

RESEARCH ARTICLE

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# Türkiye social studies textbooks and SOLO taxonomy: An evaluation on measurement and assessment situations

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## Abstract

In this study, four Türkiye textbooks used in the 2024-2025 academic year by the “Ministry of National Education, Türkiye” at the primary and secondary school levels “, 4th Grade Social Studies Textbook, 5th Grade Social Studies Textbook, 6th Grade Social Studies Textbook, and 7th Grade Social Studies Textbook” were examined. The research aimed to determine the levels of measurement and assessment questions in “4-7th-grade social studies textbooks” based on the SOLO Taxonomy. The study utilised document analysis as a qualitative research method. The data obtained were analysed using the descriptive analysis method. According to the overall findings of the study, the questions that most commonly aligned with the “Unistructural” level of the SOLO Taxonomy were identified, whereas the “Extended Abstract” level was found to have the fewest questions. Subsequently, questions corresponding to the “Relational” level and “Multistructural” level were identified. The textbooks collectively contained 620 measurement and assessment questions. The most frequently represented levels in the textbooks were identified as follows: In the 4th-grade textbook, 78 questions corresponded to the “Unistructural level.” In the “5th-grade social studies textbook,” 31 questions corresponded to the “Relational” level. In the 6th-grade textbook, 89 questions corresponded to the “Unistructural” level. In the 7th-grade textbook, 77 questions corresponded to the “Relational” level. The findings revealed that, as grade levels increased, there was no change in the epistemic level of measurement and assessment questions. However, it was observed that the 7th and 5th-grade textbooks included more questions that aligned with higher-order epistemic skills and the level of the SOLO Taxonomy.

**Keywords:** Social studies textbooks, SOLO taxonomy, measurement and assessment.

## Introduction

In today’s world, fostering development and raising successful individuals with diverse skills that can contribute to humanity are among the primary goals of education. Accordingly, educational trends have been shaped to not only provide information but also to nurture individuals who are active, productive, problem-solving, creative, equipped with strong communication skills, and capable of using these skills for the benefit of humanity. In this context, education, which focuses on instilling desired behavioural changes in individuals, has evolved into a structure that values individuality, considers differences, and aims to develop skills. Despite the rapid pace of globalisation, technology and science, which have led to the digitalisation of educational activities, textbooks have retained their importance due to their accessibility and availability for

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Received 07.01.2025

Revised 15.05.2025

Accepted 05.07.2025

everyone. This is true not only globally but also specifically in Türkiye. Therefore, textbooks must be revised in line with the demands of the era, and their development processes should be approached with meticulous care. As fundamental and easily accessible materials for all individuals, textbooks are indispensable educational tools. While transferring knowledge or being utilised by learners, textbooks must be structured according to the epistemic levels of individuals, considering factors such as the language used, level appropriateness, richness and relevance of visual-text elements, attractiveness and effective contemporary measurement and assessment methods. Overall, textbooks should be designed to contribute to individuals' academic lives, and their creators must consider various variables during the design process.

Social studies emerged in the United States, aiming to cultivate desirable citizens based on the principle of consolidating social sciences, starting from primary school (Levstik & Tyson, 2008, p. XIX). However, due to its multidisciplinary structure, some opinions suggest that instruction may not adequately meet the developmental level of individuals based on their age (Şimşek, 2017, p. 2). Nevertheless, the more appropriately and engagingly textbooks are designed, the more accessible social studies education becomes for individuals, ensuring that teaching and learning processes are delivered holistically. The primary purpose of preparing textbooks in the teaching and learning process is to align them with the curriculum, encompassing knowledge, skills, values, learning outcomes, and measurement and assessment situations, while also serving as a guide for these activities. Textbooks should provide individuals with effective learning processes and serve as a guide throughout their academic journey. This can be achieved by exposing individuals to as many stimuli as possible. The elements in textbooks should aim to capture the attention and interest of individuals, prepare them for learning by fostering motivation, offer learning experiences related to the skills being taught and provide opportunities for self-directed learning (Altun, 2013, p. 20). Since 2004, the social studies curriculum has been designed in accordance with the constructivist approach. In 2024, it was revised to adopt a skills-based approach. Along with the changes in the social studies curriculum, textbooks underwent modifications. Notable changes include an emphasis on digitalisation, a skills-based approach and the integration of contemporary measurement and assessment tools. Changes made in countries' education systems and learning-teaching processes directly impact textbooks.

One of the fundamental materials and perhaps the most important that facilitates individuals' access to knowledge in social studies lessons is the textbook (Nalçacı & Erçoşkun, 2005, pp. 144-145). Therefore, enabling individuals at various developmental stages to prepare for life, adapt to society, and contribute effectively will be possible through the introduction of an effective textbook into the system (Kab, 2012, p. 37; Mehonikj, 2018, pp. 4-6). Social studies textbooks, like those of other subjects, are prepared in accordance with the curriculum. This implies certain limitations on the content authors can present (Ulusoy, 2011, p. 195). Definitions regarding textbooks highlight the feature of being prepared in line with the curriculum's goals, content, teaching-learning processes and assessment dimensions (Demirel & Kiroğlu, 2005, p. 5; Güneş, 2002, p. 11). In this context, a book qualifies as a textbook if it is created in alignment with the relevant curriculum. Moreover, deciding which characteristics and information to include or exclude in textbooks often holds significant importance in historical, cultural, social and political contexts (Esen, 2005, p. 13). The worldviews of authors or societies can be reflected in textbooks along with cultural, social, political, traditional and democratic values, norms and behavioural patterns. In this way textbooks play a crucial role in helping students define themselves, shape

their identity and determine their place in society (Ulusoy, 2011, p. 195).

