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Evaluation of the 9th Grade Mathematics Curriculum According to Eisner's Expertise-Based Evaluation Model

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Abstract

The aim of this study is to evaluate the 9th-grade mathematics curriculum developed within the framework of the 2024 Türkiye Century Education Model according to Eisner's Educational Criticism Model. In line with the purpose of the study, the phenomenon under investigation was examined in depth and within its real-life context. In this context, the study was conducted using a case study methodology. As for the pattern, a nested singleton pattern has been used. Since data were collected from two different units of analysis within a single case, an embedded single-case design was employed. The study group consisted of 20 mathematics teachers and 10 mathematics education experts selected through criterion sampling. Data were collected using semi-structured interview forms developed separately for teachers and experts by the researchers. The data were analyzed using content analysis. The findings revealed that both teachers and experts perceived the 9th-grade mathematics curriculum as being grounded in a contemporary, student-centered, and constructivist educational perspective. The curriculum's emphasis on fostering mathematical literacy, problem-solving, reasoning, and higher-order thinking skills was identified as one of its major strengths. However, several contextual factors, including students' prior knowledge and readiness levels, differences among school types, large class sizes, limited instructional time, and the centralized examination system, were reported as challenges that may hinder the effective implementation of the curriculum.

1. Introduction

Education systems continuously update themselves in response to the expectations of individuals, society, and the demands of the contemporary world. Rapid changes and transformations in today's world necessitate the revision of existing curricula and the development of new educational programs. Following such innovations, curriculum evaluation is conducted to obtain feedback regarding the extent to which the intended outcomes have been achieved.

Curriculum evaluation is the process of making judgments about a program by examining its adequacy, appropriateness, efficiency, effectiveness, success, and feasibility through the use of scientific data collection and analysis methods (Uşun, 2016). Similarly, curriculum evaluation can be defined as the process of determining criteria and standards to be used in decision-making about a program and assessing the extent to which the program meets those criteria and standards (Worthen et al., 2004). As emphasized in these definitions, curriculum evaluation is a systematic process through which decisions are reached based on predetermined criteria and scientific methods.

Curriculum evaluation ensures the cyclical nature of educational programs by guiding their design, implementation, and revision stages (Stufflebeam & Shinkfield, 2007). In this way, both the strengths and areas requiring improvement are identified, allowing programs to be evaluated not only in terms

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of outcomes but also as ongoing processes (Klenowski, 2010). Furthermore, curriculum evaluation promotes accountability and transparency in education by providing evidence for policymakers and curriculum development specialists (Rossi et al., 2003). By generating feedback on educational programs, curriculum evaluation contributes to their continuous improvement and sustainability.

Curriculum evaluation may vary depending on how the curriculum under consideration is conceptualized. For example, if a curriculum is viewed as a syllabus, content, or written document, evaluation focuses on the extent to which the intended principles, values, or objectives are reflected in that document. If it is perceived as students' educational experiences, the focus shifts to the learning experiences provided to students. Similarly, when a curriculum is viewed in terms of goal attainment, evaluation examines the extent to which the intended objectives have been achieved by learners (Posner, 2004). Consequently, a variety of curriculum evaluation models have emerged.

Ornstein and Hunkins (2016) classify curriculum evaluation models into two broad categories: scientific–factual models and humanistic–naturalistic models. Scientific–factual models focus primarily on program objectives, measurement instruments, and student performance, whereas humanistic–naturalistic models also seek to understand the underlying causes of student performance and other educational outcomes. One of the humanistic–naturalistic approaches is Eisner's Educational Connoisseurship and Criticism Model.

Developed by Elliot Eisner, the Educational Connoisseurship and Criticism Model argues that evaluations based solely on objective measurement of predetermined goals provide only a limited understanding of educational quality. Therefore, the model emphasizes qualitative evaluation and focuses on educational processes, school experiences, classroom interactions, and the overall quality of education (Eisner, 1985). By highlighting the concepts of educational connoisseurship and criticism, Eisner emphasized the importance of describing educational programs as rich and meaningful educational experiences (Özdemir, 2009). He viewed educational programs as works of art and argued that evaluators should function similarly to art critics. Accordingly, evaluators are expected to possess the expertise necessary to recognize subtle qualities and distinctions within educational programs that may be overlooked by ordinary observers (Donmoyer, 2014). By emphasizing classroom and school experiences, the Educational Connoisseurship and Criticism Model positions evaluators in the role of educational critics and draws upon their knowledge, experience, and diverse perspectives. This expert perspective contributes to the validity, credibility, quality, and effectiveness of the evaluation process.

Eisner's evaluation model consists of four stages: description, interpretation, evaluation, and thematics. In the description stage, information related to the classroom environment, curriculum, stakeholders, and other relevant aspects is collected and presented through detailed descriptions (Ata Özer & Bal, 2024). In the second stage, interpretation, the meanings and underlying reasons of the information and observed events identified in the previous stage are examined (Çokyaman & Ünal, 2025). The third stage, evaluation, involves making judgments about the curriculum based not only on the findings obtained from the description and interpretation stages but also on the evaluator's professional knowledge and expert judgment (Demirel, 2017). The fourth and final stage, thematics, involves identifying and articulating the themes, generalizations, principles, and insights that emerge from the previous three stages (Flinders & Eisner, 2000). Conducting an evaluation in accordance with the steps of the model will contribute to improving the quality of educational services and ensuring their sustainability (Abbak et al., 2025).

Unlike earlier technical and quantitatively oriented evaluation paradigms, Eisner (2002) conceptualized evaluation as a humanistic-naturalistic and qualitatively oriented process. The use of qualitative methods in evaluation enables researchers to obtain in-depth information from stakeholders and to reveal the complete story of a curriculum (Sunay & Taşgın, 2020). Eisner argued that evaluation requires educational connoisseurship and criticism, suggesting that evaluators should draw on more than raw data and observable outcomes during the evaluation process. Such an approach allows newly implemented curricula to be examined in a rich, in-depth, and qualitative manner (Orhan Karsak, 2018). Curriculum evaluation studies are important for designing or

improving more functional curricula, as the findings obtained reveal the extent to which curricula achieve their intended objectives, as well as their effects on teaching and students (Aydan & Sarıdemir, 2025).

Mathematics education aims to develop learners' ability to make logical inferences, establish relationships among concepts, and systematically organize and interpret knowledge (İnan, 2006). To achieve these goals, students are expected to possess competencies such as conceptual understanding, procedural fluency, analysis, problem solving, and reasoning (Findell et al., 2001). Understanding the effectiveness of a subject such as mathematics, which encompasses abstract concepts, multidimensional structures, and higher-order cognitive skills, requires a comprehensive evaluation approach similar to that proposed in Eisner's Educational Criticism Model.

Studies evaluating mathematics curricula through Eisner's Educational Criticism Model remain limited in the literature. Şen and Peker Ünal (2021) evaluated the 2018 middle school mathematics curriculum, Köse (2011) examined the 2005 primary school mathematics curriculum, Eyiol (2019) evaluated the middle school mathematics curriculum, and Ata Özer and Bal (2024) assessed the eighth-grade mathematics curriculum using Eisner's model. Given the absence of studies evaluating the ninth-grade mathematics curriculum through this framework and considering the model's humanistic-naturalistic and comprehensive evaluation perspective, the present study is expected to contribute to the literature by addressing this gap.

2. Method

2.1. Research Design

This study employed a qualitative case study design to evaluate the Ninth-Grade Mathematics Curriculum (G9MC), which was implemented in the 2024–2025 academic year, based on Eisner's Educational Criticism Model. Case studies are research designs that enable an in-depth examination of a bounded phenomenon within its real-life context and facilitate the development of a comprehensive understanding of that phenomenon (Merriam, 1998; Creswell & Poth, 2018).

In this study, G9MC was treated as a single case; however, multiple units of analysis within this case were examined. When a single case contains different embedded units of analysis that are investigated separately, the design is considered an embedded single-case study (Yıldırım & Şimşek, 2021). In the present study, teachers and experts constituted the embedded units of analysis. Teachers' and experts' views regarding G9MC were analyzed separately, and themes and categories were developed for each unit of analysis to evaluate the curriculum from the perspectives of different stakeholders. The interpretation and evaluation of the findings were guided by Eisner's Educational Criticism Model.

2.2. Participants

Criterion sampling, one of the purposive sampling methods, was used to identify participants whose views would be sought regarding G9MC. Criterion sampling involves selecting individuals who meet predetermined criteria relevant to the purpose of the study (Yıldırım & Şimşek, 2021). The criteria used in this study were established by the researchers in accordance with the research objectives.

For teacher participants, the primary criterion was having taught ninth-grade mathematics for at least one academic year under the Ninth-Grade Mathematics Curriculum introduced in the 2024–2025 academic year. The purpose of this criterion was to obtain comprehensive data regarding curriculum implementation from teachers who had directly experienced the curriculum in practice.

For expert participants, the criteria included holding a doctoral degree in mathematics education and serving as a faculty member in the field of mathematics education at a higher education institution. These criteria were established to obtain expert evaluations regarding the theoretical structure and implementation potential of the curriculum.

The study included a total of 20 mathematics teachers, consisting of 8 females (40%) and 12 males (60%). Regarding professional experience, 13 teachers (65%) had 11–20 years of teaching experience, 4 (20%) had 21–30 years, and 3 (15%) had 31 years or more. In terms of workplace

location, 12 teachers (60%) were employed in provincial centers, whereas 8 (40%) worked in district centers. Regarding educational qualifications, 11 teachers (55%) held a bachelor's degree and 9 (45%) held a graduate degree.

The expert group consisted of 10 participants, including 4 females (40%) and 6 males (60%). In terms of professional experience, 2 experts (20%) had 11–15 years of experience, 4 (40%) had 16–20 years, 3 (30%) had 21–25 years, and 1 (10%) had 26 years or more. Regarding academic rank, 2 participants (20%) held the title of Doctor, 3 (30%) were Assistant Professors, 3 (30%) were Associate Professors, and 2 (20%) were Full Professors.

2.3. Data Collection Instruments

Semi-structured interview forms were used to obtain the views of teachers and experts. In developing the teacher and expert interview forms, the purpose of the study, the relevant literature, and the principles of semi-structured interview form development were taken into consideration (Yıldırım & Şimşek, 2021). Accordingly, draft interview forms were initially prepared and submitted for expert review to ensure content validity.

In this process, the opinions of six academics were sought, including one specialist in qualitative research, four specialists in curriculum and instruction, and one specialist in Turkish education. Based on the feedback received from these experts, the necessary revisions were made to the interview forms. Specifically, one additional question was included in the expert interview form, and the wording of several questions was revised.

