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The Perspective of the Mathematics Teacher Educator on the Design of Mathematics Teaching Method Courses for Elementary Teacher Candidates*

Bilge YILMAZ ASLAN[1], Mehmet Fatih ÖZMANTAR[2]

[1] Department of Mathematics and Science Education, The University of Gaziantep, Gaziantep, Turkey, ORCID:0000-0001-8632-4775
[2] Department of Mathematics and Science Education, The University of Gaziantep, Gaziantep, Turkey, ORCID:0000-0002-7842-1337 E-mail: mfozmantar@hotmail.com

Correspondence: Bilge Yılmaz Aslan, E-mail: bilqe.yilmaz@gmail.com

Abstract
This study examines the perspective of a mathematics teacher educator (MTE) regarding the design and structuring of mathematics teaching method course in the elementary teaching education program. The research was designed as a single case study. The case was a teacher educator who has been delivering mathematics methods course for elementary teacher candidates for 10 years. The data were collected through an in-depth interview on items placed in a questionnaire. The thematic analysis method was used for data analysis. The focus of our analysis is on MTE's perspective as a course designer and practitioner for the mathematics teaching method course. Our findings show that this course has a nature in design and structuring and that the teacher trainer builds on these four arguments, namely value judgments, resources, big ideas, and professed practices while supporting the mathematics teaching development of prospective elementary teachers. Based on the findings, we discuss the interactions among these four arguments. In addition, it is examined whether there is a perspective in the design and structuring of the mathematics teaching course among teacher educators who deliver this course.

Keywords: Mathematics Teacher Educator, Teacher Education, Mathematics Methods Course, Course Design

1. Introduction

Elementary teacher candidates are expected to learn how to teach many fields in their preparation for the profession as well as to improve their ability to teach mathematics. The mathematics education society has long been concerned that elementary teacher candidates are not sufficiently prepared to teach mathematics effectively (van Es and Conroy 2009; Philipp et al. 2007, National Research Council 2001; Ball 1990). One of these concerns is related to the idea that mathematics teaching is a complex and multidimensional phenomenon for

* This paper is a byproduct of first author's PhD studies

prospective elementary teachers. In addition, the fact that prospective teachers lack the depth and flexibility of mathematical understanding and the beliefs they should have about mathematics teaching is an important cause of anxiety (Boaler and Humphreys 2005; Philipp, 2008;).

On the other hand, Ma (1999) states that elementary school mathematics is more complex than it seems. Therefore, the researcher emphasized that the content of mathematics method courses designed for prospective elementary school teachers and the teaching of this content by the instructors are very important in order to improve the mathematical knowledge and understanding needed by prospective teachers. Therefore, faculty members who take mathematics method courses for prospective primary school teachers play an important role in helping them obtain the information they need for teaching and have a positive attitude/belief in mathematics teaching. In this context, in a study conducted by Masingila et al. (2012), who gave the mathematics method courses in the classroom teaching program of the mathematics education community in the United States, it was examined how they designed these courses, and that these instructors knew little about their academic and teaching backgrounds. From this point of view, the process of designing and structuring mathematics methods courses given to prospective classroom teachers who take teaching courses for many branches has become the focus of our study.

2. Literature

We will share the literature on the research in two areas: (1) the professional roles and responsibilities of teacher educators and (2) the mathematics teaching course and its components.

2.1. Professional roles and responsibilities of teacher educators

Among the definitions of teacher educators is the statement made by the European Commission in 2013. In the statement made by the Commission, teacher educators were defined as "people who enable teachers or teacher educators to learn formally" (Commission, 2013, p. 8). This definition implies that teacher educators are not the only community interested in a single group over a single role. As a matter of fact, Chauvot (2008) emphasized diversity with the definition "teacher educators are a group of various professionals who are in different arenas and offer more than one role." Due to these people's responsibilities in the teacher training process, having knowledge about their roles, approaches, and practices in this process has become the focus of interest in educational research in recent years. As a matter of fact, these studies have contributed to the literature on what the profiles of teacher educators (TE) are, the nature of their work, and their professional development (Wilson & Franke, 2008; Jaworski, 2008b; Superfine & Li, 2014). Studies on MTEs focus on four main dimensions; knowledge of MTEs (Approva & Taylor, 2017; Superfine & Li, 2014), practices of MTEs (Doerr & Thompson, 2004; Taylor, 2013; Ghousseni & Herbtz, 2016;), professional development of MTEs (Campbell & Malkus, 2014), roles and responsibilities of MTEs (Jowarski & Huang, 2014; Li & Superfine, 2018).