To determine whether these objectives are being fulfilled and whether their goals are being achieved, scientists have developed various taxonomies. Among these, the most well-known and widely used is “Bloom’s Taxonomy,” developed by B. S. Bloom. However, over time, the need for more precise measurements emerged due to changing conditions and circumstances, leading to criticisms of Bloom’s Taxonomy and the development of alternative taxonomies (Gezer & İlhan, 2015, pp. 4-5). Over time, several taxonomies have been created, including the SOLO Taxonomy by J. B. Biggs and K. Collis (1982), the Anderson Taxonomy by L. W. Anderson (2000), the Fink Taxonomy by L. D. Fink (2003) and the Dettmer Taxonomy by P. Dettmer (2006). Among these, the SOLO Taxonomy stands out for its ability to provide detailed measurements and in-depth information. This taxonomy, whose name is derived from the initials of “Structure of Observed Learning Outcomes,” was developed by J. B. Biggs and K. Collis in 1982. While it is often used as an alternative to Bloom’s Taxonomy, it is also frequently applied to evaluate individuals’ responses (Gövercin & Filiz, 2023, p. 526). The SOLO Taxonomy is not only employed for evaluation purposes but also for determining the levels of learning outcomes, contributing to the preparation of effective curricula (Biggs, 1999a, pp. 59-60). The SOLO Taxonomy, used for both evaluation and identifying learning outcome levels, consists of five levels. The characteristics of these levels are explained in Table 1.

**Table 1** Levels of the SOLO taxonomy (Biggs & Collis, 1982, pp. 17-18)

| SOLO Taxonomy | Level    |                           | Feature                                                                                             |
|---------------|----------|---------------------------|-----------------------------------------------------------------------------------------------------|
| Quantitative  | Level-1  | Pre-structural (PS)       | Lacking any knowledge and skills related to the field.                                              |
|               | Level -2 | Unistructural (US)        | Limited interest and expresses a tendency in one direction.                                         |
| Qualitative   | Level -3 | Multistructural (MS)      | It expresses the independence of multiple interests.                                                |
|               | Level -4 | Relational Structure (RS) | It expresses the ability to relate and specify the characteristics of knowledge within a structure. |
|               | Level -5 | Extended Abstract (EA)    | It reflects the expansion of knowledge.                                                             |

The SOLO Taxonomy consists of five levels. These levels consist of Pre-structural (PS), Unistructural (US), Multistructural (MS), Relational Structure (RS) and Extended Abstract (EA). Each level includes unique learning experiences and cognitive levels. For example, at the Pre-structural (PS) level, which is the first level of the taxonomy, learning is initiated. Detailed information about these levels is provided in Table 2.

**Table 1** SOLO taxonomy (Biggs & Collis, 1982, pp. 17-18; Biggs & Moore, 1993; Biggs & Liam, 1989).

| SOLO Taxonomy | Level                     | Feature                                                                                                                                                                                                                                                                                                                                                  |
|---------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Level-1       | Pre-structural (PS)       | “The learner might attempt some initial preparation for learning, but they do not approach the task appropriately. They either fail to demonstrate an understanding of what is required or misinterpret the task altogether (Biggs, 1999; Biggs & Collis, 1982).”                                                                                        |
| Level-2       | Unistructural (US)        | “The learner focuses on a single aspect of the learning task in isolation, showing a limited understanding of the concept. A unistructural response is generally brief and lacks depth or detail (Biggs, 1999).”                                                                                                                                         |
| Level-3       | Multistructural (MS)      | “The learner shows an understanding of multiple aspects of the learning task, but does not connect them. While they recognise the scope of the learning experience, they have yet to comprehend the systems or relationships involved. At this level, curriculum objectives may require students to classify, describe, list, or narrate (Biggs, 1999).” |
| Level-4       | Relational Structure (RS) | “Multiple aspects of the learning task are connected to form a cohesive understanding, enabling the learner to apply the concept to familiar problems or situations. At this level, curriculum objectives may involve                                                                                                                                    |

|         |                        |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                        | understanding, applying, integrating, comparing and contrasting, or explaining causes (Biggs & Moore, 1993)."                                                                                                                                                                                                                                                                                                          |
| Level-5 | Extended Abstract (EA) | "This stage involves significant restructuring of material or advanced higher-order thinking (Biggs & Moore, 1993). Learners at this level often exhibit abstract thinking that exceeds instructional requirements. Extended abstract objectives may include generating, hypothesising, theorising, or reflecting (Biggs, 1999). It is noted that some individuals may never reach this stage (Biggs & Collis, 1982)." |

The SOLO Taxonomy can ensure that the objectives of curricula, the effectiveness of activities provided to individuals, and the epistemic level of measurement and assessment questions are at the desired level and that this process is conducted in a controlled manner (Gövercin & Filiz, 2023, p. 528). Topics learned at a higher epistemic level are more meaningful and complex, while those at a lower epistemic level represent more profound teaching and learning processes (Hattie & Purdie, 1998, pp. 148-149). When determining an epistemic level according to the SOLO Taxonomy, certain indicator verbs are used. Table 3 includes the indicator verbs designed for the SOLO Taxonomy.

