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Teacher views about the 8th grade mathematics textbook prepared according to the new primary education mathematics curriculum

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Abstract

This study aims to reveal the mathematics teachers' views about the 8th grade Mathematics Textbook (MTB) prepared according to the New Primary Education Mathematics Curriculum (NPEMC) which took effect in the 2005-2006 education period for the first time. The study uses a case study method. Convenience sampling was used in order to obtain more in-depth knowledge. The data we examine came from the semi structured interviews conducted with four mathematics teachers working in different primary schools in Trabzon province. The results of the study are that the teachers experienced distress in finding the necessary materials required for the activities in the textbook and the activities could not be implemented effectively in the over-populated classes. The study ends with the recommendations as the materials required for the activities in the textbooks should be easily accessible and the activities should be prepared considering the number of students in mathematics classes.

Keywords: New primary education mathematics curriculum; mathematics textbook; teacher views

1. Introduction

There are two main purposes of school mathematics: First of these purposes is to raise the workforce the industry, technology and daily life demands by increasing the rate of literacy, secondly to bring the individuals that chose to work as a mathematics scientist in the academic circle by shaping them as mathematicians starting from small ages (Baki, 2006). Though, mathematics is often viewed as a hard to learn and teach subject. Students usually view mathematics as "difficult", "boring" and "unappealing", whereas teachers evaluate it as a "hard to teach", "uninteresting to students" subject. With no doubt, the previous experiences, prejudices, fears of students as well as the methods, strategies, attitudes and beliefs of teachers with the MTBs influence this situation (Dayak, 1998;

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Duman, Karakaya, Çakmak, Eray & Özkan, 2001). Textbook is the third most frequent reference in the class following the teacher and board. Indeed, in many cases it's the sole means of instructional material (Kolaç, 2003). Holding a special position among instructional tools, textbooks should have an appropriate quality.

The most distinguishing feature of textbooks is to be prepared for students, then comes the superior features such as offering detailed knowledge, describing relations between different knowledge, making the students repeat what is known, and providing reinforcement. How should a good textbook be? How much do the current textbooks align with the proposed aims? What should be expected from textbooks? The answers to these questions have the power to reveal the quality of the primary and secondary education (Yılmaz, Seçken & Morgil, 1998).

Investigating the attitudes of teachers towards using and their expectations from the textbook are considered to be a significant topic in order to prepare and more effectively use MTBs that will be written according to the new curriculum. For this aim, textbooks should be designed considering the salient features these books should carry. In contrast, the attributes that textbooks should not carry should also be considered and these flaws should be removed or minimized in the textbooks (Kılıç & Seven, 2004). In this context, revealing the views of teachers about the primary education 8^{th} grade mathematics textbook that was prepared according to the new mathematics curriculum and started to be used since 2008-2009 instructional period proves significant.

1.1. The Aim of the Study

This study aims to describe the views of mathematics teachers having different levels of education about the 8^{th} grade MTB prepared according to the NPEMC. For this aim, the answers for the following questions were sought:

1. What are the teacher views on the content of 8^{th} grade MTB?
2. What are the teacher views on the visual quality of 8^{th} grade MTB?
3. What are the teacher views on the language and narrative of 8^{th} grade MTB?
4. What are the teacher views about the activities in the 8^{th} grade MTB?
5. What are the teacher views about the chapters on measurement and evaluation in the 8^{th} grade MTB?

1.2. Limitations of the study

The data in this study are limited with the 8^{th} grade MTB prepared according to NPEMC.

2. Method

The study uses a case study method. Case study method is selected because it is particularly suitable for individually implemented studies and enables an in-depth inquiry of one aspect of the problem, and can be completed in a shorter time frame (Çepni, 2007).

2.1. Sampling of the Study

Purposive sampling was used in accordance with the research design and more detailed and richer data are sought. The sampling of this study consists of 2 primary education mathematics education program graduates and 2 graduate students in the same program in 4 different primary schools in Trabzon. The participants were coded as "K_1, K_2, K_3 and K_4" in reference to our ethical considerations. The personal information for the participants is shown in Table 1.