As can be seen from the research conducted, one of the topics highlighted by the studies is the roles and responsibilities of mathematics teacher educators, and there are studies examining what the roles are (Bouckaert & Kools, 2018; Nilsson, 2017; Jennifer Way et al., 2020). Although the categories in these studies are created with different names, they actually refer to roles that have the same duties and responsibilities. When we look at the prominent ones among these roles, these are the roles of teacher educators; researcher, teacher, collaborator, curriculum designer, and practitioner.

As a researcher, mathematics teacher educator is faced with responsibilities such as knowing how to read, evaluate, criticize and use in his/her own studies and having expertise in researching his/her own practices to renew and improve his/her practices (Gerda Geerdink, Fer Boei, Martijn Willemse, Quinta Kools & Haske Van Vlokhoven, 2016 pp.3; Jennifer Way et al., 2020).

With the teacher role, the MTE is faced with responsibilities such as having the knowledge and benefiting from the practices necessary for teaching, not only mathematical knowledge but also designing how prospective teachers should learn mathematics in the future and teaching by reflecting on how they can use different teaching

strategies in classroom practices (Lunenberg, Korthagen, and Swennen 2007; Anthony, Averill, and Drake, 2018). With its collaborative role, MTEs are faced with responsibilities such as collaborative teaching and joint planning with colleagues, exchanging information about a subject, and creating learning opportunities for each other (Loughran, J. 2014; Anderson & Tully, 2020). It can be said that these roles of MTEs are part of the puzzle in forming teacher educator identities.

In addition to the roles we mentioned above regarding the professions of MTEs or TEs in general, it is possible to talk about the role of course designer and implementer (Beswick and Chapman, 201; Lunenberg, Dengerink, and Korthagen, 2014; Marina Bouckaert & Quinta Kools, 2017). With the course designer role, a MTE has responsibilities such as designing and structuring courses at the university level. These courses include content courses (Li & Superfine, 2018; Approva & Taylor, 2019; Max & Welder, 2020) and methods courses (Kastberg, Tyminski & Sanchez, W. B., 2017; Lynch, 2017; Durkee, 2019).

When the studies are examined, it is seen that there is a focus on the course designer and implementer role of TEs (Hoydalsvik, 2017; Tannehill, 2016). Studies in the literature on the course designer and implementer role have shown that the content of method courses for mathematics teaching greatly improves the mathematics knowledge and mathematics teaching skills of teacher candidates (Spitzer et al., 2011; Bartell et al., 2013; Morris et al., 2009). In this respect, it becomes an important issue to learn about what is going on in these method courses and focus on what the building blocks of these courses are.

2.2. Mathematics teaching methods course and its components

Strawhecker (2005) stated that "the main purpose of a method lesson is to tell prospective teachers how children learn various mathematical concepts and skills and how to teach children certain mathematical ideas" (p. 2). Mathematics method courses are designed to enable prospective teachers to learn how to facilitate their learning while structuring their knowledge about students. Prospective teachers try to understand how students learn developmentally and how students think about mathematics (Kastberg et al., 2013). In addition, Althauser (2018) states that prospective teachers should learn to "listen to students in a way that allows them to create a model of each student's mathematical knowledge."

One of the topics that researchers focus on is the effect of method courses on the beliefs and attitudes of prospective teachers towards mathematics teaching. As a matter of fact, there are studies showing that mathematics methods courses have a positive effect on prospective teachers' attitudes towards mathematics teaching (Ball, 2009; Bekdemir, 2010; Robinson & Adkins, 2002; Saran & Gujarati, 2013; Swars, 2005; Althauser, 2018). Certain aspects of teacher candidates' attitudes include mathematics teacher activity, identity, authority, and mathematics anxiety. Each of these areas was found to affect teachers' decision-making on personal and instructional competence issues, such as how much time should be planned for mathematics and what kind of tasks and activities students should be given, and accordingly, classroom practices. As a result of a study conducted by Hacıömeroğlu (2013), it was shown that the theoretical knowledge obtained by the elementary teacher candidates within the scope of the mathematics methods courses they took in the undergraduate program affected their personal competence levels of the candidates.

On the other hand, when we look at the studies on the mathematics method course, we see that there are studies on the importance of mathematics content information presented in the method courses (Burton, Daane, and Gleisen, 2008; Ford & Strawhecker, 2011). The research findings showed that "when prospective teachers take pedagogy for teaching content and mathematics at the same time, they have the potential to have clearer connections between mathematics subjects" (Fast and Hankes;2010, p.335)

When the literature is examined, it is seen that some of the studies on method courses focus on learning-teaching situations and mathematical pedagogical knowledge. Baumert et al. (2010), as one of the most important findings of the studies on mathematics methods course, stated that the variety of teaching strategies presented and mathematical representations, the size of the explanations pool depends largely on the depth of the conceptual understanding of the subject. Pedagogical knowledge specific to mathematics teaching is a

combination of "what one knows about mathematics, about students, about general pedagogy, and about mathematics learning" (Strawhecker, 2005, p.2). Caughlan et al. (2017) pointed out the importance of method courses as "special teaching practices to address the place where novice teachers encounter certain pedagogical problems in a discipline and as they intersect with the content that needs to be taught" (p. 270).