**Table 3** Indicator verbs used in determining the levels of SOLO taxonomy (Biggs & Collis, 1982, pp. 35-36; Potter & Kustra, 2012, p. 8; Çetin & İlhan, 2016, pp. 861-862).

| Levels of SOLO Taxonomy | Pre-structural (PS) | Unistructural (US) | Multistructural (MS) | Relational Structure (RS) | Extended Abstract (EA) |
|-------------------------|---------------------|--------------------|----------------------|---------------------------|------------------------|
| Indicator Verbs         |                     | "Explain           | "Classify            | "Distinguish              | "Design                |
|                         |                     | Convey             | Combine              | Categorize                | Create                 |
|                         |                     | State              | Create a list        | Question                  | Judge                  |
|                         |                     | Sequence           | Define               | Combine                   | Formulate a            |
|                         |                     | Count              | Plan                 | Relate                    | hypothesis             |
|                         |                     | Remember           | Clarify              | Apply                     | Evaluate               |
|                         |                     | Recognize          | Symbolize            | Analyze                   | Discuss                |
|                         |                     | Name               | Qualify              | Compare                   | Generalize             |
|                         |                     | Repeat             | Explain the          | Predict                   | Develop a theory       |
|                         |                     | Mark               | meaning              | Evaluate                  | Conduct an in-         |
|                         |                     | Memorize"          | Assign               | Summarize                 | depth                  |
|                         |                     |                    | metaphorical         | Integrate                 | examination            |
|                         |                     |                    | meaning              | Explain the               | Apply the theory       |
|                         |                     |                    | Follow the           | reasons                   | to a new field"        |

When Table 3 is examined, it is seen that the levels of the solo taxonomy contain different and many indicator verbs. These indicator verbs are a distinguishing feature of the Solo taxonomy compared to other taxonomies. The distribution of these indicator verbs to the four levels where learning takes place makes it very easy to classify measurement and evaluation questions and to reveal the levels of individuals.

When reviewing the literature, studies are found that examine learning outcomes in relation to the Solo Taxonomy within the context of social studies courses, both globally and specifically in Türkiye. In these studies, not only are the learning outcomes analyzed but also the examination of textbooks has been addressed (Gezer & İlhan, 2014; Gezer & İlhan, 2015; Bursa, 2022; Korkmaz & Ünsal, 2017; Caniglia & Meadows, 2018; Brabrand & Dahl, 2009; Dönmez & Zorluoğlu, 2020; Ağçam & Babanoğlu, 2018; Alsaadi, 2001; Doğan, 2020; Leung, 2000; Putri, Mardiyana & Saputro, 2017; Kusmaryono, Suyitno, Dwijanto & Dwidayati, 2018; Mahmood, Ali & Hussain, 2014; Silwana, Subanji, Manyunu & Rashahan, 2021; Öner, 2022; Gövercin & Filiz, 2022; Acar & Peker,

2023; Polat, Bilen & Kayacan, 2022; Göçer & Kurt, 2016; Bağdat & Anapa-Saban, 2014; Yenilmez & Kağnıcı, 2023; İlhan & Gezer, 2017). This study aims to analyse the epistemic levels of assessment and measurement questions in social studies textbooks used in Türkiye during the 2024-2025 academic year, using the SOLO taxonomy as a framework. Previous studies have examined social studies and the SOLO taxonomy, with a primary focus on the previous curriculum and textbooks. With the introduction of a new curriculum, the development of textbooks aligned with it, and the shift to a new approach, there is a need to evaluate the assessment and measurement questions in these textbooks using the SOLO taxonomy. In this way, this new approach, which has just been implemented, can be comprehensively evaluated, and feedback can be provided. In addition to all this, “Learning to learn” involves learners reflecting on the strengths and weaknesses of their own thinking during the learning process and making thoughtful decisions about their next steps. Students of all ages can use Solo taxonomy levels, rubrics, and frameworks to guide their thinking by answering these key questions: *What am I learning?, How is it going? Moreover, what should I do next?* (Biggs, J. 1987). Additionally, the lack of any studies in the literature regarding the textbooks created under this new approach highlights the importance of this study. In line with this goal, the following questions have been addressed.

