(ISSN: 2602-4047)

Sarıgöz, O. & Bilge-Ercan, S. (2025). An Examination of the Middle School Mathematics Curriculum Within the Scope of the Metfessel-Michael Evaluation Model, *International Journal of Eurasian Education and Culture, 10(30), 326-344.*

DOI: http://dx.doi.org/10.35826/ijoecc.2881

Article Type: Research Article

AN EXAMINATION OF THE MIDDLE SCHOOL MATHEMATICS CURRICULUM WITHIN THE SCOPE OF THE METFESSEL-MICHAEL EVALUATION MODEL

Okan SARIGÖZ

Assoc. Prof. Dr., Hatay Mustafa Kemal University, Antakya, Türkiye, okan.sarigoz@gmail.com

ORCID: 0000-0002-1616-9789

Senanur BİLGE ERCAN

Teacher, MEB, Defne, Türkiye, sbilge67@gmail.com

ORCID: 0009-0003-6818-8935

Received: 18.07.2025 *Accepted: 29.08.2025* *Published: 15.09.2025*

ABSTRACT

The aim of this study is to examine the 6th-grade mathematics curriculum based on teachers' opinions within the framework of the Metfessel-Michael evaluation model. In the study, a semi-structured interview form, developed by the researchers and one of the qualitative data collection techniques, was used. To obtain the necessary data for the research, interviews were conducted on a voluntary basis with 24 mathematics teachers working in public schools, whose professional experience ranged between 1 and 25 years. During the interviews, open-ended questions were asked to teachers regarding the transferability of the curriculum's learning outcomes, the adequacy of its content, the physical facilities, the teaching methods used, the assessment and evaluation approach, and the aspects of the curriculum that need improvement. The study examined in depth teachers' perceptions, experiences, and evaluations of the 6th-grade mathematics curriculum. Participants' views on the curriculum's applicability, the level of achievement of targeted learning outcomes, content structure, teaching process, and assessment-evaluation practices were analyzed based on their experiences. The research aims to provide qualified data on the functioning of the curriculum in the field by addressing teachers' experiences in a multidimensional manner. The theoretical basis of the research is grounded in the Metfessel-Michael evaluation model. This model provides a data-based framework that enables a comprehensive and systematic evaluation of educational programs in the field. It not only focuses on outcomes but also takes a holistic approach to the elements of the curriculum—objectives, content, teaching process, and evaluation—by emphasizing the process as well. The data obtained from the study were analyzed using the content analysis method. The study concluded that, in general, the 6th-grade mathematics curriculum is positive, but certain structural and implementation-related improvements are needed. The research also offered suggestions such as increasing the variety of materials supporting the teaching process in the curriculum, simplifying the number of learning outcomes, and updating the curriculum by considering teachers' practice-oriented needs.

Keywords: 6th-grade mathematics curriculum, curriculum evaluation, mathematics teaching, Metfessel-Michael evaluation model.

Corresponded Author: *Senanur BİLGE-ERCAN, Teacher, MEB, Defne, Türkiye, sbilge67@gmail.com*

Ethics Committee Approval: Hatay Mustafa Kemal University, Social and Human Sciences Ethics Committee, Ethics Committee approval was obtained with the decision numbered 09 and 38, dated 03.07.2025.

Plagiarism/Ethics: This article has been reviewed by at least two referees and has been confirmed to comply with research and publication ethics, containing no plagiarism.

INTRODUCTION

Curricula are plans prepared to equip individuals with the knowledge and skills they will need in life (Demirel, 2015). For a course curriculum to be successful, it is not sufficient for the program to be well-developed; it must also be effective in its implementation (Taba, 1962). Turkey experienced a major change in the field of its education system in 2005. A radical transformation was undertaken in the country's education system by adopting the constructivist philosophical approach, and methods were introduced that allowed students to be more active in the learning process (MoNE, 2005). This constructivist philosophy, which has been adopted in Turkey and in many countries worldwide, was based on the process of adding new knowledge to previously learned information and reconstructing all this knowledge in the mind. Although a philosophical shift occurred in the field of education at that time, it was also necessary for the curricula of the courses taught in schools to be prepared in accordance with both the adopted philosophical trend and the student level, as well as the country's socio-cultural structure.

The Ministry of National Education (MoNE, 2005) developed its own curriculum development model and revised the curricula for all subjects. However, it was also necessary to evaluate the effectiveness of the newly developed curricula. Many courses were evaluated according to different curriculum evaluation models, and sections considered incomplete or incorrect were revised. One of the courses affected by this change was the mathematics curriculum. Particularly after the changes in Turkey, in middle school mathematics courses, not only formulas but also skills such as problem-solving and reasoning gained importance (Altun, 2020). Middle school mathematics is especially important in laying the foundations of mathematics because it is during this period that students learn to think mathematically (Van de Walle, 2014). There are many curriculum evaluation models developed to assess mathematics curricula. One such model is the Metfessel-Michael curriculum evaluation model, which considers both quantitative data and qualitative observations (Metfessel & Michael, 1967). This model evaluates all aspects of a curriculum (objectives, content, methods) simultaneously (Worthen & Sanders, 1987). Its greatest strength is that it focuses not only on outcomes but also on the process. Thus, shortcomings in the curriculum can be easily identified and corrected (Patton, 2008). The Metfessel-Michael curriculum evaluation model is a particularly useful method for evaluating mathematics curricula (Şahinel, 2003).

