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## Teachers' opinions about the renewed fifth grade mathematics curriculum and comparison of two versions

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### Abstract

The aim of the present study was to determine mathematics teachers' opinions about the renewed fifth grade mathematics curriculum and to investigate the new mathematics curriculum and the former one comparatively. In the current study, two qualitative research methods namely, document review and semi-structured interview methods were used. With document review, the similarities and differences between the renewed fifth grade mathematics program and the former one were discussed by comparing the two curriculums. The related documents were derived from mathematics curriculum that was published in Turkish Education Board official website. With semi structured interview form, teachers' opinions about the new curriculum was determined. In the present study, in which the purposeful sampling was used, 18 mathematics teachers were interviewed that worked at schools depending on the Ministry of Education in Sakarya province Ferizli district. The obtained data was analyzed via descriptive statistics. According to findings, the new mathematics curriculum and the former one were similar in general, and teachers had both positive and negative opinions about the new curriculum.

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*Keywords:* Mathematics curriculum, Mathematics teaching, Teachers' opinions.

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### 1. Introduction

In the 21st Century, the knowledge has changed rapidly and in the globalizing world, it has increased in value. As it always has been in every area, in education area the change necessity shows up. Nowadays, with the extensiveness of the application fields, the mathematics has become indispensable for

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all scientific fields. The mathematics education given in school life, forms a significant part of the teaching that individual takes for his/her life (Baki, 2006). Mathematics was accepted as a universal language that builds on symbols and figures. Mathematics includes processing data, producing information, making prediction, and solving problem by using this universal language (Ministry of Education, 2005.) According to Askar (1986) learning mathematics is highly important for the individual who can improve higher order thinking skills as communicating, thinking creatively and independently in daily life. Altun (2003) indicated that, mathematics teaching was important in terms of improving students' intellectual and creative thinking competencies. According to Olkun and Toluk (2003), nowadays, the effective education that is appropriate to the structure of mathematics can be actualized with associative learning, which is explained as the knowledge of concepts and operations and the relationship between them and which also ease remembering and using the information. As Baykul stated that (2003), the important part of the student problems related to learning the mathematics is derived from mathematics teaching methods. In our country, reforms have been made for more effective mathematics teaching. The new primary and secondary school mathematics curriculums that were in the direction of program development efforts in education system, and which were tested with a pilot study in 2004, were put into practice in 2005-2006 years by the Ministry of Education. The method, applied before 2005, was in accordance with the traditional teaching methods, while after 2005, it was arranged in accordance with contemporary methods. In the 2006 program, the principle of "Every child can learn the mathematics" used as base. Within the scope of the curriculum aims, raising individuals that can use the mathematics, solve problems, share their solutions and thoughts, work in groups, feel confident in mathematics, and develop positive attitudes towards mathematics is essential (Ministry of Education, 2005). The 2013 mathematics curriculum had the same aims with 2006 mathematics curriculum. Furthermore, 2013 program included extra skills like students' appraisal of the mathematics, being enjoyed while dealing with the mathematics, considering the mathematics as useful, using the mathematics in daily life, and communicating with mathematic knowledge in addition to features that should be brought to students (Ministry of Education, 2013). In the renewed mathematics curriculum, the content was simplified, and accordingly, the necessary features in terms of more effective and fruitful mathematics teaching were determined. The aim of the present study was to investigate the renewed fifth grade mathematics curriculum and the former one comparatively and to determine teachers' opinions about the renewed fifth grade mathematics curriculum.