Subsequently, pilot interviews were conducted with three teachers and two experts to assess the clarity and functionality of the interview forms. The pilot implementation indicated that the questions were understandable and did not contain any statements that could be interpreted in substantially different ways by participants.

In its final form, the teacher interview form consisted of 10 questions, including four demographic questions (gender, professional experience, workplace location, and educational background) and six questions related to curriculum evaluation. The expert interview form consisted of eight questions, including three demographic questions (gender, professional experience, and academic title) and five questions related to curriculum evaluation.

2.4. Data Collection Process

Semi-structured interview forms were used to determine teachers' and experts' views regarding G9MC. The interview forms were prepared using Google Forms, and access links were shared with the participants. The data collection process was conducted online to enable participants to express their views in a detailed and in-depth manner without time and location constraints. In addition, a considerable number of participants indicated that they could provide more comprehensive responses in a written format than in face-to-face interviews. For this reason, data were collected through Google Forms. The data collection process was carried out in May 2026 and lasted approximately one month.

2.5. Data Analysis

The data obtained from teachers' and experts' views were analyzed using content analysis. Content analysis is a systematic analytical technique that aims to identify patterns of meaning within data and organize them into themes, categories, and codes according to specific procedures (Büyüköztürk et al., 2020). The primary purpose of content analysis is to identify concepts that explain the collected data and to reveal the relationships among these concepts (Yıldırım & Şimşek, 2021).

In this study, the written responses obtained from teachers and experts were first examined in detail. Subsequently, the data were divided into meaningful units and coded, with each unit being assigned a descriptive code that reflected its content. In the next stage, codes sharing similar characteristics were grouped into categories. These categories were then organized under broader themes based on their common features. In the final stage of the analysis, the themes, categories, and codes were reviewed

and refined by examining the representativeness of the codes and their consistency with the categories and themes. The themes, categories, codes, and frequency values obtained from the analysis are presented in tabular form in the findings section.

To protect participants' confidentiality, their real names were not used. Teachers were assigned codes ranging from T1 to T20, while experts were assigned codes ranging from E1 to E10. These codes were also used when presenting direct quotations in order to reflect participants' views accurately while maintaining anonymity.

2.6. Validity and Reliability of the Study

Several measures were taken to enhance the validity and reliability of the study. First, during the development of the semi-structured interview forms used as data collection instruments, expert opinions were sought to ensure content validity. Based on the feedback received from experts, the necessary revisions were made to the interview forms, after which a pilot study was conducted with three teachers and two experts. The pilot implementation indicated that the questions were clear, understandable, and aligned with the purpose of the study.

Only teachers and experts who met the predetermined criteria and voluntarily agreed to participate were included in the study. Prior to data collection, participants were informed about the purpose of the research and were invited to share their views voluntarily. In addition, participants were assured that their identities would remain confidential, thereby creating an environment in which they could express their opinions freely.

To enhance the credibility of the findings, direct quotations from teachers' and experts' responses were included in the findings section. To protect confidentiality, teachers were identified using the codes T1–T20 and experts using the codes E1–E10.

To ensure reliability, the data were analyzed independently by two researchers. The coding schemes and categories developed by the researchers were compared, and intercoder agreement was calculated using the formula proposed by Miles and Huberman (1994):

$$\text{Reliability} = \text{Agreement} / (\text{Agreement} + \text{Disagreement}) \times 100$$

The analysis yielded an agreement rate of 94% for the coding of teacher responses and 96% for the coding of expert responses. Subsequently, the researchers met to discuss the codes and categories on which disagreements existed, and consensus was reached following the necessary revisions.

3. Findings

The views of teachers and experts regarding the Ninth-Grade Mathematics Curriculum (G9MC) were examined based on Eisner's Educational Criticism Model. In addition to the dimensions of description, interpretation, evaluation, and thematics included in Eisner's model, a recommendations dimension was incorporated into the analysis of both stakeholder groups.

3.1. Teachers' Views on G9MC

The findings obtained from teachers' views regarding G9MC are presented in this section.

3.1.1. Description

This subsection presents teachers' views regarding the content of G9MC, the resources and instructional materials used during its implementation, the teaching methods and techniques employed, and the problems and challenges encountered throughout the implementation process. Teachers' views concerning the content of G9MC are presented in Table 1.

An examination of Table 1 shows that mathematics teachers' views regarding the content of G9MC were concentrated around the dimensions of appropriateness for students, content organization, clarity and comprehensibility, and functionality.

Table 1

Teachers' Views on the Content of the G9MC

Content	*f*
Student Appropriateness	15
Not aligned with students' readiness levels	11
Addresses only specific student ability levels	1
Appropriate for students' level	1
Assessment questions are difficult	1
Includes fundamental mathematical skills	1
Content Organization	15
Lack of sequential progression	10
Overly dense content	2
Insufficient presentation of conceptual foundations	1
Presence of unnecessary repetitions	1
Spiral structure	1
Clarity and Comprehensibility	8
Lack of clarity and comprehensibility	7
Clear and comprehensible	1
Functionality	5
Content inconsistent with the nature of mathematics as a discipline	4
Insufficient connection to real-life contexts	1

With respect to appropriateness for students, teachers most frequently emphasized that the content was not aligned with students' readiness levels. In addition, some teachers stated that the curriculum addressed only certain student groups, that the assessment questions were overly difficult, or that the content was appropriate for students' levels.

Regarding content organization, teacher views largely focused on the lack of a gradual and sequential structure. Other issues raised by teachers included the excessive density of the content, insufficient presentation of conceptual foundations, unnecessary repetition, and the spiral structure of the curriculum.

In terms of clarity and comprehensibility, the majority of teachers indicated that the content was not clear or easily understandable. In contrast, one teacher stated that the curriculum content was clear and comprehensible.

With regard to functionality, teachers particularly noted the presence of content that they perceived as inconsistent with the nature of mathematics as a discipline. They also emphasized that the curriculum provided insufficient connections to everyday life. Sample quotations illustrating this theme are presented below.

T11 expressed that the content was not aligned with students' readiness levels and was overly dense, stating, *"It is not appropriate for students' readiness levels. Since the structuring component is excessively lengthy, students have difficulty identifying the generalizations they are expected to make. Even with students who possess an adequate background, implementation is difficult because of overcrowded classrooms."*

T1 indicated that the sequencing of topics lacked a coherent progression and that some concepts were introduced without sufficient conceptual foundations: *"The sequence of topics is not well designed. For example, while teaching functions, students encounter concepts such as domain and range without first understanding sets and relations. When teaching statistics, students are expected to make interpretations based on median and mean values by examining graphs, even though they have never been introduced to these concepts. Students are expected to evaluate according to criteria that have not yet been taught. We also encounter an artificial concept called a 'reference function,' which was never part of our own educational experience."*

T7 stated that the content lacked a sequential progression, included difficult assessment questions, provided insufficient connections to real-life contexts, and contained too many topics for the available instructional time: *"The topics are not cumulative in nature. Explanations are very superficial, while the assessment questions in the textbook are particularly difficult relative to the instruction provided. There is little connection to everyday life or prior knowledge. The content contains more verbal information than mathematical reasoning, departs from the traditional context of mathematics, and includes too many topics for the available instructional time."*

T14 expressed concerns about the clarity of the curriculum and the sequencing of topics, noting that the examples were not consistently aligned with students' levels: *"The curriculum lacks clarity. The examples are either far below or far above students' levels. The sequencing of topics also appears somewhat disorganized."*

T12 argued that the algorithm and computing unit was inconsistent with the nature of mathematics as a discipline and that its inclusion made the course more verbal in nature: *"The algorithm and computing unit should be taught as a separate course. We do not have sufficient expertise in this area. It is not closely related to mathematics and turns the course into something more like a verbal subject."*

Participants' views indicate that the curriculum has significant issues in terms of students' readiness levels, the sequencing of topics, prerequisite learning, content density, and alignment with the nature of mathematics. In particular, teachers emphasize that the content is disconnected from students' existing levels of knowledge and, at times, overly dense, making the learning process more difficult.

Teachers' views regarding the resources, instructional materials, methods, and techniques used during the teaching process are presented in Table 2.

Table 2

Teachers' Views on the Instructional Process of the Grade 9 G9MC

Resources, Materials, Methods, and Techniques Used	***f***
Resources and Materials	36
Official Digital Education Platforms	11
MEBI Platform	6
EBA	4
OGM Materials	1
Technology-Supported Instructional Tools	11
Interactive Whiteboard	8
GeoGebra Software	2
Graphing/Drawing Software	1
Printed Instructional Materials	14
Textbook	12
Notebook	1
Supplementary Resources	1
Teaching Methods and Techniques	18
Teacher-Centered Instructional Practices	12
Direct Instruction	6
Question-and-Answer Technique	5
Demonstration Method	1
Student-Centered Instructional Practices	4
Activity-Based Learning	2
Problem-Based Learning	1
Discovery Learning	1
Collaborative and Interactive Instructional Practices	2
Brainstorming	1
Group Work	1

An examination of Table 2 indicates that mathematics teachers' views regarding the instructional process of G9MC were concentrated around the dimensions of resource and material use, as well as teaching methods and techniques.

Within the resource and material dimension, the textbook emerged as the most frequently used printed instructional material. In addition, teachers reported using supplementary resources and student notebooks. Regarding official digital educational platforms, teachers most frequently used the MEBİ platform, while also benefiting from EBA and OGM Materials. In terms of instructional technologies, teachers reported making extensive use of interactive whiteboards, as well as GeoGebra and various drawing software applications during instruction.

With respect to teaching methods and techniques, teachers most commonly employed direct instruction and question-and-answer methods. They also reported using demonstration, activity-based instruction, problem-based learning, discovery learning, brainstorming, and group work. Sample quotations illustrating this theme are presented below.

T14 reported using the Ministry's textbook and the MEBİ platform as instructional resources, while employing direct instruction and demonstration methods: *"As instructional resources, I use the Ministry's textbook, questions that I prepare myself, and the MEBİ platform. I implement activities that are appropriate for students' levels and use direct instruction and demonstration methods."*

T12 indicated that technology-supported instructional tools, including the interactive whiteboard, GeoGebra, and drawing software, were used in the instructional process, together with direct instruction, question-and-answer activities, problem solving, and group work: *"I use the interactive whiteboard, GeoGebra, and other drawing software. We use direct instruction, problem solving, question-and-answer activities, and group work."*

T1 stated that the textbook was used as a primary instructional resource, with an emphasis on activities aimed at improving students' basic computational skills: *"I use the textbook. First, I try to allocate time to exercises that improve students' basic computational skills. Then, I try to implement the activities included in the textbook."*

T18 reported using brainstorming as an interactive instructional technique, guiding students toward conclusions through questions: *"I generally use the brainstorming technique. We reach conclusions through questions that guide students from the parts to the whole."*

Teachers, as expected, were found not to limit themselves to a single method during the teaching process; rather, they used different methods depending particularly on students' levels and the topics being taught. Efforts to ensure student participation, the use of technological materials, and collaborative and interaction-based practices all point to this.