Developed by Norman, Metfessel, and Michael in 1967, this model provides a systematic framework for evaluating curricula (Metfessel & Michael, 1967). The model was influenced by the CIPP model (Context, Input, Process, Product) and Goal-Oriented Evaluation models, both of which hold significant importance in the field of educational evaluation (Stufflebeam, 2003; Tyler, 1949). The most important characteristic of this model is that it focuses not only on outcomes but also on all stages of the educational process (Patton, 2008). In this way, all changes and developments that occur during the implementation of the curriculum can be carefully examined (Scriven, 1991). The model's holistic approach provides educators with more objective and comprehensive evaluation opportunities (Kirkpatrick, 1994). The stages of the model are as follows:

1. **Determining Objectives**: The general and specific objectives of the curriculum are clearly defined (Bloom, 1956). At this stage, the expected outcomes of the curriculum are explicitly stated (Mager, 1997).
2. **Making Objectives Implementable**: The defined objectives are transformed into concrete teaching strategies and management plans (Gagné, 1985). In this way, abstract objectives are broken down into actionable steps (Dick & Carey, 1996).
3. **Planning the Implementation Process**: How the curriculum will be implemented is planned in detail (Posner, 1995). At this stage, scheduling, resource allocation, and responsibilities are determined (Kaufman, 1988).
4. **Developing Evaluation Instruments**: Appropriate measurement tools are prepared to assess the effectiveness of the curriculum (Thorndike, 2005).
5. **Data Collection**: While the curriculum is being implemented, information is gathered through various data collection methods, and this data can be obtained using both quantitative and qualitative methods (Merriam, 2009).
6. **Data Analysis**: The collected data is analyzed using statistical methods, and because of these analyses, the strengths and weaknesses of the curriculum are revealed (Fraenkel & Wallen, 2006).
7. **Interpreting the Results**: The analysis results are interpreted by educators, and these interpretations form the basis for revising the curriculum (Stake, 2004).
8. **Feedback and Revision**: Necessary adjustments are made to the curriculum in line with the findings obtained. This process ensures the continuous improvement of the curriculum (Deming, 1986).

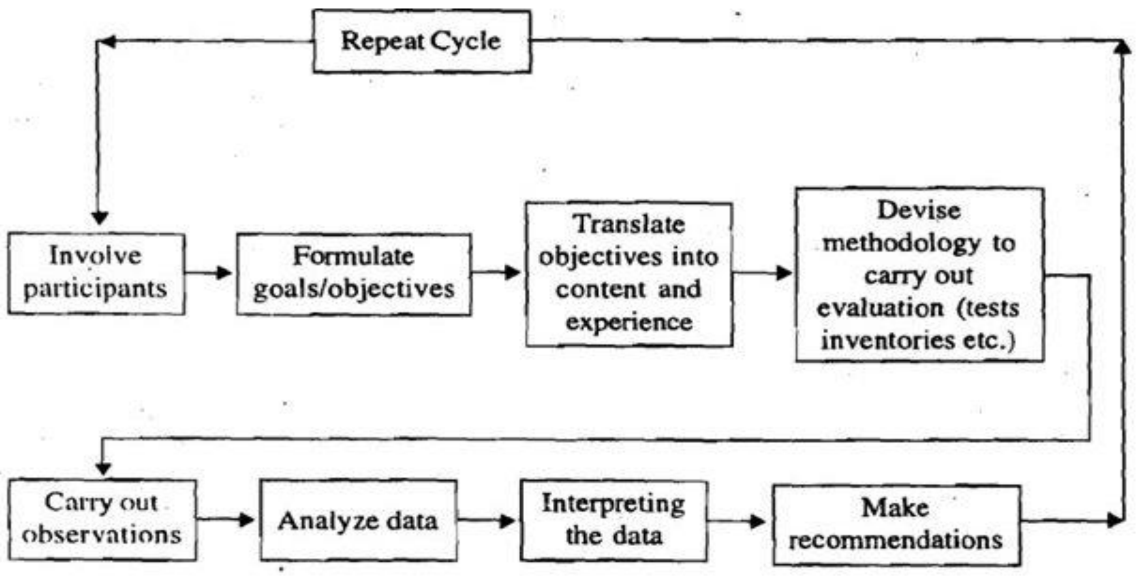

Figure 1. The Tyler-Metfessel-Michale Model

The success of curricula depends not only on the accuracy of the theoretical objectives but also on the extent to which these objectives are realized in practice (Metfessel & Michael, 1967). Therefore, the Metfessel Michael evaluation model offers the opportunity to analyze the functionality and effectiveness of programs in a multidimensional manner, considering not only student outcomes but also the teaching process, content, environment, and teacher practices (Metfessel & Michael, 1967; Şahinel, 2003). The program evaluation model consists of five stages.

1. **Evaluation of Objectives:** The extent to which the learning outcomes specified in the program are achieved by students and the ways in which teachers transfer these objectives into practice are evaluated. Examining the alignment between objectives and learning outcomes plays a critical role in understanding the effectiveness of the program (Demirel, 2012; Erdem, 2001).
2. **Appropriateness of Content:** The suitability of the program content to students' developmental levels, current experiences, and academic needs is evaluated. It is noted that in disciplines such as mathematics, relating the content to real life deepens learning (Yıldırım, 2019).
3. **Teaching Process and Methods:** The compatibility of the methods and techniques used by teachers with the constructivist approach and the consistency of classroom activities with the program objectives are examined. Approaches such as problem-based learning, cooperative learning, and mathematical modeling are emphasized as effective (Altun, 2020; Baykul, 2019).
4. **Student Learning Outcomes and Assessment-Evaluation:** The extent to which students acquire the knowledge, skills, and attitudes envisaged by the program is assessed using both traditional and alternative assessment tools. It is stated that process-oriented evaluation is more effective than evaluation based solely on results (Gür, 2014).
5. **Learning Environment and Physical Conditions:** The impact of the school's physical facilities, material resources, and classroom environment on the teaching process is analyzed. Due to regional differences, it is emphasized that program implementations should be evaluated within the local context (Küçükahmet, 2009).

The applicability of the Metfessel-Michael model is particularly advantageous in terms of data collection in the field and multidimensional evaluation. The flexible structure of the model makes it possible to observe the 6th-grade mathematics curriculum directly in its implementation areas, support it with teacher opinions, and enrich it with quantitative data on student outcomes indeed, it is stated that this model can be used effectively, especially in program evaluation studies conducted at the micro level (Şahinel, 2003). Through the integration of the model into curricula, it becomes possible to conduct not only content-based but also process- and outcome-based evaluation (Metfessel & Michael, 1967). In this way, the reflections of curricula in the field can be observed more clearly, the difficulties encountered by teachers in practice can be identified, and constructive feedback based on recommendations can be generated (Demirel, 2012).

