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An Evaluation of the 2024 Geography Curriculum Learning Outcomes in Türkiye Based on the Revised Bloom's Taxonomy

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Abstract

This study aimed to analyze the learning outcomes in the Geography Curriculum developed under "the Century of Türkiye Education Model" introduced in 2024, using the Revised Bloom's Taxonomy as a framework The research was conducted using a case study design. The data were obtained from the website of the Board of Education and Discipline of the Ministry of National Education. A total of 76 learning outcomes from the geography curriculum were examined. The data were analyzed using descriptive analysis. The results showed that the learning outcomes in the curriculum predominantly focus on the conceptual knowledge level within the knowledge dimension. In the cognitive process dimension, the learning outcomes are largely focused on the evaluation level, while the learning outcomes at the creation level are notably limited. This finding indicates that although the curriculum provides opportunities to support analytical and critical thinking skills, it falls short in fostering creative thinking processes. Based on these findings, it is recommended that increasing the number of learning outcomes at the creation level could enhance students' creative problem-solving, innovative thinking, and ability to produce original works.

Keywords: Geography education, Geography curriculum, Revised Bloom's taxonomy, Learning outcomes, Cognitive process, Türkiye.

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Introduction

In education systems, learning outcomes serve as a fundamental roadmap, defining not only the knowledge and skills students are expected to acquire but also the levels at which these acquisitions should be achieved. Therefore, a comprehensive analysis of learning outcomes is crucial, not only for evaluating and enhancşng the effectiveness of curricula but also for conducting a needs analysis for further revisions (Allan, 1996; Eisner, 1979; Karabağ & Şahin, 2007; Kırkeser, 2021; King & Evans, 1991; Prøitz, 2010; Şahin, 2019; Yiğit Özüdoğru, 2024). In this context, Revised Bloom's Taxonomy (RBT) provides a robust framework for systematically evaluating learning outcomes (Airasian & Miranda, 2002; Anderson, 2002; Bennett, 2001; Krathwohl, 2002). This taxonomy helps analyze both the types of knowledge students are expected to acquire and the ways in which they process this knowledge. Previous studies in the national literature have revealed that learning outcomes of earlier curricula (such as the 2005 and 2018 curricula for social studies, science, history, Turkish, physics, chemistry, biology, and mathematics) generally focused on lower-order cognitive processes and fell short in addressing higher-order processes (Avcı et al., 2021; Büyükalan-Filiz & Yıldırım, 2019; Çerçi, 2018; Çolak & Demircioğlu, 2010; Eke, 2018; Erol, 2021; Güldüren & Cangüven, 2020; Kuzu et al., 2019; Zorluoğlu et al., 2017). Similarly, studies examining the learning outcomes of geography curricula (Gülersoy, 2007; İlhan & Gülersoy, 2019a; 2019b; Kaya & Aladağ, 2023; Sözcü & Aydınözü, 2019) have reported comparable results, underscoring the need for efforts to enhance the effectiveness of the curricula. In this context, the present study aims to analyze the learning outcomes in the 2024 Geography Curriculum (GC), implemented by the Ministry of National Education (MoNE) starting in the 2024–2025 academic year, through the lens of RBT. To this end, the study seeks to answer the following research question: *What is the distribution of the learning outcomes in the 2024 GC across grades (9th, 10th, 11th, and 12th) in terms of the knowledge and cognitive process dimensions of the taxonomy?* By evaluating the extent to which the 2024 GC addresses students' cognitive and knowledge-based needs, this study aims to propose recommendations for improving the quality of education. As the first study to examine the learning outcomes of the 2024 GC, this study is expected to make significant contributions to literature and educational policies, providing valuable insights for future curriculum revision processes.

The 2024 Geography Curriculum: Learning Outcomes and Components

The Century of Türkiye Education Model (CTEM) is a holistic framework composed of the fundamental approach of the curriculum, the student profile, the Virtue-Value-Action Framework, and the skills framework (MoNE, 2024b, p. 4). The GC is structured based on this model. Learning outcomes in the curricula are defined as knowledge, skills, attitudes, or competencies that students are expected to acquire by the end of a course (MoNE, 2024b, p. 5). According to CTEM, learning outcomes are derived from subject-specific skills or conceptual skills associated with the content knowledge of the unit (MoNE, 2024b, p. 5). The scope of the learning outcomes is provided under the heading "Content Framework". The relationship of learning outcomes with other curriculum components is presented in the section titled "Learning-Teaching Experiences" (MoNE 2024b, p. 6). These components include tendencies, social-emotional learning skills, values, literacy skills, and interdisciplinary relations. Additionally, interdisciplinary relations are included in relation to the content of the learning outcomes.