1. How are the assessment and evaluation questions in the Social Studies Textbooks for Grades 4-7 shaped according to the SOLO taxonomy?
2. How are the epistemic levels and distributions of the measurement and assessment questions in the grade “4th Grade Social Studies textbook” according to the SOLO taxonomy?
3. How are the epistemic levels and distributions of the measurement t and assessment questions in the grade “5th Grade Social Studies textbook” according to the SOLO taxonomy?
4. How are the epistemic levels and distributions of the measurement and assessment questions in the grade “6th Grade Social Studies textbook” according to the SOLO taxonomy?
5. How are the epistemic levels and distributions of the measurement and assessment questions in the grade “7th Grade Social Studies textbook” according to the SOLO taxonomy?

## Method

In this study, document analysis—a qualitative research method—was employed. The “Social Studies textbooks” for grades 4, 5, 6, and 7, obtained from the Educational Information Network (EBA), were analysed through document analysis. The analysis of written texts containing information about events and phenomena relevant to the research is referred to as document analysis (Patton, 1990, pp. 5-7). Additionally, in qualitative research, document analysis can be used as the sole data collection method or combined with other data collection methods to diversify the approach.

## Data Source

The research dataset comprises four textbooks used in elementary and middle schools by the “Ministry of National Education” during the 2024-2025 academic year: “4th Grade Social Studies Textbook, 5th Grade Social Studies Textbook, 6th Grade Social Studies Textbook, and 7th Grade

Social Studies Textbook.” Detailed information about the textbooks is presented in Table 4.

**Table 4** General information on social studies textbooks (2024-2025 Ministry of National Education)

| Name Of The Textbook                | Author/Authors                                                                                                                                                   | Editor/Editors                                                                                               | Publisher          |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------|
| “4th Grade Social Studies Textbook” | “Tolgahan Ayantaş”                                                                                                                                               | “Özcan KARACA”                                                                                               | “Hecce Publishing” |
| “5th Grade Social Studies Textbook” | “Cemal Gökhan Ol”<br>“Faruk Gökalp Yılmaz”<br>“Hilal Demirezer”<br>“Mehtap Polat”<br>“Murat Akpınar”<br>“Ömer Evin”<br>“Turan Sinan Çelebi”<br>“Yasemin Yabansu” | “Associate Professor Fatma TORUN”<br>“Associate Professor İbrahim TURAN”<br>“Asst. Prof. Üyesi Hamide KILIÇ” | “State Library”    |
| “6th Grade Social Studies Textbook” | “Cengiz YILDIRIM”<br>“Fatih KAPLAN”<br>“Hayriye KURU”<br>“Mukaddes YILMAZ”                                                                                       | “Prof. Dr. Süleyman ELMACI”<br>“Asst. Prof. Murat Bayram YILAR”                                              | “State Library”    |
| “7th Grade Social Studies Textbook” | “Öznur AÇIL”<br>“Hülya GÜVENÇ”<br>“Ayşegül HAYTA”<br>“Sezcan KILIÇ”                                                                                              | “Associate Professor Erol KOÇOĞLU”                                                                           | “State Library”    |

When Table 4 is examined, general information about 4th to 7th-grade social studies textbooks is provided. While three of the books were published as state books, one was published by a private publisher. While there are editors in all books, only the 4th grade social studies textbook was created with a single author.

### Collection and analysis

The four Social Studies textbooks (fourth and seventh) that make up the sample group of the research were obtained in PDF format from the digital education and teaching platform “Eğitim Bilişim Ağı [Educational Information Network] (EBA),” created by the Ministry of National Education, Türkiye. In this study, the measurement and assessment questions in the textbooks used in elementary and middle schools for the 2024-2025 academic year were examined. The questions related to measurement and assessment were classified according to the SOLO taxonomy levels. Accordingly, the questions were categorised into four levels of the SOLO taxonomy: “Un-istructural, Multistructural, Relational Structure, and Extended Abstract” levels. The first level of the Solo taxonomy, “Prestructural,” was excluded from the study because no learning occurs at this level. The data obtained in this study were analysed using a descriptive analysis method. Descriptive research is a method used to identify and describe the characteristics of a population or a specific phenomenon. It helps researchers recognise patterns within a group’s traits and provides a comprehensive understanding of what is happening, though it does not explain why it is happening.

### Reliability

There are many definitions of reliability in the literature. Reliability is defined as the ability to repeat an activity under similar conditions with the same individuals in order to measure a specific characteristic (Crocker & Algina, 1986, p. 124). In addition, reliability is also related to situations where a single coder codes a specific document at different time intervals or when multiple coders code the same document similarly (Lune & Berg, 2017, p. 106). For this purpose, the measurement and assessment questions in the “4th-7th grade Social Studies textbooks”

were coded and grouped twice by the researcher, with an interval of four months, according to the Solo taxonomy. The consistency between the codings and groupings made at different times was taken into account, and discrepancies in levels were resolved through consultation with three program development experts and two measurement and assessment experts. The agreed-upon levels were grouped by grade level, presented with the aid of graphs, and the reliability of the research was ensured.