In addition to blending mathematics content and pedagogy, there are also studies on the promotion and use of mathematics methods courses, different types of materials, and manipulatives (Bamberger et al., 2010; Sara n & Gujarati, 2013). As a matter of fact, these studies state that the courses that enable prospective teachers to determine which manipulators and "when and how to use mathematics concrete models to support learning" are mathematics method courses (Ünlü, 2018, p. 68). In this respect, it is possible to say that mathematics methods courses help prospective teachers to have knowledge about materials and manipulatives that differ according to their grade levels.

In the light of these studies, mathematics methods courses could be considered to mediate the ability to have certain prominent elements such as belief and attitude, content knowledge and pedagogical knowledge, and the selection of appropriate course materials to teach mathematics effectively. Therefore, in order to understand how prospective teachers develop their mathematical knowledge and pedagogies necessary for effective teaching, it is very important to understand the design of these courses (McCrory et al. 2009, McCrory and Cannata 2011).

With this research, it is aimed to examine how a MTE structured this process as a course designer and practitioner in the creation of mathematics methods courses that will prepare prospective classroom teachers to acquire mathematics teaching competencies and competencies as much as possible before entering their own classes.

2.3. Mathematics teaching methods course for elementary teacher candidates

According to CBMS (Conference Board of Mathematical Sciences) “primary school mathematics teaching needs both important mathematical knowledge and broad pedagogical skills” (p. 55), it is also not easy to teach without deep thinking and without paying attention to the complexity of elementary mathematics (Ball and Bass 2000; Bass 2005; CBMS, 1996; Seaman and Szydlik 2007). Deborah Zopf (2010) states that there are differences between mathematics teaching for primary school students and mathematics teaching for primary school students in terms of content, substance and purpose.

On the other hand, the courses given in the elementary teacher training curricula of universities around the world are generally grouped into four categories; (a) liberal arts, (b) mathematics and related content (academic mathematics, school mathematics, mathematics pedagogy), (c) educational sciences, and (d) pedagogy. Although these categories are similar, this situation differs from country to country in terms of the number and hours of courses given. In Turkey, where this study was conducted, a total of 48 hours of basic mathematics course is given for one semester (14 weeks/ 2 hours) in the elementary teacher training program. Regarding the teaching course, a total of 84 hours of mathematics teaching is given in both semesters (14 weeks/ 3 hours) in the third year.

3. Method

3.1. Study Pattern

This research adopts qualitative research methods as it aims to reveal how the MTE structured this process as a course designer and practitioner in the creation of the mathematics teaching method course that prospective classroom teachers took. Bernat and Gvozdenko (2005) emphasize that case study is qualitative in nature and contributes to an interpretive paradigm and state that it is a research approach that facilitates the discovery of a phenomenon in its context using various data sources (see also Baxter and Jack, 2008; Yin, 2009). Hence case study is an appropriate method to understand the perspective of a MTE in the process of structuring and implementing mathematics methods courses. As a matter of fact, the case study constitutes an appropriate

approach in terms of this research, as it is a clear definition of the phenomenon in the study and an effective research method for producing new hypotheses, models, and understandings about this phenomenon (Dörnyei, 2007).

3.2. Participant

The present study was conducted with a MTE working in the faculty of education of a state university in Turkey. She has a bachelor's degree in science and literature of mathematics, and she completed her master's degree in mathematics education; she received the title of teacher educator in the field of program development. Esra (not her real name), who is currently an Associate Professor, has been teaching mathematics for 10 years. Since Esra has been teaching mathematics teaching methods courses for a long time and the mathematics methods course is a field of education course, the fact that the teacher educator has received education in both mathematics education and program development and education in his/her academic background are important parameters for this study. In addition, it is important to give the mathematics method course as a branch in the university where the teacher educator is located and to have different instructors enter other branches in order to see the cooperation factor, which is one of the focal points of the study. In addition, the accessibility of the teacher educator by the researcher and his voluntary participation in the process was effective in choosing her as a participant in the study.