The key component "interdisciplinary relations," refers to the interaction and cooperation between different disciplines, i.e., subjects. The aim of interdisciplinary relations is to enhance students' ability to make connections across subjects, develop multiple perspectives, and solve complex problems (MoNE, 2024a, p. 59). Within this context, the curriculum establishes connections among different disciplines that students have encountered, may encounter in the future, or that align with their grade levels. According to CTEM, interdisciplinary relations are not directly associated with learning outcomes (MoNE, 2024a, p. 59). Instead, the curriculum expects teachers to establish interdisciplinary relations that are suitable for the content of each unit. Subject-specific skills encompass conceptual skills and/or integrated skills specific to each discipline, including the process components of these skills (MoNE, 2024a, p. 24). Conceptual skills refer to basic skills acquired and observed without requiring a complex process, as well as integrated and higher-order thinking skills that are products of mental activities used to transform abstract ideas and complex processes into actions (MoNE, 2024a, p. 14). The content framework provides a basis for the acquisition of skills and combines with skills to form learning outcomes by answering the question "What should the student know?". Within this context, the content framework refers to generalizations, principles, key concepts, and symbols that are significant to a specific discipline (MoNE, 2024a, p. 49). A new element introduced in the 2024 GC is dispositions, which refer to the mental patterns that explain how individuals use their skills when necessary, in line with elements such as intention, sensitivity, willingness, and evaluation (MoNE, 2024a, p. 20).

Social-emotional learning skills represent individuals' abilities to manage the processes of understanding and learning through sensory perceptions during social interactions. These skills are recognized as a set of competencies designed to support students' success in school and out-of-school life (MoNE, 2024a, p. 51). Literacy skills refer to the ability to understand, evaluate, interpret, and, when necessary, recreate information, messages, and texts of various types (Sever, 2022). In the 2024 GC, literacy skills are addressed implicitly rather than being explicitly emphasized in the learning outcomes. Literacy types identified within the framework of the curricula are introduced through a holistic spiral model starting from early childhood education. The 2024 GC learning outcomes are structured based on these components, and they are developed by integrating the body of knowledge of each unit with the relevant subject-specific skills or conceptual skills (MoNE, 2024b, p. 5).

The learning outcomes in the curriculum are designed using a process-based approach, aiming to evaluate students' holistic development and progress qualitatively and quantitatively throughout the learning process (MoNE, 2024a, p. 49). The 2024 GC includes a total of 76 learning outcomes: 19 outcomes in the 9th grade, 18 outcomes in the 10th grade, 19 outcomes in the 11th grade, and 20 outcomes in the 12th grade (based on a 4-hour program in the 11th and 12th grades) (MoNE, 2024b). The numerical codes assigned to the learning outcomes indicate the unit number corresponding to each grade level (Figure 1).

The learning outcomes are defined with clear and measurable process components, specifying what students are expected to achieve or perform during a particular learning process. In this context, analyzing the learning outcomes within a structured framework is considered essential for effectively planning and implementing teaching processes. Against this background, this study aims to analyze the 2024 GC learning outcomes to support teachers in planning the teaching-learning process more effectively, selecting appropriate instructional methods

aligned with the learning outcomes, and conducting assessment and evaluation processes.

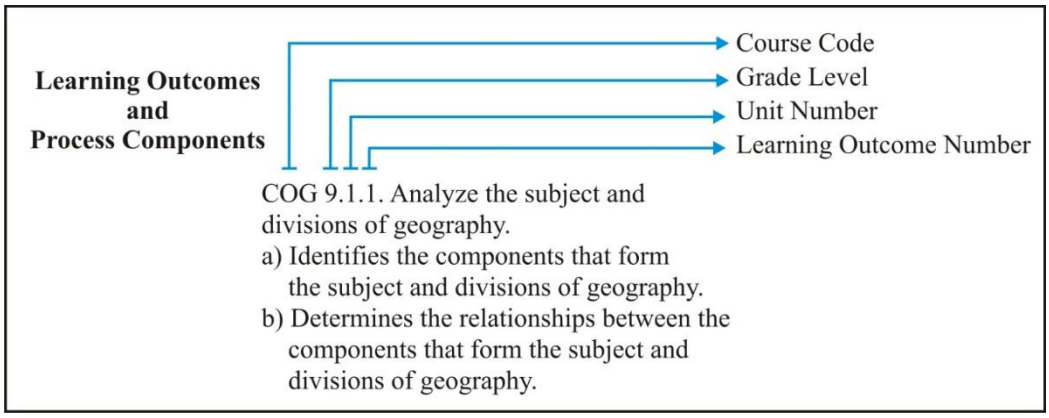

Figure 1: Geography Learning Outcomes

Revised Bloom's Taxonomy

Bloom's Taxonomy, which classifies educational objectives within the cognitive domain, was developed by Benjamin S. Bloom in 1956 and has provided an essential framework for organizing learning in the cognitive domain (Arı, 2011; 2013; Bloom, 1956; Bümen, 2006). In 1995, Lorin W. Anderson, a former student of Bloom, assembled a working group to adapt the cognitive domain taxonomy to address the needs of 21st-century students and teachers. This group included experts from diverse fields, such as cognitive psychologists (e.g., Mayer, Pintrich, and Wittrock), curriculum and instruction specialists (e.g., Anderson, Cruikshank, and Raths), and assessment and evaluation experts (e.g., Airasian and Krathwohl) (Özdemir et al., 2015). The result of this collaboration was the Revised Bloom's Taxonomy (RBT), which classifies learning objectives into two interrelated dimensions: the knowledge dimension and the cognitive process dimension. These dimensions are not independent of each other; any cognitive process inherently requires the application of a category within the knowledge dimension (Anderson et al., 2001; Krathwohl, 2002).