Although the Metfessel-Michael evaluation model offers a multidimensional and process-based structure, it also contains certain limitations in practice (Metfessel & Michael, 1967). The implementation of this model requires large-scale data collection, which constitutes a significant burden in terms of both time and human resources (Demirel, 2012). In particular, the processes of collecting, analyzing, and reporting qualitative data require the researcher to devote considerable effort and attention (Gür, 2014). Therefore, the model provides many contributions to the evaluation of curricula. One of the most fundamental advantages of the model is that it does not focus solely on student achievement; rather, it offers the opportunity to evaluate the entire teaching process, including teacher practices, content, methods, learning environment, and student interaction (Altun, 2020; Sarıgöz, 2015-2016). With the model, it becomes possible to analyze not only the outcomes but also the variables within the process, thus enabling a multidimensional examination of the applicability of the curriculum in the field (Baykul, 2019). Thanks to the integration of qualitative and quantitative data offered by the model, teacher opinions, observations, documents, and student products can be analyzed together to achieve more comprehensive results (Yıldırım, 2019). This approach makes it possible to understand not only what is taught, but also how it is taught and what kinds of interactions occur during the learning process (Şahinel, 2003). In addition, the applicability of the model at different grade levels and in different disciplines demonstrates its flexible structure and widespread validity (Küçükahmet, 2009). In this respect, the Metfessel-Michael model offers an alternative and in-depth framework for curriculum evaluation (Demirel, 2012).

Purpose of the Study

The purpose of this study is to examine the effectiveness of the 6th-grade Mathematics Curriculum within the framework of the Metfessel-Michael evaluation model, based on teachers' opinions. In this context, teachers' views regarding the applicability of the program's learning outcomes, the adequacy of its content, the physical conditions, the teaching methods used, the assessment and evaluation approaches, and the aspects of the program that need improvement were analyzed. Data obtained from semi-structured interviews conducted with mathematics teachers of varying seniority were evaluated using the content analysis method. As a result of the research, it was determined that the curriculum was generally received positively; however, some structural and practical improvements were found to be necessary. Accordingly, it was aimed to shed light on the problems encountered in the field by presenting suggestions for the improvement of the program.

Research Questions

This research aims to evaluate the 6th-grade mathematics curriculum based on teachers' opinions within the framework of the Metfessel-Michael evaluation model. In this regard, the following research questions were addressed:

1. How do teachers evaluate the objectives of the 6th-grade mathematics curriculum?
2. What are the sufficient and deficient aspects of the program content?
3. To what extent do the physical conditions of the schools where teachers work support mathematics teaching?
4. Which teaching methods and techniques do teachers use in their lessons, and how compatible are these methods with the curriculum?
5. Is the program's assessment and evaluation approach considered sufficient by teachers?
6. According to teachers, what aspects of the program need improvement?

Limitations of the Study

The research is limited only to the 6th-grade mathematics curriculum. The participants consist of 24 teachers working in public secondary schools. As a data collection tool, a semi-structured interview form developed by the researchers was used. The findings do not have generalizability due to the nature of the qualitative research design; instead, they aim to provide in-depth descriptive information.

METHOD

Research Design

In this study, the phenomenology design, one of the qualitative research methods, was used. Phenomenology is an approach that aims to reveal individuals' experiences regarding a particular phenomenon and the meanings they attribute to these experiences (Yıldırım & Şimşek, 2021). In the research, teachers' perceptions, experiences, and evaluations regarding the 6th-grade mathematics curriculum were examined in depth. The opinions of the participating teachers on the applicability of the program, the level of achievement of targeted learning outcomes, the structure of the content, the teaching process, and assessment-evaluation practices were analyzed based on their experiences. Therefore, the study aims to provide qualified data on the functioning of the curriculum in the field by addressing teacher experiences in a multidimensional way. The theoretical foundation of the study is based on the Metfessel-Michael program evaluation model. This model enables a multifaceted and systematic evaluation of educational programs and is a data-driven evaluation model. The model aims to address the goals, content, teaching process, and evaluation dimensions of the program holistically by focusing not only on the outcomes but also on the process (Metfessel & Michael, 1967). Thus, it is a model that can provide meaningful feedback to decision-makers by applying it based on the findings obtained. In the study, the data obtained through teacher opinions were structured and analyzed in line with the principles of this model. In this way, based on teacher opinions, the study aimed to develop a holistic perspective on both the reflections of the mathematics curriculum in the field and the evaluation process.

Ethics committee permission

Hatay Mustafa Kemal University, Social and Human Sciences Ethics Committee, Ethics Committee approval was obtained with the decision numbered 09 and 38, dated 03.07.2025.

Participants

The study group of the research consists of a total of 24 middle school mathematics teachers working in public secondary schools affiliated with the Hatay Provincial Directorate of National Education in the 2024–2025 academic year. Participants were determined through maximum variation sampling. This type of sampling aims to obtain rich data on how the phenomenon under study is experienced in different contexts (Patton, 2014). In this regard, diversity was ensured by considering variables such as teachers' seniority and place of duty. Teachers were included in the study on a voluntary basis. Before the interviews, appointments were made with the teachers, and interviews were conducted at times when they were free and did not have lessons. The names of the teachers included in the study group were kept confidential and coded as T1, T2, … T24.

Data Collection Tools

The data required for the research were collected through a semi-structured interview form developed by the researchers. The interview form was prepared in line with a literature review and the Metfessel-Michael Evaluation Model. The interview form consists of six open-ended questions. Expert opinion was obtained in the preparation of the interview form, and the final version of the form was given after a pilot application. The questions in the interview form are about objectives, content, physical conditions, teaching methods and techniques, assessment-evaluation, and the deficiencies of the program.

Semi-Structured Interview Form Questions:

1. **Regarding the Objective:** "How do you evaluate the level of transferring the learning outcomes of the 6th-grade mathematics curriculum to students?"
2. **Regarding the Content:** "Do you think the content adequacy of the program is sufficient? Are there any topics you find lacking?"
3. **Physical Conditions:** "Do the physical facilities of your school (technology, laboratory, etc.) support mathematics teaching?"
4. **Methods and Techniques:** "Which teaching methods do you use in your lessons? Does the program support these methods?"
5. **Assessment-Evaluation:** "Do you find the program's assessment-evaluation approach sufficient? Do you have any alternative suggestions?"
6. **Deficiencies of the Program:** "In your opinion, what is the most important aspect of the program that needs improvement?"