Teachers' views regarding the problems and challenges encountered during the instructional process are presented in Table 3.

Table 3

Teachers' Views on Challenges and Difficulties Encountered During the Implementation of the Grade 9 Mathematics Curriculum

Challenges and Difficulties	***f***
Curriculum and Instructional Process-Related Issues	28
Misalignment between centralized examination requirements and curriculum objectives	7
Instruction implemented without a sequentially structured content progression	6
Lengthy activity procedures	5
Activity-centered structure leading to instructional fragmentation	4
Excessively time-consuming knowledge construction process	2
Content imposing excessive cognitive load	2
Content incompatible with teachers' competencies	2

Challenges and Difficulties	*f*
Student and Learning Process-Related Issues	7
Students' difficulties in understanding concepts	4
Differences in student achievement/readiness levels	2
Limited student participation	1
Implementation Conditions-Related Issues	9
Insufficient instructional time	6
Overcrowded classrooms	3

An examination of Table 3 indicates that mathematics teachers' views regarding the problems and challenges encountered during the implementation of G9MC were concentrated around three dimensions: curriculum and instructional process, student and learning process, and implementation conditions.

Within the curriculum and instructional process dimension, teachers most frequently emphasized the misalignment between the objectives of the curriculum and the requirements of centralized examinations, the lack of a gradual and sequential organization of the content, and the excessive length of activity procedures. Other important issues included instructional discontinuity resulting from the activity-centered structure, the lengthy nature of the structuring process, the cognitive load imposed by the content, and the incompatibility of certain content areas with teachers' professional competencies.

Within the student and learning process dimension, teachers most commonly reported that students experienced difficulties in understanding the topics. Differences in student readiness levels and limited student participation were also identified as significant challenges.

Regarding implementation conditions, insufficient instructional time emerged as the most frequently reported problem, while overcrowded classrooms were also considered to negatively affect the teaching process. Sample quotations illustrating this theme are presented below.

T8 emphasized that the mismatch between the objectives promoted by the curriculum and the expectations of centralized examinations hindered the implementation of the curriculum as intended, while also noting the learning difficulties associated with the density and abstract nature of some topics: "The density and abstract nature of some topics, combined with students' deficiencies in prerequisite knowledge, create learning difficulties. In addition, the expectation associated with mathematics in centralized examinations is that students achieve high scores and gain admission to a university. Students, school administrators, and parents all expect instruction to serve this purpose. However, there is a mismatch between what the curriculum promotes and what is required in centralized examinations. This prevents the curriculum from being implemented as intended."

T10 indicated that the instructional process did not always follow a sequential progression, with later stages of topics being introduced before the necessary foundational concepts had been taught: *"Later stages of a topic are introduced before the foundational concepts have been taught."*

T11 reported that the lengthy activity procedures placed considerable demands on instructional time, particularly because of the number of sections that needed to be completed: *"We open the textbook through EBA and try to help students discover concepts through the question-and-answer method. If time permits after completing the textbook activities, we also attempt to solve assessment questions from the MEBİ platform with students in the classroom. Unfortunately, the large number of sections that must be completed in the activities takes up a considerable amount of our time."*

T14 stated that the activity-centered structure could lead to fragmentation of the instructional process, as the content became obscured by activities and was sometimes presented too late or insufficiently: *"The instructional content gets lost among the activities. The fact that information is provided too little or too late creates discontinuity. We struggle greatly to maintain this balance."*

T2 emphasized that students experienced difficulties in understanding the concepts and that the activities were time-consuming: *"Students have difficulty understanding the topics. The activities are time-consuming."*

T20 highlighted insufficient instructional time and difficulties in implementing some activities and performance tasks, particularly in overcrowded classrooms: *"There is a shortage of time. Some parts are unnecessarily extended, and there is too much repetition, so we have to skip certain sections. Some performance tasks are not practical to implement, and they are difficult to carry out in classes of 35–40 students."*

According to teachers' views, there is a conflict between the approach envisioned by the curriculum and the conditions of classrooms and exam-oriented expectations. In addition, due to insufficient time, teachers have to skip or shorten some activities.

3.1.2. Interpretation

When teachers' views are examined holistically, it appears that the ninth-grade mathematics curriculum (G9MC) was designed in accordance with a constructivist approach to learning. Teachers positively evaluated several aspects of the curriculum, including its support for student-centered learning, its incorporation of content connected to everyday life, its emphasis on developing fundamental mathematical competencies, and its provision of discovery-based learning experiences. In particular, the activity-based structure, which places students' active participation at the center of the learning process, was considered to promote an understanding of learning that moves beyond rote memorization. Teachers also viewed the curriculum's compatibility with technology-supported instruction and the simplified presentation of certain topics as positive features.

At the same time, teachers' views indicate that the curriculum contains significant structural and pedagogical challenges during implementation. Teachers emphasized that the content structure does not adequately take students' readiness levels into account. Introducing advanced concepts before prerequisite knowledge has been fully developed makes it difficult for students to construct meaningful understanding, thereby creating discontinuities in mathematical learning. In particular, the lack of a gradual and sequential organization of content, together with expectations for higher-order cognitive skills before foundational concepts have been sufficiently established, was identified as a major concern.

Another issue highlighted by teachers concerns the curriculum's activity-based structure. Although the activities included in the curriculum are intended to support constructivist learning, teachers reported experiencing difficulties during implementation because activity procedures are often lengthy, activities are time-consuming, and an appropriate balance between activities and direct instruction is not always achieved. These challenges become particularly evident in overcrowded classrooms and in schools where there are substantial differences in students' readiness levels. Teachers further indicated that activity-based instructional practices may, in some cases, make it more difficult for students to recognize fundamental mathematical concepts and generalizations, thereby negatively affecting the overall coherence of the instructional process.

The findings also indicate that teachers have serious concerns regarding the applicability of the curriculum across different school types. Teachers stated that the current curriculum may be more functional in science high schools and among students with high academic achievement, whereas its implementation is considerably more challenging in vocational high schools and among students with lower levels of academic readiness. These views suggest that teachers believe the curriculum does not adequately account for individual and institutional differences across student populations. Accordingly, teachers indicated that differentiated curricula designed for different school types might be a more functional alternative.

Another issue highlighted in teachers' views concerns the perceived incompatibility of certain content areas with the nature of mathematics education. In particular, teachers reported that topics related to algorithms and computer science had not been fully internalized by mathematics teachers, that teacher competence in these areas was limited, and that such content transformed mathematics lessons into a

more verbally oriented subject. These findings suggest that teachers do not perceive some components of the curriculum as fully aligned with their subject-matter expertise or with the traditional structure of mathematics instruction.

Furthermore, teachers' views reveal that the support mechanisms associated with curriculum implementation are not sufficiently robust. Teachers reported that in-service support related to curriculum implementation was limited and that the underlying philosophy and practical applications of the curriculum had not been adequately explained. In particular, teachers indicated that they did not feel sufficiently prepared to teach newly introduced content areas. This situation suggests the existence of a degree of misalignment between the theoretical goals of the curriculum and the realities of implementation.

Overall, the findings indicate that teachers acknowledge the curriculum's foundation in a contemporary and student-centered educational philosophy. However, they also believe that the curriculum creates various implementation challenges when existing school conditions, student profiles, instructional time constraints, and the centralized examination system are taken into consideration. In particular, teachers' criticisms regarding the functionality of the curriculum appear to stem from the difficulty of balancing its activity-based instructional approach with academic expectations that are largely shaped by examination performance.

3.1.3. Evaluation

This subsection presents teachers' views regarding the strengths and weaknesses of G9MC. Teachers' views concerning the strengths of G9MC are presented in Table 4.

Table 4

Teachers' Views on the Strengths of the Grade 9 Mathematics Curriculum (G9MC)

Strengths	***f***
Learning and Teaching Approach	9
Supports constructivist learning	4
Supports student-centered learning	2
Supports meaningful learning	1
Supports discovery-based learning	1
Suitable for technology-enhanced instruction	1
Content-Related Strengths	7
Provides content connected to everyday life	3
Simplified content structure	2
Supports fundamental mathematical skills	2
No clearly identifiable strength of the curriculum	5

An examination of Table 4 indicates that mathematics teachers' views regarding the strengths of G9MC were concentrated around the dimensions of the learning and instructional approach and content.

Within the learning and instructional approach dimension, teachers most frequently stated that the curriculum supports constructivist learning. Other strengths identified by teachers included its support for student-centered learning, meaningful learning, and discovery-based learning, as well as its compatibility with technology-supported instruction.

Within the content dimension, teachers considered the inclusion of content connected to everyday life to be a major strength of the curriculum. In addition, the simplification of content and its emphasis on fundamental mathematical skills were identified as other positive features. Nevertheless, some teachers stated that the curriculum did not possess any clearly identifiable strengths. Sample quotations illustrating this theme are presented below.

T11 highlighted that the curriculum promotes meaningful learning by emphasizing understanding rather than memorization: *"I would say that its strongest aspect is its attempt to promote understanding rather than memorization."*

T19 emphasized that the curriculum supports student-centered learning by actively involving students in the educational process, although the effectiveness of this approach may depend on students' academic performance levels: *"Its strongest aspect is that it actively involves students in the educational process. However, this may work only in very high-performing schools."*

T8 noted that the curriculum provides content connected to everyday life and is suitable for technology-enhanced instruction, particularly through the use of visual materials: *"Through examples connected to everyday life, it helps students recognize the areas in which mathematics is used. Its compatibility with technology and visual materials increases students' interest in the course."*

T15 identified the simplified content structure and its emphasis on fundamental mathematical skills as key strengths of the curriculum: *"Its strength lies in the simplification of the content and its direct focus on fundamental skills."*

T1 reported that he could not identify a clearly identifiable strength of the curriculum and expressed concerns about the allocation of instructional time: *"As a teacher with 20 years of experience, I do not see a strong aspect of this curriculum. In a year when students are expected to improve their basic computational skills, I believe that six hours of mathematics instruction per week are being wasted."*

The views indicate that the curriculum is generally evaluated positively in terms of meaningful learning, active student participation, and connecting mathematics to everyday life. However, it can be said that these strengths are realized to varying degrees depending on the school and student profile.