The knowledge dimension involves the elements necessary for acquiring knowledge or solving problems within a discipline. It represents the types of content students need to acquire during the learning process, essentially answering the question "What does the student know?" (Demirel, 2014). This dimension is used to make learning objectives more specific and determine how different types of knowledge contribute to the educational process. The knowledge dimension consists of four main categories: factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge. Factual knowledge includes the fundamental terminology and specific details within discipline. Conceptual knowledge refers to understanding the relationships between core elements and how these relationships operate within a broader framework. The subcategories of conceptual knowledge include knowledge of classifications and categories, principles and generalizations, and theories, models, and structures. Procedural knowledge pertains to knowing how to perform a task and understanding methods and procedures, and it includes knowledge of discipline-specific techniques and methods, as well as the criteria for determining when to apply appropriate procedures. Metacognitive knowledge involves an individual's awareness of their own cognitive processes and cognitive processes in general. This type of knowledge includes

subcategories such as strategic knowledge, knowledge about cognitive tasks, and self-knowledge (Anderson et al., 2001; Bümen, 2006; Krathwohl, 2002).

The cognitive process dimension focuses on how learning occurs, addressing the question "How do students think?" (Demirel, 2014). This dimension is used to understand how students acquire knowledge and analyze how they process it. The cognitive process dimension consists of six main categories: remembering, understanding, applying, analyzing, evaluating, and creating. Remembering refers to retrieving relevant knowledge from long-term memory. Understanding involves the process of determining and explaining the meaning of messages. The sub-processes such as interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining fall under the understanding category. Applying refers to using a learned procedure in a specific situation. Analyzing involves breaking down a phenomenon, event, or concept into its components and identifying the relationships among those parts. This process includes sub-processes such as differentiating, organizing, and attributing. Evaluating involves making judgments based on criteria and standards and includes sub-processes such as checking and critiquing. Creating refers to generating a new product or integrating elements into a cohesive structure. The sub-processes of this dimension include planning and producing (Anderson et al., 2001; Bümen, 2006; Krathwohl, 2002). These categories are organized hierarchically, progressing from simple to complex and concrete to abstract (Anderson et al., 2001). The first three categories, i.e., remembering, understanding, and applying are considered lower-order cognitive processes, while the latter three, i.e., analyzing, evaluating, and creating are regarded as higher-order cognitive processes (Crowe et al., 2008).

RBT has enabled a broader perspective in analyzing learning outcomes, driving a significant transformation in education (Köğce et al., 2009). This approach has been proven to be a powerful tool for defining learning outcomes more clearly and precisely, enriching learning experiences, and enhancing the effectiveness of assessment processes (Anderson, 2002; Airasian & Miranda, 2002; Bennett, 2001; Krathwohl, 2002). Numerous studies have utilized RBT to analyze learning objectives across various disciplines (Avcı et al., 2021; Büyükalan-Filiz & Yıldırım, 2019; Çerçi, 2018; Çolak & Demircioğlu, 2010; Eke, 2018; Güldüren & Cangüven, 2020). Additionally, the literature includes research that examines the 2018 GC using the RBT framework (İlhan & Gülersoy, 2019a; 2019b; Sözcü & Aydınözü, 2019). The analysis of the 2024 GC learning outcomes is expected to contribute to the literature on earlier curriculum analyses and provide an opportunity to evaluate the continuity of learning objectives. Furthermore, a comparative analysis of GCs from different years within the RBT framework will offer insights into how curriculum updates have been reflected in instructional goals.

Method

The research was conducted using a case study design, one of the qualitative research methods, and the data were obtained from the website of the Board of Education and Discipline of MoNE. The dataset consisted of 76 learning outcomes included in the 2024 GC published by the Board of Education and Discipline. Descriptive analysis was used to analyze the data. In this process, the learning outcomes and curriculum components of the 2024 GC were examined in detail (Appendix 1). Each learning outcome was analyzed by placing it into the two-dimensional matrix structure of RBT, which includes the knowledge and cognitive process dimensions. During the analysis,