Explanation of Interview Questions According to the Metfessel-Michael Evaluation Model:

1. **Question Regarding the Objective:**
   This question is directly aimed at evaluating the objectives and product dimension of the model. It shows the extent to which the goals of the program have been achieved. Teachers' evaluations regarding the level at which students have attained the targeted knowledge and skills provide qualitative data on the success level of the program (Erdem, 2001; Güven & Dere, 2019).
2. **Question Regarding the Content:**
   This question is addressed within the scope of the input dimension of the model. This is because the topics included in the curriculum, the content of the learning outcomes, and the quality of these contents are among the fundamental inputs at the start of the educational process. Teacher opinions provide important information regarding the appropriateness of the content to the grade level and whether it addresses the cognitive development levels (Demirel, 2012; Baykul, 2019; Şahin, 2021).

3. **Question on Physical Conditions:**
   This question is also considered as an extension of the input component. This is because the learning environment, the materials used, technology, and physical infrastructure are inputs that directly affect the quality of the learning process. In this context, it is in line with the Metfessel-Michael model's principle of considering environmental conditions (Güneş, 2022; Ersoy & Aydın, 2018).
4. **Question on Methods and Techniques:**
   This question corresponds to the process dimension of the model. Which methods and techniques teachers adopt in the teaching process and the extent to which these align with the program are important in terms of the applicability of the curriculum.
5. **Question on Assessment and Evaluation:**
   This question serves both the product and feedback stages. This is because measuring and evaluating student achievement plays a key role in determining the outputs of the program. At the same time, using the results of the assessment to make revisions or to improve the program contributes to the feedback mechanism of the model (Çakıroğlu & Yılmaz, 2020; Turgut, 1997).
6. **Question on the Deficiencies of the Program:**
   The suggestions made by teachers based on their experiences are a valuable source of data in terms of identifying the deficiencies of the program and determining areas open to improvement. In this stage, where the model values teacher contribution to the decision-making process, the feedback received constitutes a basis for future program revisions (Demirtaş & Güneş, 2017; Gür, 2014; Korkmaz & Şahin, 2013).

Data Collection Process

The interviews were conducted face-to-face on a one-on-one basis by the researcher. Each interview lasted approximately between 30 and 40 minutes. Prior to the start of the interviews, verbal and written informed consent was obtained from the participants, and the interviews were carried out on a voluntary basis. The interviews of those participants who granted permission were recorded using a voice recorder, and these recordings were then carefully transcribed into written text. During the transcription process, the participants' statements were preserved in their original form, without any prompting or alterations. The interviews were completed between April 1 and April 30, 2025, in line with the planned data collection schedule of the research. The identities of the participants were kept confidential, no personal information was included in the interview transcripts, and all data were collected solely for use within the scope of this study. The confidentiality and security of the obtained data were ensured.

Data Analysis

The qualitative data obtained in this study were analyzed using the descriptive analysis method. Descriptive analysis aims to present participants' opinions clearly and systematically by organizing the data according to themes determined in advance by the researcher (Yıldırım & Şimşek, 2021). In this method, the participants' statements are directly quoted by the researcher and transferred into writing, and interpretations are made based on these quotations. In this context, the data obtained through the semi-structured interview form developed by the researcher were first transcribed into written text and then reviewed again for accuracy and completeness. For data analysis, themes determined beforehand in line with the research objective (objectives, content, physical conditions, teaching methods, assessment-evaluation, and aspects in need of improvement) were used as the basis. Teachers' statements were grouped under these headings. In order to conduct a deeper analysis of the data, the content analysis method was also used as a supplementary approach alongside descriptive analysis (Yıldırım & Şimşek, 2021; Neuendorf, 2017). In the content analysis, similar opinions, recurring expressions, and notable emphases were identified. These similarities were brought together to form certain common meaning groups (Krippendorff, 2013). Additionally, the frequency of repetition of each opinion under each theme was indicated, thereby expressing numerically how prevalent certain ideas were. This contributed to the reliability of the research findings. Throughout the entire analysis process, the researcher paid close attention to remain faithful to the participants' statements when making interpretations. In this way, the validity and reliability of the research were enhanced.

FINDINGS

This section presents the findings of the study, which examined the effectiveness of the 6th Grade Mathematics Curriculum within the framework of the Metfessel-Michael evaluation model, based on teachers' opinions. The findings are presented in line with six sub-problems. First, teachers' views on the objectives and learning outcomes of the curriculum were examined. Then, evaluations regarding the curriculum's content, physical conditions, teaching methods, assessment-evaluation approach, and aspects in need of improvement were included. Each sub-problem was addressed thematically in accordance with teachers' views.

Findings Related to the First Sub-Problem

Table 1 presents the findings related to the sub-problem: *How are the objectives of the 6th Grade Mathematics Curriculum evaluated by teachers?*

Table 1. How do you evaluate the level at which the learning outcomes of the 6th Grade Mathematics Curriculum are conveyed to students?

Code	Participant	Frequency
The learning outcomes are clear, but lack of time makes learning difficult	T5, T7, T9, T11, T14, T16, T18, T20, T21	9
Abstract topics are difficult for students to understand	T1, T4, T6, T10, T12, T13, T17, T20	8
Students' readiness limits the delivery of learning outcomes	T2, T3, T8, T15, T19	5
The learning outcomes are appropriate to the students' level	T3, T4, T18	3

As shown in Table 1, most teachers (n=9) stated that they were unable to cover all the learning outcomes within the available time, and that the lesson duration was insufficient for students to fully grasp the outcomes. In addition, 8 teachers emphasized that especially abstract topics were not easily comprehended by students and highlighted the necessity of concretization in teaching. While 5 teachers referred to the difficulties in delivery due to the varying readiness levels of students, only 3 teachers considered the learning outcomes to be appropriate for the level. Below are the statements of mathematics teachers regarding these situations.

T1: "Topics such as volume and ratio–proportion do not fully settle in the students' minds." **T6:** "Learning becomes more difficult when there is no visualization and material support." **T14:** "Having too many learning outcomes in the program creates a structure that cannot be completed in time, both for the teacher and the student." **T3:** "The learning outcomes are quite suitable for students, but in some years the students' readiness level makes it difficult to deliver these outcomes." **T17:** "Students have difficulty when abstract learning outcomes are delivered. Without concretization, it is impossible for them to understand some concepts." **T19:** "The skills we aim to instill are good, but when students' readiness level is low, achieving the target becomes difficult." **T20:** "Although success is achieved in some learning outcomes, the speed and intensity of the program make it difficult for them to fully settle with the students. It cannot be studied."