## **2. Method**

The current study was divided into two stages. In the first stage, the renewed fifth grade mathematics curriculum and the former one were compared. The new curriculum was stated as "2013 program", and the former one was stated as "2006 program". The similarities and differences between the two programs were discussed. In the first stage, the document review method that is one of the qualitative research methods was used. The related documents were derived from mathematics curriculum that was published in Turkish Education Board official website. In the second stage, teachers' opinions about the renewed fifth grade mathematics curriculum (2013 program) were determined. In this stage, interview method that is one of the qualitative research methods was used. With semi structured interview form, teachers' opinions were determined. In the present study, in which the purposeful sampling was used, 18 mathematics teachers were interviewed that worked at schools depending on the Ministry of Education in Sakarya province Ferizli district. In the semi structured interview form teachers' opinions about the followings were included: getting informed about the new curriculum, the foreseen gains of the program, the content, activities, evaluation methods, problems in the application process of the curriculum and teachers' solutions offers for these problems. The obtained data was analyzed via descriptive statistics and findings were presented as tables.

### 3. Findings

The fifth grade mathematics curriculum that was applied in 2005-2006 academic year and that of 2013 program were investigated comparatively in terms of the following criteria: the vision of the program, the aim of the curriculum, its approach, explanations towards applying the curriculum (teacher- student role, course book, workbook, teacher guidebook; learning areas, and skills), mathematics learning and teaching, assessment and evaluation, number of gains, and course hours.

#### 3.1. *The vision of the Program*

In 2006 program, under the title of the vision of the program, the vision was explained while in 2013 program, there was no such a title. The vision of 2006 program based on the principle that “Every child can learn the mathematics.” On the other hand, in 2013 program, the vision of the curriculum was described in the direction of general purposes. In the curriculum, students’ appraisal of the mathematics and improving problem solving abilities were emphasized. In addition, preparing learning environments that provide students with considering the mathematics as “perceivable, useful, worth the effort” was emphasized.

#### 3.2. *The Aim of the Program*

The aims of the 2006 program were to improve students’ individual skills and abilities such as independent thinking, making their own decision, and self-regulation. The 2013 program included similar aims and the aim of the program was described as “bringing students in knowledge, skills, and attitudes that are specific to the mathematics and students can need those things in their lives and further education steps”. The aim of the program was presented in 15 items in 2006 program, whereas it was stated in 10 items in 2013 program.

#### 3.3. *The Approach of the Program*

Both the 2006 program and the 2013 program adopted the conceptual approach. The conceptual approach requires spending more time to form a conceptual basis of mathematical knowledge, thereby forming an association between conceptual and operational knowledge and skills is necessary. 2006 program aimed to make students form mathematical meanings based on their concrete experiences and feelings. On the contrary, 2013 program aimed to encourage students to be fast in their mathematical operations and to communicate with mathematical knowledge. Besides, it put emphasis on improving students’ problem solving skills.

**Teacher- Student Role:** Both of the curriculums used similar expressions while mention to roles of teachers and students. In 2006 program, student is active while teacher is the guide. On the contrary, in 2013 program, the active role of the student was expressed as active participant whereas the guidance role of the teacher was expressed as planning well structures activities and actualizing activity applications in the classroom.

**Learning Areas:** Both in the 2006 and 2013 programs, there were 5 learning areas. Differently, in 2006 program the learning area of “Numbers” was changed as “Numbers and Operations” in 2013 program. Moreover, in 2006 program, “Geometry” and “Measurement” learning areas were approached separately while in 2013 program they were mentioned under the title of “Geometry and Measurement”. Finally, in 2006 program, there was a learning area called as “Probability and Statistics”, while in 2013 program, there were learning areas as “Probability” and “Data Processing”.

**Skills:** In 2006 program, skills were divided into two categories as “Skills Specific to Common Field” and “Mathematical Skills”. Skills that are specific to the common field covered effective, correct, and

fluent Turkish performance, critical thinking, creative thinking, communication, problem solving, research, making decision, using information technologies, and entrepreneurship. On the other hand, the mathematical skills included problem solving, communication, association, and reasoning. In 2013 program, skills were collected under the same title as “basic skills that the program gains”. These skills included problem solving, mathematical process skills (communication, reasoning, and association), affective, and psychomotor skills, and information and communication technologies. In both programs, mathematical skills were similar. Differently, in 2013 program, affective and psychomotor skills took part in the curriculum.