the level of each learning outcome was determined based on the intersection of the categories in the knowledge dimension (factual, conceptual, procedural, and metacognitive knowledge) and the cognitive process dimension (remembering, understanding, applying, analyzing, evaluating, and creating). Validity and reliability are critical in ensuring trustworthiness and accuracy of findings in qualitative research (Guba & Lincoln, 1994). To ensure reliability, several measures were taken during the research process. The researcher listed all learning outcomes and curriculum components in an Excel file and conducted simultaneous analyses to maintain consistency. During the preliminary analysis, the 9th-grade learning outcomes were shared with a geography education expert who had participated in the curriculum preparation committee. Two researchers independently analyzed the learning outcomes, and their results were later compared and evaluated. Subsequently, the findings were presented to two faculty members specializing in RBT for further review. A form prepared by the researcher was used to collect expert feedback, categorizing the results as *"acceptable," "unacceptable,"* or *"requires revision."* The level of agreement between the experts was calculated using the formula proposed by Miles and Huberman (1994) [Reliability = Agreement / (Agreement + Disagreement) x 100]. The reliability score was calculated as 148 / (148 + 4) x 100 = 97%, indicating a high level of reliability. The four points of disagreement were reviewed, and consensus was reached on all of them. Following the second round of expert feedback, adjustments were made to certain classifications: the 9th-grade learning outcomes initially categorized at the evaluation level were reassigned to the analysis level, and the 11th-grade learning outcomes initially classified under procedural knowledge were reassigned to conceptual knowledge.

Results

The results obtained from the analysis of the 9th-grade GC learning outcomes according to RBT are presented in Table 1.

Table 1. Distribution of 9th-Grade Learning Outcomes According to RBT

The Knowledge Dimension	**The Cognitive Process Dimension**						
	Remember	Understand	Apply	Analyze	Evaluate	Create	**Total (%)**
Factual Knowledge	-	-	-	-	-	-	-
Conceptual Knowledge	9.1.3, 9.6.2	9.2.2, 9.3.4	-	9.1.1, 9.1.2 9.2.3, 9.3.1 9.3.2, 9.6.1	9.4.1, 9.4.3 9.4.4, 9.5.1 9.6.3, 9.7.1	-	**15 (78.95)**
Procedural Knowledge	-	-	9.2.1, 9.3.3	9.4.2	-	-	**4 (21.05)**
Metacognitive Knowledge	-	-	-	-	-	-	-
Total (%)	**2 (10.53)**	**2 (10.53)**	**2 (10.53)**	**7 (36.84)**	**6 (31.58)**	**-**	**19 (100)**

Table 1 shows that the 9th-grade geography learning outcomes are primarily concentrated at the conceptual knowledge level (78.95%, n = 15) within the knowledge dimension, whereas procedural knowledge (21.05%, n = 4) is represented to a lesser extent. In the cognitive process dimension, the outcomes are mainly distributed across

the analyzing (36.84%, n = 7) and evaluating (31.58%, n = 6) levels. In contrast, remembering, understanding, and applying levels are equally represented (10.53%, n = 2). These results suggest that conceptual knowledge and the analyzing level are emphasized in the 9th-grade learning outcomes. The results obtained from the analysis of the 10th-grade GC learning outcomes according to RBT are presented in Table 2.

Table 2. Distribution of 10th-Grade Learning Outcomes According to RBT

The Knowledge Dimension	**The Cognitive Process Dimension**						
	Remember	Understand	Apply	Analyze	Evaluate	Create	**Total (%)**
Factual Knowledge	-	10.2.1, 10.7.1.	-	-	-	-	**2 (11.1)**
Conceptual Knowledge	-	10.1.1, 10.4.2 10.5.1, 10.5.2	-	10.3.1, 10.3.3 10.6.2.	10.3.5, 10.4.1	10.6.4	**10 (52.63)**
Procedural Knowledge	-	-	10.2.2,10.3.4 10.5.3		10.6.1.	-	**4 (22.22)**
Metacognitive Knowledge	-	-	-	--		10.3.2,10.6.3	**2(11.1)**
Total (%)	**-**	**6 (33.33)**	**3 (16.67)**	**3 (16.67)**	**3(16.67)**	**3(16.67)**	**18(100)**

Table 2 presents that the 10th-grade geography learning outcomes are predominantly concentrated at the conceptual knowledge level (52.63%, n = 10) within the knowledge dimension, while procedural knowledge (22.22%, n = 4) and factual knowledge (11.11%, n = 2) are represented to a lesser extent. In the cognitive process dimension, the learning outcomes are mainly distributed at the understanding level (33.33%, n = 6), while the other levels (applying, analyzing, and creating) are equally represented (16.67%, n = 3). These results suggest that conceptual knowledge and the understanding process are prioritized in the 10th-grade learning outcomes. The results obtained from the analysis of the 11th-grade GC learning outcomes according to RBT are presented in Table 3.