Findings Regarding the Second Sub-Problem

Table 2 presents the findings related to the sub-problem: *In your opinion, is the content of the curriculum sufficient, and are there any topics you find lacking?*

Table 2. In your opinion, is the content of the curriculum sufficient? Are there any topics you find lacking?

Code	Participant	Frequency
The content is overly dense; simplification is necessary	T4, T6, T8, T10, T13, T14, T16, T18, T20, T21	11
Insufficient connection to daily life	T2, T5, T9, T13, T15, T17, T19, T20, T21, T22	10
Lack of higher-order skills (logical thinking, problem solving)	T2, T5, T7, T11, T13, T16, T19, T21, T24	9
Repetitive learning outcomes are present	T1, T3, T6, T10, T14, T18, T23	7

In Table 2, 11 teachers stated that the program is overly dense in terms of content and that some learning outcomes should be simplified. Ten teachers indicated that the content is not sufficiently connected to students' daily lives, which leads to a loss of motivation among students. Nine teachers expressed that the program does not adequately address higher-order thinking skills. In addition, seven teachers emphasized that the same skill is repeated in the content through different learning outcomes, and such repetitions make the teaching process more challenging. Below are the statements of mathematics teachers regarding these situations.

T1: *"Some content is very repetitive. We see that the same skill is repeated with different learning outcomes. Instead, more emphasis should be placed on logical thinking."* **T2:** *"More real-life problems should be solved."* **T9:** *"Although the content seems sufficient, it lacks in making connections to daily life. Students ask, 'When will we ever use this topic?'"* **T11:** *"I would like to see more emphasis on higher-order skills such as logical thinking."* **T14:** *"There is too much repetition in the content. More topics related to students' thinking skills should be included."*

T15: *"There is very little connection to daily life. Students ask, 'What use will this knowledge be to us?"* **T17:** *"The content is appropriate to the students' age level. However, it does not promote skill-oriented development. Memorized knowledge is still very dominant."* **T24:** *"Skills such as problem-solving strategies and modeling are in the background in the program. These topics should be given more prominence."*

Findings Regarding the Third Sub-Problem

Table 3 presents the findings related to the sub-problem "To what extent do the physical conditions of the schools where teachers work support mathematics teaching?"

Table 3. To what extent do the physical conditions of the schools where teachers work support mathematics teaching?

Code	Participant	Frequency
Technological infrastructure (smart board, internet) is insufficient	T2, T6, T9, T10, T12, T15, T16, T17, T18, T21, T22, T23	12
Lack of materials limits teaching	T3, T5, T6, T10, T12, T13, T18, T20, T22, T24	10
Differences in classroom equipment cause inequality of opportunity	T4, T11, T14, T18, T21, T23	6
Basic digital equipment is available, providing partial support	T1, T4, T7, T8	4

According to Table 3, 12 teachers stated that the technological infrastructure in their schools is insufficient, particularly emphasizing that the lack of internet access and interactive tools negatively affects teaching. Ten teachers indicated that the lack of materials complicates both the planning and implementation processes. Six teachers highlighted that there are differences in equipment between schools, which creates inequality of opportunity among students. Only four teachers stated that the technological equipment is generally adequate but remains limited in practice. Below are the statements of mathematics teachers regarding these situations.

T3: *"We have a smart board, which is very useful. However, we experience shortages in terms of laboratories and tangible materials."* **T6**: *"Unfortunately, it is not sufficient. We struggle to use interactive materials."* **T10**: *"I can say it is moderate. Some classrooms have smart boards, but the internet connection is problematic."* **T12**: *"Insufficient. The use of a projector or computer is not possible. Conducting interactive lessons becomes difficult."* **T15**: *"It does not support us. Apart from a few materials, we have no technological facilities. We manage everything through our own efforts."* **T23**: *"We have a smart board, but there is no adequate material support. Additionally, we experience internet problems."*

Findings Related to the Fourth Sub-Problem

Table 4 presents the findings related to the sub-problem: *Which teaching methods and techniques do teachers use in their lessons? How is the alignment of these methods with the curriculum?*

Table 4. Which teaching methods and techniques do teachers use in their lessons? How is the alignment of these methods with the curriculum?

Code	Participant	Frequency
Time and class structure limit active methods	T1, T2, T3, T6, T9, T11, T12, T16, T17, T20, T22	11
The curriculum is open to methodological diversity but difficult to implement	T4, T5, T7, T8, T10, T13, T14, T19, T21, T24	10
Lack of materials and resources restricts methods	T3, T5, T7, T10, T12, T13, T18, T22, T24	9
Traditional methods (lecture, question–answer) are more widely used	T1, T3, T6, T9, T12, T15, T17, T21	8

According to Table 4, 11 teachers stated that due to time constraints and crowded classrooms, they have difficulty using active teaching methods such as games and group work. Nine teachers reported that they could not adequately implement alternative methods due to a lack of materials. Ten teachers emphasized that although the curriculum supports methodological diversity, there are physical and logistical barriers in practice. In addition, eight teachers stated that they generally tend to use traditional methods such as lecturing and question–answer. Below are the statements of mathematics teachers regarding these situations.

T1: *"There is a significant time constraint. Even if I want to do group work, the class size and time available do not allow it."* **T3:** *"For many years, I have focused on lecturing and solving examples."* **T11:** *"I implement problem-solving and group work methods. However, the crowded classroom and lack of materials sometimes make this difficult."* **T13:** *"The curriculum is suitable, but the materials are insufficient."* **T15:** *"Lecturing and example solving are the methods I use the most. Although the curriculum suggests group work, the facilities are limited."* **T19:** *"I try various methods: storytelling, question–answer, drama, etc. The curriculum is flexible, but insufficient in terms of materials."* **T21:** *"I use lecturing, example solving, and sometimes group work. The curriculum seems to provide support, but the textbooks do not reflect this support."*

Findings Regarding the Fifth Sub-Problem

Table 5 presents the findings related to the sub-problem *"Is the program's assessment and evaluation approach considered adequate by teachers?"*

Table 5. Is the program's assessment and evaluation approach considered adequate by teachers?