Course book, Workbook, Teacher Guidebook: In 2006 program, information related to the course book, workbook, and teacher guidebook took part in the curriculum whereas in 2013 program there was no such information. In the application of 2006 program, students and teachers provided with books. However, in the application of 2013 program, students and teachers provided only with the course book, and the workbook and teacher guidebook was not provided.

### 3.4. Learning- Teaching Approach

The learning and teaching approaches were indicated in similar expressions in both programs. Students’ active participation to learning process should be provided. Learning environment based on problem solving should be benefited. Students should be assisted in terms of forming meanings from their concrete experiences and abstracting. Individual differences should be considered. Learning based on cooperation should be emphasized. Information and communication technologies should be used effectively. Differently, in 2006 program, associating the gains with intermediate disciplines were given importance while in 2013 program, this issue was not mentioned.

### 3.5. Explanations Related to the Application of the Curriculum

In both programs the explanations related to the application of the curriculum were stated as items in detail. Differently, in 2013 curriculum, suggestions related to preparing individualized education programs for students who needed special education took place.

#### Assessment and Evaluation Methods

In both programs, as an assessment and evaluation concept, progress evaluation was given particular importance. Students’ evaluation of themselves and their friends were emphasized. Using the necessity of various assessment and evaluation methods was stated. In addition to student evaluation, both the evaluation of the curriculum and teacher’s self-evaluation were emphasized. Differently, in 2006 program, all alternative assessment and evaluation methods were introduced and explained in detail. On the other hand, in 2013 program, there was no explanation related to methods.

#### The Number of Gains and the Course Hours

In 2006 program, the number of gains was 94 and the course hours were 144 hours in total. On the contrary, in 2013 program, the number of gains was 57, and the course hours were 180 hours in total. When considering the number of gains and the course hours of the two curriculums, it can be said that 2013 program was simplified. In 2013 program, the weekly course hours of the mathematics of the fifth grade was increased to 5 hours in a week. Thus, the allocated time for the gains was more than that of 2006 program.

Teachers’ opinions about the renewed fifth grade mathematics curriculum were represented as tables below. Teachers’ opinions about getting informed about the curriculum were presented in Table 1.

Table 1. Teachers’ opinions about getting informed about the curriculum

Themes/ Categories	Codes	N	%
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Getting informed	There was no informing. (T1,T2,T3,T4,T5,T6,T7,T8,T9, T10,T11,T12,T13,T14,T15,T16,T17,T18)	18	100
Getting information methods	I got information on the internet.(T2, T4, T5, T6, T7, T8, T9, T10, T11, T12, T14, T15, T17, T18)	14	77,7
	I got information from the course book. (T1, T13, T16)	3	16,6
	I got information about the curriculum by attending the classes. (T3)	1	5,5
	Source books. (T4, T7)	2	11,1
	I got information by discussing with other group teachers. (T5, T9)	2	11,1

As seen in Table 1, all of the teachers indicated that they got no informing. Moreover, 77,7% of the teachers got information about the curriculum from the internet, 16,6% of them got information from the course book, 11,1% of them got from source books, and by discussing with group teachers, and 5,5% of them got information by attending the classes. Direct quotations from teachers' opinions were as follows:

“There was no informing. I reached information from the course book.” (T1)

“... We reached information about the curriculum on the internet and by discussing with other mathematics group teachers.” (T5)

“...We leagued together with group teachers and we exchanged opinions. There was no informing. We reached necessary information from the internet.” (T9)

Teachers' opinions about the elements of the curriculum like the gains, the content, activities, and evaluation methods were presented in Table 2.