Table 3. Distribution of 11th-Grade Learning Outcomes According to RBT

The Knowledge Dimension	**The Cognitive Process Dimension**						
	Remember	Understand	Apply	Analyze	Evaluate	Create	**Total (%)**
Factual Knowledge	-	-	-	-	-	-	-
Conceptual Knowledge	-	11.3.1, 11.5.4 11.7.2, 11.7.3 11.7.5	-	11.4.1	11.3.2, 11.4.2 11.5.1, 11.5.2 11.5.3, 11.5.5, 11.6.3, 11.7.1	-	**14 (73.68)**
Procedural Knowledge	-	11.2.1	-	-	11.6.2	11.7.4	**3 (15.79)**
Metacognitive Knowledge	-	-	-	-	-	11.6.1, 11.1.1	**2 (10.53)**
Total (%)	**-**	**6 (31.58)**	**-**	**1 (5.26)**	**9 (47.37)**	**3 (15.79)**	**19 (100)**

As seen in Table 3, within the knowledge dimension, the 11th-grade geography learning outcomes are largely focused on the conceptual knowledge level (73.68%, n = 14), while procedural knowledge accounts for 15.79% (n = 3). In the cognitive process dimension, a significant proportion of the learning outcomes, 47.37% (n = 9), are concentrated at the evaluating level, while the creating (15.79%, n=3) and analyzing (5.26%, n=1) levels are less represented. These results highlight that conceptual knowledge and the evaluating level are the main focus in the 11th-grade geography learning outcomes. The results obtained from the analysis of the 12th-grade GC learning outcomes according to RBT are presented in Table 4.

Table 4. Distribution of 12th-Grade Learning Outcomes According to RBT

	The Cognitive Process Dimension						
The Knowledge Dimension	Remember	Understand	Apply	Analyze	Evaluate	Create	**Total (%)**
Factual Knowledge	-	-	-	-	-	-	-
Conceptual Knowledge	-	12.3.3,12.5.1 12.6.2,12.6.3 12.7.2	-	12.5.2, 12.7.3, 12.7.3,12.7.4	12.1.1,12.3.2 12.4.1,12.5.3 12.6.1,12.6.4, 12.7.1		**16(84.21)**
Procedural Knowledge	-	-	12.2.1.	-	-	-	**1 (5.26)**
Metacognitive Knowledge	-	-	-	-	-	12.3.1,12.6.5 12.6.6	**3(15.79)**
Total (%)	**-**	**5(26.32)**	**1 (5.26)**	**4 (21.05)**	**7 (36.84)**	**3 (15.79)**	**20 (100)**

As seen in Table 4, within the knowledge dimension, the 12th-grade geography learning outcomes are mainly concentrated at the conceptual knowledge level (84.21%, n = 16), while procedural knowledge is represented to a minimal extent (5.26%, n = 1). In the cognitive process dimension, the outcomes are predominantly distributed across the evaluating (36.84%, n = 7) and understanding (26.32%, n = 5) levels. The analyzing level represents 21.05% (n=4), while the applying level (5.26%, n = 1) and the creating level (15.79%, n = 3) are represented at lower percentages. These results suggest that conceptual understanding and evaluating are the main focus in the 12th-grade geography learning outcomes.

Discussion

This study aimed to evaluate the learning outcomes of the 2024 GC (9th, 10th, 11th, and 12th grades) using RBT as a framework. The findings provided insights into the distribution of the curriculum learning outcomes across the knowledge and cognitive process dimensions. The analysis results showed that the learning outcomes at all four grade levels are predominantly concentrated at the conceptual knowledge level (72.37%). The conceptual knowledge level was found to be 78.95% for the 9th grade, 52.63% for the 10th grade, 73.68% for the 11th grade, and 84.21% for the 12th grade. The dominance of conceptual knowledge at each grade level in the 2024 GCC indicates that the curriculum aims to equip students with the fundamental building blocks of geography discipline. This approach can be considered an important indicator for students to develop a deep understanding of geography

discipline, grasp the relationships between fundamental concepts, and interpret this knowledge holistically. Similarly, studies analyzing the learning outcomes of the 2018 GC within the framework of RBT (İlhan & Gülersoy, 2019a; 2019b) also highlighted the prevalence of conceptual knowledge in the curriculum. These findings suggest that this focus on conceptual knowledge in the 2018 and 2024 GC learning outcomes reflects the continuity of an approach that centers on conceptual knowledge in geography education.

In the learning outcomes, procedural knowledge follows the knowledge dimension, but the proportion of learning outcomes at the procedural knowledge level within the total learning outcomes is relatively low (15.79%). By grade, the proportion of procedural knowledge was 21.05% in the 9th grade, 22.22% in the 10th grade, 15.79% in the 11th grade, and only 5.26% in the 12th grade. This limited focus on procedural knowledge may weaken the application-oriented aspects of geography education, potentially negatively affecting students' ability to understand, analyze, and generate solutions for geographical events. Another finding is that skills such as identifying cause-and-effect relationships of events, adapting specific methods to different situations, and understanding the practical aspects of the discipline seem to be not adequately supported in geography education. Moreover, the low representation of learning outcomes at the procedural knowledge level in the curriculum may limit students' ability to relate their theoretical knowledge of geographical events to practice and could present the risk of not fully developing the analytical thinking processes required by the discipline. Prior studies have emphasized that theoretical knowledge alone is insufficient for developing geographical skills (Arıkan & Baysan, 2024; Karakuş, 2009; Öcal, 2013; Önal & Güngördü, 2008; Seremet, 2024; Sezer, 2011).