Table 1. Personal information of participants

	Professional Experience (years)	Duty	Level of Education	Gender
K_1	3	Primary Education Mathematics Teacher	Graduate student	Female
K_2	3	Primary Education Mathematics Teacher	Graduate student	Female
K_3	6	Primary Education Mathematics Teacher	Undergraduate	Male
K_4	6	Primary Education Mathematics Teacher	Undergraduate	Male

2.2. Data collection and analysis

The data of this study were collected by semi structured interviews. Firstly, literature was reviewed and sub-problems were developed in the light of the examined documents. Then in the light of the sub-problems interview questions were prepared. The interview questions developed by the researchers (also obtaining expert support), were directed at volunteering teachers thought to serve the purpose of the study.

The data obtained from the interviews were transcribed first. These transcripts were read by the researchers several times and the data were reduced and coded before the analysis. The data was reviewed after the emerging codes and the existing codes were examined again. In the next step, tables were prepared describing the codes stated by each participant. Lastly, the categories representing the codes in these matrices were determined.

3. Findings

3.1. 1st findings regarding the sub-problem

The views of teachers about the content of 8th grade MTB were given in Table 2.

Table 2. Teacher views on the content of 8th grade MTB

	CATEGORIES	CODES / PARTICIPANTS	K_1	K_2	K_3	K_4
IN THE CONTENT OF TEXTBOOK	POSITIVE FEATURES	Including new topics	+	+	+	+
		Including brief knowledge			+	
		Being related with everyday life			+	
		The suggestive and reinforcing structure of content	+			+
		Having a learning-promoting structure	+		+	
		Syllabus being different from other books	+	+	+	
		More time allocated to topics			+	
		The syllabus ordering the topics from simple to more complex				+
		Complementing the contents of 6th and 7th grades.	+			
		Involving topics towards the use of IT			+	
	NEGATIVE FEATURES	The scarcity in the number and diversity of examples		+	+	
		Involving over-difficult example		+		
		The examples being presented from simple to difficult		+		

Note: "+" denotes what the participants told and "-" denotes what they didn't say.

When we examine Table 2, we observe that the participant answers to the 1st question can be grouped into two categories (themes) as *Positive and Negative Features in the Textbook Content*. Regarding the content of the textbook, the most pronounced positive features were including new topics and presenting a syllabus different from previous books and the negative feature was scarcity in the number and diversity of examples. Besides, the participants seemed to find the content of the 8th grade textbook often positive.

3.2. 2nd findings regarding the sub-problem

The views of teachers about the visual quality of 8th grade MTB were given in Table 3.

Table 3. The teacher views on the visual quality of 8th grade MTB

	CATEGORIES	CODES / PARTICIPANTS	K_1	K_2	K_3	K_4
THE VISUAL QUALITY OF TEXTBOOK	POSITIVE FEATURES	Being interesting	+	+	+	+
		Including concrete models			+	
		Appropriate font size				+
		Involving various visual elements (Table, graphics, pictures etc.)			+	
		Increasing engagement and motivation	+			+
	NEGATIVE FEATURES	Intense structure of page designs		+	+	

When we examine Table 3, we observe that the participant answers to the 2nd question can be grouped into two categories (themes) as *Positive and Negative Features in the Visual Quality Textbook Content*. Among positively perceived features of the visual quality of textbook, being interesting was found to be most distinguishing and among the negative features, having an intense page design was the leading feature. Besides, the participants seemed to find the visual quality of the 8th grade textbook often positive.

3.3. 3rd findings regarding the sub-problem

The views of teachers about the language and narrative of 8th grade MTB were given in Table 4.

Table 4. The teacher views on the language and narrative of 8th grade MTB

	CATEGORIES	CODES / PARTICIPANTS	K_1	K_2	K_3	K_4
IN THE LANGUAGE AND NARRATIVE OF TEXTBOOK	POSITIVE FEATURES	Plainness	+		+	
		Fluency		+		
		Clarity	+	+	+	+
	NEGATIVE FEATURES	Involving long sentences				+

When we examine Table 4, we observe that the participant answers to the 3rd question can be grouped into two categories (themes) as *Positive and Negative Features in the Language and Narrative of Textbook Content*. The most distinguishable feature among the language and narrative properties of the textbook is clarity. Besides, the participants seemed to find the language and narrative of the 8th grade textbook often positive.