Table 2. Teachers' opinions about the elements of the curriculum

Themes (Categories)	Codes		Positive		Negative		
			n	%	n	%	
The gains	They are appropriate to student level (T1, T3, T4, T6, T12, T15, T17)		7	38.8	They are not accessible (T5, T7, T11, T13, T14)	5	27.7
	They are clear and explicit (T1, T2, T3, T5, T6, T8, T9, T10, T15, T6, T18)		11	61.1	Time of the gains is insufficient (T4, T7)	2	11.1
The content	It is compatible with the gains (T3, T4, T5, T6, T7, T10, T11, T12, T14, T16, T17,T18)		12	66.6	It is not sufficient (T1, T5, T6, T8, T9, T14, T17, T18)	8	44.4
	Topics are concrete (T5, T15)		2	11.1	It is not appropriate for student level (T11, T13)	2	11.1
					It is not compatible with the immediate environment (T4)	1	5.5
Activities	They are compatible with the gains and the content (T1, T3, T4, T5, T6, T17, T18)		7	38.8	They are not enough (T2, T11, T14, T15)	4	22.2
	They are appropriate for student level (T8, T10, T12, T13)		4	22.2	They are not applicable in the classroom (T5, T7, T9, T11, T14)	5	27.7
					Time is not enough (T12, T13, T17)	3	16.6
Evaluation methods	They are compatible with the student level (T2, T5)		2	11.1	Insufficient (T9, T11, T12, T13, T15, T16, T17, T18)	8	44.4
	They are applicable in the classroom (T3, T6, T14)		3	16.6			

As Table 2 shows that the elements of the curriculum was categorized into four groups as “the gains”, “the content”, “activities” and “the evaluation methods” and teachers' opinions about them were coded as either positive or negative. Teachers' positive opinions about the gains were mostly related to clarity and explicitness with 61.1%. Other positive opinion was related to their appropriateness to student level with

38.8%. Teachers' negative opinions about the gains were mostly related to inaccessibility with 27.7%. Other negative opinion was related to insufficient time with 11.1%. Teachers' positive opinions about the content were mostly related to its appropriateness with the gains with 66.6%. Other positive opinion was related to concrete topics with 11.1%. Teachers' negative opinions about the content were mostly related to its insufficiency with 44.4%. Other negative opinions were related respectively to its inappropriateness to student level with 11.1%, and its inappropriateness to the immediate environment with 5.5%. Teachers' positive opinions about the activities were mostly related to its compatibility with the gains and the content with 38.8%. Other positive opinion was related to its appropriateness to student level with 22.2%. Teachers' negative opinions about the activities were mostly related to inapplicability of them in the classroom with 27.7%. Other negative opinions were related respectively to its insufficiency with 22.2%, and insufficient time with 16.6%. Finally, teachers' positive opinions about the evaluation methods were mostly related to their applicability in the classroom with 16.6%. Other positive opinion was related to their appropriateness to student level with 11.1%. Teachers' negative opinions about the evaluation methods were mostly related to their insufficiency with 44.4%. Direct quotations from teachers' opinions were as follows:

“It is a program that students can understand. The gains are clear and explicit. Moreover, the gains were prepared in a level that student can reach. The activities mentioned in the curriculum are compatible with the gains and the content.” (T1)

“In my opinion, some gains are not in a level that students can be brought, even the gains exceed the level of some students. I think the content is compatible with the gains. However, the activities are not applicable in the classrooms because of the high class size.” (T7)

“Most of the contents and gains are not compatible with the student level. They should be prepared by considering students' intellectual development. The time is not enough to apply the activities. In my opinion, the evaluation methods are insufficient.” (T13)

Teachers' opinions about the problems they confronted in the application process of the curriculum and their solution offers were presented in Table 3.