It is believed that more learning outcomes aimed at developing procedural knowledge should be incorporated into the program. A notable observation is the absence of learning outcomes at the factual knowledge level, except for the 10th grade. Similar results were found in studies analyzing the learning outcomes of the 2018 GC according to the knowledge dimension (İlhan & Gülersoy, 2019a; Sözcü & Aydınözü, 2019). As mentioned in the literature review, the absence of factual knowledge concepts in the updated 2024 GC learning outcomes may be due to the approach adopted by the curriculum. In the 2024 GC, the main generalizations, principles, key concepts, and symbols related to the discipline (such as place names, and historical events) are provided in connection with the content framework (MoNE, 2024a, p. 74). This means that the sub-heading of key concepts in the curriculum includes geographical terms related to the discipline that students will learn in the unit. However, the lack of explicit articulation of this relationship in the 2024 GC and the absence of these concepts in the learning outcome statements make the evaluation in this study more complex. The results of this study show that in future revisions, the relationships between the learning outcomes and curriculum components should be explicitly written in the curriculum. On the other hand, it is believed that the preparation of curricula according to the principles of vertical coherence has led to the lower representation of concepts at the factual knowledge level in the learning outcomes. In the Turkish education system, geographical terms are typically taught to students through various subjects in primary and secondary schools (e.g., Life Science, Social Studies, and Turkish). Therefore, the low representation of factual knowledge terminology, reflecting the basic knowledge level, in the high school GC is a natural outcome. However, research has shown that high school students often lack sufficient knowledge of geographical concepts (Aladağ, 2016; Geçit, 2010; Kırkeser & Demiralp, 2019; Kızılçaoğlu, 2009; Turan, 2002). Therefore, learning outcomes at the factual knowledge level are essential for supporting conceptual knowledge and providing

students with a knowledge-based foundation (Bümen, 2006). The teaching process should be designed with this in mind, and the planning should be aligned with students' readiness levels.

Another notable finding is the absence of learning outcomes at the metacognitive knowledge level in the 2024 GC learning outcomes. As mentioned earlier, metacognitive knowledge is considered critical for students to develop their ability to plan, monitor, and evaluate their learning processes (Anderson, 2002). Learning outcomes based on metacognitive knowledge allow students to become aware of their own thinking processes, develop problem-solving strategies, and more effectively guide their learning. In this sense, the lack of learning outcomes at the metacognitive knowledge level in the GC may limit students' ability to develop deep learning and autonomous thinking skills (Cangüven & Avcı, 2022; Kaya & Aladağ, 2023; Yolcu, 2019; Zorluoğlu et al., 2017). The broader inclusion of learning outcomes based on metacognitive knowledge, especially at the high school level, is crucial for helping students cope with complex geographical problems and enhance their critical thinking skills. However, creating learning outcomes at this level is challenging. One of the main reasons for this difficulty is that metacognitive knowledge-based learning outcomes often rely on strategic knowledge and self-knowledge, making assessment and evaluation challenging. Due to this challenge, national exams in Türkiye predominantly focus on questions based on conceptual knowledge in the field of geography (Şanlı, 2021). Similarly, the curriculum prioritizes content aimed at equipping students with conceptual knowledge of geographical information. Another challenge is that the articulation of cognitive needs that vary according to context and situations requires both pedagogical knowledge and abstract thinking skills, which makes this process quite complex for curriculum developers. In this context, it is considered crucial for curriculum developers to make necessary revisions to the curriculum by collaborating more with geography educators and establishing long-term, comprehensive joint working environments.

According to the analysis results, in the cognitive process dimension, the 2024 GC learning outcomes across all four grade levels are predominantly concentrated at the evaluating level (34.21%). Considering the sub-dimensions of the evaluating level in RBT (e.g., judgment, evidence-based evaluation), these learning outcomes focus on developing students' analytical thinking and critical evaluation skills. As mentioned in the literature review, the low representation of learning outcomes at the remembering level in the 2024 GC further supports this argument, as it indicates that the curriculum prioritizes deeper thinking and analytical processes rather than rote memorization based on factual knowledge. In this context, it can be stated that the suggestions from previous studies on the GC (İlhan & Gülersoy, 2019a; 2019b; Sözcü & Aydınözü, 2019) have been taken into account in the revised program. Indeed, these studies identified that the learning outcomes of the 2018 curriculum were predominantly at the understanding level in terms of cognitive processes. The low representation of learning outcomes at the creating level in the 2024 GC, however, limits the development of students' higher-order thinking skills. Prior studies have highlighted that curricula often have significant gaps in fostering creative thinking (Çolak & Demircioğlu, 2010; Güldüren & Cangüven, 2020; Kuzu et al., 2019; Zorluoğlu et al., 2017). These gaps suggest that teaching processes limit the potential for developing students' creative thinking skills and that these skills are not sufficiently supported within the education system. Considering that high school education represents a pivotal stage in the transition to higher education, students' potential for transforming knowledge, generating innovative ideas, and developing original projects must be more strongly supported through revised curricula. In addition,