Code	Participant	Frequency
Performance tasks and rubrics are inadequate and unclear	T1, T3, T7, T8, T11, T12, T13, T16, T17, T20, T22, T24	12
Result-oriented test system is dominant, process evaluation is weak	T5, T6, T8, T10, T13, T15, T18, T19, T21, T23	10
Assessment tools are diverse but there is a lack of guidance in practice	T2, T4, T9, T14, T17, T18, T22	7

Upon examining Table 5, 12 teachers stated that the curriculum does not provide sufficient clarity on how performance tasks should be implemented and that the rubrics are not explicit. Ten teachers emphasized that the current system is largely based on examinations and results, and that there is an insufficiency of assessment and evaluation tools that monitor the students' developmental process. Seven teachers, while finding the diversity of assessment tools included in the program positive, expressed that there is a lack of guidance for the in-class implementation of these tools. Below are statements reflecting the views of mathematics teachers regarding these situations:

T1: *"The assessment and evaluation approach proceeds based on multiple-choice questions. There are also open-ended questions, but how performance tasks should be carried out is not sufficiently explained."* **T8:** *"Process evaluation is not conducted. There should be more comprehensive systems that monitor student development."* **T11:** *"There is no clarity in performance tasks. We spend a lot of time explaining to the student what to do and how to do it."* **T15:** *"Just solving tests is not enough. Criteria such as projects and observations should be used more."* **T17:** *"The test system is still dominant. There should be a transition to assessment methods that monitor the student's process."* **T22:** *"Assessment and evaluation tools are not applicable. Especially for projects, there should be clearer criteria."*

Findings Related to the Sixth Sub-Problem

Table 6 presents the findings related to the sub-problem: *What aspects of the curriculum, according to teachers, need to be improved?*

Table 6. What aspects of the curriculum, according to teachers, need to be improved?

Code	Participant	Frequency
The number of learning outcomes is excessive; simplification is needed	T1, T4, T5, T9, T10, T14, T16, T17, T18, T20, T21, T22, T23	13
Material and textbook support is insufficient	T3, T5, T6, T7, T10, T12, T13, T18, T20, T22, T23, T24	12
Skill-based and real-life related content should be increased	T2, T5, T7, T11, T13, T15, T17, T19, T21, T22, T24	11

When Table 6 is examined, 13 teachers stated that the program contains many learning outcomes, creating an unmanageable structure for both teachers and students. Twelve teachers emphasized the insufficiency of material and textbook support, noting that teachers are forced to produce content with their own means. Eleven teachers argued that the program has moved away from being skill-based and that content related to daily life, which supports meaningful learning, should be increased. Below are the statements of mathematics teachers regarding these situations.

T3: *"Textbooks are insufficient. More resources with numerous examples and extensive practice should be provided."* **T5**: *"Skill-based education should be emphasized more. It should instill thinking in students, not rote memorization."* **T8**: *"The biggest shortcoming of the program is the lack of practice-oriented materials.*

Concretization is essential for abstract concepts." **T13**: *"We should move away from rote learning and shift to a skill-based structure. In addition, the number of learning outcomes should be reduced."* **T16**: *"The number of learning outcomes is too high. Simplification is needed for students to learn both deeply and permanently."* **T19**: *"It is not the students who learn but those who memorize that stand out. This situation should change, and a skill-based system should be adopted."* **T20**: *"The pace and intensity of the program make it difficult for students to fully internalize the content. It cannot be covered in depth."* **T22**: *"Books and materials should be revised. In addition, differentiated instruction should be provided according to students' interest levels."*

CONCLUSION and DISCUSSION

This study evaluated the effectiveness of the 6th-grade mathematics curriculum within the framework of the Metfessel-Michael evaluation model based on teachers' opinions. As emphasized by Metfessel and Michael (1967), the curriculum evaluation process should be addressed not only through outcomes but also through all dimensions such as the instructional process, content, teaching methods, and learning environments.

The findings obtained in the study indicate that, although the overall structure of the curriculum is perceived positively, certain structural elements and implementation processes remain insufficient in meeting teachers' expectations. While most teachers found the learning outcomes of the curriculum clear and applicable, they stated that there were difficulties in conveying abstract concepts and that the lack of time made this transfer even more challenging. This situation, as Erdem (2001) points out, indicates that the effectiveness of the curriculum will decrease if the "learning outcome–method–time" trio is not in balance. In terms of content, while some teachers found the curriculum sufficient, a significant portion stated that there were repetitions in the content and that some abstract concepts were presented without relating them to students' life experiences. Yıldırım (2019) emphasizes that the lack of connection between the content and students' life experiences negatively affects the permanence of learning. Regarding physical conditions, although technological infrastructure supports most teachers' lessons, regional differences and the unequal distribution of technology to classrooms have brought educational inequality to the agenda. As Ersoy and Aydın (2018) state, disparities in school facilities are an important factor limiting the applicability of curricula in the field. In terms of teaching methods, most teachers reported preferring traditional methods due to time constraints and lack of materials. This finding is consistent with Altun's (2021) study, which states that support in teaching materials and time management is essential for the effective implementation of the constructivist approach. Finally, regarding assessment and evaluation practices, although most teachers generally expressed satisfaction, uncertainties in the implementation of performance tasks and rubrics were frequently mentioned. Çakıroğlu and Yılmaz (2020) argue that, for such alternative assessment tools to be effective, detailed guidelines should be provided to teachers.

In this context, thanks to the multidimensional evaluation structure offered by the Metfessel-Michael model, not only the content of the curriculum but also the practical problems encountered during the implementation process could be analyzed holistically (Şahinel, 2003; Güven & Dere, 2019). Thus, more concrete and applicable recommendations regarding the curriculum development process have been generated.