As seen in Table 3, teachers confronted with some problems in the application process of the curriculum. 26.3% of the teachers thought that students' readiness level is not enough for the fifth grade mathematics subjects, and the evaluation methods were insufficient. 22.2% of them stated that there was an imbalance between the content and the course duration, and there was no workbook and teacher guidebook. 11.1% of them indicated that they experienced problems while applying the curriculum related to be not informed about the curriculum. Teachers offered some solutions to solve these problems. 38.8% of them stated that the content should be more interesting for the students. 33.3% of them thought that the evaluation methods should be increased. 26.3% of them indicated that schools should be provided with necessary source books (workbook, teacher guidebook), and materials. 22.2% of them pointed out that the allocated time for the subjects should be arranged in a more planned way. 11.1% of them asserted that interactive CDs related to subjects should be prepared. Direct quotations from teachers' opinions were as follows:

“There were problems because we got no information related to the fifth grade mathematics curriculum before, and students' readiness level was not enough. Students were used to a single teacher so that they were confused for a long time. Students associate the Mathematics with some words such as complicated, difficult, operation etc. This is because of the facts that the curriculum does not attract students' attention. While preparing the content, alternative sources that can attract students' attention and help teachers should be provided or should take part in course books.” (T4)

“I had problems while applying the curriculum because we cannot exceed students' habits from the primary school. I would include more evaluation methods because they are insufficient. The content should be more interesting.” (T1)

“As for me students should have workbook. This was not published in this year so that students cannot do enough practice. I should increase some revisions that enable students to use their intellectual

capacity instead of memorizing, and reveal creative ideas. In other words, I would make it more interesting for the students.” (T5)

#### **4. Discussion**

The findings the present study that compared the renewed fifth grade mathematics curriculum and the former one, can be summarized as follows:

1. The vision of the curriculum was every child can learn the mathematics in 2006, whereas in 2013 it was the mathematics is valuable.
2. In terms of the aims of the curriculum, in 2006, the curriculum put emphasis on individuals' independent thinking, making their own decision, and self- regulation, while in 2013 program, bringing individuals in knowledge, skills, and attitudes specific to the mathematics for the future was emphasized.
3. In terms of the approach of the curriculum both programs adopted the conceptual approach.
4. In the sense of Teacher- student roles, the 2006 the curriculum asserted that the student was active and the teacher is the guide whereas the 2013 program stated that student was the active participant and the teacher was someone who was responsible from applying the activities.
5. With regards to learning areas, both programs collected the learning areas under five titles.
6. In terms of skills, in 2006 program the skills specific to the common field and to mathematics skills were handled separately. On the contrary, in 2013 program, it was mentioned as basic skills that should be gained in mathematics. Furthermore, in 2013 program affective and psychomotor skills were defined.
7. In the sense of source books, in 2006 there were course book that was compatible with the curriculum, student workbook, and teacher guidebook. On the other hand, in 2013 program, there was only a course book. There was no student workbook and teacher guidebook.
8. In both curriculums, the suggestions in terms of applying the curriculum were similar. Differently, in 2013 curriculum, suggestions related to preparing individualized education programs for students who needed special education took place.
9. With regards to assessment and evaluation, in 2006 program, there were explanations about alternative evaluation methods, whereas in 2013 program, there was no such information.
10. In terms of gain numbers and course duration, in 2013 program, the number of gains was decreased and the course duration was increased as compared to 2006 program.

In general, the 2006 and 2013 programs are similar to each other. In 2013 program, there was no appropriate student workbook and teacher guidebook, and there was no information related to evaluation methods in the curriculum, and these were shortcomings of the curriculum. According to researches, it was found that teachers had problems in terms of assessment and evaluation in the application process of the curriculum because the curriculums did not mention enough explanations and examples in terms of applying the evaluation methods. Although student-centered assessment and evaluation was suggested in the curriculum for this reason, teachers evaluate students with traditional methods due to lack of information (Bal, 2009; Güneş & Baki, 2011; Budak & Okur, 2012). In the new curriculum, decreasing the number of gains and increasing the course hours are thought to be superior things about the program. The researches about the former curriculum show that teachers had problems in the application process of the curriculum mostly because the course hours were not enough for bringing students in foreseen gains of the curriculum (Güneş & Baki, 2011; Üzel & Şimşeker, 2012; Budak & Okur, 2012; Anılan & Sarier, 2008; Keleş, Haser & Koç, 2012). It can be stated that with decreasing the number of gains and increasing the course hours in the new curriculum, this problem can be overcome.