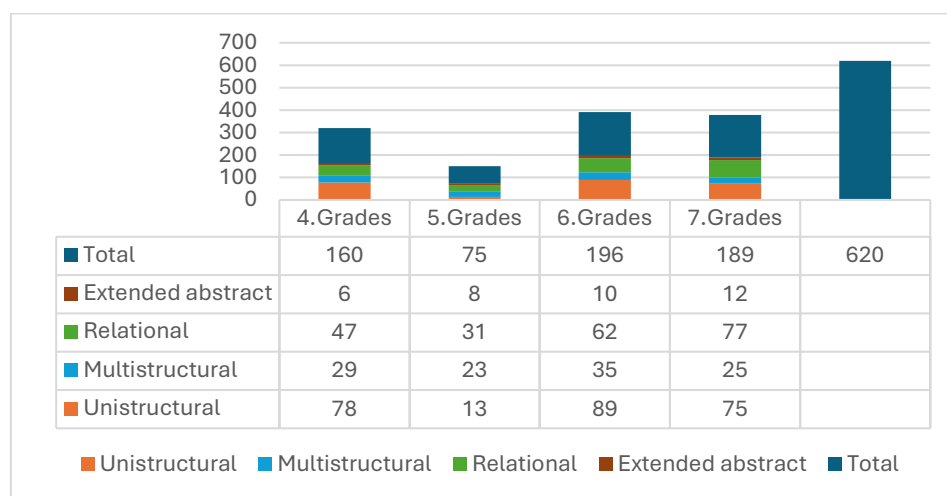
## Findings

This section presents the findings obtained from the research. First, the general distribution of the measurement and assessment questions in the “4th-7th grade Social Studies textbooks” is outlined. Then, each grade level is addressed individually to provide a specific perspective on the textbooks.

### The SOLO taxonomy levels and distribution of measurement and assessment questions in “4<sup>th</sup>-7<sup>th</sup> Grade Social Studies Textbooks”

The first research question is framed as follows: “How are the SOLO taxonomy levels and distributions of measurement and assessment questions in 4th-7th grade Social Studies textbooks?” The findings obtained from this question are presented in Graph 1.

**Graph 1** SOLO Taxonomy levels and distribution of measurement and assessment questions in grade 4-7 social studies textbooks



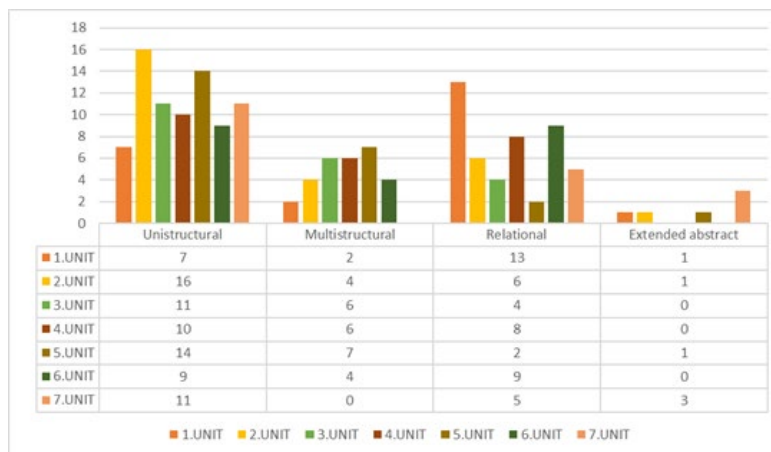
Graph 1 presents the SOLO taxonomy levels and distributions of the measurement and assessment questions in the “4th-7th grade social studies textbooks.” There are a total of 620 questions in the 4th- to 7th-grade social studies books. Of these questions, 255 belong to the “Unistructural” level, 112 to the “Multistructural” level, 217 to the “Relational” level, and 36 to the “Extended Abstract” level. When examined by grade level, the “4th grade social studies textbook” contains 78 “Unistructural”, 29 “Multistructural”, 47 “Relational”, and 6 “Extended Abstract” level questions. The 5th-grade textbook contains 13 “Unistructural”, 23 “Multistructural”, 31 “Relational”, and 8 “Extended Abstract” level questions. The 6th-grade textbook contains 89 “Unistructural,” 35 “Multistructural,” 62 “Relational,” and 10 “Extended Abstract” level questions. Finally, the 7th-grade textbook contains 75 “Unistructural,” 25 “Multistructural,” 77 “Relational,” and 12 “Extended Abstract” level questions. When all grade levels are examined, it is observed that there is no balanced distribution of Solo taxonomy levels.

At the 4th grade level, the most frequent questions are at the “Unistructural” levels; at the 5th grade, they are at the “Relational” level; at the 6th grade, they are again at the “Unistructural” level; and at the 7th grade, they are at the “Relational” level. However, the “Extended Abstract” level is the least represented Solo taxonomy level at all grade levels. While the “Extended Abstract” level increases as the grade level rises, it can be said that the increase is limited.

#### SOLO Taxonomy Levels and Distribution of Measurement and Assessment Questions in the “4th Grade Social Studies Textbook”

The second research question is framed as follows: “How are the epistemic levels and distributions of the measurement and assessment questions in the 4th-grade Social Studies textbook according to the SOLO taxonomy?” The findings derived from this question are presented in Graph 2.