RECOMMENDATIONS

The research findings reveal that there are certain structural and functional problems in the implementation of the 6th-grade mathematics curriculum. Most teachers stated that the curriculum is quite dense in terms of content, and this situation makes the process difficult for both teachers and students. The excessive content prevents learning outcomes from being addressed in depth and negatively affects students' meaning-making process. Indeed, Köksal (2009) states that curricula should be simple and clear, and that excessive density can make learning difficult. Therefore, it is recommended to reduce the number of learning outcomes and to move to a structure where each outcome can be addressed more thoroughly (Demirel, 2012). Simplifying the objectives of the curriculum in a clearer manner and in a way that is appropriate to the student level can increase the efficiency of the teaching process (Varış, 1996).

Teachers emphasized that the curriculum does not sufficiently establish a connection with daily life. It was expressed that mathematics topics with weak real-life connections do not become meaningful for students and cause the subject to become irrelevant. The lack of real-life contexts causes students to perceive mathematics as an abstract field of knowledge. This situation has also been emphasized in the literature; Özmantar and Bingölbali (2009) stated that students should be supported with examples from their daily lives to make sense of mathematics. Therefore, more activities and problem-solving applications associated with daily life should be included in the curriculum (Altun, 2020).

Another noteworthy finding is the inadequacy of technological infrastructure. Many teachers participating in the study stated that smart boards frequently break down, internet connection is problematic, and due to the lack of equipment, digital materials cannot be used sufficiently. This situation causes interruptions in the teaching process. Yıldırım and Şimşek (2018) state that technological infrastructure directly affects the quality of lessons and that the effective use of teaching materials is only possible with sufficient equipment and support. In this context, technological equipment should be strengthened and in-service training on the use of digital tools should be provided to teachers (Turan & Yıldız, 2021).

A large portion of teachers stated that due to the large class sizes and limited lesson time, they could not sufficiently use active teaching methods. It was noted that the applicability of group work, game-based learning, or student-centered practices in the classroom is low. This problem directs teachers more towards lecture-based, traditional methods. Baş (2006) emphasizes that to use student-centered approaches in the teaching process, classroom environments should be appropriately arranged and flexibility in terms of time should be provided to the teacher. In this regard, teaching time should be organized, class sizes should be reduced, and support should be given to teachers to make teaching methods more functional.

There are also inadequacies in the diversity of assessment tools in the curriculum. Teachers stated that the assessment and evaluation approach of the curriculum is mostly based on tests and that process-oriented assessment tools are not sufficiently used. It was expressed that performance tasks are not clearly defined, and rubrics are not well specified. Ersoy (2005) argues that in assessment and evaluation processes, focus should be placed not only on results but also on the learning process, and in this context, the use of process assessment tools should be increased. Therefore, for teachers to effectively implement performance tasks, clear guidelines, understandable rubrics, and structured sample applications should be provided (Baykul, 2010).

Teachers believe that the curriculum should be more skill-based, practice-oriented, and student-centered. Instead of a structure based on rote knowledge, a curriculum is requested that includes activities to develop students' mathematical thinking, problem-solving, and critical thinking skills. This view is also consistent with many studies. Aktaş and Ünlü (2013) state that skill-based approaches in mathematics teaching increase students' permanent learning and improve their ability to produce solutions to real-life problems. In this regard, more space should be given in the curriculum to problem-based learning, modeling activities, and practical applications (Bozkurt & Koç, 2020).

REFERENCES

Altun, M. (2020). *Ortaöğretim ve ilköğretim matematik öğretimi*. Alfa Akademi Yayınları.

Altun, M. (2021). *Matematik öğretimi*. Alfa Akademi Yayınları.

Aydın, M., & Şahin, Ç. (2020). *Matematik eğitiminde program değerlendirme modelleri*. Pegem Akademi.

Aypay, A. (2017). *Eğitim programları ve öğretim*. Nobel Akademik Yayıncılık.

Baykul, Y. (2019). *Matematik öğretimi (İlköğretim 6–8. sınıflar için)*. Pegem Akademi.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7–74. https://doi.org/10.1080/0969595980050102

Çakıroğlu, Ü., & Yılmaz, K. (2020). Ortaokul matematik programının ölçme-değerlendirme boyutuna ilişkin öğretmen görüşleri. *Eğitimde Kuram ve Uygulama, 16*(1), 77–92. https://doi.org/10.30831/akukeg.646398

Çiftçi, S., & Aslan, M. (2019). Ortaokul matematik öğretim programına yönelik öğretmen görüşlerinin değerlendirilmesi. *İlköğretim Online, 18*(3), 1202–1215. https://doi.org/10.17051/ilkonline.2019.613207

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947–967. https://doi.org/10.1016/S0742-051X(02)00053-7

Cohen, D. K., & Ball, D. L. (1990). Relations between policy and practice: A commentary. *Educational Evaluation and Policy Analysis, 12*(3), 331–338. https://doi.org/10.3102/01623737012003331

Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. Jossey-Bass Publications.

Demirel, Ö. (2012). *Eğitimde program geliştirme: Kuramdan uygulamaya*. Pegem Akademi.

Demirtaş, Z., & Güneş, H. (2017). Eğitim programlarının değerlendirilmesi. *Eğitim ve Bilim, 42*(190), 45–68. https://doi.org/10.15390/EB.2017.7104

Doğanay, A. (2020). *Eğitim programları ve öğretim: Kuramdan uygulamaya*. Pegem Akademi Yayıncılık.

Erdem, A. R. (2001). Eğitim programlarını değerlendirmede kullanılan modeller. *Kuram ve Uygulamada Eğitim Yönetimi, 25*, 99–112.

Ernest, P. (1991). *The philosophy of mathematics education*. Routledge Publications.

Ersoy, A., & Aydın, F. (2018). Eğitimde fırsat eşitliği bağlamında okul fiziki altyapılarının değerlendirilmesi. *Eğitim ve Toplum Araştırmaları Dergisi, 5*(1), 45–60.

Ertürk, S. (1972). *Eğitimde program geliştirme*. Meteksan Yayınları.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). Teachers College Press Publications.

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Sage Publications.

Güneş, H., & Demirtaş, Z. (2017). Eğitim programlarının değerlendirilmesinde çoklu veri kaynaklarının kullanımı. *Eğitim ve Bilim, 42*(190), 89–104. https://doi.org/10.15390/EB.2017.7113

Güneş, T. (2022). Matematik öğretiminde fiziki imkânların etkisi: Okullar arası eşitsizlikler. *Eğitimde Kuram ve Uygulama, 18*(2), 89–102. https://doi.org/10.30703/muefd.1100191

Guskey, T. R. (2000). *Evaluating professional development*. Corwin Press Publications.