Teachers' views regarding the weaknesses of G9MC are presented in Table 5.

Table 5

Teachers' Views on the Weaknesses of the Grade 9 Mathematics Curriculum (G9MC)

Weaknesses	***f***
Issues Related to Content Organization	17
Pedagogically inadequate examples	5
Excessively dense and detailed content	5
Inadequate presentation of subject matter	2
Content inconsistent with the nature of mathematics education	2
Insufficient support for fundamental computational skills	1
Activities lacking practical applicability	1
Misalignment between content presentation and activities	1
Issues Related to the Appropriateness of Content for Student Level	9
Content not aligned with students' readiness levels	7
Activities exceeding students' proficiency levels	1
Inclusion of advanced-level mathematical content	1

An examination of Table 5 indicates that mathematics teachers' views regarding the weaknesses of G9MC were concentrated around the dimensions of content organization and structure and appropriateness to student level.

Within the dimension of content organization and structure, teachers most frequently emphasized the pedagogical inadequacy of the examples and the excessive density and detail of the content. Other weaknesses identified by teachers included the inadequacy of the topic explanations, the presence of content that is not aligned with the nature of mathematics education, insufficient support for basic computational skills, the limited practicality of the activities, and a lack of coherence between instructional explanations and activities.

With regard to appropriateness to student level, teachers predominantly stated that the curriculum was not aligned with students' readiness levels. They also noted that some activities exceeded students' capabilities and that the curriculum included advanced mathematical content beyond students' current levels. Sample quotations illustrating this theme are presented below.

T12 criticized the pedagogical adequacy of the examples in the textbook, noting that they were lengthy, subjective, and insufficiently engaging, and also expressed concerns about the inclusion of content outside teachers' areas of expertise: *"With the addition of the new topics, mathematics has become somewhat like a verbal subject. The examples in the textbook are particularly long, subjective, and do not attract students' interest at all. There are even some topics that we, as mathematics teachers, are not familiar with because they fall outside our area of expertise, especially the algorithm and computer science unit."*

T20 identified the excessive detail and elaboration of the content as a weakness and emphasized that the curriculum provided insufficient support for students' fundamental computational skills: *"There is too much detail and unnecessary elaboration. Another weakness is that it does not sufficiently strengthen students' computational skills. The previous curriculum was better in this regard. Students now learn the underlying logic, but their computational skills remain weak."*

T5 stated that the instructional presentation of the subject matter was inadequate because explanations were too superficial: *"The instructional explanations of the topics are too superficial. I would say this is the curriculum's weakest aspect."*

T1 emphasized the need for more practice exercises appropriate to students' levels and noted that students lacking fundamental computational skills would have difficulty completing the activities in the textbook: *"The number of practice exercises appropriate to students' levels should be increased. It is impossible for a student who lacks basic computational skills to complete the activities included in the textbook."*

The findings indicate that while the curriculum supports conceptual and logical learning, it remains insufficient in developing basic procedural skills and structuring content according to students' levels. In particular, the inclusion of topics beyond teachers' areas of expertise and superficial explanations of the content may negatively affect both the applicability of the curriculum and the clarity of the teaching process.

3.1.4. Thematization

An examination of the findings derived from teachers' views revealed that evaluations of the Grade 9 Mathematics Curriculum (G9MC) were concentrated around several overarching themes. Teachers' perspectives indicated the existence of certain inconsistencies between the theoretical foundations of the curriculum and the realities of its implementation, tensions between the constructivist learning approach and the examination-oriented education system, and the perception that the curriculum had been designed primarily with academically high-achieving students in mind. Accordingly, the findings were organized under three major themes: "The Mismatch Between the Theoretical Curriculum and Implementation Reality," "The Tension Between the Constructivist Approach and the Examination-Oriented System," and "The Curriculum's Design Around an Ideal Student Profile."

The Mismatch Between the Theoretical Curriculum and Implementation Reality

The findings indicate that the Grade 9 Mathematics Curriculum was theoretically designed in accordance with a constructivist and student-centered perspective; however, it does not fully align with the realities of school implementation. Teachers positively evaluated aspects of the curriculum such as its incorporation of real-life contexts, its emphasis on active student participation, and its support for inquiry- and discovery-based learning. Nevertheless, they reported various implementation challenges arising from limited instructional time, overcrowded classrooms, differences in student readiness levels, and the lengthy procedures associated with curriculum activities.

Teachers' views particularly suggest that the activity-based structure of the curriculum may create instructional discontinuities in practice. Although the curriculum aims to enable students to construct knowledge actively, teachers reported that this approach sometimes makes it difficult for students to identify and internalize essential concepts and generalizations. Furthermore, the introduction of certain concepts without ensuring prerequisite learning appears to hinder students' mathematical meaning-making processes. Teachers also indicated that the explanations provided in the textbook were often insufficient and that an appropriate balance between content presentation and instructional activities had not been fully achieved.

Based on these findings, it may be argued that some of the practical challenges likely to emerge during implementation were not fully anticipated during the curriculum development process. Teachers' perceptions that the current curriculum is less functional than its predecessor, together with their reports of numerous implementation difficulties, suggest that field realities and practitioner experiences may not have been adequately considered during curriculum design. These findings highlight the importance of evaluating implementation-related factors-such as school resources, student readiness, and teacher competencies-more comprehensively during the curriculum development process.

Tension Between the Constructivist Approach and the Examination-Oriented System

One of the major themes emerging from the study is the tension between the constructivist learning approach adopted by the curriculum and the prevailing examination-oriented education system. The curriculum appears to support a student-centered, activity-based, and inquiry-oriented approach to learning. Teachers generally viewed positively the curriculum's emphasis on moving beyond rote memorization. However, their views also indicate that the exam-driven nature of the current education system complicates the implementation of the curriculum.

Teachers reported difficulties in balancing activity-based instructional practices with test-oriented teaching due to the central role of mathematics in high-stakes examinations. In particular, the tendency of students, parents, and school administrators to evaluate mathematics achievement primarily through examination performance encourages teachers to devote more time to solving examination-type questions. As a result, the extended and process-oriented activities envisioned by the curriculum often remain in the background during classroom implementation.

Overall, the findings suggest the existence of a substantial tension between the constructivist learning philosophy underpinning the curriculum and an educational system in which high-stakes examinations play a dominant role. Teachers' reports of difficulties in balancing activity-based learning practices with examination preparation indicate that the learning experiences envisioned by the curriculum are constrained in practice. These findings suggest the need for a more balanced alignment between process-oriented learning objectives and instructional practices that support mathematical procedural fluency and performance in central examinations.

Curriculum Design Based on an Idealized Student Profile

The findings indicate that a considerable proportion of teachers do not perceive the current curriculum as equally applicable to all student groups. Teachers reported that the curriculum may be more effective for students with higher levels of academic readiness, whereas its implementation becomes more challenging for students with lower academic achievement levels. This finding may suggest that the curriculum has been structured with an idealized student profile in mind.

Teachers stated that the curriculum does not adequately take students' readiness levels into account, that more advanced content is introduced before foundational concepts have been fully developed, and that many examples are not aligned with students' developmental and academic levels. Furthermore, teachers reported that implementing the curriculum in the same manner across different school types, such as science high schools, Anatolian high schools, and vocational high schools, creates significant challenges. Accordingly, they emphasized the need for differentiated curricula that are responsive to the characteristics and needs of different school contexts.

In addition, teachers expressed concerns that some curriculum content does not fully align with the nature of mathematics education. In particular, they highlighted limited teacher competence regarding algorithmic and computing-related topics and argued that these content areas tend to shift mathematics instruction toward a more verbal and descriptive orientation. These views suggest that the curriculum may have been designed not only with assumptions about student characteristics but also with expectations regarding teacher competencies that may not be consistently present across educational settings.

Overall, teachers' views indicate that the curriculum has been structured primarily around student groups possessing a certain level of academic readiness, rather than being designed with equal consideration for the diversity of school types, student profiles, and teacher competencies. Consequently, teachers argued that the curriculum should be redesigned to provide greater flexibility, be more responsive to the needs of different school contexts, and allow for differentiation according to student readiness levels.

3.1.5. Suggestions

This subsection presents the findings related to teachers' suggestions for improving the Grade 9 Mathematics Curriculum (G9MC). Teachers' recommendations for the development of the curriculum are presented in Table 6.

Table 6

Teachers' Recommendations for the Improvement of G9MC

Recommendations	***f***
Suggestions for Improving the Content and Program Structure	25
Inclusion of prerequisite learning in the content	5
Sequential and progressive organization of the content	4
Development of differentiated curricula according to school types	4
Improvement of the presentation of the content	3
Simplification of the content	3
Addressing certain content areas as separate courses	1
Removal of content inconsistent with the nature of mathematics education	1
Alignment of the content with students' developmental and academic levels	1
Removal of theorem proofs	1
Revision of the curriculum	1
Increasing content that supports fundamental computational skills	1
Suggestions Related to the Instructional Process and Students	11
Pedagogical improvement of activities and examples	3
Adapting examples to students' proficiency levels	2
Supporting students' prior knowledge and readiness levels	1
Increasing teacher guidance during activities	1
Aligning instructional time with content requirements	1
Establishing a balance between direct instruction and activities	1
Restructuring performance and project assignments	1
Increasing real-life–based learning activities	1
Suggestions for the Effective Use of Digital Tools	3
Aligning digital content with the curriculum	1
Integration of the MEBİ platform into the instructional process	1
Use of mathematical visualization tools	1

Within the dimension of curriculum content and structure, teachers most frequently emphasized the need to incorporate prerequisite learning into the curriculum. In addition, the gradual sequencing of content and the development of differentiated curricula for different school types were among the most commonly expressed recommendations. Other suggestions included improving the presentation of content, simplifying curriculum content, addressing certain topics as separate courses, removing

content perceived as inconsistent with the nature of mathematics education, aligning content more closely with students' developmental levels, eliminating theorem-proof requirements, revising the curriculum structure, and increasing content that supports fundamental procedural skills.

Within the dimension of instructional processes and student-related arrangements, teachers primarily emphasized the need to improve the pedagogical quality of activities and examples. Other recommendations included adapting examples to students' readiness levels, supporting student preparedness, increasing teacher guidance during activities, aligning instructional time more effectively with curriculum content, establishing a better balance between direct instruction and activities, restructuring performance and project assignments, and increasing the number of real-life-based learning activities.