3.4. 4th findings regarding the sub-problem

The views of teachers about the activities in the 8th grade MTB were given in Table 5.

Table 5. Teacher views about the activities in the 8th grade MTB

	CATEGORIES	CODES / PARTICIPANTS	K_1	K_2	K_3	K_4
REGARDING THE ACTIVITIES IN THE TEXTBOOK	POSITIVE FEATURES	Being striking		+	+	
		Increasing motivation		+	+	
		Activating students	+		+	
		Developing psychomotor skills			+	
		Providing meaningful learning	+		+	
		Involving simple tools			+	
		Being related with everyday life		+		
		Having a reification role	+			
	NEGATIVE FEATURES	Excessive amount of activities	+		+	
		Involving simple and idle activities				+
		Involving activities harder than average students can handle		+		+
		Requiring unavailable instruments	+	+		+
		Involving activities that cannot be performed in over populated classes		+		+
		Involving time consuming activities	+	+	+	+

When we examine Table 5, we observe that the participant answers to the 4th question can be grouped into two categories (themes) as *Positive and Negative Features Regarding the Activities Found in the Textbook*. The most distinguishing negatively perceived features of the textbook were found to be requiring unavailable instruments and involving time-consuming activities. Furthermore, it can be suggested that the participants faced some problems with the activities found in the 8th grade MTB.

3.5. 5th findings regarding the sub-problem

The views of teachers about the chapters on measurement and evaluation in the 8th grade MTB were given in Table 6.

Table 6. Teacher views about the chapters on measurement and evaluation in the 8th grade MTB

	CATEGORIES	CODES / PARTICIPANTS	K_1	K_2	K_3	K_4
IN THE MEASUREMENT AND EVALUATION CHAPTERS OF THE TEXTBOOK	POSITIVE FEATURES	Involving chapters that give feedback (Practice, Subject evaluation, Unit evaluation and etc.)			+	
		Involving applicable PTPTs	+			
		Involving PTPTs that invoke research	+			
		Involving open ended questions		+	+	
		Involving various visual elements (Table, graphics, pictures etc.)			+	
		The questions suitable for the students' level	+			
		Involving various measurement and evaluation forms (Self Evaluation Form etc.)			+	
	NEGATIVE FEATURES	Involving very few questions				+
		Involving questions ordered from difficult to easier		+		

PTPT: Project task and performance task

When we examine Table 6, we observe that the participant answers to the 5th question can be grouped into two categories (themes) as P*ositive and Negative Features Regarding the Chapters on Measurement and Evaluation in the Textbook.* The most distinguishing feature among the positively perceived features of the measurement and evaluation chapters of the textbook was involving open ended questions. Furthermore, it can be suggested that the participants evaluated the measurement and evaluation chapters of the 8th grade MTB usually as positive.

4. Results and recommendation

The results of the study are as follows:

The textbook was found to be clear, it involves open ended questions, the syllabus is different, the number of examples is small and the pages are quite intensely designed. The content, language and narrative, visual elements and the chapters on measurement and evaluation of the textbook were found by the participants to be positive. It was found that the participants face several difficulties in completing the activities in the textbook on time and providing the instruments mentioned in the textbook.

Regarding these findings the following are recommended:

The number and diversity of the examples found in 8th grade MTB should be increased. The textbook should not include examples that are over-difficult for the students and the examples should be ordered from simple to more complex. The cover of the textbook should be redesigned more interestingly and the intensity of the page contents should be diluted. Long sentences should be abstained from and instead shorter and clearer sentences should be preferred. The number of activities per topic should be decreased and the over-difficult activities should be eliminated. The instruments that are required by the activities should be widely available. Because there are some problems faced in the implementation of the activities in the classes and there's a lack of sufficient time, the number of students per mathematics class might be decreased and the number of mathematics class hours might be increased. Moreover, additional chapters on history of mathematics, comics, brainstormers and puzzles that may be found appealing by the students may be inserted in the textbook.

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