increasing the learning outcomes at the creating level in curricula is crucial for fostering skills such as analysis, synthesis, evaluation, innovative thinking, and problem-solving. In this regard, future adjustments are expected to contribute to students' acquisition of 21st-century skills. The inclusion of "differentiation and enrichment" elements in the 2024 GC learning and teaching experiences is intended to offer an inclusive educational environment by considering students' abilities, interests, and profiles. The goal is to offer students opportunities to engage in original cognitive processes through project and performance tasks (MoNE, 2024a, 13). These components added to the curriculum are believed to support students' creative thinking skills. However, the lack of clear expression of learning outcomes related to creative thinking in the context of cognitive processes in the 2024 GC complicates the evaluation process in this study. Despite being included in the learning outcomes, the connections made with inter-curriculum components (such as social-emotional learning skills and literacy skills) suggest that the goal of developing higher-order thinking skills in students is a complex process for both practitioners and researchers. These findings suggest that curricula need to be redesigned considering these challenges and should be supported with concrete examples and tools to guide practitioners.

There are also differences in the distribution of the 2024 GC learning outcomes by grade level in the cognitive process dimension. For the 9th grade, 36.84% of the learning outcomes are concentrated at the analyzing level. In contrast, the learning outcomes at the understanding, remembering, and applying levels are limited to 10.53%, with no learning outcomes included at the creating level for this grade. This distribution indicates that analytical thinking skills are prioritized in the 9th grade. In the 10th-grade learning outcomes, the understanding level (33.33%) emerges as the most highly represented cognitive process. These learning outcomes predominantly support students in deepening their comprehension and enhancing their ability to assign meaning to knowledge. Additionally, the 10th-grade learning outcomes show an equal distribution across the applying, analyzing, evaluating, and creating levels (16.67%), highlighting an emphasis on developing students' problem-solving and analytical thinking skills. In the 11th grade, the concentration of learning outcomes at the evaluating (47.37%) and creating (15.79%) levels reflects an approach that aims to encourage students to engage with knowledge more deeply and evaluate it from a critical perspective. For the 12th grade, the representation of learning outcomes at the evaluating (36.84%) and creating (15.79%) levels continues this trend of prioritizing the development of higher-order thinking skills. These proportions indicate an approach that supports students in critically engaging with knowledge, deepening their evaluation processes, and generating creative solutions. However, the differences in the 2024 GC learning outcomes across grades in the cognitive process dimension are believed to stem from the diversity of topics in each grade, as well as the variety of skills (such as conceptual skills, subject-specific skills, and tendencies) associated with these learning outcomes. This suggests that each grade is designed with a specific learning objective in mind, and therefore, the learning outcomes are aligned with different cognitive processes unique to each grade.

Conclusion and Recommendations

The results of the research revealed that the learning outcomes are predominantly concentrated at the conceptual knowledge level in the knowledge dimension and at the evaluating level in the cognitive process dimension. The prominence of conceptual knowledge suggests that the 2024 GC aims to equip students with the fundamental

concepts of geography discipline and the relationships between them. The emphasis on the evaluating level in the cognitive process dimension presents a significant opportunity for students to develop their analytical thinking and critical judgment skills. However, it is expected that increasing the learning outcomes that promote creative thinking processes in the curriculum will support students in developing innovative problem-solving and creative thinking skills. It is believed that these improvements in learning outcomes will be beneficial for both students and teachers in the effective implementation of the curriculum. This study did not examine components such as subject-specific skills, conceptual skills, and other elements in the unit design (teaching practices, content framework, etc.) associated with the creation of the 2024 GC learning outcomes. Future research may consider conducting more detailed and comprehensive analyses to examine these associations. Additionally, it is important to increase in-service training opportunities for teachers to effectively help students achieve the learning outcomes outlined in the curriculum.

Limitations

In this study, the 2024 GC learning outcomes were analyzed from the perspective of RBT. Only the learning outcome statements included in the 2024 GC were considered in the study. The reason is that learning outcomes are frequently preferred as a criterion for evaluating the educational effectiveness of curricula (Anderson, 2002; Brady, 1997; Burke, 1995; Bümen, 2006; Capper & Jamison, 1993; Prøitz, 2010). However, the common text of CTEM states that the learning outcomes of the 2024 GC are aligned with the curriculum components (such as subject-specific skills, conceptual skills, tendencies, and content framework) during their preparation. However, the theoretical foundations and specific associations between these components and the learning outcomes are not elaborated in detail within the CTEM text or the curriculum document. Within this framework, the researcher comprehensively examined the curriculum components to view the educational objectives holistically in the analysis of learning outcomes according to RBT. However, an analysis based on associations was not conducted in the study. The scope of the research was limited to the 2024 GC learning outcome statements.