**Graph 2** SOLO taxonomy levels and distribution of measurement and assessment questions in 4th-grade social studies textbooks



Graph 2 presents the levels and distributions of the measurement and assessment questions in the 4th-grade Social Studies textbook according to the SOLO taxonomy. The book includes a total of 160 measurement and assessment questions. Of these, 78 are at the “Unistructural” level, 29 at the “Multistructural” level, 47 at the “Relational” level, and six at the “Extended Abstract” level. A significant portion of the measurement and assessment questions in the textbook are created at the “Unistructural” and “Relational” levels. The “Multistructural” level is relatively less represented compared to the other two levels, while there is very little coverage of questions at the “Extended Abstract” level. According to the SOLO taxonomy, it is important to include measurement and assessment questions related to structures that assess learning at each level. However, although the first three levels, “Unistructural,” “Multistructural,” and “Relational,” are relatively more emphasised in the “4th grade textbook,” there is very little coverage of questions that correspond to the “Extended Abstract” level. The “Extended Abstract” level, which involves higher epistemic abilities, is included at an acceptable level considering the age and developmental stage of 4th-grade students.

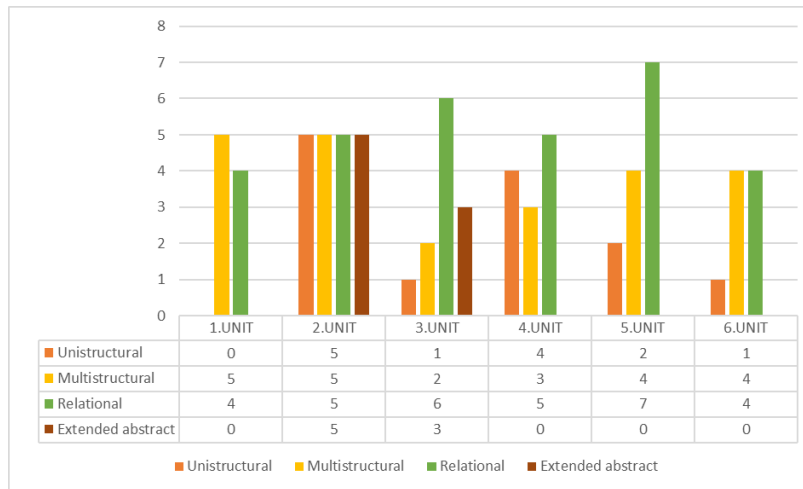
#### SOLO taxonomy levels and distribution of measurement and assessment questions in the “5<sup>th</sup> Grade Social Studies Textbook”

The third research question is framed as: “How are the epistemic levels and distributions of the measurement and assessment questions in the 5th-grade Social Studies textbook according to



the SOLO taxonomy?” The findings from this question are presented in Graph 3.

**Graph 3** SOLO taxonomy levels and distribution of measurement and assessment questions in 5th-grade social studies textbooks

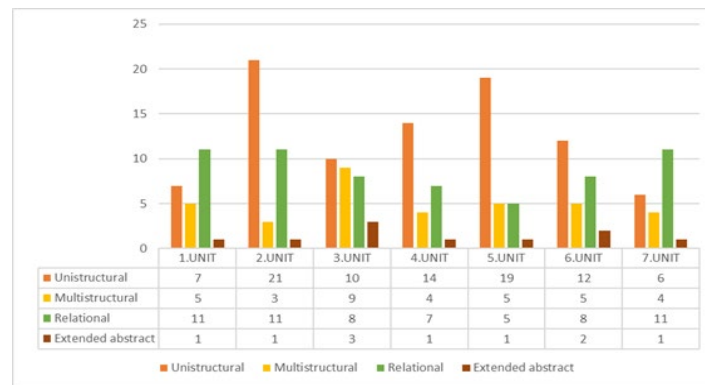


Graph 3 presents the levels and distributions of the measurement and assessment questions in the 5th-grade Social Studies textbook according to the SOLO taxonomy. The book contains a total of 75 measurement and assessment questions. Of these, 13 correspond to the “Unistructural” level, 23 to the “Multistructural” level, 31 to the “Relational” level, and 8 to the “Extended Abstract” level. A significant portion of the questions in the textbook is found to correspond to the “Multistructural” and “Relational” levels. On the other hand, the “Unistructural” and “Extended Abstract” levels are less represented. Compared to other grades, the “5th grade Social Studies textbook” contains fewer measurement and assessment questions. This is due to the new system implemented in Türkiye as of 2024, called the “Türkiye Yüzyılı Maarif Modeli” (Türkiye Century Education Model). This model, which is more skills-based, is being gradually applied at the 1st, 5th, and 9th grade levels, necessitating a different approach in shaping the “5th grade Social Studies textbook.” Considering that individuals are at a developmental stage and about to transition to middle school, it is expected that more measurement and assessment questions corresponding to the “Relational” and “Extended Abstract” levels should be included in the textbook. This is because the 5th grade is seen as a stepping stone for higher-level epistemic processes and is considered a pivotal point in academic life.