Regarding the effective use of digital tools, teachers suggested that digital content should be better aligned with the curriculum, that the MEBİ platform should be integrated more effectively into the instructional process, and that the use of mathematical visualization tools should be expanded.

Illustrative excerpts from teachers' statements related to this theme are presented below.

T7 recommended reorganizing the content in a sequential and progressive manner, incorporating prerequisite learning before introducing more advanced representations, and removing content that is inconsistent with the nature of mathematics education: *"The sequencing of topics should be revised, and topics need to be addressed in greater depth. Students should not be expected to draw graphs of concepts before understanding their underlying foundations. In addition, components related more to statistical computer applications than to mathematics should be removed."*

T12 recommended developing differentiated curricula according to school types rather than implementing a single curriculum across all schools: *"There should not be a single curriculum for all schools. Three different levels should be developed for science high schools, Anatolian high schools, and vocational high schools. Each school type should have its own curriculum."*

T15 emphasized the need for teachers to adapt and filter the content according to students' grade levels and recommended more effective use of digital resources, particularly the MEBİ platform: *"Teachers should adapt their instruction by filtering content according to the grade level; however, most importantly, they should make effective use of resources such as MEBİ."*

T20 recommended shortening and simplifying the activities, reducing unnecessary repetition, and increasing examples that support students' fundamental computational and procedural skills: *"The activities are unnecessarily lengthy and repetitive. They should be shorter, clearer, and include more examples that strengthen students' procedural skills. Some students can formulate equations but cannot solve them."*

T11 recommended simplifying and restructuring the activities and performance tasks to make them more feasible and understandable for students, particularly in crowded classrooms: *"I appreciate the philosophy of the Maarif Model, but it is difficult to implement in classes of 30 students. Repetitive questions should be removed, and the 'Your Turn' sections should be expanded. Performance tasks and projects should either be eliminated or redesigned with clearer instructions that students can understand. In its current form, they result only in a waste of paper and effort."*

T18 recommended using mathematical visualization tools, particularly on interactive whiteboards, to enhance students' visualization of mathematical concepts such as function graphs: *"Particularly when teaching function graphs, various mathematical applications could be installed on smart boards to enhance visualization. GeoGebra alone is a practical and user-friendly tool that could be utilized effectively."*

Teachers suggest that, in order to improve the curriculum, it should be made more flexible, appropriate to students' levels, simplified, and practical. Particularly considering large class sizes, insufficient instructional time, and differences among students, differentiating the content and supporting it with technological tools would make the curriculum more functional.

3.2. Experts' Views on G9MC

This section presents the findings obtained from the expert opinions regarding the Grade 9 Mathematics Curriculum (G9MC).

3.2.1. Description

This subsection presents experts' views regarding the components of the G9MC and its alignment with contemporary approaches to mathematics education. Experts' views concerning the curriculum components are presented in Table 7.

Table 7

Experts' Views on the Curriculum Components of G9MC

Curriculum Components	*f*
Content	33
Structural Characteristics	16
Ensuring coherence among concepts	5
Progressive sequencing of content	3
Inappropriate sequencing of topics	2
Lack of a progressive learning structure	2
Establishing logical relationships among subject areas	1
Consideration of prior learning	1
Spiral curriculum structure	1
Appropriate sequencing of topics	1
Quality of Content	10
Lack of clarity and comprehensibility	3
Clarity and comprehensibility	2
Presence of content gaps	2
Insufficient conceptual explanations	1
Insufficient number of examples	1
Excessive content density	1
Suitability for Students	5
Not appropriate for diverse student ability levels	4
Appropriate for students' readiness levels	1
Presence of topics inconsistent with the nature of mathematics	1
Alignment with intended learning outcomes	1
Learning Evidence	8
Assessment and Evaluation Approach	5
Process-oriented assessment	4
Outcome-based assessment	1
Functionality of the Assessment Process	3
Monitoring student development	2
Alignment of assessment components with learning outcomes	1
Learning Experiences	8
Applicability	3
Clarity of the learning process	1
Feasibility of the instructional process	1
Limited applicability across different school contexts	1
Structural Characteristics	3
Organized to provide guidance for teachers	1
Establishing connections between prior knowledge and new learning	1
Identification of prerequisite learning	1
Promoting active student participation	2

Curriculum Components	*f*
Learning Outcomes	6
Structure of Learning Outcomes	3
Consistency with learning evidence	1
Process-oriented structure	1
Inclusion of interdisciplinary connection skills	1
Mathematical Process Skills	3
Inclusion of reasoning skills	2
Inclusion of problem-solving skills	1

An examination of Table 7 indicates that expert opinions were primarily concentrated on the curriculum components of content, evidence of learning, learning experiences, and learning outcomes. Among these, experts provided the greatest number of comments regarding the content dimension. Within this dimension, particular emphasis was placed on the coherence among mathematical concepts, the progressive structuring of content, and the sequencing of topics. While some experts argued that the content lacked clarity and did not adequately address students with different levels of readiness, others stated that the content was understandable and aligned with the intended learning outcomes.

Within the dimension of evidence of learning, expert views largely focused on the curriculum's process-oriented assessment approach. Experts also considered the assessment process positively because it allows the monitoring of student development and because assessment components are aligned with the intended learning outcomes.

Regarding learning experiences, experts highlighted the practicality of the instructional process, its capacity to provide guidance for teachers, and its support for active student participation. In relation to learning outcomes, experts particularly valued the inclusion of mathematical process skills such as reasoning and problem solving, the curriculum's process-oriented structure, and its emphasis on establishing connections with other disciplines.

Illustrative excerpts from expert statements related to this theme are presented below.

E2 noted that the content framework establishes logical relationships among different subject areas and mathematical concepts: *"An examination of the content framework indicates that logical relationships have been established among subject areas and mathematical concepts."*

E8 expressed concerns about the clarity and comprehensibility of the content, noting that the thematic and process-oriented language used in the content framework reduced the readability of the curriculum: *"However, because the content framework employs a thematic and process-oriented language, the curriculum's readability and comprehensibility are reduced."*

E4 stated that the content was appropriate for students with sufficient prior knowledge and readiness but was challenging for students in vocational high schools, indicating limitations in its suitability for diverse student ability levels: *"I would say that it is appropriate for students who possess the necessary prior knowledge and readiness. However, it is challenging for students enrolled in vocational high schools."*

E5 highlighted the process-oriented nature of the learning evidence and emphasized the need to diversify assessment examples, while also noting that the learning outcomes address higher-order mathematical skills such as reasoning, problem solving, and making connections: *"Although the process-oriented design of the evidence of learning is a positive feature, I believe that assessment examples should be diversified. It is also a strength that the learning outcomes focus not only on knowledge acquisition but also on higher-order skills such as reasoning, problem solving, and making connections."*

E6 emphasized that the learning–teaching experiences include activities that effectively promote active student participation: *"The learning–teaching experiences include activities that effectively support students' active participation."*

Experts indicate that the curriculum offers a contemporary approach that prioritizes the learning process and skill development. However, structuring this approach in a way that is appropriate for different student groups would enhance the curriculum's applicability.

Experts' views regarding the alignment of the G9MC with contemporary approaches to mathematics education are presented in Table 8.

Table 8

Experts' Views on the Alignment of G9MC with Contemporary Approaches to Mathematics Education

Alignment	***f***
Alignment with Contemporary Educational Approaches	8
Alignment with contemporary approaches to mathematics education	6
Alignment with contemporary educational philosophies	2
Use of Multiple Representations	3
Inclusion of different forms of mathematical representation	1
Use of tables in instruction	1
Use of graphs in instruction	1
Process-oriented assessment approach	1
Failure to address diverse student ability levels	1
Integration of mathematics with other disciplines	3
Mathematical modeling of real-life problems	5

As shown in Table 8, expert opinions were largely concentrated on the alignment of the G9MC with contemporary educational approaches. Experts indicated that the curriculum is generally consistent with contemporary approaches to mathematics education and reflects the fundamental principles of modern educational philosophies. In addition, the curriculum's emphasis on the mathematical modelling of real-life problems and its promotion of connections between mathematics and other disciplines were identified as notable strengths.

Experts also emphasized the use of multiple representations, positively evaluating the inclusion of different mathematical representation forms, tables, and graphs within the curriculum. Furthermore, the curriculum's process-oriented assessment approach was regarded as a characteristic consistent with contemporary mathematics education perspectives. Nevertheless, experts noted that the curriculum does not adequately address the needs of students with varying levels of academic preparedness, identifying this as an area requiring further development. Sample excerpts from expert opinions related to this theme are presented below.

E4 considered the curriculum compatible with contemporary approaches to mathematics education, particularly because it positions students as active participants in problem solving and knowledge construction: *"Overall, it can be considered compatible with contemporary approaches to mathematics education because it has been designed as a curriculum in which students take an active role in problem solving and construct their own knowledge."*

E5 stated that the curriculum was largely aligned with contemporary perspectives on mathematics education, particularly through its constructivist orientation, emphasis on problem solving and connections with everyday life, and process-oriented assessment approach: *"I believe that the curriculum is largely aligned with contemporary perspectives on mathematics education. In particular, positioning students as individuals who construct knowledge rather than merely receive it is important from a constructivist perspective. The emphasis on problem solving, establishing connections with everyday life, and mathematical thinking processes is also consistent with contemporary approaches. Furthermore, the importance attached to process-oriented assessment supports evaluating students not only in terms of outcomes but also in terms of their learning processes."*

E8 emphasized that the curriculum was theoretically compatible with contemporary educational trends, including 21st-century skills, STEM education, and algorithmic thinking, while highlighting its emphasis on mathematical argumentation and modeling: *"The curriculum is theoretically highly compatible with contemporary educational trends such as 21st-century skills, STEM education, and algorithmic thinking. Its emphasis on mathematical argumentation and modelling approaches is well aligned with the core principles of contemporary education."*

It can be said that the curriculum is largely aligned with contemporary approaches to mathematics education and positions students as active individuals who construct knowledge rather than passive recipients of information.

3.2.2. Interpretation

When expert opinions are examined holistically, the Grade 9 Mathematics Curriculum (G9MC) is evaluated as a theoretically robust curriculum grounded in contemporary approaches to mathematics education and aligned with current educational paradigms. Experts regard the curriculum's emphasis on developing mathematical reasoning, mathematical literacy, and metacognitive skills as a significant strength. In addition, the integration of mathematics with everyday life, the use of mathematical modelling to address real-world problems, and the connection of mathematics with other disciplines were identified as important strengths of the curriculum. Experts further noted that the instructional approach, which promotes discovery-based learning, active student engagement, and the use of visual representations, is consistent with the fundamental principles of contemporary mathematics education.