Author(s)' Statements on Ethics and Conflict of Interest

***Ethics Statement*:** In this study, all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were not taken. This study does not involve qualitative or quantitative data collection methods that require ethics committee approval, such as surveys, interviews, focus groups, observations, experiments, or similar techniques. Therefore, obtaining approval from an ethics committee does not apply to this research.

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Appendix 1. Analysis Process

<table>
<tr><td colspan="2">GCC Learning Outcomes and Process Components
COG.9.3.3. Ability to create tables, graphs, figures, and/or diagrams using climate data from places with different climate types in Türkiye and around the world.

a) Determines the purpose of the table, graph, figure, and/or diagram to be created using climate data from places with different climate types in Türkiye and around the world.
b) Identifies the tools and equipment required for creating the table, graph, figure, and/or diagram based on the type of climate data from places with different climate types in Türkiye and around the world.
c) Collects climate data from places with different climate types in Türkiye and around the world.
ç) Classifies the climate data from places with different climate types in Türkiye and around the world.
d) Visualizes the climate data from places with different climate types in Türkiye and around the world in the form of tables, graphs, figures, and/or diagrams.
e) Uses the table, graph, figure, and/or diagram visualized with the climate data from places with different climate types in Türkiye and around the world for its intended purpose. (MoNE, 2024b)</td></tr>
<tr><td rowspan="8">Program Components</td><td>Unit 3: Natural Systems and Processes</td></tr>
<tr><td>SUBJECT-SPECIFIC SKILLS: Table, graph, figure, and/or diagram</td></tr>
<tr><td>CONCEPTUAL SKILLS: Analysis, observation-based prediction</td></tr>
<tr><td>DISPOSITIONS: Pursuit of truth</td></tr>
<tr><td>INTER-CURRICULUM COMPONENTS
Social-Emotional Learning: Self-regulation skills
Values: Diligence
Literacy Skills: Data literacy</td></tr>
<tr><td>INTERDISCIPLINARY RELATIONS: Climate, environment and innovative solutions, astronomy and space sciences, physics</td></tr>
<tr><td>INTER-SKILL RELATIONS: Critical thinking, working with data and data-driven decision-making, scientific observation-based prediction, scientific data-driven prediction, scientific inference, perceiving time and chronological thinking, evidence-based inquiry and research, mapping.</td></tr>
<tr><td>CONTENT FRAMEWORK
Weather Events and Their Effects on Daily Life
Components and Variables of the Climate System
Climate Types
Changes in the Climate System
Key Concepts:
Extreme weather events, atmosphere, pressure, biodiversity, biosphere, maritime influence, rotation and revolution, ecosystem, axial tilt, geoid, sunshine duration, folk calendar, hydrosphere, climate, climate system, continentality, urban heat island, cryosphere, global climate change, lithosphere, season, humidity, ocean currents, wind, temperature, topographic factors, precipitation.</td></tr>
<tr><td>LEARNING-TEACHING EXPERIENCES
Basic Assumptions: It is assumed that students can distinguish between weather events and climate, are knowledgeable about the factors affecting weather and climate, and are aware of the importance of climate in the interaction between humans and the environment.

Learning-Teaching Practices:

To examine the climate types in Türkiye and around the world, tables, graphs, figures, and/or diagrams to be created are identified. A checklist outlining the steps for setting goals and managing the process of creating geographic representations can be provided to students. The necessary geographic representations (such as climate maps, tables, graphs, etc.) are identified to compare temperature and precipitation data across different climate types. In this regard, climate data is collected from places with different climate characteristics in Türkiye and around the world. The collected climate data is classified according to its purpose and the intended inferences and is made ready for use. Based on the organized climate data, temperature and precipitation graphs for the respective regions are created and visualized. Using the created visuals, the climate types observed in different regions of Türkiye and the world are examined. In this regard, digital globes can also be utilized to draw inferences. Checklists for the study are reviewed, and feedback regarding the results of the review can be provided to the students.</td></tr>
</table>

RBT Analysis

Analysis of Learning Outcomes According to RBT Dimensions

Knowledge Dimension: Procedural Knowledge

The analysis of climate data included in the learning outcome and its transformation into tables or graphs requires knowledge of the software and tools used for data processing, as well as the selection of types of graphs (bar, line, pie charts), which involves procedural knowledge. Therefore, the learning outcome in the knowledge dimension is at the procedural knowledge level.

Cognitive Process Dimension: Application

The learning outcome involves the ability to prepare tables, graphs, figures, and/or diagrams, requiring students to create a representational tool using climate data. Because students are expected to follow a given procedure or method to produce the outcome, the learning outcome is at the applying level in the cognitive process dimension.

The Cognitive Process Dimension

The Knowledge Dimension	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge						
Conceptual Knowledge			**X**			
Procedural Knowledge						
Metacognitive Knowledge						