### SOLO taxonomy levels and distribution of measurement and assessment questions in the “6<sup>th</sup> Grade Social Studies Textbook”

The fourth research question is shaped as “How are the epistemic levels and distributions of the measurement and assessment questions in the 6th-grade Social Studies textbook according to the SOLO taxonomy?” The findings obtained from this question are presented in Graph 4.

**Graph 4** SOLO taxonomy levels and distribution of measurement and assessment questions in 6th-grade social studies textbooks

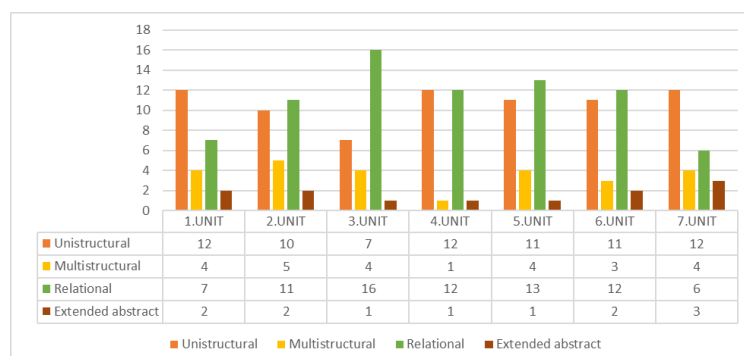


Graph 4 presents the levels and distributions of the measurement and assessment questions in the “6th-grade Social Studies textbook” according to the SOLO Taxonomy. The book includes a total of 196 measurement and assessment questions. Of these, 89 are classified as “Unistructural,” 35 as “Multistructural,” 62 as “Relational,” and 10 as “Extended Abstract” levels. It was found that a significant portion of the questions in the textbook are at the “Unistructural” and “Relational” levels. Measurement and assessment questions at the “Multistructural” and “Extended Abstract” levels are comparatively less represented. Measurement and assessment questions at the “Unistructural” level are considered important for providing prior knowledge and advancing learning to a higher epistemic level. This is because the first level of the SOLO Taxonomy forms a foundation for prior learning and contributes to higher epistemic learning. Although there is no balanced distribution in the “6th grade textbook,” the inclusion of measurement and assessment questions at the “Unistructural” level, which supports prior learning, and at the “Relational” level, which fosters higher epistemic learning, is expected to contribute to individuals' academic life and provide a basis for important learning as they transition to higher grades.

### SOLO taxonomy levels and distribution of measurement and assessment questions in the “7<sup>th</sup> Grade Social Studies Textbook”

The fifth research problem sentence is shaped by the question: “How are the epistemic level and distributions of the measurement and assessment questions in the 7th-grade Social Studies textbook according to the SOLO taxonomy?” The findings derived from this question are presented in Graph 5.

**Graph 5** SOLO taxonomy levels and distribution of measurement and assessment questions in 7th-grade social studies textbooks



Graph 5 shows the epistemic levels and distributions of the measurement and assessment questions in the “7th-grade Social Studies textbook” according to the SOLO Taxonomy. The book includes a total of 189 measurement and assessment questions. Of these, 75 are at the “Unistructural” level, 25 are at the “Multistructural” level, 77 are at the “Relational” level, and 12 are at the “Extended Abstract” level. It has been determined that a significant portion of the questions in the textbook are at the “Unistructural” and “Relational” levels. The questions at the “Multistructural” and “Extended Abstract” levels are relatively less prevalent. Compared to other grade levels, the “7th-grade Social Studies textbook” includes more measurement and assessment questions, and a general framework for higher-order epistemic assessment is evident. Given the age and developmental level of students in the 7th-grade, more measurement and assessment tools appropriate to the “Relational” and “Extended Abstract” levels of the SOLO Taxonomy, which represent higher epistemic levels, should be included. However, the presence of questions at the “Relational” level is significantly greater than that at the “Extended Abstract” level, thus shaping the 7th-grade textbook. However, considering the grade and developmental level, it is necessary to reduce the number of questions at the “Unistructural” level and replace this reduction with questions at the “Extended Abstract” level. Otherwise, it will hinder students' development and lead to a deviation from the educational objectives. Based on these results, the following recommendations can be made: sources such as textbooks, which are readily available to everyone and present learning situations, should maintain high epistemic levels in their measurement and assessment questions. It is recommended that committees preparing and overseeing these materials structure their processes with this consideration in mind. Moreover, starting in 2024, Türkiye has felt the need to integrate skill-based teaching into both its programs and textbooks, thereby redesigning its national education system in this direction. Therefore, numerous aspects need to be explored, and elements that constitute the fundamental components of textbooks, such as measurement and assessment situations, should be examined using different taxonomies.

## Conclusion, discussion, and recommendations

The purpose of this study is to identify the epistemic levels of the measurement and assessment questions in the “Social Studies textbooks for grades 4-7” used in Türkiye during the 2024-2025 academic year, according to the SOLO Taxonomy.