Nevertheless, expert opinions indicate a degree of mismatch between the curriculum's theoretical foundations and the realities of implementation. Experts emphasized that the learning experiences envisioned by the curriculum require substantial instructional time, whereas the current number of weekly class hours is insufficient to achieve these objectives. In particular, it was noted that instructional time is inadequate for the effective implementation of mathematical modelling, inquiry- and discovery-based learning, and interdisciplinary activities. This issue is considered a potential barrier to fully realizing the curriculum's intended pedagogical approach in classroom settings.

Another important issue highlighted by experts concerns the extent to which the curriculum addresses diverse student profiles and school types. Experts suggested that the curriculum is likely to produce more effective outcomes among students with high levels of academic preparedness, whereas implementation challenges may arise among students with learning deficiencies or lower academic achievement levels. These views reflect concerns that the curriculum does not sufficiently account for student diversity and variations in school contexts. Accordingly, experts argued that the development of differentiated curricula tailored to different school types and student characteristics could enhance the curriculum's applicability and effectiveness.

The findings also indicate that experts expressed several criticisms regarding the content structure of the curriculum. In particular, some content areas were perceived as not fully consistent with the nature of the mathematics discipline, while certain learning outcomes were considered to lack sufficient mathematical depth. Furthermore, the limited number of examples and the shortcomings of textbooks in supporting the instructional approach envisioned by the curriculum were identified as important challenges that may affect implementation. Experts emphasized the need for a greater variety of examples and more extensive implementation support to help students develop a deeper conceptual understanding and to enable teachers to implement the curriculum more effectively.

Another prominent theme emerging from expert opinions concerns the support mechanisms required for the successful implementation of the curriculum. Experts noted that teachers may not possess sufficient experience with the new instructional approaches envisioned by the curriculum and therefore require comprehensive in-service professional development. They also emphasized that the development of digital materials, the preparation of teacher implementation guides, and the alignment of supplementary instructional resources with curriculum objectives would enhance the effectiveness of the curriculum. These views suggest that the success of the curriculum depends not only on the

quality of the curriculum document itself but also on the competencies of practitioners and the availability of supportive learning environments.

Another noteworthy issue raised by experts is the perceived mismatch between the educational philosophy underpinning the curriculum and the existing central examination system. Experts indicated that the curriculum prioritizes higher-order thinking skills, mathematical modelling, and process-oriented learning, whereas students' and parents' expectations regarding success in high-stakes national examinations often promote different learning priorities. It was argued that this discrepancy may place pressure on teachers and limit the implementation of the learning experiences envisioned by the curriculum.

Overall, the findings suggest that experts view the Grade 9 Mathematics Curriculum as a theoretically strong programme that is aligned with contemporary educational perspectives and reflects current trends in mathematics education. However, experts emphasized that implementation conditions were not sufficiently considered during the curriculum development process and argued that factors such as school resources, teacher competencies, student readiness, and the central examination system should be evaluated more realistically. In this regard, expert opinions indicate that while the curriculum provides a strong theoretical framework, various structural, pedagogical, and administrative improvements are needed to enhance its effectiveness in practice.

3.2.3. Evaluation

In this sub-dimension, experts' views regarding the strengths and weaknesses of the Grade 9 Mathematics Curriculum (G9MC) are presented. Experts' opinions concerning the strengths of the G9MC are shown in Table 9.

Table 9

Expert Opinions on the Strengths of the Grade 9 Mathematics Curriculum (G9MC)

Strengths	***f***
Development of Skills	8
Supporting mathematical reasoning skills	4
Enhancing mathematical literacy skills	2
Developing metacognitive skills	2
Relating Mathematics to Real Life and Other Disciplines	9
Connecting mathematics with everyday life	5
Relating mathematics to different disciplines	4
Student-Centered Teaching Approach	7
Promoting active learning	4
Supporting discovery-based learning	3
Structural Strength of the Content	4
Progressive construction of mathematical concepts	1
Building new knowledge upon prior learning	1
Systematic organization of learning outcomes	1
Inclusion of fundamental mathematical topics	1
Alignment with Contemporary Instructional Approaches	5
Use of visual representations	2
Process-oriented assessment and evaluation	1
Inclusion of mathematical modeling	1
Integration of technology-supported instruction	1

As shown in Table 9, expert opinions regarding the strengths of the G9MC were primarily concentrated on the dimensions of connecting mathematics with everyday life and other disciplines, skill development, and student-centred instruction. Experts most frequently identified the curriculum's ability to relate mathematics to daily life and various disciplines as a major strength. In addition, the curriculum's support for the development of mathematical reasoning, mathematical literacy, and metacognitive skills was emphasized as a significant advantage.

Another prominent strength highlighted by experts is the curriculum's student-centred orientation, which promotes active learning and encourages students to construct knowledge through discovery. Furthermore, the progressive structuring of mathematical concepts, the opportunity for students to build new knowledge upon prior learning, and the systematic organization of learning outcomes were regarded as positive features of the curriculum content. Experts also noted that the inclusion of visual representations, process-oriented assessment practices, mathematical modelling, and technology-supported instruction reflects the curriculum's alignment with contemporary educational approaches. Sample excerpts from expert opinions related to this theme are presented below.

E3 highlighted the curriculum's emphasis on mathematical reasoning and other cognitive strategies, including representation and making connections: *"Its greatest strength is placing cognitive strategies such as mathematical reasoning, representation, and making connections at the centre of learning."*

E5 emphasized that the inclusion of activities connected to everyday life strengthens the functional dimension of mathematics: *"The inclusion of activities connected to everyday life is important because it highlights the functional nature of mathematics."*

E4 identified the promotion of active learning as a key strength of the curriculum, emphasizing that students take greater responsibility for the problem-solving and knowledge-construction processes: *"Its strength lies in encouraging students to think more and leaving more of the problem-solving process to them. In this curriculum, students become more active participants. Rather than merely receiving information, they reach knowledge themselves and construct it in their own minds."*

E2 emphasized that the curriculum reflects contemporary approaches to mathematics education through the hierarchical organization of mathematical concepts, visual representations, mathematical modeling, STEM, and interdisciplinary connections: *"Overall, the curriculum has been designed in accordance with contemporary approaches to mathematics education. The hierarchical organization of mathematical concepts enables students to construct new knowledge based on their prior learning. Furthermore, the emphasis on visual representations, mathematical modelling processes, the STEM approach, and interdisciplinary connections supports students' understanding of mathematics within real-life contexts."*

According to the experts, the program's greatest strength is its connection to everyday life and its learning approach that actively engages students and places thinking and reasoning processes at the center through visual elements, models, STEM, and interdisciplinary relationships.

Experts' views regarding the weaknesses of the G9MC are presented in Table 10.

Table 10

Expert Opinions on the Weaknesses of the Grade 9 Mathematics Curriculum (G9MC)

Weaknesses	***f***
Issues Related to Curriculum Implementability	8
Insufficient weekly instructional time	6
Misalignment between curriculum objectives and school resources	1
Ambiguities regarding curriculum implementation	1
Content-Related Issues	10
Failure to address diverse student ability levels	4
Inclusion of content inconsistent with the nature of mathematics as a discipline	2
Insufficient number of examples	2
Overly dense content	1
Inclusion of content misaligned with learning objectives	1
Misalignment Between Centralized Examinations and Curriculum Objectives	5
Insufficiencies in Instructional Materials and Resources	5
Inadequacy of textbooks	2
Requirement for additional instructional materials	2

Weaknesses	*f*
Misalignment of digital content with the curriculum	1
Lack of Teacher Support and Guidance	3
Teachers' limited experience with new instructional approaches	1
Lack of guidance on the use of technological tools	1
Insufficient explanations regarding visual representations	1
Shortcomings in Student-Centered Learning Practices	3
Insufficient opportunities for mathematical discussion and argumentation	1
Insufficient implementation of collaborative learning practices	1
Insufficient activities aimed at fostering mathematical thinking	1

As shown in Table 10, experts' views were primarily concentrated on content-related issues, the practicality of implementation, and inadequacies in instructional materials. Experts identified the curriculum's limited responsiveness to different student ability levels, the inclusion of content that is not fully aligned with the discipline of mathematics, and the insufficient number of examples as major concerns. In addition, the misalignment between the objectives of the curriculum and the requirements of centralized examinations was highlighted as another notable weakness.

Regarding curriculum implementation, experts most frequently emphasized the insufficiency of weekly instructional time. They also pointed out that curriculum objectives do not fully align with existing school conditions and that certain aspects of implementation remain unclear. Within the category of material and resource inadequacies, concerns included the inadequacy of textbooks, the need for supplementary instructional materials, and the lack of alignment between digital content and curriculum objectives.

Experts further noted the need to support teachers in adopting new instructional approaches, the lack of guidance regarding the use of technological tools, and the insufficiency of activities promoting student-centered learning. In particular, they emphasized the need to increase activities designed to foster mathematical discussion, argumentation, collaborative learning, and mathematical thinking. Sample quotations from experts related to this theme are presented below.

E3 identified insufficient weekly instructional time as a major limitation and also highlighted a mismatch between the curriculum objectives and the expectations of centralized examinations: *"The weekly instructional time is insufficient. There is a practical mismatch between the objectives of the curriculum and the expectations of centralized examinations."*

E5 emphasized that the curriculum was not equally implementable across different school types and student profiles, particularly because some learning outcomes and activities may be too demanding for students with weaker academic backgrounds: *"One of the most important shortcomings of the curriculum emerges at the implementation level. In particular, it is not equally applicable across all school types and student profiles. For students with weaker academic backgrounds, some learning outcomes and activities may be excessively demanding."*

E4 criticized the inclusion of topics such as algorithms and computing that were perceived as inconsistent with the nature of mathematics as a discipline and recommended revising the sequencing of topics by considering prerequisite learning: *"The curriculum includes topics that are not entirely related to mathematics, such as algorithms and computing. These topics should be taught within computer science courses. In addition, the sequencing of topics should be revised by taking prerequisite learning into consideration."*

E6 emphasized that the effective mathematization of real-life situations requires instructional resources aligned with the curriculum objectives and identified the inadequacy of the current textbooks as a limitation: *"The curriculum expects students to mathematize real-life situations. However, instructional resources aligned with the curriculum objectives are essential for achieving this goal. The current textbooks are insufficient in this regard."*

According to the experts, the main weaknesses of the program center on implementation time, student differences, content density, and the inadequacy of instructional materials. In particular, the limited

number of weekly class hours, the mismatch between centralized examinations and the program objectives, the fact that some content is not appropriate for students' levels, and the insufficient support provided by textbooks for the goal of mathematizing real-life situations limit the program's effectiveness in practice.