In the present study, findings derived from teachers' opinions about the renewed fifth grade mathematics curriculum can be summarized as follows:

1. Teachers got no information about the curriculum. Teachers reached information about the curriculum mostly from the internet.
2. The positive features of the foreseen gains of the curriculum were they are clear and explicit while the negative features were they are not accessible. The positive thing about the content was its appropriateness to gains, whereas the negative thing was the content is not sufficient. The superior characteristics of the activities were they are in line with the gains and the content, while the shortcoming about them was they are not applicable in the classroom. The positive

feature of the evaluation methods was they can be applied in the classroom whereas the negative feature of them was they are insufficient. 3. The most important problem that teachers confronted in the application was students' readiness level was not sufficient, and the evaluation methods were insufficient. The most suggested solution was the content should be more interesting for students. In the current study, it was found that teachers got no information about the new curriculum, and they reach necessary information on the internet. It is thought that in order to apply the new curriculum as proposed in the classes, it is important to give information to teachers about the curriculum. Teachers had troubles in the application because they did not have enough information about the curriculum. This is in line with the literature that, according to findings, teachers experienced problems in the application because the new curriculum was not introduced to them adequately (Duru & Korkmaz, 2010; Güneş & Baki, 2011; Demirtaş, Arslan, Eskicumalı & Civan, 2014). Similarly, as Halat (2007) stated that class masters cannot apply the curriculum exactly in mathematic course because they had no informative seminars about the curriculum. Besides, Keleş, Haser and Koç (2012) indicated that mathematic teachers needed effective in service training so as to apply the curriculum as proposed. In the present study, it was found that teachers considered the gains as clear and explicit but not reachable. This is compatible with the previous researches that the positive things were the gains are clear, explicit, and understandable (Bal & Dinç-Artut, 2013; Budak & Okur, 2012), while the negative things were they are not compatible with student level (Güneş & Baki, 2011) so that they are not reachable for students. In terms of the content and activities, the findings of the current study show that teachers considered the content as compatible with the gains but as insufficient. Similarly, they thought that the activities are in line with the gains and the content but they are not applicable in the classroom. Budak and Okur (2012) indicated that for teachers' opinions, the content's being compatible with the gains and the activities' being compatible with the gains were found at good levels while the content's being enough for actualizing the gains and the activities' being applicable were found as moderate level. Bal and Dinç-Artut (2013) found that the content was superficial and insufficient, and activities were not applied completely. In the present study, with regards to the evaluation methods, it was found that for teachers methods were applicable in the classroom but they were still insufficient. Budak and Okur (2012) stated that teachers thought assessment and evaluation activities were applicable in moderate level and enough. Besides, Aksu (2008) pointed out that the evaluation activities were not sufficient. In the current study, it was found that teachers had problems because the students' readiness level was not enough, and the evaluation methods were insufficient so that as a solution offer they suggested that the content should be arranged in a way that it should be more interesting for student. Previous researches showed that the program's being incompatible with the student level, students' being not ready for the new curriculum, and not accommodate to it, the readiness level of students' being not enough, and students' being uninterested to the curriculum were considered as problems (Güneş & Baki, 2011; Keleş, Haser & Koç, 2012). Moreover, as Bal and Dinç-Artut (2013) stated that the subjects were not interesting for students. In addition to this, according to Aksu (2008), the content was not applicable. Thus, it is thought that it is important to prepare the content as compatible with students' readiness and learning levels, and arrange it in a way that it is interesting and attractive especially for applying the curriculum effectively.

All in all, the followings can be suggested according the findings of the present study: teachers and students should be provided with the sourcebooks that are appropriate to the curriculum, the evaluation methods should be explained in more detail in the curriculum, besides, a separate brochure related to the assessment and evaluation methods should be prepared, related persons should be informed about the new curriculum before the application process, and the gains, the content, activities, and evaluation methods of the new curriculum should be revised in a way that they are compatible with students' readiness and interest levels

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