According to the findings related to the first problem of the study, it has been determined that there are a total of 620 measurement and assessment questions in the “Social Studies textbooks for grades 4-7.” When these questions are evaluated according to the levels of SOLO Taxonomy, it is observed that the majority of them are suitable for the “Unistructural” level. In contrast, the fewest questions are suitable for the “Extended Abstract” level. On average, the “Multistructural” and “Relational” levels are more prominent. This shows that in the 4th-grade level, most of the measurement and assessment questions are suitable for the “Unistructural” level, in the 5th-grade level, they are mostly suitable for the “Relational” level, in the 6th-grade level, they are mostly suitable for the “Unistructural” level, and in the 7th-grade level, most of the questions are suitable for the “Relational” level. In the studies conducted by Gezer and İlhan (2015), it was determined that the learning outcomes at the 4th and 5th-grade levels were generally appropriate for the “Multistructural” and “Unistructural” levels, while the learning outcomes at the 6th and 7th-grade levels were appropriate for the “Relational” and “Extended Abstract” levels. Since the 5th grade represents a critical period in the academic life of students, with the transition to middle

school, the measurement and assessment questions for this level must align with higher-order epistemic skills to meet the goals of the “Türkiye Century Education Model.” According to Göçer and Kurt (2016), it can be quite difficult for individuals to establish relationships and apply acquired skills without prior knowledge. Moreover, to enable individuals to apply the knowledge they have learned in different areas, make generalisations from concrete information, and produce original ideas, they must first master the basic concepts (Gezer & İlhan, 2014). Dönmez and Zorluoğlu (2020) found that of the 187 learning outcomes they analysed, 31% were at the “Unistructural” level, 19% at the “Multistructural” level, 29% at the “Relational” level, and 21% at the “Extended Abstract” level. According to Anderson and Krathwohl (2001), for learning and teaching activities to be effective, the learning outcomes should be distributed homogeneously. As the grade level increases, materials suitable for the corresponding epistemic level should be used. As can be seen, a linear relationship exists between grade level and SOLO taxonomy, and studies in the literature support and contradict these findings. Regarding the second problem of the study, the measurement and assessment questions in the “4th-grade Social Studies textbook” were evaluated according to SOLO Taxonomy. Out of the 75 questions, the highest number of questions were found to be suitable for the “Relational” level, while the fewest questions were suitable for the “Extended Abstract” level. There are studies in the literature that support and contradict these results. According to Hartman (1998), higher-order epistemic levels in learning and teaching are significant because they directly affect the application of knowledge by individuals. Considering the developmental characteristics of the grade and age group, it has been determined that the measurement and assessment questions in the 4th-grade textbook are relatively well-distributed and structured in a way that will assist future learning. In the study by Gezer and İlhan (2014), it was found that the 4th-grade level contains the highest number of measurement and assessment questions suitable for the “Unistructural” level, followed by “Multistructural”, “Relational”, and “Extended Abstract” levels. For the third problem of the study, the measurement and assessment questions in the “5th-grade Social Studies textbook” were evaluated according to SOLO Taxonomy. Out of the 75 questions, the most were found to be suitable for the “Relational” level, while the fewest were suitable for the “Extended Abstract” level. In the study by Gezer and İlhan (2014), it was found that 433 questions at the 5th-grade level were mostly at the same level, with only 32 questions distributed across different levels. Additionally, when comparing the measurement and assessment questions for the 5th grade with the learning outcomes, it was concluded that there was a compatibility with the SOLO Taxonomy levels. According to Dönmez and Zorluoğlu (2020), the majority of the learning outcomes were appropriate for the “Relational” level. For the fourth problem of the study, the measurement and assessment questions in the “6th-grade Social Studies textbook” were evaluated according to SOLO Taxonomy. Out of the 196 questions, the most were suitable for the “Unistructural” level, while the fewest were suitable for the “Extended Abstract” level. In their study, Gezer and İlhan (2014) found that there were very few measurement and assessment questions at the “Extended Abstract” level in the 6th grade. According to Van Rossum & Schenk (1984), the learning outcomes at the “Unistructural” and “Multistructural” levels measure individuals’ basic knowledge of the topic. Göçer and Kurt (2016) stated that it is difficult for individuals to make connections and apply acquired skills without prior knowledge. Moreover, to apply learned knowledge to different fields, make generalisations from concrete facts, and produce original ideas, individuals need to have mastered basic concepts (Gezer & İlhan, 2014). For the fifth problem of the study, the measurement and assessment questions in the “7th-grade Social

Studies textbook” were evaluated according to SOLO Taxonomy. Out of the 189 questions, the most were found to be suitable for the “Relational” level, while the fewest were suitable for the “Extended Abstract” level. In the study by Gezer and İlhan (2014), it was found that at the 7th-grade level, there was a high number of “Unistructural” level questions, while the “Relational” level questions were relatively few. Dönmez and Zorluoğlu (2020) found that 31% of the questions were at the “Unistructural” level, 19% at the “Multistructural” level, 29% at the “Relational” level, and 21% at the “Extended Abstract” level. Additionally, the 7th-grade textbook contains a curriculum with an intensive focus on higher epistemic performance, especially in history and geography, which require critical thinking, but also include a substantial amount of rote memorisation.

## Statement of researchers

### Researchers' contribution rate statement

The authors declare that they have no conflicts of interest. The publication rights of this article have been transferred to the Pedagogical Perspective Journal.

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