3.2.4. Thematization

An examination of the findings derived from expert opinions revealed that evaluations of the Grade 9 Mathematics Curriculum (G9MC) were clustered around several central themes. Although experts described the curriculum as theoretically strong, innovative, and aligned with contemporary approaches to mathematics education, they also emphasized that various structural challenges may emerge during its implementation. Expert opinions pointed to inconsistencies between the theoretical design of the curriculum and actual implementation conditions, the curriculum's limited adaptability to diverse student and school profiles, and a lack of coherence between the curriculum and the expectations of the current educational system. Accordingly, the findings were organized under three main themes: *"The Misalignment Between Ideal Curriculum Design and Implementation Reality," "Limitations Arising from a Non-Differentiated Curriculum Structure,"* and *"The Inconsistency Between Curriculum Philosophy and the Expectations of the Educational System."*

The Misalignment Between Ideal Curriculum Design and Implementation Reality

The findings indicate that the majority of experts regarded the curriculum as a strong program reflecting the fundamental principles of contemporary mathematics education. The inclusion of real-life problems, support for mathematical modeling, integration of mathematics with other disciplines, and emphasis on developing mathematical reasoning and mathematical literacy skills were considered major strengths of the curriculum. In addition, the promotion of active learning processes, opportunities for students to learn through discovery, and the inclusion of visual representations were identified as important positive features.

Nevertheless, experts emphasized that this strong theoretical framework may not be implemented with the same level of effectiveness in existing educational settings. In particular, insufficient weekly instructional time, the limited capacity of textbooks to support curriculum objectives, inadequacies in instructional materials, and disparities in school resources were identified as factors that reduce the curriculum's practicality. Experts noted that the successful implementation of the curriculum's intended instructional approach requires digital instructional materials, teacher guidance resources, and supplementary materials aligned with curriculum objectives.

Based on these findings, it may be argued that the curriculum development process prioritized an ideal instructional vision, whereas implementation-related variables such as school resources, teacher competencies, and student characteristics may not have been sufficiently taken into account. Experts' emphasis on instructional time, material support, and implementation conditions suggests the existence of a certain degree of mismatch between the curriculum's theoretical foundations and the realities of educational practice. Therefore, the effectiveness of the curriculum appears to depend not only on its theoretical quality but also on the strengthening of implementation conditions.

Limitations Arising from a Non-Differentiated Curriculum Structure

Another major theme emerging from the findings concerns the curriculum's limited flexibility in addressing diverse student profiles and school types. Experts stated that the curriculum is likely to yield more effective outcomes for students with high levels of academic readiness, whereas it may create various challenges for students with learning deficiencies or lower academic achievement levels. According to the experts, the current curriculum does not adequately take into account student diversity and the differences among school types within the Turkish education system.

In particular, experts noted that implementing the same curriculum across school types characterized by distinct student profiles—such as science high schools, Anatolian high schools, and vocational high schools—may lead to various difficulties. Therefore, they emphasized the need for differentiated curricula tailored to specific school types.

Another noteworthy finding within this theme concerns the perception that certain curriculum content does not fully align with the nature of the mathematics discipline. Experts indicated that some content areas lack sufficient mathematical depth and may weaken the coherence of mathematics instruction. In addition, the limited number of examples was identified as a factor that restricts the curriculum's ability to address the needs of students at different achievement levels.

Overall, expert opinions suggest that the curriculum should be transformed into a more flexible structure that is responsive to the needs of different school types and takes student characteristics into greater consideration.

The Inconsistency Between Curriculum Philosophy and the Expectations of the Educational System

Another theme revealed by the findings is the inconsistency between the educational philosophy underlying the curriculum and the expectations of the current educational system. Experts indicated that the curriculum is built upon a contemporary educational perspective aimed at developing mathematical thinking, reasoning, modeling, and higher-order cognitive skills. However, they also noted that students' and parents' expectations regarding success in centralized examinations do not fully align with the priorities of the curriculum.

According to the experts, while the curriculum emphasizes process-oriented learning and the development of mathematical competencies, a substantial part of the educational system continues to operate within an outcome-oriented assessment framework. This situation may make it difficult for teachers to implement the learning experiences envisioned by the curriculum and may lead to competing priorities within the instructional process.

In this regard, experts stressed the importance of establishing stronger alignment between curriculum objectives and assessment systems. Otherwise, a conflict may emerge between the theoretical goals of the curriculum and the expectations that arise in educational practice.

Overall, expert opinions indicate that the Grade 9 Mathematics Curriculum provides a strong theoretical framework that reflects the fundamental principles of contemporary mathematics education. However, experts emphasized that the successful implementation of the curriculum depends not only on the quality of the curriculum document itself but also on school conditions, teacher competencies, student characteristics, instructional resources, and the broader structure of the educational system. Therefore, enhancing the effectiveness of the curriculum requires a stronger alignment between its theoretical objectives and the realities of educational practice.

3.2.5. Recommendations

In this sub-dimension, findings related to experts' recommendations for improving the Grade 9 Mathematics Curriculum (G9MC) are presented. Experts' recommendations regarding the development of the G9MC are summarized in Table 11.

Table 11

Expert Recommendations for the Improvement of the Grade 9 Mathematics Curriculum (G9MC)

Recommendations	***f***
Recommendations for Supporting Effective Curriculum Implementation	16
Increasing weekly instructional hours	3
Providing digital instructional materials	3
Aligning assessment and evaluation practices with centralized examinations	3
Ensuring the alignment of supplementary materials with curriculum objectives	4
Improving school resources and facilities	1
Enhancing the implementability of the curriculum	1
Supporting mathematical modeling practices	1
Recommendations for Content Improvement	11
Simplifying the curriculum content	3
Diversifying assessment examples	2

Recommendations	*f*
Revising the presentation of certain topics	1
Addressing missing information within the content	1
Supporting the teaching of abstract concepts	1
Increasing content that promotes fundamental computational skills	1
Expanding the number of sample activities	1
Increasing the number of examples	1
Recommendations for Supporting Teachers	16
Providing in-service professional development for teachers	8
Developing implementation guides for teachers	4
Providing guidance on the integration of technology	2
Preparing detailed lesson plans	2
Recommendations for Curriculum Restructuring	7
Developing differentiated curricula for different school types	2
Relocating certain topics to different grade levels	1
Including analytic geometry in the curriculum	1
Transferring certain content to other courses	1
Incorporating problem-based learning activities into the curriculum	1
Incorporating collaborative learning activities into the curriculum	1

As shown in Table 11, experts' recommendations were primarily concentrated on supporting the effective implementation of the curriculum and supporting teachers. Regarding the effective implementation of the curriculum, experts most frequently recommended aligning supporting instructional materials with curriculum objectives, increasing weekly instructional hours, providing digital instructional resources, and ensuring greater alignment between assessment practices and the centralized examination system. Additional recommendations included improving school resources, enhancing the practicality of the curriculum, and strengthening opportunities for mathematical modeling activities.

With respect to supporting teachers, experts particularly emphasized the need to expand in-service training opportunities. They also recommended the development of implementation guides, the provision of guidance on the use of educational technologies, and the preparation of detailed lesson plans. Concerning content development, simplifying curriculum content and diversifying assessment examples emerged as prominent recommendations. Furthermore, the development of differentiated curricula tailored to different school types was highlighted as an important recommendation related to curriculum restructuring.

Sample quotations from experts related to this theme are presented below.

E5 recommended restructuring the curriculum more flexibly according to different school types and student levels, while emphasizing the need for implementation guides, sample activities, digital materials, and in-service professional development to support teachers. E5 also suggested increasing weekly instructional hours or reducing content density and aligning assessment and evaluation practices more closely with centralized examinations: *"First, I believe that the curriculum should be structured more flexibly by taking different school types and student levels into consideration. Preparing implementation guides, sample activities, and digital materials for teachers would enhance the practicality of the curriculum. In addition, teachers should be supported through in-service training to help them adapt to the new instructional approach. Increasing weekly instructional hours or reducing content density could also contribute to more effective implementation. Another important issue is the need to align assessment and evaluation practices more closely with the centralized examination system."*

E3 emphasized the need for supplementary instructional materials that are aligned with curriculum objectives, particularly textbooks and other supporting resources, to facilitate the mathematization of real-life situations: *"The curriculum expects students to mathematize real-life situations. However,*

instructional resources aligned with curriculum objectives (e.g., textbooks and supplementary materials) are essential for achieving this goal."

E7 recommended increasing weekly instructional hours or reducing the content load to provide sufficient time for process-oriented activities and proposed the development of classroom-ready activity booklets and digital resources to support implementation: "*Weekly instructional hours should be increased to allow students to fully engage with process-oriented activities, or the content load should be reduced. Skill-Based Activity Booklets that teachers can directly use in their classrooms, along with digital simulation and software guides, should be urgently integrated into the system."*

E1 recommended restructuring the curriculum by relocating or removing certain content areas, particularly algorithms and data analysis, and suggested incorporating data analysis into Grade 10 while adding selected topics from analytic geometry to the Grade 9 curriculum: *"Although I do not believe that the curriculum needs to be completely redesigned, I think it would be more appropriate to remove the topics related to algorithms and data analysis from the Grade 9 curriculum and incorporate data analysis into the Grade 10 curriculum instead. In its current form, I do not consider the algorithm topic to be appropriate. In addition, I believe that including at least some topics from analytic geometry in the curriculum is essential."*

Experts recommend supporting teachers' practical skills, increasing instructional time, aligning assessment and evaluation with centralized examinations, and reorganizing certain topics according to grade levels as key improvements that would enhance the effectiveness of the curriculum.

4. Discussion and Conclusion

This study, which evaluated the 9th Grade Mathematics Curriculum of the 2024 Türkiye Century Education Model through Eisner's Educational Criticism Model, was conducted using a nested single-case design. The data were collected from mathematics teachers and mathematics education experts through data collection instruments developed by the researchers and were analyzed using content analysis.

The findings indicated that the curriculum is student-centered and grounded in the constructivist approach. The activity-based structure of the curriculum, which is linked to real-life situations, actively engages students in accordance with the principles of constructivist learning. In constructivist learning environments, students are regarded as individuals who investigate, question, solve problems, use prior knowledge as a foundation for acquiring new knowledge, construct knowledge, and transfer learning to real-life contexts (Chand, 2023).

During the description phase, teachers evaluated the curriculum content largely from a critical perspective. Teachers reported that the curriculum was not adequately aligned with students' readiness levels and appeared to address only certain groups of students. They also stated that the 9th-grade mathematics topics were not presented in a sequential and progressive manner, that the content was overly dense, that conceptual foundations were not sufficiently established, and that unnecessary repetitions were present.