Gür, H. (2014). Öğretim programlarının değerlendirilmesinde bütüncül yaklaşım. *Eğitim ve Bilim, 39*(176), 310–324.

Güven, B., & Dere, H. (2019). Matematik öğretim programlarının değerlendirilmesinde Metfessel-Michael modelinin kullanımı. *Eğitim ve Bilim, 44*(199), 23–45. https://doi.org/10.15390/EB.2019.8125

Korkmaz, C., & Şahin, M. (2013). 2009 Pisa başarılarına göre ülkelerin genel ve insani gelişmişlik düzeyleri arasındaki ilişki. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10*(22), 225-247.

Krippendorff, K. (2013). *Content analysis: An introduction to its methodology* (3rd ed.). Sage Publications.

Metfessel, N. S., & Michael, W. B. (1967). A paradigm involving multiple criterion measures for the evaluation of the effectiveness of school programs. *Educational and Psychological Measurement, 27*(4), 921–938. https://doi.org/10.1177/001316446702700404

Milli Eğitim Bakanlığı (MEB). (2018). *Matematik dersi öğretim programı (6. sınıf)*. https://mufredat.meb.gov.tr

National Council of Teachers of Mathematics (NCTM). (2000). *Principles and standards for school mathematics*. NCTM Publications.

Neuendorf, K. A. (2017). *The content analysis guidebook* (2nd ed.). Sage Publications.

Ornstein, A. C., & Hunkins, F. P. (2018). *Curriculum: Foundations, principles, and issues* (7th ed.). Pearson Publications.

Remillard, J. T. (2005). Examining key concepts in research on teachers' use of mathematics curricula. *Review of Educational Research, 75*(2), 211–246. https://doi.org/10.3102/00346543075002211

Sarıgöz, O. (2016). Anthropological attitudes and views of the teachers towards lifelong learning. *The Anthropologist, 24*(2), 598-610.

Sarıgöz, O. (2015). Meslek yüksekokulu öğrencilerinin yaşam boyu öğrenme yaklaşımına ilişkin görüş ve farkındalıklarının değerlendirilmesi. Doktora Tezi, Yakın Doğu Üniversitesi.

Schoenfeld, A. H. (2002). Making mathematics work for all children: Issues of standards, testing, and equity. *Educational Researcher, 31*(1), 13–25.

Sezgin, H., & Yıldız, C. (2022). Matematik öğretiminde materyal kullanımının öğrenci başarısına etkisi: Nitel bir inceleme. *Matematik Eğitimi Araştırmaları Dergisi, 3*(1), 24–39.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1–22. https://doi.org/10.17763/haer.57.1.j463w79r56455411

Sönmez, V. (2007). *Program geliştirmede öğretmen el kitabı*. Anı Yayıncılık.

Stufflebeam, D. L., & Coryn, C. L. S. (2014). *Evaluation theory, models, and applications* (2nd ed.). Jossey-Bass Publications.

Şahin, M. (2021). Course materials and textbook selection criteria of English language teachers. *Anemon Mus Alparslan Üniversitesi Sosyal Bilimler Dergisi, 9*(6), 1587-1611. https://doi.org/10.18506/anemon.960575

Şahin, M. (2022). Eğitimde yönetici yetkinlikleri. *Akdeniz Üniversitesi Eğitim Fakültesi Dergisi, 1*(2), 340-361.

Şahinel, M. (2003). Program değerlendirme modelleri ve Türkiye'de durum. *Milli Eğitim Dergisi, 160*, 143–155.

Taba, H. (1962). *Curriculum development: Theory and practice*. Harcourt, Brace & World Publications.

Turgut, M. F. (1997). *Eğitimde ölçme ve değerlendirme metotları*. Pegem Akademi Yayıncılık.

Tyler, R. W. (1949). *Basic principles of curriculum and instruction*. University of Chicago Press Publications.

Van den Akker, J. (2003). Curriculum perspectives: An introduction. In J. Van den Akker, W. Kuiper & U. Hameyer (Eds.), *Curriculum landscapes and trends* (pp. 1–10). Springer Publications. https://doi.org/10.1007/978-94-017-1205-7_1

Webb, N. L. (1997a). Criteria for alignment of expectations and assessments in mathematics and science education (Research Monograph No. 6). Madison: University of Wisconsin-Madison, National Institute for Science Education.

Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). ASCD Publications.

Yalçın, S. (2021). Öğretim programlarının öğretmen uygulamaları üzerindeki yansımaları. *Milli Eğitim Dergisi, 50*(250), 130–144.

Yıldırım, A., & Şimşek, H. (2021). *Sosyal bilimlerde nitel araştırma yöntemleri* (12. baskı). Seçkin Yayıncılık.

Yıldırım, C. (2019). Ortaokul matematik öğretim programının öğrenci yaşantılarıyla ilişkisi. *Türk Eğitim Bilimleri Dergisi, 17*(1), 45–67.

Ethics Statement

This article complies with the journal's writing guidelines, publication principles, research and publication ethics, and journal ethical rules. Responsibility for any violations that may arise regarding the article rests with the authors. Hatay Mustafa Kemal University, Social and Human Sciences Ethics Committee, Ethics Committee approval was obtained with the decision numbered 09 and 38, dated 03.07.2025.

Declaration of Authors' Contribution Rate: The contribution rate of the authors is 50% for the first author and 50% for the second author.

CONTRIBUTION RATE	CONTRIBUTORS
Idea or Notion	Okan SARIGÖZ
Literature Review	Senanur BİLGE ERCAN
Method	Okan SARIGÖZ
Data Collecting	Senanur BİLGE ERCAN
Data Analysis	Okan SARIGÖZ
Findings	Okan SARIGÖZ
Discussion and Commentary	Senanur BİLGE ERCAN

Funding: No contribution and/or support was received during the writing process of this study.

Informed Consent Statement: Informed consent form was obtained from all participants in the study.

Data Availability Statement: All data related to the article is included in the article.

Acknowledgments: No.

Conflict of Interest: There is no conflict of interest between the authors and other individuals, institutions or organizations related to the research.