3.3. Data Collection Tool

Within the scope of the research, in order to reveal how MTE structured this process as a course designer and practitioner in the creation of mathematics methods courses, a questionnaire developed by the researchers and then a face-to-face interview was conducted to understand and elaborate the answers given by the participant to this questionnaire. Various stages were followed in the creation of the questionnaire, which was developed as a data collection tool. First of all, the relevant studies on the subject to be investigated were examined in the literature. We initially examined the literature on the submarine of the mathematics methods course. When the studies on mathematics method courses were analyzed, it was seen that there were studies on the importance of the course for classroom teacher candidates; the goal was real because it was a course, content, teaching methods, and measurement and evaluation structures. In addition to the content of the mathematics teaching methods course in the elementary teacher training program, it was noteworthy that the MTE who gave this course was also important in this course. From this point of view, we structured our data collection process with the concept map in Figure-1, which we created based on the mathematics method courses, TE and preservice teachers relationship network. Then, three mathematics education experts and a program development expert came together to discuss the focus of the data collection tool. Then, questions about the determined foci were created, the categories to be included in the data collection tool, and the suitability, representation, and comprehensibility of the questions under these categories were presented to the opinion of three field experts and a program development expert again, and their final form was given.

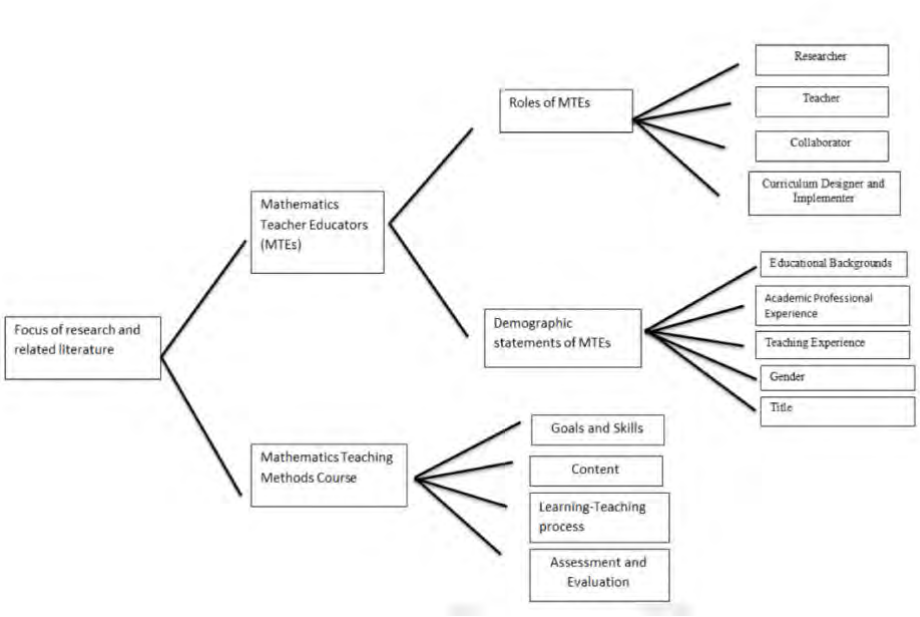

Figure 1. The focus of the features of the developed instrument

In this study, a case study design was adopted to see the existence of a perspective, what are the elements that mathematics teaching methods course design is based on in structuring and implementation, and what are the sources that affect these elements. Evidence for case study can come from different data sources such as documents, archive records, interviews, direct observation, participant observation, video-visual recordings, physical material (Yin, 2009). A single source of evidence or evidence is often not sufficient to sustain a case study; as in-depth explanations are needed to understand a particular situation, a large number of sources of evidence are often required (McGinn, 2010). In this context, during the data collection process, an e-mail explaining the purpose and scope of the research was first sent to the Esra with the protocol developed and she was asked to answer this protocol. In the second stage, a face-to-face interview was held with the participant in order to deepen the data obtained by looking at the answers given by the teacher educator. The semi-strcutured interview lasted two and a half hours. The interview was audio-recorded, which were then transcribed. In this study, data were collected through the protocol developed from the MTE, semi-structured interview and the documents obtained from her.

3.4. Data Analysis

The data collected in the study were analyzed using the thematic analysis technique because it allows theoretical flexibility, detailed reporting of patterns in the data and interpretation of the data (Braun and Clarke, 2013). Since the study is exploratory and the findings can be categorized into meaningful themes, this analysis method was considered suitable for the study. Thematic analysis is the search and extraction of general models found in data through multiple readings. Fereday and Muir-Cochrane (2006) defined thematic analysis as “a form of pattern recognition in data in which emerging themes become categories for analysis” (pp. 3-4). In this study, the guidelines provided by Braun and Clarke (2013) were followed in the analysis of the data. According to this guide, thematic analysis consists of six stages: familiarization of the data, creating initial codes, searching for themes, reviewing themes, defining and naming themes, preparing the report. First, the data were familiarized by examining the transcripts and documents many times until the data obtained from the participant was fully understood. Secondly, from the answers given by the participant regarding the content of the mathematics teaching lessons, codes were created to help interpret the data in a way that reflects a vision/ approach about what the lesson looks like. Later, the main themes and/or concepts that reveal the values that guide the MTE’s practice were investigated.

4. Findings

It is important to note that the aim of this study is to explore the course design, the possible perspectives underlying this design, and how it shapes them in realization using the perspective of the MTE as a tool to understand the nature of the mathematics teaching methods course. As a result of the thematic analysis, a total of four themes emerged: sources, values, big ideas and professed practices. It is possible to say that the MTE structured the mathematics teaching developments of prospective elementary teachers on these four themes. As these themes are interactive with each other, it has been observed that the theme of value judgments has a strong effect on the other three themes.

4.1. "Resources" Theme

One of the roles of teacher educators is that they are program/course designers. With this role, MTEs have advanced knowledge areas in more than one field they should have (Chauvot, 2009; Jaworski, 2008). Some of the areas of knowledge required to teach prospective teachers are strong mathematical knowledge (Chazan & Lewis, 2008; Superfine & Li, 2014), rich curriculum knowledge (Chauvot, 2008; Zbiek & Hirsch, 2008), knowledge of teaching strategies (Arbaugh, Nolan, Mark & Burns; 2012; Steele, 2008), knowledge of students' learning (Appova & Taylor, 2017); knowledge of tasks (Zaslavky, 2007), knowledge of goals (Superfine & Li, 2018), knowledge of teaching and learning (Heid & Lee, 2008), and knowledge of educational policy (Silver & Walker, 2008). It is an important issue how they obtain or develop the specialization process, that is, the necessary professional knowledge, in these categories of knowledge. As a matter of fact, the resources that the MTE apply form the basis of the perspectives they have in course designs and structures. Results of interviews with Esra educator, five different sub-theme regarding the source theme have been determined (Table-1).

Table 1: Sub-theme and quotations for the sources theme

Sub-theme	Description	Blockquote
Professional Experience	It is the academic and professional experiences of the teacher educator	*"In my mathematics method courses, I benefit from my previous years' experience during the delivery of the subjects and the presentation of the content of the course, I care about this."* *"Teacher candidates have many deficiencies in basic mathematics and even complaints. I say this based on experience in previous years. Within the scope of this course, I plan to eliminate these deficiencies. "*
Collaboration with Members	Teaching in other branches of the mathematics methods course are the decisions they make with teacher educators.	*"We made a change in mathematics teaching lessons this semester. We did not start from the first topic in the YÖK's (officially designed) topic ranking. We first started in the elementary school mathematics program. We switched places. We decided as a group. First of all, what is the program? recognize it, they have sent it down. What's on the schedule, what are the gains? We asked them to examine a textbook in this direction. We made such a change. "* *"When organizing the content of the mathematics teaching methods course, we pay attention to the group decisions first. We prepare common clusters of grades that I used in mathematics teaching lessons. "* *"We have a friend who gives each branch, but it's all we have in common. Sometimes we even go to class as partners. We*

		deliberately coincide at the same time for 2 periods. We are always in dialogue, we are not disconnected at all, we know who works what. "
Study Area	The source based on the field of research and/or the field employed by the teacher educator	*"Within the scope of this course, we attach importance to focusing on concept mistakes. My student studied misconceptions and our other teacher also had an article about step value. So, from our own academic studies. Again, within the scope of this course, we attach special importance to modeling because my student works. "* *"There are no representations here in the context of the skills I aim to develop in prospective teachers, and I emphasize this skill because both I and my student are working on it."*
Academic Documents	These are the books, articles and projects that the teacher educator follows in relation to mathematics teaching.	*"I give prospective teachers articles and theses about the course content. I use it in the development of the concepts I have given through these. In addition, there is Ziya Argün's book as a source in the preparation of the course, and we also benefit from it. In addition, the blue book prepared by Fatih Özmantar teachers (Mathematical Concepts with their Definitions and Historical Developments) is very good. "*
Documents related to the curriculum	These are the resources related to the curriculum that the teacher educator looks at.	*"I follow the primary school mathematics curriculum and primary school mathematics textbooks. I include it in my course content in the context of the topics here. "*

When Table 1 is examined, it is seen that the codes under the 'source' theme of the MTE play a role in the selection and presentation of the topics to be given in the mathematics method course. In addition, it has been observed that she applied to these sources during the course planning and implementation process. In this context, it is possible to say that the MTE attaches importance to theory and practice simultaneously when looking at the resources employed in the planning, design and implementation processes of the mathematics method course. In addition, it is seen that cooperation is taken into account while providing this unity. As a matter of fact, planning the content of the course with her fellows, taking into account the experiences of the past years and reading the literature were taken as indicators of this connection.

4.2. "Value Judgments" Theme

Explaining the concept of value actually depends on one's belief in what value is. In other words, its definition is subjective (Southwell, 1995). Raths, Harmin, and Simon (1987) perceive value as that involves choosing, rewarding, and taking action, all of which are largely cognitive in nature. While Matthews (2001) defines values as the tools or foundations of behaviors, Halstead and Taylor (2000) refer to behavior as the principles that lead to behavior. Values are deep affective qualities that education aims to develop in mathematics teaching. Values are expressed as "beliefs in action" in one aspect (Bishop, FitzSimons, Seah & Clarkson; 1999). That is, one can have a few beliefs, but when faced with choices and in those choices, what one accepts becomes or reflects one's values. In this study, it is seen that the MTE conveys the existence of values taken into account in the design and application of mathematics methods courses to the teacher candidates. Results of interviews with the MTE, five different sub-theme regarding the value judgments theme have been determined (Table-2).

Table 2: Sub-theme and quotations for the value judgments theme

Value Judgments	Blockquote
Designing and doing activities is a key point for teaching.	*"Mathematics teaching methods courses aim to show prospective teachers how to teach mathematics to primary school students by running it on activities. Activities absolutely have to happen, absolutely. "*
Content knowledge is important in mathematics teaching.	*"It is important that mathematical concepts are used correctly. There is something about this. Sinan Olkun has a book. What is the rational number? what is the fraction? Is there a difference? We ask at the beginning of each lesson, and they know the difference. Children should definitely have field knowledge. In the meantime, we also teach mathematical errors in these lessons. We attach importance to this issue in relation to what mistakes are made. We attach importance to focusing on concept mistakes. It is important for prospective teachers to know these misconceptions about the subjects. "*
Group (Coterie) meetings come as an effective priority in the structuring of the course.	*After saying this interview, where we will try to understand your course design for your mathematics teaching methods course, the first sentence he says is as follows:* *We are conducting the lessons jointly. At the beginning of the semester, we talk about what we will do; our exams are common, our finals are common, what week the children will do, and our gains are common. They're all partners. There is no branch difference in us. We act by paying attention to the decisions of the group in the first place as to what will be done within the scope of this course and in what order we will go while presenting the content.*
Previous experiences are important resources that shape the method course.	*While deciding on the topics I have explained within the scope of this course, and we determine our experiences in previous years by benefiting from our field of study.*
Attitudes and beliefs toward mathematics are important in effective teaching.	*We say this at the beginning of the lesson because affective characteristics affect success by 25 percent. I am definitely talking about, what is anxiety, what is an attitude, I am talking about these in the first place. Because the fact that the counter audience has a positive attitude towards this course is a major factor in the effectiveness and quality of a mathematics course.*

Looking at the codes under the theme of value judgments, it is possible to see the existence of the perspective of the MTE on the method course. These judgments, which constitute the basic point of view, give us clues about what the MTE wants to bring to the fore in her practices. It is also seen that her belief in the experience she has in the background and the decisions she has taken with her colleagues while revealing the thoughts and practices that she wants to shine and find important. It has been seen that there are some value judgments that she attributes to the method course, not only in cognitive but also affective sense, and she also talks about value judgments about the effectiveness of content knowledge even though it is a teaching course.

4.3. "Big Ideas" Theme

Big ideas in the field of mathematics are basic mathematics concepts that can be used continuously to teach various mathematics skills/processes. On the other hand, these ideas/thoughts provide reference starting points to students while learning new mathematics concepts/skills (Carnine, 1997 ; Kameenui & Carnine, 1998; Miller & Mercer, 1997; NCTM, 2000). Within the scope of this study, it is possible to mention the existence of big ideas that the MTE only attributes to the mathematics teaching methods course and targets within the scope of this course. These thoughts are the ideas that distinguish this course from other courses and that only teacher candidates can see and have within the scope of this course. Results of interviews with the MTE, four different sub-themes regarding the big ideas theme have been determined (Table-3).

Table 3: Sub-themes and quotations for the big ideas theme

Big Ideas	Blockquote
Concept Development	*after explaining a topic, making a concept map is the skill I want to gain in teacher titles at the end of this lesson. They don't know the nature of a mathematical concept.* *For example, we give an example case, they do not write a daily life problem related to dividing fractions, or they cannot do it. For example, they can not do it at all in the modeling of multiplication. For example, in noticing fraction errors, they do not know the fractional-rational number difference. The step value is very important, but if we do not emphasize it, they may have problems.*
Teaching Perspective	*Within the scope of this course, we attach great importance to problem solving. In addition, it is a problem-solving process as a teaching method-technique in the lessons we have done. When introducing the materials, for example, I give a problem. Let's use the tens of base blocks to make a tens change.* *As a resource, I try to benefit from those related to problem solving. There is one problem solving suitable for Timms. We are injured from there. This year, we are showing short and timss-style questions to teacher candidates. We wanted them to be informed. There is problem solving and there is a translation book. I look at them from time to time. We focus a lot on problem solving. It is like the main thing.*
Misconception	Informing prospective teachers about the misconceptions in each topic in the content and in the catalog of the Council of Higher Education and at this point, improving the prospective teachers *"... here we also give mistakes (the topics in the catalog of YÖK). We attach importance to what the mistakes are. We give importance to focusing on concept mistakes."* *"...for example, we definitely emphasize the types of errors in fractions."* *"... we benefit from the historical developments and misconceptions of the Blue Book Özmantar teachers regarding the misconceptions."*
Objectification	*..."I use materials for teaching mathematics and also have prospective teachers use them. There was even a postgraduate student with no thesis. He didn't know about this thing; he didn't know about fraction sets. He's a very old graduate. He didn't see it in college. We always have it in our lockers and we use it. For example, I am giving problems. Let's make a decimal change by using tens of base blocks. "* *"...Before doing micro teaching, I sometimes ask him/her to prepare a material and to determine a subject suitable for that material and to prepare a lesson plan and then show it to me and teach micro teaching accordingly. "*

Looking at the codes under the theme of big ideas, it is seen what ideas the teacher educator expects from the pre-service teachers and what they aim to achieve at the end of the course. At the end of this course, it is aimed for pre-service teachers to show a semantic development regarding mathematical concepts, to embody in teaching, to identify misconceptions and to have a perspective while teaching.

4.4. "Professed Practices" Theme

These are the practices expressed by the MTE and/or made during the lesson obtained through inferences during the interview. Results of interviews with the MTE, five different sub-themes regarding the professed practices theme have been determined (Table-4).

Table 4: Sub-themes and quotations for the professed practices theme

Professed Practices	Blockquote
Micro teaching	*"…we do micro teaching. In fact, this semester, we did something, we did the lessons of two classes at the same time, we took two lessons at the same time, we gave feedback at the same time so that they could see more people. "* *"… we pull in a real classroom environment and watch him here. It's like I turned around here and looked this way. First the group that makes the presentation, then the other teacher candidates, we are the last two teachers in the class, we interpret it. "*
Material Utilization	*…"I use materials for mathematics teaching and I also have it used by prospective teachers. There was even a non-thesis undergraduate student. He did not know this thing; he did not know the fraction sets. He graduated from the old school. He did not see it in the university. We always have it in our cabinets and we use it. For example, I give a problem. I say let's make a decimal change using tens of base blocks. "* *"… I want them to prepare a material before doing micro-education and sometimes to determine a subject suitable for that material and to prepare a lesson plan and then show it to me and teach micro-education accordingly."*
Planning	*We want prospective teachers to make lesson plans before micro teaching performances and before showing a material usage example. Regardless of my criteria in the evaluation, he/she will prepare a lesson plan in advance and show us this lesson plan. He/she needs to give us detailed information about what he/she will do. He/she can tell us after he/she passes the control. For example, when they do a small application, we say immediately prepare a lesson plan.*
Doing an Task	We *try to show it by working on the activities on how to teach mathematics. We definitely use the activity. For example, we show it and have it done in the classroom, like tangram in geometry. We also do geometry in folding etc.*
Classroom Discussion Specific to the Concept	*This level has a big advantage. They also get internships for what we tell them. And they say that when our teacher turns around and goes like this in class, our teacher did this, our teacher did this. At this point, I turn my observations into an opportunity and create an environment for discussion and expressing opinions in the classroom.* *The children who come to us have a good profile, but everything is tested with logic. When I ask classic questions, they get bad grades. Therefore, I create environments for them to learn conceptually.*

When we look at the subthemes, we see that it is consistent with the subthemes under the other 3 themes. As a matter of fact, it is stated that the MTE made activities in the practices she mentioned about the value judgment related to the activity design. As another example, she makes applications about using materials for the idea of concretization.

Within the scope of this study, it was investigated what are the elements that a MTE referred to in structuring and implementing mathematics methods course design, and whether there is a perspective. As a result of our analysis, it was concluded that the design of the mathematics methods course has a particular nature. It was concluded that there are four themes that make up this dynamic process and that these four themes interact among themselves.

5. Conclusion and Discussion

In this study, we tried to reveal how a MTE, as a course designer and practitioner, structures the mathematics method course. We found that the MTE has a dynamic in designing and implementing the teaching process. This has allowed us to focus on the local integration of a few constructs and assertions rather than networking theoretical perspectives.

As a result of the analysis of the data obtained from the interviews, it was seen that the MTE had a structure with 4 arguments in the background while designing and structuring mathematics method courses. From these

arguments, value judgments have a role in the design and structuring of the course as well as a decisive role in the emergence of the other three arguments. As a matter of fact, in the selection of the resources that the teacher educator refers to in the design and application of the course, values guide the teacher candidates in deciding what the ideas they will have within the scope of this course should be and which teaching practices they should be.

Dede (2013) concluded that decision-making is fundamentally influenced by values. Educational decision-making involves value judgments. In one aspect, these value judgments, which are expressed as the standards of the person, are related to what the person thinks to be right or wrong, good or bad, important or cannot be ignored, and consciously or unconsciously directs the practice of the person continuously (Carbone, 1987). Values in mathematics teaching are defined as deep affective qualities that are an indispensable part of the classroom environment (Bishop, 2002; Bishop, 2016; Bishop, FitzSimons, Seah and Clarkson, 1999; Dede, 2011; Seah & Wong, 2012). In this study, when the statements of the MTE regarding the design and structuring of the mathematics teaching methods course are examined, it is seen that the activity design (value-1), field knowledge (value-2), group meetings (value-3), previous experiences (value-4) and attitudes towards the course (value-5) have particular importance to her. Another argument that constitutes the nature of the design of the mathematics methods course by the MTE is the sources. It is possible to say that the values it has are also effective in the selection of these sources. As a matter of fact, the academic and professional experiences of the MTE and the fact that she says the decisions they made with the other instructors in the course as a source coincides with some of her values (value-3 and 4).

On the other hand, in the light of the interviews with the MTE, another argument that we suggest constitutes the nature of the mathematics methods course is the big ideas. These are the goals that the teacher educator expects and aims to develop in prospective teachers through mathematics teaching. It is seen that concept development, misconception, and concretization, which are among the great ideas of the teacher educator, are in parallel with some of the value judgments (value-1 & 2).
We can say that there is a similar effect in the mentioned applications that we obtained as a result of the interviews and presented as the last argument. Practices such as having activities and having class discussions about the concept again coincide with the values owned.

Apart from the above, we see that these four arguments have an interaction within themselves. For example, it is found that the idea of materialization overlaps with the application of material use and the idea of concept development overlaps with the practice of working with misconceptions.

Teachers' beliefs influence their perceptions, and value judgments, and this in turn affects the effectiveness of their practice in the classroom, either directly (Jones & Leagon, 2014) or through an indirect connection (Hutner & Markman, 2016). Therefore, it is emphasized that values are extremely important in the content and process of teaching (Gonzalez Thompson, 1984, pp. 105-127; Cohen, 1990; Thompson, 1992). For example, Wilkins (2008) found that value judgments regarding the effectiveness of questioning for 481 American primary school teachers were the strongest predictor of questioning teaching practices. Using structural equation modeling, Brown, Harris, and Harnett (2012) found that teacher feedback perceptions of primary and secondary school teachers were associated with feedback practices. In the light of all these, it is possible to say that teacher educators absorb a number of hidden values they have in their choices about resources, ideas and practices that will guide prospective teachers in teaching and learning certain mathematics content.

This study enabled us to see the existence of a perspective in the design and structuring of mathematics methods courses of MTE. It is important to know the values of the MTE, the resources he/she has applied, the goals related to the big ideas and the teaching practices he/she has made during the lesson in terms of seeing the character of the mathematics teaching that the teacher candidates have received. For example, if the teacher educator has a theoretical perspective and cares about the resources and practices he/she applies accordingly, he/she is structuring the teaching process with a theoretical perspective. On the other hand, the teacher educator who sees the group decisions as a value judgment is structuring the process with a perspective that cares about

implementing a common decision. It is possible to say that this situation gives a message about what mathematics teaching will look like in their classrooms.

Issues such as what should be taught, what should be polished, and what should be ignored in the method course, which has become an important point for teacher candidates, and whether there is a difference in the teaching practices of teacher candidates who take lessons from teacher educators with different perspectives in mathematics classes, we feel, warrant further research attention.

References

Althauser, K. L. (2018). The Emphasis of Inquiry Instructional Strategies: Impact on Preservice Teachers' