charge to every teacher and student by MoNE, it is possible to say that they are the most accessible tool that allows value development practices through mathematics education to be transferred to the classroom environment. In this sense, it is thought that it is important to investigate the values included in the content of mathematics textbooks and the content in which they are presented. For this reason, it is thought that the importance of the study arises from the necessity to examine the root values in the middle school mathematics textbooks. It is important to reveal the extent to which the contents of the mathematics textbooks recommended by MoNE reflect the values specified in the program, both in terms of evaluating the current textbooks and giving an idea about how the textbooks to be written in the future can contain these values sufficiently.

Value Education and Mathematical Textbooks

According to a comprehensive analysis of the relevant literature, the inclusion of discussion of values in mathematics textbooks has grown in prominence in recent years (Cetin et al., 2021; Dede, 2006a, 2006b; Karaca & Uzunkol, 2019; Kilcan, 2020; Ozkaya & Duru, 2020; Sayin et al., 2019; Sahin & Basgul, 2018; Sahin & Tugrul, 2020). While some of these studies investigated the mathematical values and mathematics education values pioneered by Bishop (1991) in middle and high school textbooks (Dede, 2006a, 2006b), others examined how moral values, such as love, respect, responsibility, cooperation, tolerance, benevolence, universalism, and kindness, were included in middle and elementary school mathematics textbooks (Sahin & Basgul, 2018; Sahin & Tugrul, 2020).

Some researchers, however, did not conduct their studies within the context of root values. Accordingly, Karaca and Uzunkol (2019) found that in elementary school third and fourth-grade mathematics textbooks that were examined in the context of values, such as patriotism, responsibility, sensitivity to the natural environment, benevolence, respect, love, giving importance to health, thrift, giving importance to family unity, self-control, and sharing, the most common values were thrift, patriotism, and self-control and the least common ones were respect, giving importance to family unity, and benevolence. In contrast, Ozkaya and Duru (2020) revealed that the middle school mathematics textbooks they studied in terms of justice and sharing, scientificity, flexibility, aesthetics, equality, and saving emphasized the values of equality the most and justice and sharing, saving, and aesthetics the least. Until recently, studies that have examined textbooks through the lens of root values have been restricted to focusing on either a single textbook at the high school level, a single textbook at the fifth-grade level, or a single textbook at the middle school grade level. In their analysis of ninth-grade mathematics textbooks, Cetin et al. (2021) found that benevolence was the most frequently mentioned root value, while patience, self-control, honesty, and love were among the least frequently included. Sayin et al. (2019) examined the fifth-grade textbooks in terms of root values and found that the most mentioned values were self-control, justice, benevolence, and responsibility, while the least mentioned ones were friendship, honesty, patriotism, respect,

and love. Kilcan (2020), on the other hand, examined middle school mathematics textbooks briefly in terms of root values and found that the most common root value was responsibility, the least common ones were honesty and respect, and that there was no balance in distribution of the values in the textbook. The common result of these studies, which were handled under these different frameworks or narrow scopes, was that values were not included in mathematics textbooks adequately and in a balanced way in terms of content. As a result, this study was carried out to produce an evaluation by studying which content the values of the middle school mathematics textbooks stressed in terms of the root values that are included in the 2018 mathematics curriculum. Therefore, the problem of the research was identified as "what kind of content was used to present the ten root values specified in the curriculum in the middle school mathematics textbooks?"

METHODS

Research Design

This qualitative study aimed to determine the extent to which the root values were included in the middle school mathematics textbooks that were recommended in the 2018 middle school mathematics curriculum by MoNE to use in public schools in Türkiye. The data were obtained from document analysis. The mathematics textbooks were the main documents of the study. During the document analysis process, the researcher gives voice and meaning to various assessment topics based on their interpretations of the selected textbooks (Bowen, 2009). Although the study appears to be descriptive in nature, its methodology is typical of more basic qualitative research design. According to Merriam (2013), data is gathered through interviews, observations, or documents in basic qualitative research. This basic qualitative research method used in this study is applicable to all academic and practice fields.

Study Group and Data Collection

MoNE Board of Education and Discipline recommended 10 different mathematics textbooks (six official and four private) in public middle schools across the country in 2019. MoNE offers, for each grade level, more than one choice of textbook, and among these choices are private publications that have been prepared in conformity with the national mathematics curriculum. Schools around the country are required to use one of these textbooks for each grade level. Therefore, all ten middle school mathematics textbooks, labeled 5A, 5B, 6A, 6B, 6C, 7A, 7B, 8A, 8B, and 8C in PDF format, were saved in the shared cloud system for use in the 2019-2020 middle school mathematics courses based on recommendations from the website https://www.ortaokulmatematik.org/ortaokul-matematik-ders-kitaplari/. These textbooks were used as data sources in this study. **Table 2** provides detailed information about the reviewed mathematics textbooks for use in middle school.

Table 2. Information about the middle school mathematics textbooks reviewed in the study

Code	Grade	Private/Official	Publisher	Author(s)	Pages
5A	5th-grade	Private	SDR Dikey	Erhan Karakuyu	300
5B	5th-grade	Official	MoNE	Hayriye Ciritci, Ilker Gonen, Dilara Arac, Murat Ozarslan, Nese Pekcan, Meltem Sahin	320
6A	6th-grade	Official	MoNE	Mahmut Bektas, Sabrinur Kahraman, Yakup Temel	368
6B	6th-grade	Private	Ogun	Cicek Ozdemir	365
6C	6th-grade	Official	MoNE	Neziha Caglayan, Aybike Dagistan, Betul Korkmaz	240
7A	7th-grade	Official	MoNE	Arzu Keskin Ogan, Soner Ozturk	295
7B	7th-grade	Private	Ekoyay	Sule Altintas, Celalettin Keskin	313
8A	8th-grade	Private	Kok-e	Zumrut Serficeli, Diler Atmaz	328
8B	8th-grade	Official	MoNE	Hadi Boge, Ramazan Akilli	240
8C	8th-grade	Official	MoNE	Ozal Cetin, Umut Aksakal, Umran Erturk, Gurkan Say, İpek Tigli	315

The textbooks were divided into two categories: private and official, as presented in **Table 2**. According to Johnson and Christensen (2014), an organization's official documents include any information that was drafted, photographed, or recorded by the institution. Private textbooks, on the other hand, are published by private publishing companies, have official approval, and are utilized by MoNE. The document analysis technique was used as a data collection tool in the research. The document analysis technique includes the analysis of written material containing information about the situation that is aimed to be studied, and documents to be used as a data source are closely related to the research problem (Yildirim & Simsek, 2018, p. 189).

Data Analysis

The content analysis technique was used to analyze the textbooks. The aim of the content analysis is to discover underlying themes and connections in the available data (Yildirim & Simsek, 2018, p. 242). During the analysis, the various contexts in textbooks were examined related to root values. The scope of this investigation was the ten root values (justice, friendship, honesty, self-control, patience, respect, love, responsibility, patriotism, and benevolence) in the 2018 middle school mathematics curriculum. While 10 root values, recommended in the program, have not been assigned to the grade levels it is expected that all values are represented in all grade levels and equally in the contents of all the textbooks. In this regard, first of all the researchers downloaded the 10 textbooks from MoNE website to read and analyze. They developed a study plan and divided textbooks into two groups. One of the authors examined five textbooks for the 5th and 6th grade levels, while the other examined the same number of books for the 7th and 8th grade levels. This step involved taking a broad look at various parts of the textbook components, such as textual information, exercises, tables, images, assessment questions, graphics, and illustrations. Then, the ten root values emphasized in the middle school mathematics curriculum were examined line by line and paragraph by paragraph

in the textbooks, primarily as direct words of root values and considering the meanings they might contain based on both previous studies on root values in the literature (Cetin et al., 2021; Karaca & Uzunkol, 2019; Kilcan, 2020; Ozkaya & Duru, 2020; Sayin et al., 2019), the definitions of values in TLA (2019) and the root-values-related actions as presented in **Table 1**. In this study, researchers enriched in **Table 1** by new themes and codes when necessary while analyzing textbooks in terms of root values. It's important to note that the authors perform data analysis while keeping in mind the sensitivity of these root-value-related actions and the examples shown in the studies in the literature. In addition to the textbook-referenced parts and examples, real-world examples of root values were also encountered. For instance, in **Table 1**, there were classifications as being fair, equal treatment, fair share, giving one's right for the justice value. However, while conducting data analysis, the word justice, observing equity and giving credit where credit is due were gathered under the theme of fairness, considering that the behaviors directly characterize the value of justice. Moreover, the winner of the election being determined by a fair count of votes in various elections produced with the election content has been seen as highlighting the value of justice. Even though they are not listed in **Table 1**, the textbook examples of content sharing based on achievement and age are also assessed within the context of justice value.

All the root values were noted by researchers in the textbooks where the root values were encountered, as well as the name of the root value, any illustrative situations, and the contexts in which it was presented. To ensure the validity and reliability of the data the researchers repeated the analysis, in different time sessions. Then, they double-checked their interpretations of the data. All disagreements about coding were discussed, and a consensus was established to achieve a full agreement on codes. Words that put an emphasis on root values were given more scrutiny throughout the data analysis. In the absence of a word that directly emphasized the root value, the data analysis was continued by examining the sentence that is thought to indirectly refer to a value and other sentences following this sentence. Coding in this scenario included the context in which the referenced root value was processed. For example, while the data analysis on the root value of justice was being conducted, the word "justice" was found directly in a sentence in the 7A textbook in the following sentence: "*The basis of freedom, equality, and justice is national sovereignty.*" On the other hand, the root value of justice discussed in the 5B textbook was handled in the context of elections with an example of a school/student representative election, as follows:

> "Murat must get the most votes to become a student representative. So, he should get more votes than Deniz. Since Deniz got 300 votes, if Murat had gotten 301 votes, he would have been elected as the student representative. In other words, Murat got 250 votes, and if he had gotten at least 301-250=51 more votes, he would have been elected as the student representative. 51 more people should vote (p. 260)."

When there were two or more values in the same sentence, both root values were coded. For example, in the sentence found in the 7B textbook, "*Two friends, aged 10 and 20, pick up 330 chestnuts and share them directly proportional to their age* (p. 151)", it is thought that the word "friend" emphasizes the root value of friendship, and the expression "sharing in direct proportion to age" emphasizes the root value of justice. Thus, they were coded accordingly. As a result of these processes, themes and codes are emerged.

Validity and Reliability

Research validity was achieved through the identification and development of a research topic based on a review of the relevant literature, and the findings of the study were discussed. To strengthen the validity of the research, the spring semester of 2019-2020, during which it was decided to conduct the study, was also considered. As a result, the study included all ten mathematics textbooks for grades 5-8 that were recommended by MoNE in the 2019-2020 school year. In addition, the findings were stated with the original sentences from middle school mathematics textbooks to increase the validity.

For the reliability of the study, researchers analyzed their parts of the data independently to understand the emerging codes. Then they compared their codes and, they identified points of consensus and divergence regarding their newly constructed codes. Disagreements were solved by discussions on the interpretations of the data. Then they decided on the main categories that would frame the data. Sorting the theme items into distinct categories followed this analysis. It is important to state that due to the COVID-19 pandemic and the distance between the regions where the researchers lived, data analysis was discussed on an online meeting platform by holding four 60-minute-long interviews and through e-mails until a full consensus was reached.

Because the data was collected via written materials, privacy and confidentiality issues were not a factor. Still, great care was taken in data analysis and report writing to center on the issues under study rather than the people or organizations themselves. No accusations against people or organizations were made. Given the intangible nature of values, it was necessary to use more than one coder to arrive at reliable conclusions.

RESULTS

This section presents findings obtained as a result of the analysis of the extent to which the 10 root values in the 2018 Mathematics Curriculum were included in the 10 mathematics textbooks prepared for the 5th, 6th, 7th, and 8th grades in line with the 2018 mathematics curriculum and recommendation of the Ministry of Education Board of Education and Discipline for the 2019-2020 academic year. In this context, first, the general picture regarding whether all middle school mathematics textbooks included the root values was presented (**Table 3**), and then the context in which the 10 root values were handled was presented with examples.

Table 3. Inclusion of root values in the textbooks

Books	Root values									
	Justice	Friendship	Honesty	Self-control	Patience	Respect	Love	Responsibility	Patriotism	Benevolence
5A	√	√	√	√	√	√	√	√	√	√
5B	√	√	X	√	√	√	√	√	√	√
6A	√	√	X	√	X	√	√	√	√	√
6B	√	√	√	√	X	X	√	√	√	√
6C	√	√	X	√	√	X	√	√	√	X
7A	√	√	X	√	√	√	√	√	√	√
7B	√	√	X	√	X	X	√	√	√	√
8A	√	√	X	√	X	√	√	√	√	√
8B	√	√	√	√	X	√	√	√	√	√
8C	√	√	X	√	X	√	√	√	√	√

According to **Table 3**, the root values of justice, friendship, self-control, love, responsibility, and patriotism were included at each grade level in the textbooks. On the other hand, the root value of honesty was not mentioned in textbooks 5B, 6A, 6C, 7A, 7B, 8A, and 8C. Similarly, while examples of cases about the root value of patience were found in all the textbooks recommended at the fifth-grade level, it was not found in 6A, 6B, 7B, and all three recommended textbooks of the eighth-grade level. While examples of cases related to the root value of respect were encountered in all the textbooks recommended at the fifth and eighth-grade levels, it was not included in the 6B, 6C, and 7B textbooks. Finally, examples related to the root value of benevolence were not found only in the 6C textbook.

Examining the background of the root values mentioned in the textbooks revealed that they were conveyed through examples from daily life, architectural works, and the lives of historical personalities or their aphorisms. In the following sections, the context in which the 10 root values were handled was examined with examples.

The Root Value of Justice

The root value of justice was conveyed through the themes of fairness, elections, and proportional sharing in the textbooks (**Figure 1**). While the theme of fairness was explained with justice, giving credit where credit is due, and observing equity, the election theme was explained by the fair conduct of class presidency, school representative, and headman elections. Finally, in the proportional sharing theme, examples of sharing directly proportional to age and success were included.

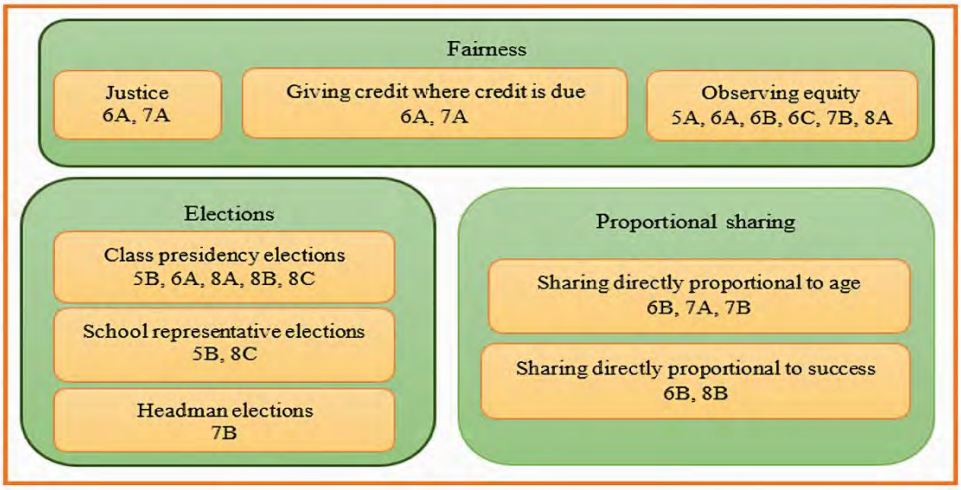

Figure 1. Handling of the root value of justice (Source: Authors' own illustration)

As can be seen in **Figure 1**, when the textbooks were examined on a grade level basis for the root value of justice, it was seen that the themes of fairness and elections were included at all grade levels, but that proportional sharing was not included at the fifth-grade level. The codes of justice and giving credit where credit is due, which were under the theme of justice, were used only in the sixth and seventh-grade textbooks. The code of justice was represented directly using the word "justice". This code was handled in Atatürk's words, "*The source of freedom, equality, and justice is national sovereignty*," (7A) in the seventh-grade textbook. The code of giving credit where credit is due was handled in the following question in a table specified as **Table 4** in the sixth-grade textbook (6A): "*According to the data, which farm should this dairy factory choose in terms of the efficiency of the amount of milk produced daily?*" In the question, students are expected to decide fairly which farm the dairy factory should choose.

Table 4. An example of content involving 'giving credit where credit is due' regarding the root value of justice (Source: Adapted from Textbook 6A, p. 252)

Table: Daily milk production capacity of the farms								
		Days						
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Daily milk production capacity (L)	Sarı İnek Farm	750	1200	1260	1000	500	1310	1400
	Benekli Farm	1100	975	1050	1225	1070	1000	1000

It was determined that the code of observing equity under the theme of justice was handled in the textbooks at every grade level. Regarding this code, a fair approach to disabled people was advocated in the 8th-grade textbook (8A) by emphasizing that at least one entrance should be available for disabled people in all commercial and public buildings and that comfortable and safe passage of wheelchair users and people with walking sticks should be provided.

Under the election theme, the textbooks gave examples of class presidency, school/student representative, and headman elections, and it was mentioned that individuals who got the most votes won the election through a fair election organization. In this context, class presidency elections were mentioned in the 5th, 6th, and all 8th grade textbooks. Another example of the election theme was handled with examples of school/student representative elections in the 5th and 8th grade textbooks. Regarding the election theme, the final example included a table presenting the number of votes that headman candidates got according to a survey conducted before elections in the Bogazici District in the 7th grade textbook (7B). Here, the candidate closest to becoming the headman was mentioned with the example of headman elections.

Under the proportional sharing theme, examples of sharing from daily life that included sharing directly proportional to age in 6th and 7th grade textbooks and sharing directly proportional to success in 6th and 8th grade textbooks were examined. The example of sharing directly proportional to success given in **Table 4** in the eighth-grade textbooks (8B) pointed out fair sharing. An example of the problem related to content about sharing directly proportional to success regarding the root value of justice is; "Teacher Ayse wants to give pencils in her bag as a reward to Alya and Ahmet as they are successful in their math exam. Explain how Alya and Ahmet can share the pencils provided that the multiplication of the number of pencils each of them will get is 18 and that Alya, who has a higher score, is given more pencils" (Textbook 8B, p. 12).

In the daily life problem example in the sixth-grade textbook (6C), an invitation where children ate half a pita and adults ate one and a half pitas was mentioned, and it was emphasized that the distribution of pita bread was done fairly in direct proportion to age.

The Root Value of Friendship

The root value of friendship was explained in the textbooks with the themes of emotional, social, cultural, physical, and mental actions (**Figure 2**). The theme of emotional actions was explained with the codes of consideration, altruism, loyalty, and solidarity, and the theme of social actions was explained with the codes of eating-drinking, visiting, sharing, giving gifts, birthday celebration, and writing letters. The theme of cultural actions was explained with the codes of traveling, going to the movies, and going to the library, and the theme of physical actions was examined with the codes of games, sports, and scouting. Finally, the theme of mental actions was examined through the code of playing mental games. In addition, it was determined that the word "friendship" was not used in the books, but the word "fellow" was used instead.

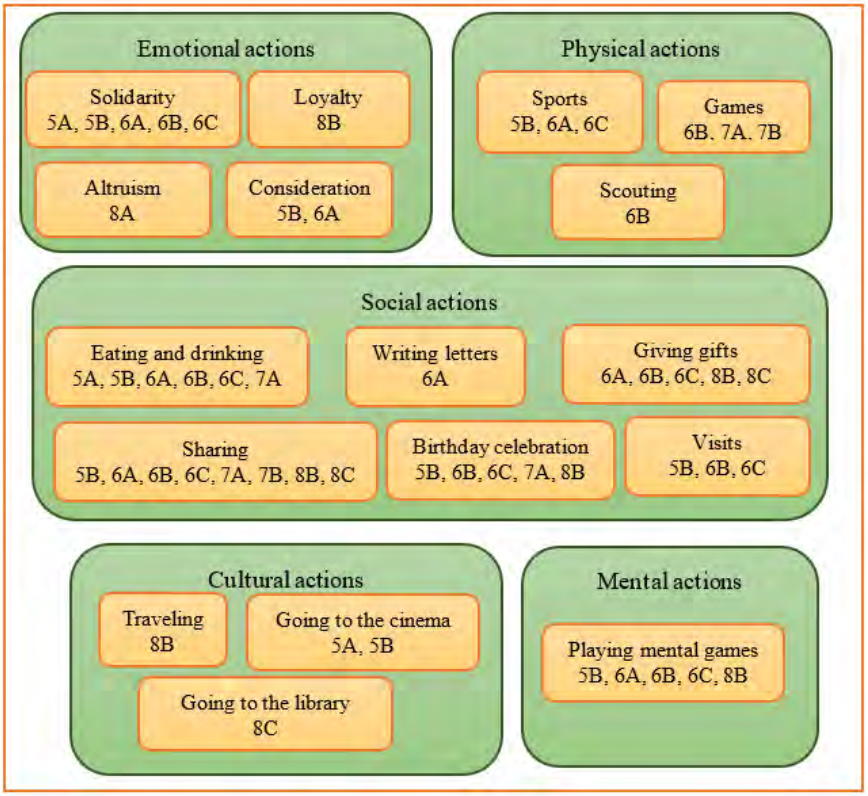

Figure 2. The handling of the root value of friendship (Source: Authors' own illustration)

As seen in **Figure 2**, the root value of friendship was included at all grade levels. While the root value of friendship was included only in the theme of social actions at all grade levels, it was determined that the theme of physical actions in the eighth grade, the theme of cultural actions in the sixth and seventh grade, and the theme of mental actions in the seventh grade were not associated with the root value of friendship. The codes of solidarity and consideration under the theme of emotional actions were used only

in the fifth and sixth grades. For example, the code of solidarity, which was explained by the act of helping a friend to save him from a tricky situation, was emphasized in the sixth-grade book (6C) as in the following example: "*Salih and his 4 friends go to a restaurant after school. When they finish their dinner and want to pay for the meal equally, Salih realizes that he has forgotten his wallet. Therefore, Salih's friends pay the bill with an extra four lira per person. How much is the total bill?*" The code of being considerate was explained with being tolerant towards friends' ideas and wishes, considering their current situation. This situation was handled in the fifth-grade book (5B) as in the following example: "*Burcu calls her friend Arda, who lives in America, at 14.50 Turkish time. Arda says that it is 07:20 in America and asks Burcu to call him at 10:00. Accordingly, what time will Burcu call Arda in Turkish time?*" The codes of altruism and loyalty under the theme of emotional actions were handled only in the eighth-grade textbooks. For example, the code of loyalty was emphasized by the example of a mathematician writing a problem in memory of a friend who died (8B), while the code of altruism was handled with the example of Fikret (8A), who went to a store to buy the pants his friend wanted because he did not have time.

The code of sports under the theme of physical actions was examined in the fifth and sixth-grade textbooks, the code of games in the sixth and seventh-grade textbooks, and the code of scouting only in the sixth-grade textbooks. For example, the following problem was given in the 6th grade textbook (6C): "*Funda and Elif go for a walk together and walk 120 m in 180 seconds. What is the proportion of the distance taken by these two friends to the walking time in km/h?*" In the 7th grade textbooks (7A and 7B), the circle spinning game, passing through the hoop, and the marble game were handled under the code of games.

The codes of sharing and birthday celebration under the theme of social actions were handled at all grade levels, the code of eating and drinking at the fifth, sixth, and seventh-grade levels, the code of visits at the fifth and sixth-grade levels, the code of giving gifts at the sixth and eighth-grade levels, and finally, writing letters was included only at sixth-grade level. Regarding the code of sharing, equal sharing among friends was handled in the textbooks. On the other hand, problems about friends who share their food at different rates were included under the code of eating-drinking. An example of sharing food was given in the fifth-grade books (5B). In the example, three friends, Ali, Mehmet, and Ayse, order 5 pizzas. Ali eats 2 whole 5/6 of the total pizzas, and Mehmet eats 6/12 of the total. Also, the amount of pizza Ali eats is 1 whole 1/3, more than the amount of pizza Ayse eats. Accordingly, the following questions were asked: What is the amount of Pizza that Ayse eats? How much more pizza does Ayse eats than Mehmet? How much is the pizza that is not eaten?

Topics, such as organizing birthday parties and receiving birthday presents, were handled under the code of birthday celebrations. In the example given in **Figure 3** in the eighth-grade textbook (8B), Yagmur buys a birthday present and celebrates her friend, Esra's birthday.

- Sinekli Bakkal
- Beyaz Gemi
- Dertli Dolap
- Osmancık
- Ateşten Gömlek

Yağmur will choose one of the books in the list side as a present for her friend Esra's birthday. Which option shows the probability of choosing the book named "Atesten Gömlek?"

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$

Figure 3. Example of birthday celebration content regarding the root value of friendship (Source: Adapted from Textbook 8B, p. 108)

The code of giving gifts included actions such as giving jewelry, books, flowers, chocolate, and marbles to friends. For example, the eighth-grade textbook (8B) included the following problem: "*There are three daisies and five roses in a vase. Aylin will randomly choose a flower from this vase and give it to her friend Berna. What is the probability of choosing a daisy*?"

Regarding the code of visitors, there were some problems in the book about the treats offered by hosts to their visitors. For example, the following problem was asked in the sixth-grade textbook (6C): "*Ms. Alev offers 2/24 of the chocolates in a box near coffee for each guest. As the 5/6 of the chocolate box is full, what is the number of guests visiting Ms. Alev*?"

The code of writing letters was handled in the sixth-grade textbook (6A) via the letter written by German mathematician Goldbach about his mathematical discoveries to Euler in 1742. In the letter, he stated that every integer greater than two could be written as the sum of 3 prime numbers. In his letter to Goldbach, Euler stated that he could not prove this, but if this was true, every even number greater than 2 could be written as the sum of 2 prime numbers.

The root value of friendship was emphasized with the codes of traveling and going to the library in the eighth-grade textbooks and going to the movies in the fifth-grade textbooks under the theme of cultural actions. Within the scope of the code of traveling (8B), a problem in which Ali and Ayse, who are on holiday abroad, take the elevator on the 49th floor of a building and want to reach the 160th and ground floors, was handled. On the other hand, the root value of friendship was emphasized with the code of going to the library (8C) through an example where Nese and Zeynep meet at the library and they both leave wishing they would like to meet again because they love reading books.

The code of playing mental games was handled in the fifth, sixth, and eighth-grade textbooks under the theme of mental actions through games such as playing cards, number cube, puzzle, origami, and number estimation. Accordingly, the following problem was included in the eighth-grade textbook (8B): "*Kürsat and his friend Olcay play the number estimation game. The square root of the number in mind is between 8 and 9 and the number kept in mind is a multiple of 11. What is the estimation that is close to 9?*"

The Root Value of Honesty

The root value of honesty was included in the textbooks under the themes of deserving a prize for being honest (5A, 6B) and keeping one's word (5A, 8B). It is possible to say that the root value with the least content in middle school mathematics textbooks

was honesty. When the textbooks were examined according to grade levels for the root value of honesty, it was seen that while the fifth and sixth-grade textbooks included content for rewarding honesty, it was not included in the seventh-grade textbooks. It was also determined that the content for keeping one's word was included in the eighth-grade textbooks. It was seen that the person who behaved honestly was usually given a material reward in the contents regarding rewarding honesty. For example, the following problem was given about rewarding honesty (5A): "*A taxi driver delivers 20,000 Turkish Liras forgotten in his car to its owner. The owner of the money gives 2% of the money to the taxi driver as a reward for his honesty. Calculate how much money the taxi driver has been given.*" In this problem, the taxi driver is rewarded with money for his honest behavior. Similarly, rewarding honesty was handled in another problem in the sixth-grade textbook as follows: "*Ahmet goes to the grocery store to buy 3 packs of pasta. He buys 3 packs of pasta and 1 pack of chocolate from the grocery store. The grocer gives him more change than he should, thinking that Ahmet has bought 2 packages of pasta. When Ahmet realizes this, he returns the extra 2.25 Turkish Liras to the grocer. The grocer, who likes Ahmet's behavior very much, gives him the chocolate as a gift. The price of the chocolate is 1/5 of the price of the pasta. Calculate the change that Ahmet should take.*" (6B) In this example, the student's honest behavior was rewarded with chocolate. In the context where honesty was associated with keeping one's word, the word "honest" was used directly, giving the message that a person who keeps his word is considered to behave honestly. The following example was given for the content in which the root value of honesty was associated with keeping one's word (8B): "*Eren, an honest child, promised to put up the photo of his and his grandfather in his room. Let's help Eren find the side length of the second photograph frame above so that he can put up the photo on one of the walls of his room.*" In this example, Eren is trying to find the appropriate photo frame to keep his promise to his grandfather to put up their photo on the wall.

The Root Value of Self-Control

The root value of self-control was handled in middle school mathematics textbooks with the themes of engaging in hobbies, controlling behaviors, and saving (**Figure 4**). While the theme of engaging in hobbies was explained with cultural, artistic, social, and physical activities, the theme of saving was explained with saving money, being thrifty, discount shopping, and recycling. Finally, the theme of controlling behaviors was handled in the contents involving time, health, and safety management and studying efficiently.

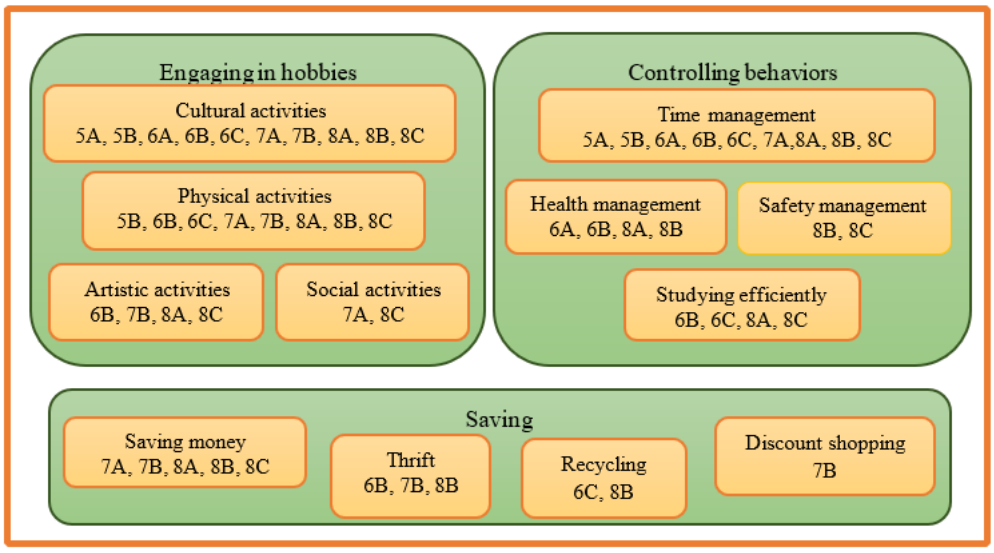

Figure 4. The handling of the root value of self-control (Source: Authors' own illustration)

As seen in **Figure 4**, when the textbooks were examined according to grade levels for the root value of self-control, it was seen that the themes of engaging in hobbies and controlling behaviors were included at all grade levels, and the theme of saving was not included only at the fifth-grade level. It was determined that hobby contents related to cultural and physical activities under the theme of engaging in hobbies were also mentioned at all grade levels. With cultural activities, hobby contents, such as collecting stamps and napkins, learning languages, and reading books and newspapers regularly were emphasized in the textbooks. For example, the mathematical content related to regular reading was given at all grade levels. Also, the eighth-grade textbook (8C) included the example of Nese and Zeynep, who love reading and who meet in the library and become friends. Then, some questions were directed to the students by giving the statement "*Nese comes to the library every 6 days and Zeynep every 10 days.*" As an example of the content about collecting things, the following problem was given in the fifth-grade textbook (5A): "*Eren starts collecting stamps with 8 stamps in the first week. In the following weeks, he adds 6 stamps a week to his collection. How many stamps does he collect at the end of the 5th week?*" In this question, it was thought that Eren needed to have the root value of self-control to regularly search and add stamps to his collection due to his hobby of collecting stamps. It was determined that walking, basketball, camping and running, flying kites, creating a hobby garden, and feeding animals on the farm were emphasized in the textbooks under the code of physical activities. For example, the content for playing basketball was handled in the sixth-grade textbook (6C) in the following problem: "*Find the minimum number of shots that Semih, who can shoot three and two-point shots in a basketball game, needs to shoot 29 points.*" Also, the content for going walking was handled in the fifth-grade textbook (5A) as follows: "*Ayse has been going walking at 06.00 in the morning every day for 234 weeks for a healthy life.*" Similarly, the following problem was given in the sixth-grade textbook (6B): "*Bülent plants celery in 2/5 of his garden, carrot in 2/8, and cabbage in ¼.*

Calculate the proportion of the uncultivated area to the entire area of the garden." While the contents related to artistic activities under the theme of engaging in hobbies were not emphasized only at the fifth-grade level, social activities were not mentioned at both the fifth and sixth-grade levels. With artistic activities, contents, such as playing a musical instrument, joining a music choir, painting, playing folk dances, and going to the cinema-theater or joining a cinema-theater club, were included. For example, the content for painting was handled with the following problem in the eighth-grade textbook (8A): "*Atakan has a box of crayons. This box contains 12 different colored crayons, including a black one. When Atakan randomly chooses a crayon from the box while painting, what is the probability that it will be black?*" Similarly, the following example in the sixth-grade textbook (6B) shows that Defne has a piano and can play it: "*Defne's piano has a total of 88 black and white keys, with 36 of them being black. Let's find the ratio of the number of black keys to the number of white keys.*" Social activities were presented with content including watching a football match, joining a math club, and going on a boat tour. For example, in the eighth-grade textbook (8C), the number of students participating in the math club of a school was shown on a table, while a group of mothers going on a trip organized by a tour company was included in the seventh-grade textbook (7A).

The content about the time management code, which was under the theme of controlling behaviors and was presented at all grade levels, included tips and suggestions such as grouping applications on the phone to use time efficiently in daily life and setting an alarm to wake up in the morning. For example, the following statements were found at the sixth-grade level (6C) as examples from everyday life: "*How do you decide the time of meeting with a friend? Before meeting your friend, you need to think about the tasks you need to do and how long it will take to get ready and get to the meeting place. Even if you calculate these times as an approximation, what you do is math*." Also, there was a problem about efficient use of time at the fifth-grade level (5B), as follows:

> "The intense pace of modern life has made time more valuable, so we need to use it efficiently. How many days of his/her life does a person who watches television 4 hours a day spend watching television? Can it be said that this person uses time efficiently? What could have been done if this time had been used differently?"

In these contents, it was emphasized that time was very valuable, especially for a self-controlled person and that it needed to be used efficiently. The content about the code of studying efficiently under the theme of controlling behaviors included strategies and measures used to create an efficient study environment and achieve continuity in learning. This situation was expressed as follows in line with the suggestions of the experts in the sixth-grade textbook (6C): *"... The first rule of success in the lessons is to determine the objectives well. In addition, it is necessary to know efficient study methods, such as motivation, revision, good use of time, and active listening*."

The health management code, which is under the theme of controlling behaviors, was only handled at the sixth and eighth-grade levels, like the code of studying efficiently. It was determined that the contents of the health management code included weight loss under the control of a dietician, medication use, and controlling the use of bread. For example, the following example in the sixth-grade textbook (6A) emphasized the importance of controlled weight loss: "*Ekrem, who is trying to lose weight under the control of a dietitian, loses 0.9 kg per month. Estimate how many kilograms Ekrem can lose in a year*." In another example in the sixth-grade textbook (6B), the importance of regular medication use to recover was emphasized as follows: "*Mert takes the medications prescribed by the doctor twice a day, in the morning and the evening. Accordingly, find out how many days will it take Mert to finish 10 pills.*" Similarly, the following example was found to point out controlling bread consumption for a healthy life in the 8th-grade textbook (8A): "*Ebru and Dilek think that eating a lot of bread is harmful and want to take measures together. To do this, they note the number of bread slices they eat for 7 days.*"

Security management, which is under the theme of controlling behaviors and was presented in the contents including setting passwords on the computer or the closet, was only handled in the eighth-grade textbooks. For example, the following statement emphasized the confidentiality of personal data (8B): "*Today, personal data can be passed into the hands of malicious people through tools, such as computers, mobile phones, and tablets. For this reason, Azra decides to set a password on her computer*."

The theme of saving mostly included the code of saving money. The content about saving money was covered in all textbooks at the seventh and eighth-grade levels. In the example given in the seventh-grade textbook (7B), Meltem, who wants to buy a gift for her mother on Mother's Day, needs to save some of her weekly pocket money. With the code of thrift associated with saving money, bread and electricity savings were emphasized. Accordingly, to draw attention to saving bread, it was stated in the eighth-grade textbook (8B) that when families bought bread in accordance with their daily bread consumption, the waste of one-fourth of the bread was prevented. The theme of saving was also addressed with recycling ideas only at the sixth and eighth-grade levels. For example, the following content in the sixth-grade textbook (6B) emphasized that the recycling of waste oils would prevent harming the living things in the environment: "*One liter of waste oil poured into the sink pollutes approximately 1 million liters of water. The Dogan, Yilmaz, and Kaya families, who do not dispose of their waste oils in the sink but collect them, decide to send these oils to recycling facilities.*" Finally, the content about saving by discount shopping was given only at the seventh-grade level with the following example (7B): "*The price of a pen is 10 Turkish Liras. What will be the new price when a 50% discount is applied?*"

The Root Value of Patience

The root value of patience was handled in the textbooks through the themes of games, puzzles, activities that require fine workmanship, and perseverance (**Figure 5**). While the game theme was explained with mind games that encourage strategic thinking such as chess, Rubik's cube, and tangram, the puzzle theme was explained by puzzles that required the follow-up of logical processes, such as Futoshiki, Resfebe, and decoding. With the theme of perseverance, sports that required perseverance for long periods were handled. In the theme of activities that required fine workmanship, examples of nature activities were

included. In addition, it was determined that the word patience was not used in the books; the value of patience was implied by examples that required spending a long time, instead.

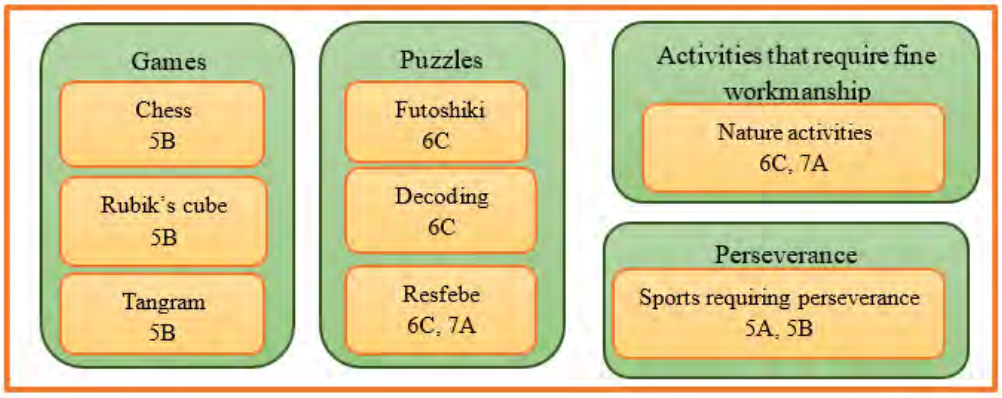

Figure 5. The handling of the root value of patience (Source: Authors' own illustration)

As can be seen in **Figure 5**, while the root value of patience was associated with games that require strategic thinking and sports that required perseverance at the fifth-grade level, it was associated with puzzles that require logical thinking and nature activities that required fine workmanship at the sixth and seventh-grade levels. At the eighth-grade level, no examples were encountered regarding the root value of patience. In fifth grade textbooks, the root value of patience was associated with tightrope walking, athletics, Olympic sports, and orienteering sports that required perseverance. For example, the following content at the fifth-grade level (5A) referred to patience with an emphasis on a long process and working with perseverance: "*It takes tightrope walkers a long process and hard work to train.*" Another example at the fifth-grade level (5B) was as follows: "*An athlete preparing for the Olympics trains every day. If this athlete trains for 3 hours a day for 2 months, how many hours will he have trained in total?*" In this example, it is possible to say that preparing for the Olympics by working continuously for long periods requires perseverance and therefore patience.

Resfebe, which was under the theme of puzzles, was handled in both 6C and 7A textbooks, while Futoshiki and decoding puzzles were used as examples in the 6C textbook. For example, Futoshiki, which means "not equal" in Japanese and is similar to Sudoku, and where the symbols <, > and the numbers -2, -1, 0, 1, 2 are used once in each row (column), was used as an example under this theme. On the other hand, information and examples about Resfebe, one of the puzzles that require effort, were given in the seventh-grade textbook, and then some questions were asked about it (**Figure 6**).

Figure 6. Examples of Resfebe. Adapted from textbook 7A, p. 109 (Source: Authors' own illustration)

As an example of nature activities that required fine workmanship, the example of bees making honey (7A) was given, as follows:

> "Bees, the master architects of nature, weave each honeycomb in a hexagonal shape. The joints of these hexagons, which have no spaces between them, are not visible. With these features, honeycombs are considered an engineering marvel."

It can be said that the work of bees to weave their honeycombs in the form of hexagons and design them with no spaces and no visible joints between them is an activity that requires patience.

The Root Value of Respect

The root value of respect was explained in the textbooks under the themes of respect, valuing, and observing the addressee (**Figure 7**). While the theme of respect was handled in contexts that directly involved the word "respect", the theme of observing the addressee was examined with the actions of observing the position, characteristics, and status of the addressee. The theme of valuing was explained in the contexts of valuing other people and valuing inanimate objects.

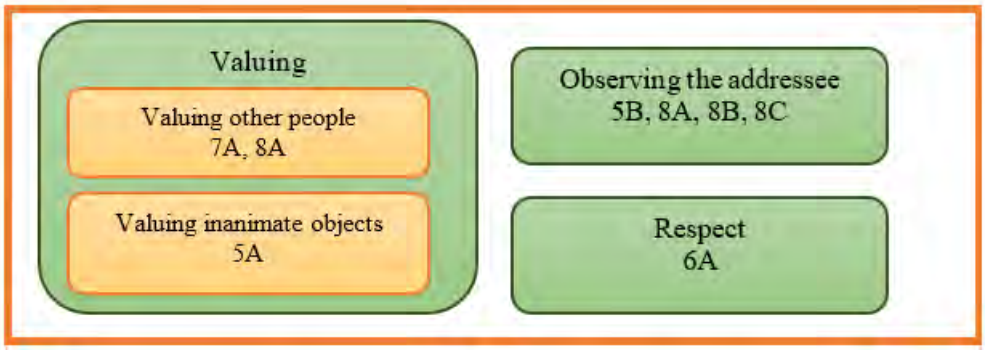

Figure 7. The handling of the root value of respect (Source: Authors' own illustration)

As seen in **Figure 7**, the root value of respect was directly associated with the word "respect" at the sixth-grade level (6A). It was used in the "operations with natural numbers" subject with an example of the encrypted word obtained by the representation of the letters in the word "respect" with exponential numbers. On the other hand, while the root value of respect was associated with valuing inanimate objects and observing the position, characteristics, and status of the addressee at the fifth-grade level in the textbooks, it was examined through the theme of valuing at the seventh-grade level, and through the theme of observing the addressee and valuing at the eighth-grade level. For example, the following content at the fifth-grade level (5A) can show that covering a book, which is an inanimate object, to protect it means valuing the book and respecting it: "*The book on the right will be covered to prevent it from damages by external factors. Let's calculate how many square centimeters of paper cover will be needed*." Similarly, the following example was given in another fifth-grade textbook (5B): "*The height of buildings has different importance in every culture. In China, buildings larger than two floors were not allowed in order not to obstruct the view of the emperor's passage, while in the Islamic world, care was taken to ensure that the height of buildings was not taller than the minaret of mosques."* According to this example, the emperor and religious values were handled in the book, and respect for these two things was expressed. Similarly, the following content in the eighth-grade textbook (8B) can be considered as an indication of observing the characteristics of the addressee: "*30 German and 35 French students will come to our country for the 23 April festivities. Accordingly, how many rooms are needed to make sure that there are an equal number of students from the same country in each room?*" Finally, at the eighth-grade level (8A), the root value of respect was associated with the example of taking children's suggestions into account. For example, the following content shows that children's suggestions are considered and respected: "*Şebnem will have a shelf built in the space under the stairs in the house, following the suggestions of the children. The length of the stairs is 3.5 m and the length of the bookshelf they want under the stairs is 2.8 m. What is the distance between A and B?*"

The Root Value of Love

The root value of love was emphasized at every grade level in middle school mathematics textbooks with the themes of affection for a person-object and giving a gift to a loved one (**Figure 8**). While the theme of giving a gift was explained by purchasing-packaging a gift, and celebrating a birthday, the theme of love for non-living things was explained with the codes of love for inanimate objects, such as branches of sports, books, lessons, food and games, and the theme of love for living beings with the code of love for family members, such as grandparents, children, nephews and the code of love for animals, such as fish and chickens.

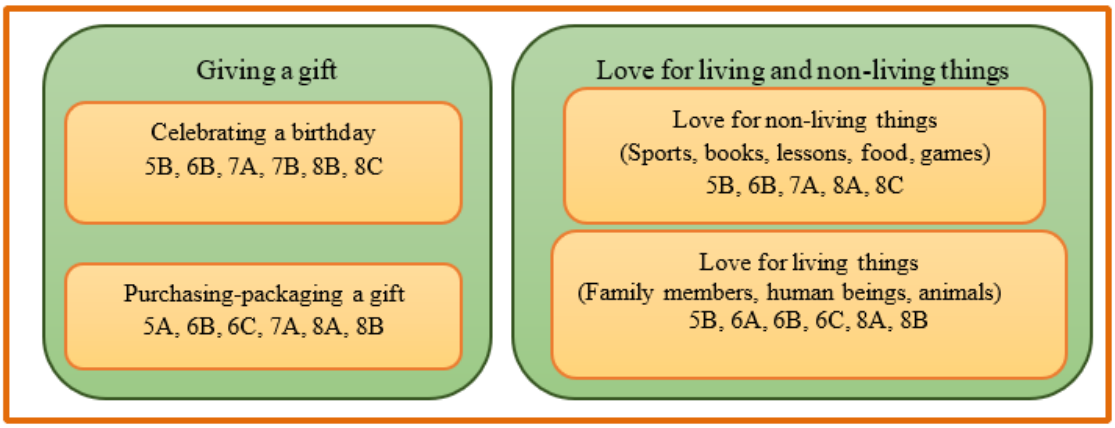

Figure 8. The handling of the root value of love (Source: Authors' own illustration)

As seen in **Figure 8**, the birthday celebration code and the purchasing-packaging a gift code under the theme of giving gifts for the root value of love were used at all grade levels. The code of birthday celebration was used in the seventh-grade textbook (7A) in the context of employees collecting 8 Turkish Liras per person to buy a birthday present for their friend, Burcu. This problem was presented in the book as follows: "*Burcu's three close friends are going to get a special gift for her, so they give up participating in the group. In this case, the group has to collect 10 Turkish Liras per person for the gift. How much is the gift?"* The code of purchasing-packaging, on the other hand, was used in the fifth-grade book (5A) with the example of a student purchasing a present

for his friend as follows: "*A book with 10 cm width, 15 cm length, and 3 cm height will be wrapped with gift wrapping paper. How many square centimeters of wrapping paper will be needed for this process?*"

It was determined that the code of love for inanimate beings under the theme of love for living and non-living things was handled at all class levels. The code of love for inanimate objects was included at the sixth-grade level with the content of love for sports (6B), as follows:

> In a class of 32 students, 14 students like watching football games, 10 students like watching basketball games, and the remaining students like watching volleyball games. (a) What is the proportion of students who like watching basketball matches to students who like watching football games? (b) What is the proportion of students who like watching volleyball matches to students in the whole class?

It was found that while favorite juice was used as content related to the code of love of inanimate objects in the eighth-grade textbook (8A), love of books content was found only in the eighth-grade book (8C). In the seventh-grade textbook (7A), the following problem was included about the love of math lessons: "*5/8 of a 32-student class is male. Math is the favorite subject of 3/4 of the boys and 5/6 of the girls. How many students' favorite subject in this class is mathematics?*" Also, hoop games were included as an example of popular games.

It was determined that the code of love for living things under the theme of love for living and non-living things was included at all grade levels except the seventh-grade level. While the code of the love for living things and the love for animals were included in the content of the sixth-grade textbook (6B) with the example of fish in the aquarium and in the content of the eighth-grade textbook with the example of asking about loved animals (8A). In another eighth-grade textbook (8B), a love poem of Yunus Emre was included. The love for family members was included in the sixth-grade textbook content (6C) with the example of a mother making cookies for her child and her friends.

The Root Value of Responsibility

The root value of responsibility was included in the textbooks with the themes of taking responsibility, sensitivity to rules and laws, participation in social responsibility projects, and paying debts on time (**Figure 9**). The examination of the textbooks in terms of the root value of responsibility according to grade levels indicated that the themes of taking responsibility, participation in social responsibility projects, and sensitivity to rules and laws were handled at the fifth-grade level and that the seventh and eighth-grade textbooks also included paying debts on time in addition to these themes. The theme of responsibility was not handled at the sixth-grade level.

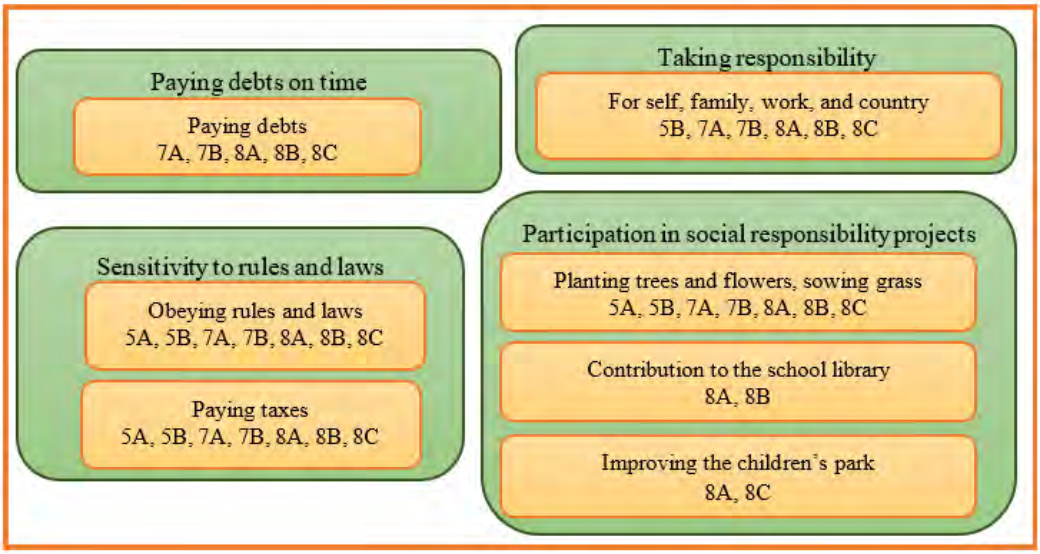

Figure 9. The handling of the root value of responsibility (Source: Authors' own illustration)

There were different contents, such as paying the rent, paying bills, paying the credit card debt, paying in installments, and being a creditor or debtor, under the theme of paying debts. In the seventh-grade textbook (7A), paying debts in installments and fulfilling responsibilities were presented in a problem as follows: "*A newly married couple will pay 5940 Turkish Liras for a fridge and a washing machine. They want to pay their debts in 36 months. Let's find the monthly installment that the couple will pay by using a calculator.*" In the eighth-grade textbook (8C), the following content, which emphasized the feeling of responsibility, was included: "*Kenan, who rented a house for 700 TL a month, paid 1500 TL as a deposit*." The students were asked to answer some questions by using this content.

The theme of taking responsibility was included with the content of self-responsibility, responsibility for the family, work, environment, and country. Self-responsibility was explained by taking protective measures in home and work environments, going to school, and doing homework. For example, the following content emphasized taking security measures at the workplace in the seventh-grade textbook (7A): "*A miner who wants to descend into a mine 12 meters below the ground surface has to press the security button once every 2 meters. Let's find how many times the miner presses the security button when he reaches the mine.*" The responsibility of individuals towards their families was exemplified by the statement in the eighth-grade textbook (8A) that those

under the age of 18 were not allowed to obtain a GSM line without the consent of their parents. The code of taking responsibility for one's job was examined with the content of employees of different occupational groups performing their duties as in the following examples: a carpenter building a bookshelf; a tailor sewing trousers or costumes; a cook making rice; a baker making bread; a gardener organizing the garden; a worker-builder finishing his work; a farmer sowing vegetables and wheat; a pharmacist selling bandages; a dietitian giving a diet program; a technician climbing the pole; a greengrocer selling fruit; a nurse working a shift. Responsibility for the environment was explained with actions aimed at protecting the living environment and ensuring its safety. While this situation was discussed in the seventh-grade textbook (7A) with a text that listed what needed to be done to reduce global warming in the eighth-grade textbook (8C), it was explained by a municipality surrounding a 1,000 m^2 square area with a warning safety strip for occupational safety. Another example was presented in the fifth-grade textbook (5B), as follows:

> "Parking properly is just as important as driving in traffic. It is important to park cars in such a way that they do not hinder the passage of vehicles such as ambulances, fire brigade, police vehicles in case of emergency."

Taking responsibility for the homeland was evaluated as a contribution to the country's economy, such as by establishing a wind turbine, establishing a factory, investing with government support, and carrying out a recycling service project. For example, a recycling service was handled in the fifth-grade textbook (5B) as follows: "*In the recycling campaign organized in a school, 3 1/5 boxes of paper were recycled in the first week and 4 4/10 boxes of paper were recycled in the second week. Let's calculate the amount of paper recycled in two weeks.*" On the other hand, information about wind energy was given in the eighth-grade textbook (8B), and then electricity production was emphasized with the following content: "*Cengiz wants to establish 40 wind turbines on his land with the support he will receive from the state*."

The theme of sensitivity to rules and laws was explained with the codes of obeying the rules and laws and paying taxes. The code of obeying rules and laws was explained by obeying the traffic rules and acting in accordance with the law. For example, the following content in the fifth-grade textbook (5A) emphasized the importance of obeying traffic rules: "*Traffic signs are used to regulate traffic, prevent possible accidents, and inform and warn people. Both pedestrians and drivers should know the meaning of traffic signs. We should not harm the traffic signs that inform and warn us.*" Similarly, an example was given in the fifth-grade textbook (5B) to point out behaviors that Ali had to comply with to catch the departure time of his flight: "*Ali will catch the plane that will take off at 14.00. Passengers must be at the airport 1 hour before the departure time. What time should Ali, whose house is 1 hour and 45 minutes away from the airport, leave home at the latest?"* The code of paying taxes was examined with contents such as taxes paid by companies and individuals and value-added tax refunds. This situation was explained in the seventh-grade textbook (7A) by giving information about taxes, special consumption taxes, and value-added taxes. It was mentioned in the book that these taxes, which were collected from individuals, were spent by the state for the public.

The theme of participating in social responsibility projects was examined with the codes of planting trees and flowers, sowing grass, contributing to the school library, and improving playgrounds. The following example about planting trees within the scope of social responsibility was found in the fifth-grade textbook (5A): "*Four years ago, Elif's grandfather planted orange trees on 1/3 of his field, tangerine trees on 1/4, and lemon trees on 4/12. The trees they cared for with devotion yielded their first fruits at the end of four years. Elif and her grandfather got very happy with the result. Let's find the proportion of the field that has no trees.*" In the eighth-grade textbook (8A), the improvement of a square-shaped park, where a square-shaped playground was constructed, was discussed. Finally, the social responsibility for collecting books for the school library was emphasized in an example in the eighth-grade textbook (8B), in which a Turkish language teacher wants to collect books for the school library and brings them to the library within the scope of the "school is life" project.

The Root Value of Patriotism

The root value of patriotism was handled in middle school mathematics textbooks with the themes of love for the country, protection of cultural heritage, sensitivity to natural heritage, and provision of information about famous Turks, Türkiye, and the Turkish Flag (**Figure 10**).

The theme of patriotism was explained by feelings or actions that showed an expression of loyalty to the country. The theme of the provision of information about Türkiye was covered in all textbooks within the scope of the root value of patriotism. This theme was explained with the codes of institutions, congresses, services-facilities, important days, notable events, the geography of Türkiye, demographics of Türkiye, and Turkish Stars. Another theme discussed in all textbooks was protecting cultural heritage. This theme was explained through cuisine culture, literature culture, architectural culture, museum culture, religious culture, art culture, and game culture. The theme of being sensitive to natural heritage was explained by animals, plants, and other natural assets naturally found in Türkiye due to its geography. Also, world-famous Turkish scientists, leaders, and athletes were included in the textbooks. Regarding the theme of informing about the Turkish Flag, it was determined that Turkish Flag pictures were used in the textbooks, and that the contents about the Turkish Flag Law and the Turkish Flag Regulation were presented.

As seen in **Figure 10**, institutions, the demographics of Türkiye, the geography of Türkiye, and service and facility codes were used at all grade levels under the theme of information about Türkiye for the root value of patriotism. The institutions and organizations emphasized in the textbooks under the code of institutions included the Turkish Statistical Institute, the Ministry of Justice, the Turkish Mountaineering Federation, and the Central Bank of the Republic of Türkiye. For example, the following information about the research carried out by the Turkish Statistical Institute was given at the seventh-grade level (7A) and students were asked to make calculations: "*According to the data of the '2016 Turkey Demographic and Health Survey' published by TURKSTAT in 2017, the rates of individuals with obesity who are aged 15 and older are given in the figure above.*"

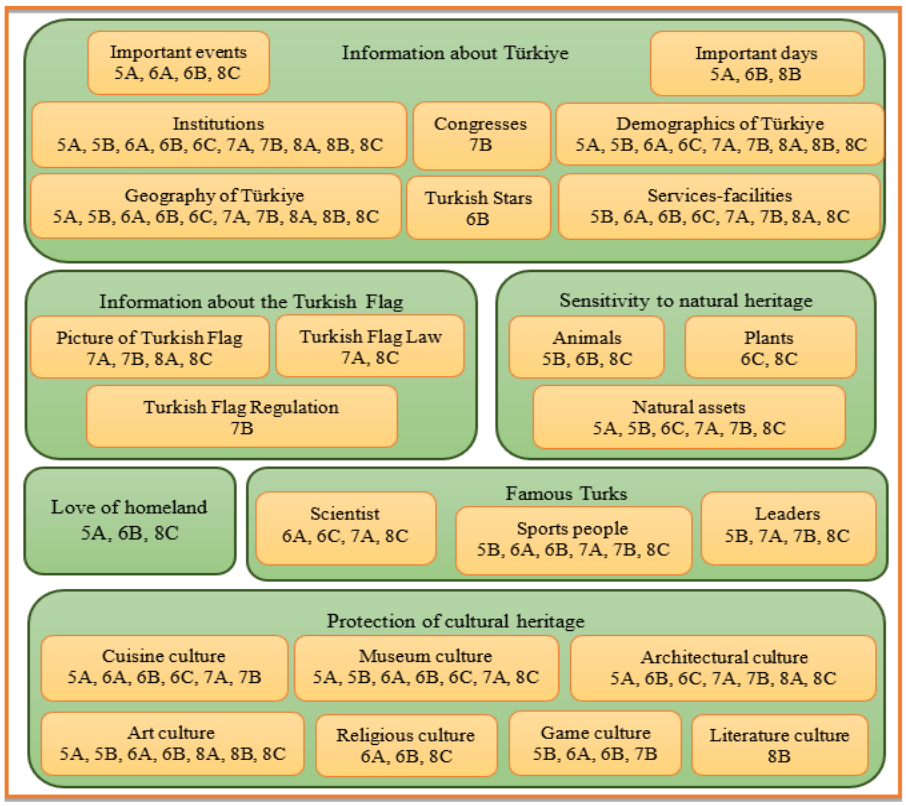

Figure 10. The handling of the root value of patriotism (Source: Authors' own illustration)

The information about Türkiye under the code of the demographics of the country included surface area, currency, language, and the alphabet of the country. For example, the fifth-grade textbook (5A) involved information about the population of the country with the following statement: "*The population of our country has reached eighty million eight hundred and ten thousand five hundred and twenty-five as of the end of 2017.*" On the other hand, it was stated in the seventh and eighth-grade textbooks (7A, 8C) that many terms we used in geometry today were translated into Turkish by Atatürk, and examples of these terms were given (e.g., zâviye=angle, zâviye-i hadde=acute angle).

Some problems were handled by using the map of Türkiye, geographical regions, and cities under the code of the geography of Türkiye, and information about them was presented. For example, the following content in the sixth-grade textbook (6C) emphasized the Aegean Region, which is one of the geographical regions of Türkiye, and the cities located in this region: "*The provinces of our country in the Aegean Region are Izmir, Mugla, Aydin, Denizli, Usak, Manisa, Kutahya, and Afyonkarahisar*."

The theme of patriotism was emphasized with the services and facilities code by providing information about facilities, such as buildings, bridges, parks, projects, tunnels, subways, airports, libraries, theaters, ambulance planes, and schools, which were put at the service of society for accessibility in transportation, health, education, and entertainment. For example, the transportation facilities were emphasized through the July 15 Martyrs Bridge (15 Temmuz Sehitler Bridge), which was covered in the sixth and seventh-grade textbooks (6A, 7A, 7B), and the Marmaray Project, which was covered in the sixth and seventh-grade textbooks (6B, 7A). In the eighth-grade textbooks, the content about entertainment included Eskisehir Sazova Park Fairy Tale Castle (8A) and the content about services in the health sector included the ambulance plane (8C).

The codes of important days and notable events, which were given as information about Türkiye, were not handled in the seventh-grade textbooks. The Turkish Stars code was only used at the sixth-grade level, and the congresses code was only used at the seventh-grade level. The content about important days code included 18 March Canakkale Victory and Martyrs' Day, 15 July Democracy and National Unity Day, and 23 April National Sovereignty and Children's Day. The notable events code was handled with the alphabet revolution, women's right to be elected as a member of parliament, and the conquest of Istanbul. For example, students were asked to calculate the time elapsed between two given dates in the fifth-grade textbook (5A) using the following information: "*Turkish women were given the right to elect and be elected with the law passed on December 5, 1934. The first female prime minister of our country took office on June 25, 1993*." The least mentioned codes under the theme of information about Türkiye were congresses and Turkish Stars. With these codes, attention was drawn to the language congresses, in which the change and development of the language were emphasized, and the Turkish Stars team within the Turkish Air Force, respectively. For example, the code of congresses in the seventh-grade textbook (7B) included information about the geometry book written by Atatürk one and a half years before his death, and right after the Third Turkish Language Congress. In the sixth-grade textbook (6B), a photograph of Turkish stars taken by one of the audience members was presented and students were asked to calculate the angle between the fighter jets using the angle measurements given.

The picture of the Turkish Flag, the Turkish Flag Law, and the Turkish Flag Regulation, which were under the theme of information about the Turkish Flag, were only handled in the seventh and eighth-grade textbooks. Accordingly, it was seen in the

seventh-grade textbooks that the dimensions of the Turkish flag were clearly stated in Article 4 of the Turkish Flag Regulation (7B) and that procedures and principles about the shape, make, and preservation of Turkish flag were stated in Turkish Flag Law (7A).

Animals, natural assets, and plants that are naturally found in the geography of Türkiye were handled under the theme of sensitivity to natural heritage. Natural assets were handled at all grade levels, and examples of mountains, lakes, straits, and touristic places, such as Lake Van (6C, 8C), Mount Ararat (5A), Bosphorus (7A), and Cappadocia (7B, 8C) were presented. Pearl mullet, Van cat, and butterfly and fish species found naturally in Türkiye were mentioned at all grade levels except for the seventh grade, while larch, yew, and olive trees naturally found in the geography of Türkiye were mentioned at the sixth and eighth-grade levels.

Museum, art, game, cuisine, and literature cultures as well as architectural and religious cultures, were emphasized in middle school textbooks under the theme of protecting cultural heritage. The code of museum culture was handled at all grade levels using content about various museums, such as Hagia Sophia, Mevlana, and Anatolian Civilizations, which are famous nationally and internationally. Another cultural heritage code that was addressed at all grade levels was architectural culture. Ancient cities, madrasas, mosques, cupolas, monasteries, castles, towers, palaces, and fortresses, which have historical value, were used in the content of mathematics subjects under the architectural culture code. Some of these architectural values included in the textbooks were Catalhoyuk Neolithic City (6C), Troy Ancient City (8C), Cacabey Madrasa (6C), Egri Minaret (6B), Sumela Monastery (6C), Elazig Harput Ulu Mosque (7A), Izmir Clock Tower (7B), Ankara Castle, Dolmabahce Palace (5A), and Anadolu Fortress (6C).

Art products, such as patchwork, Turkish triangles, tiles, carpet weaving, Erhani silver embroidery technique, which are known as unique to Türkiye and valued for ages, and artists such as the famous Turkish folk poet Asik Veysel were handled at all grade levels except for the seventh grade under the code of art culture. Mangala, which is a famous game, Hacivat-Karagoz, and folk dances were emphasized at all grade levels except for the eighth grade. For example, in the seventh-grade textbook (7B), students were asked to choose among several types of folk dances such as Horon, Caucasian, Zeybek, and Caydacira as social activities, and they were asked to draw a chart showing the folk dances and the number of students choosing the dances. On the other hand, in the fifth-grade textbook (5B), Mangala, a Turkish intelligence and strategy game, was introduced by giving the information that it is played with two people, and that there are 12 small holes, six on each side, on the game board, and a large treasure hole for each player to collect their stones. In this way, the game of Mangala, which has been passed down from generation to generation and associated with mathematics lessons, was introduced. The place of Ashura, doner kebab, baklava, tea, and buttermilk in Turkish cuisine was emphasized under the cuisine culture code of the theme of protecting the cultural heritage, which was not mentioned only at the eighth-grade level. For example, students were given the ingredients of Ashura in the seventh-grade textbook (7A) and they were asked some math questions after the following information: "*Ashura is a traditional dessert made with cereals, dried pulses, dried fruits, and sugar*." Similarly, baklava was introduced in the fifth-grade textbook (5A), as follows: "*Baklava, which is part of primarily Turkish cuisine and also Middle Eastern, Balkan, and South Asian cuisines, is a type of dessert made of dough… Evidence in history shows that it is a dessert of Turkish origin in Central Asia*." Values specific to religious days, such as the month of Ramadan, the Sacrifice Feast, and holiday shopping, were handled within the religious culture code under the theme of protecting cultural heritage. For example, the concepts of suhoor (morning meal) and iftar (dinner), which are considered important in Ramadan, were discussed in the sixth-grade textbook (6B) as follows: "*Cihangir drinks 4/5 bottles of water at suhoor and 1 5/8 bottles of water at iftar during Ramadan. Estimate how many bottles of water Cihangir drinks in total*." Finally, Yunus Emre, who has a unique style in Turkish Sufi literature, was handled under the literary culture code of the theme of protecting the cultural heritage by giving the scores of three students, Ceyda, Semiha, and Eren, who participated in the Yunus Emre Poems Reading Competition.

It was determined that scientists, leaders, and athletes were emphasized under the theme of famous Turks. While the content about famous Turkish scientists included the examples of Ali Kuşçu, Aziz Sancar, Cahit Arf, Halil İnalcık, Vecihi Hürkuş, and Canan Dağdeviren, the content about Atatürk, a famous Turkish leader, and his reforms, sayings, and life were handled in all textbooks except the sixth grade. For example, the 44-page-long geometry book that was written by Atatürk between 1936 and 1937 and the Turkish equivalents of geometry terms were mentioned in the seventh-grade textbook (7A) after the following introductory information: "*Mustafa Kemal Atatürk, the founder of the Turkish Republic, paved the way for innovation and modernity in every field for the Turkish nation, and he also carried out scientific studies."* Finally, information about famous Turkish National Team sports figures such as Naim Süleymanoğlu and Eşref Apak and their achievements was presented.

Finally, the love of country theme, which was not examined only at the seventh-grade level, was explained using exercises in which the homeland and love of country phrases were used under the root value of patriotism. The following statement was given in the fifth-grade textbook (5A) and students were asked to interpret the chart given: "*The number of students who went to the theater to see a play named "Love of Homeland" is given in the following column chart.*"

The Root Value of Benevolence

The root value of benevolence was handled in middle school mathematics textbooks with the themes of sensitivity to disadvantaged groups, participating in charity activities, and providing information about charity organizations (**Figure 11**). When the textbooks were examined on a class basis for the root value of benevolence, it was determined that these three themes were included at all grade levels.

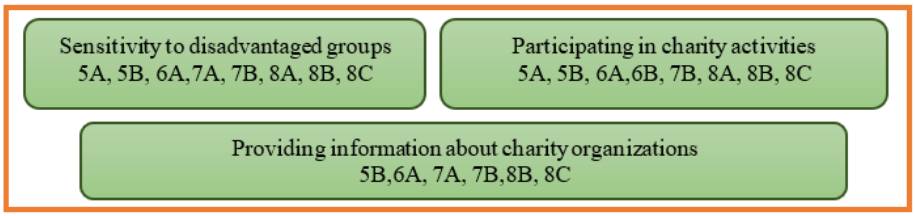

Figure 11. The handling of the root value of benevolence (Source: Authors' own illustration)

The content within the scope of the theme of helping disadvantaged groups and other living things included topics, such as raising society's awareness about disabled citizens and their needs, giving seats to disabled, pregnant, and elderly people in public transportation, visiting nursing homes, and improving animal shelters. The following example in the seventh-grade textbook (7A) shows the sensitivity of a student towards a disadvantaged citizen: "*Mehmet, who took the elevator from the ground floor of a building, first went up 3 floors to help his visually impaired neighbor and then went down 4 floors. On which floor is Mehmet now?"* Students were given information about the needs of disabled citizens in the eighth-grade textbook (8A) with the following expression: "*At least one entrance to all commercial and public buildings must be accessible to the disabled. The slopes at the entrances should allow wheelchair users and people with walking sticks to pass comfortably and safely. Accordingly, the entrances should be arranged with a maximum slope of 5% without steps.*" Also, the eighth-grade textbook (8B) included content that emphasized the importance of improving animal shelters.

The content about the theme of participating in charity events included activities, such as working in a soup kitchen, donating blood to the Red Crescent, organizing a fundraising campaign for the families of martyrs and victims of war, providing food to people in need, distribution of stationery material, and distribution of aid during Ramadan. Students were asked about the following content on helping the families of martyrs in the fifth-grade textbook (5A): "*A football team donates the income of two matches to the families of martyrs.*" The following example in the sixth-grade textbook (6A) emphasized the importance of aid given during Ramadan: "*In Ramadan, AFAD (Disaster and Emergency Management Presidency) donated 20 kg of flour and 10 kg of sugar to each of 15 families in need in a neighborhood. Let's calculate how many kg of food aid AFAD provided in total."* Another example of a charity campaign was given in the seventh-grade textbook (7B). This campaign included the example of Sude and Aylin, who organized an aid campaign for the needs of children in the disaster area. In addition, the importance of blood donation to the Red Crescent was pointed out in the eighth-grade textbook (8C) with the example of Fatma, who is a sensitive individual, donates blood every four months. In another eighth-grade textbook (8B), it was stated that Emir, who produces pens in his workshop, carries out a stationery aid campaign by distributing one-eighth of the pens he produces to students in need.

Another theme included in the textbooks regarding benevolence was determined as the provision of information about charities. The textbooks included information about the aims and activities of charity organizations and benevolent persons. For example, the books presented information about AFAD, Turkish Red Crescent, Green Crescent Week, December 3 International Day of the Disabled, and Florence Nightingale's biography. Accordingly, the following information about the Turkish Red Crescent was included in the fifth-grade textbook (5B):

> "The Turkish Red Crescent, which has helped thousands of people in many wars and disasters since 1868, delivers the blood taken from volunteer donors to those in need. One unit of donated blood saves the lives of 3 people. A total of 92,923 units of blood were donated in Central Black Sea Region Blood Center, 79,180 units in Western Anatolia Region Blood Center, and 51,874 units in Eastern Anatolia Region Blood Center in 2016 to Kızılay, which has blood donation centers in 17 regions. What do you think about the importance of blood donation? How do these donations make a difference even when a small amount of blood is donated from each region? How many units might have been donated in 2016 from these three regions?"

On the other hand, the eighth-grade textbook (8B) included information about Florence Nightingale's arrival in Istanbul, her treatment of wounded soldiers, and her communication with generals and politicians to improve hospital conditions.

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This study was conducted to examine the mathematics textbooks content of middle school mathematics textbooks in terms of ten root values to identify the extent to which the root values were incorporated. Justice, friendship, self-control, love, responsibility, and patriotism were identified as root values emphasized in all textbooks across all grade levels. With the inclusion of the root values in all textbooks in accordance with the mathematics curriculum (MoNE, 2018a), it is expected that this would help students internalize these values. However, it may be said that there was a gap in the instruction of root values since the root values like honesty, patience, respect, and kindness were not included in every textbook. The lack of usage of the root value of honesty in the seventh-grade textbooks and the patience value in the eighth-grade textbooks was another shortcoming about the root values observed in the textbooks. Similarly, the study by Cetin et al. (2021) which focused on the root values in ninth-grade textbooks, found that patience and honesty were mentioned less often than other root values. It is possible to make the assertion that this circumstance presents challenges regarding the continuity and reinforcement of root values.

Research on root values in mathematics textbooks (Cetin et al., 2021; Sayin et al., 2019; Ozkaya & Duru, 2020) reveals that root values have been mostly evaluated and compared quantitatively, from most included to least included. The current study provides

a unique perspective by analyzing the content and meaning of root values in mathematics textbooks. Accordingly, it was deduced that all root values were utilized heterogeneously and with both their first and secondary meanings in the textbooks. Similarly, Kilcan (2020) stated that the content related to values in the books did not show a homogeneous distribution. Friendship, self-control, responsibility, patriotism, and benevolence were all frequently used in their first meanings, whereas justice, respect, love, honesty, and patience were more often employed in their second meanings and were not given enough attention and not presented with enough content.

It was observed that the root value of justice was employed in textbooks with three distinct meanings: fairness, elections, and proportional sharing. The first meaning of justice is "ensuring everyone's use of the law's rights," "compliance with rights and laws," and "observance of equality" (TLA, 2019). However, it was observed that the idea of equality and equal sharing was emphasized more in textbooks for the underlying value of justice. There were examples of equal sharing, particularly in the content of fraction problems. Researchers have also addressed the content of observing equity, such as equal sharing of what is supposed to be shared, fairness, and acting equally in collaborative activities within the framework of the value of justice (Cetin et al., 2021; Kilcan, 2020; Sayin et al., 2019). In their study, Ozkaya and Duru (2020) found that one of the values that were least included in the textbooks was the root value of justice. Although this was addressed in all of the textbooks reviewed, the current study discovered that there was still not enough content dedicated to the underlying root value of justice.

The concept of friendship, which is defined as the state of friendship and showing friendly behavior (TLA, 2019) was seen that the word friend was used more than the word fellow in the books. In the present study, the contents of being fellow in the textbooks were evaluated within the scope of the root value of friendship. Since the textbooks covered the five aspects of the root value of friendship (emotional, social, cultural, physical, and mental actions), it is possible to conclude that there was sufficient content for teaching about the importance of friendship and fellowship. Under the friendship value, consideration, altruism, loyalty, and solidarity were evaluated as emotional actions; eating and drinking, visits/hospitality, sharing, giving a gift, birthday celebration, and writing letters as social actions; traveling together, going to the cinema, and going to the library as cultural actions; games, sports, and scouting activities as physical actions; and playing mental games as mental actions. Only social actions such as offering something to guests, neighbors, and friends, and giving them presents, were used by Kilcan (2020) to address the root value of friendship. However, Sayin et al. (2019) focused on a single 5th-grade mathematics textbook, where they linked the root value of friendship's underlying value to social and emotional actions, including financial aid and solidarity.

The first meaning of the root value of honesty is defined as an honest person who does not depart from truth in his/her words and behaviors (TLA, 2019). In the current study, it was determined that the value of honesty, which is exceedingly rare in middle school mathematics textbooks, was used with its second meaning. In this study, the value of honesty was examined with two different themes: deserving a prize for being honest and keeping one's word. The first theme, honesty, was associated with a prize. Since students could understand that if they are honest, they would be rewarded financially. Associating the value of honesty with a financial prize might not fully meet its meaning. It is thought that it would be more appropriate to give the message that being honest will benefit other people. Contrary to current study, Cetin et al. (2021) stated in their study the root value of honesty in 9th-grade mathematics textbooks was associated with being truthful. Similarly, Kilcan (2020) associated the root value of honesty with the case of a farmer who does not sell his/her spoiled products and fulfillment of a promise given by a person. In this sense, it can be said that it is a more correct approach in the books to associate honesty with keeping one's word.

The root value of self-control is defined as auto-control or controlling and restricting one's reactions, behaviors, or tendency toward another goal to achieve a more important goal. It was seen that the value of self-control was presented in the textbooks with the themes of dealing with hobbies and saving as well as controlling behaviors. The root value of self-control, which is thought to have enough content in the textbooks, was generally used with its first meaning. The contents that emphasized the first meaning were effective time management, efficient study techniques, healthy nutrition, and safety management. The contents, such as dealing with cultural, artistic, social, and physical activities, were evaluated under the hobby theme. There were also contents, such as saving money, thrifting, discount shopping, and recycling, under the theme of saving. When studies in the literature were reviewed regarding the root value of self-control, it was discovered that Cetin et al. (2021) associated this value with measures related to water saving, Kilcan (2020) with self-control so that the person does not put on weight and get sick by achieving time management and working effectively and efficiently, Sayin et al. (2019) with saving money, and Karaca and Uzunkol (2019) with planning the day.

The root value of patience is defined as the virtue of waiting silently for the passing of sad situations such as pain, poverty, or injustice, endurance, and waiting for something to come without hesitation (TLA, 2019). Kilcan (2020) emphasized the first meaning of patience by using the content that included making effort without haste during the production of an object and waiting to reach the goal, while Cetin et al. (2021) stated that the contents of perseverance and resilience were examined in the textbooks. On the other hand, Karaca and Uzunkol (2019) and Sayin et al. (2019) stated that the root value of patience was not included in the textbooks. In the current study, although there was enough content about the root value of patience, it was seen that there were examples of games, puzzles, and activities that required fine workmanship and perseverance in the textbooks rather than its first meaning. For the game theme, there were examples of strategic games like chess, the Rubik's cube, and Tangram, which require a lot of challenging work and patience to win. For the puzzle theme, there were examples of puzzles like Futoshiki, Resfebe, and decoding, which require following logical steps. Similarly, content, including sports that require exercising perseverance for a while, was evaluated within the scope of the root value of patience. Demirci (2002) said that patience is resisting without rushing and not giving up on the goal, even when problems come up that make it hard to do what you want to do or get what you want.

The root value of respect is defined as the feeling of love, reverence, respect, and avoidance of disturbing others, which causes one to be careful, attentive, and controlled due to the superiority, age, usefulness, and sanctity of someone or something (TLA, 2019). It was determined that the root value of respect was found in the books with the themes of respect, valuing people or

inanimate beings, and observing the addressee, with contents close to its first meaning. However, it is thought that more content should be created for the value of respect, which is quite rare in the textbooks reviewed within the scope of the study. In their studies, Karaca and Uzunkol (2019) came to the same conclusion and stated that the value of respect should be given more place in the textbooks.

The root value of love is defined as the emotion that leads people to show close attention and devotion to something or someone (TLA, 2019). Contrary to the result of Kilcan (2020), the root value of love, which was one of the values that were not handled enough in the textbooks examined in the current study, was generally included in the textbooks through love for a football team, animals, books, or purchasing gifts to show love for the person loved. Unlike the contents here, there are studies (Cetin et al., 2021; Kilcan, 2020) showing that both the love of flowers and animals and the love of people (siblings, grandparents, neighbors, and children) are handled in the textbooks, while there are studies indicating that the content of purchasing gifts is included in the books, which is similar to the finding of the current study (Karaca & Uzunkol, 2019; Sayin et al., 2019). However, the root value of love, which was highlighted by the content of purchasing a gift for the person one loved, was considered to be presented incorrectly because of the possibility that it may give students the message that "*I need to buy gifts for people I love as the value of my love can be measured with a gift*." It is thought that it would be more appropriate to include content, such as expressing love for the person one loves, spending time with him/her, and developing common hobbies. It was found that the root value of love in the textbooks, which should be developed during school years, was not adequately included.

The root value of responsibility, which was found to be adequately included in the textbooks with its first meaning and numerous examples, is defined as assuming one's own behavior or the consequences of any event that falls under his/her responsibility (TLA, 2019). For the root value of responsibility, which is considered in the literature as responsible persons' fulfillment of their duties (Sayin et al., 2019) and responsibilities toward the environment and nature (Kilcan, 2020), in the current study, it was included in the contents, such as complying with social rules, paying debts, obeying laws, taking responsibility towards oneself/work/country, and participating in social responsibility projects. It is possible to say that these contents, which were handled in the textbooks for the root value of responsibility, offer important content about how other values (for example, self-control, respect, love, patriotism, and benevolence) should be handled and set an example. So, the idea is that students can learn the root value of responsibility by looking at good examples, like taking responsibility when it's needed, following rules and laws, taking part in social responsibility projects, and paying off debts on time.

The root value of patriotism, which was adequately included in the textbooks with its first meaning and several examples, is defined as "love of homeland" (TLA, 2019). It was clear that this value was explained in a broad way in the textbooks with examples like caring for society and putting the interests of Türkiye first, and that the importance of working for Türkiye was emphasized. It was also clear that it was covered in detail, with contents like love of homeland, protecting cultural heritage, being sensitive to natural heritage, and providing information about famous Turks, Türkiye, and the Turkish Flag. Cetin et al. (2021) stated that the root value of patriotism was explained by the behaviors of being hardworking and productive as well as caring about society in the textbooks, whereas Sayin et al., (2019) stated that it was presented with the contents explaining the importance of working for Türkiye. On the other hand, Kilcan (2020) stated that the root value of patriotism was presented in textbooks with content, such as protecting domestic goods, planting saplings for the country's needs, and choosing both the functional and economical materials to be used on the streets. Another value that contained comprehensive information and many examples in the textbooks, was the root value of benevolence, which was examined as the tenth and last value in the current study. The root value of benevolence, which was defined as "charitability" (TLA, 2019), was shown with the examples of being sensitive to disadvantaged groups and other living things, organizing charity campaigns, or giving information about these people. It was stated that the root value of benevolence was exemplified through charity campaigns and supporting those in need in textbooks (Karaca & Uzunkol, 2019; Sayin et al., 2019).

In conclusion, the ten root values that were examined as part of the study–friendship, self-control, responsibility, patriotism, and benevolence–were used in different parts of the textbooks in a way that was true to their original meaning. The root value of patience was shown not in its first meaning but through games, puzzles, and activities that required careful work and examples that showed the need for patience. It was seen that there was not enough content about the root values of justice, honesty, respect, and love, and that the root value of justice was rather used to mean equality. In addition, it is thought that the root value of honesty should not be associated with a prize, and the root value of love should not be associated with purchasing gifts for others. As stated by Asici and Dede (2019), values can be taught and transferred through mathematics lessons. According to the results of the study, it can be said that content involving root values should be distributed more homogeneously to the grade levels and values should be used with their first meaning in mathematics textbooks. It is considered that textbooks can be qualified enough to guide teachers on how values can be taught to students through sample activities. There should be more specific information in mathematics textbooks about how to integrate root values into a mathematics classroom.

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