The low readiness levels of students may stem from the transition between lower secondary and upper secondary education as well as deficiencies in prerequisite learning. Similarly, Yalçınkaya (2018) identified learners' readiness levels as low in the revised 9th-grade mathematics curriculum introduced in 2018. The fact that the curriculum appears to target only certain student groups, particularly without adequately supporting low- and average-achieving students, may contribute to increased mathematics anxiety (OECD, 2023). Furthermore, the lack of progressive content sequencing, the excessive density of the curriculum, and repetitive content may create concerns among teachers regarding curriculum coverage while simultaneously increasing learning anxiety among students. Demirel (2023) argues that excessively broad curriculum content may negatively affect the quality of the instructional process. Similarly, regarding mathematics curricula, Kalaç and Konyalıoğlu (2025) identified the sequencing of topics and the neglect of certain student groups and school types among the weaknesses of the curriculum.

Similarly, the experts reported that there were certain shortcomings in the sequencing of the content and in establishing relationships among learning domains. In their evaluations of the curriculum, they described issues related to comprehensibility, content deficiencies, and inadequacies in the presentation of subject matter. They also indicated that the curriculum did not adequately address different student readiness levels and that some content areas were not fully aligned with students' developmental characteristics.

The experts considered the 9th-grade mathematics curriculum to be applicable and effective because it is aligned with contemporary educational approaches, incorporates process-oriented assessment, provides implementable learning experiences, offers guidance for teachers, promotes active student participation, and includes reasoning and problem-solving skills. Process-oriented assessment represents a contemporary educational approach that moves beyond evaluating students solely through examinations. Güneş et al. (2025) suggested that the use of alternative assessment methods such as self-assessment, peer assessment, and group assessment in mathematics education could enhance the effectiveness of the curriculum by facilitating students' individual development.

The experts' positive evaluations of the curriculum's support for active student participation are consistent with contemporary learning theories. Through active participation, students construct knowledge more effectively because they engage directly in the learning process and are therefore better able to apply their knowledge in different problem situations. Similarly, teachers have emphasized the need for active learning practices in mathematics classrooms (Gür Erdoğan & Şimşek, 2023). Furthermore, reasoning and problem-solving are recognized both as essential twenty-first-century skills and as fundamental components of mathematics education (Yeşildere İmre et al., 2022).

Mathematics teachers reported using both traditional instructional resources and modern digital technologies (MEBİ, EBA, and GeoGebra) in a balanced manner, thereby adopting a hybrid instructional approach. Similarly, with regard to instructional methods and techniques, teachers reported employing a combination of teacher-centered, student-centered, collaborative, and interaction-based teaching practices. These approaches are consistent with the principles of blended learning and balanced pedagogy emphasized in contemporary educational perspectives.

Studies in the mathematics education literature indicate that teachers tend to use digital technologies and traditional instructional methods in a synchronized and complementary manner (Jailani et al., 2025; Weigand et al., 2024). In addition, previous research has shown that teacher-centered practices have not disappeared entirely, particularly because teacher guidance remains necessary when introducing new concepts, solving example problems, and providing conceptual explanations (Busto et al., 2021). Student-centered, collaborative, and interaction-based mathematics activities designed with digital technologies contribute to students' discussion and problem-solving skills while supporting collaborative learning processes (Dilling et al., 2024).

When the problems and challenges associated with the mathematics curriculum are examined, it becomes evident that most of the difficulties are related to the curriculum and instructional process itself. These challenges appear to stem from factors such as the structure of the curriculum, the centralized examination system, the organization of the content, activity procedures, student characteristics, time constraints, and crowded classroom environments. In particular, the inconsistency between the objectives of the curriculum and the requirements of centralized examinations emerged as one of the most frequently reported problems, indicating that teachers are caught between the process-oriented and competency-based approach promoted by the curriculum and the knowledge- and test-oriented expectations measured by examinations.

Çetin and Ünsal (2019) similarly reported that centralized examinations lead teachers to make examination-oriented adjustments to curriculum content, instructional processes, and assessment practices. Particularly in challenging subjects such as mathematics, the sequential organization and simplification of content are important for facilitating student understanding. Complex content structures and an excessive density of topics may impose a high cognitive load on students (Sweller et

al., 2019). In addition, limited instructional time and crowded classrooms negatively affect curriculum implementation. Selamet and Gürlen (2024) found that teachers were unable to implement instructional activities effectively when instructional time was insufficient.

During the interpretation phase, teachers characterized the 9th-grade mathematics curriculum as theoretically contemporary, student-centered, and grounded in constructivist principles. However, they also interpreted factors such as students' readiness levels, differences among school types, limited instructional time, lengthy activity procedures, class size, and the centralized examination system as major obstacles to effective implementation. Similarly, experts emphasized that the curriculum provides a contemporary theoretical framework centered on mathematical literacy, problem-solving, reasoning, and higher-order thinking skills. They highlighted variables such as teacher competencies, instructional materials, school conditions, student readiness, and examination systems as critical factors influencing the success of the curriculum.

From this perspective, enhancing curriculum effectiveness requires supporting teachers, developing flexible implementation strategies that address differences among school types and student characteristics, and strengthening the alignment between curriculum objectives and assessment systems. Similar challenges identified by teachers and experts in the present study have also been reported in previous research. Köse (2011), who evaluated the 2005 elementary mathematics curriculum using Eisner's Educational Criticism Model, found that although the curriculum was viewed positively by school administrators, teachers, and students, significant implementation problems related to time, instructional resources, and assessment practices remained. Likewise, Ata Özer and Bal (2024), in their evaluation of the revised 2018 eighth-grade mathematics curriculum using Eisner's Educational Criticism Model, reported challenges associated with insufficient instructional time, inadequate student readiness, mathematics anxiety, preparation for examinations, large class sizes, and a lack of instructional materials.

Teachers perceived the strengths of the curriculum as its support for constructivist learning, student-centered instruction, meaningful learning, and technology-enhanced teaching. In addition, the curriculum's connection to real-life contexts and its emphasis on developing fundamental mathematical skills were identified as other major strengths. These findings are consistent with contemporary perspectives on mathematics education and the general philosophy underlying recently revised curricula. Teachers' emphasis on these features suggests that learner-centered educational philosophies are increasingly being recognized and implemented by practitioners.

A meta-analysis conducted by Ayaz and Şekerci (2015) demonstrated that instructional processes designed according to constructivist principles positively affect students' academic achievement and attitudes. Similarly, Cumhur (2025) reported that mathematics teachers actively integrate technology into mathematics instruction, with mobile phones, interactive whiteboards, and the internet being the most frequently used technological tools, while GeoGebra emerged as the most commonly used software. Tartan and Erşen (2024) found that instructional activities were predominantly associated with real-life contexts. Such connections help students make learned knowledge more functional and meaningful.

Teachers identified the major weaknesses of the curriculum as the density of the content, the pedagogical inadequacy of examples, and the lack of alignment between the curriculum and students' readiness levels. Similarly, Tekin and Bayar (2026), in their evaluation of the revised mathematics curriculum, reported that although teachers viewed the overall philosophy of the curriculum positively, they experienced difficulties regarding the applicability of the content and activities as well as the consideration of student differences. These findings are consistent with teachers' evaluations in the present study that certain parts of the curriculum exceed students' developmental and academic levels. Likewise, Uyar et al. (2023) identified several weaknesses in the implementation of the mathematics curriculum revised in 2018, including issues related to textbooks, curriculum content, school conditions, teacher-related factors, student readiness, and lack of motivation.

Experts evaluated the strengths of the curriculum in terms of its contribution to skill development, its integration of mathematics with other disciplines and everyday life, its student-centered orientation, the quality of its content, and the alignment of its instructional processes with contemporary educational approaches. Selamet and Gürlen (2024) similarly reported that the elementary mathematics curriculum supports students' mathematical thinking processes and contributes particularly to the development of higher-order cognitive skills.

The integration of mathematics with everyday life and interdisciplinary contexts is likely to enhance students' motivation, promote retention of learning, and facilitate the concretization of abstract mathematical concepts. Bingölbali and Özdiner (2022) emphasized that presenting mathematics through real-life connections strengthens students' conceptual understanding processes. Other prominent strengths of the 9th-grade mathematics curriculum include its progressive organization of content, student-centered structure, and compatibility with contemporary instructional approaches, such as the use of visual representations, mathematical modeling, technology integration, and process-oriented assessment practices.

Erdoğan (2025) highlighted that, due to the abstract nature of mathematics, students often experience difficulties in understanding mathematical concepts and that the use of digital technologies can facilitate learning by making abstract concepts more accessible and comprehensible.

Experts evaluated the weaknesses of the curriculum as being largely concentrated around insufficient instructional time, its inability to adequately address different student ability levels, and the mismatch between curriculum objectives and the centralized examination system. Similarly, in their evaluation of the mathematics curriculum revised in 2018, Ata Özer and Bal (2024) reported that although the learning outcomes were generally clear, appropriate for the grade level, sufficiently delimited and sequenced, and adequate in terms of assessment and evaluation, the allocated instructional time was insufficient. As in many other curricula, individual differences have not been adequately considered in the mathematics curriculum. Similar findings were reported by Selamet and Gürlen (2024) for the fourth-grade mathematics curriculum, Ata Özer and Bal (2024) for the eighth-grade mathematics curriculum, and Uyar et al. (2023) for the tenth-grade mathematics curriculum.

Another notable finding, namely the mismatch between the centralized examination system and curriculum objectives, is directly related to the broader issue of high-stakes examinations shaping curriculum implementation. Uyar et al. (2023) reported that there was not a complete alignment between the higher-order thinking skills targeted by the tenth-grade mathematics curriculum and the competencies assessed in centralized examinations. Likewise, Selamet and Gürlen (2024) stated that the pressure exerted by the examination system during curriculum implementation hindered the achievement of curriculum objectives.

In conclusion, both teachers' and experts' perspectives indicate that the ninth-grade mathematics curriculum is theoretically grounded in a contemporary, student-centered, and constructivist educational philosophy. The curriculum's emphasis on developing mathematical literacy, problem-solving, reasoning, and higher-order thinking skills is regarded as one of its major strengths. However, implementation-related factors such as students' readiness levels, differences among school types, class size, limited instructional time, and the centralized examination system may hinder its effective implementation. The findings suggest that the success of the curriculum depends not only on its content and intended learning outcomes but also on supportive factors such as teacher competencies, instructional materials, and school resources.

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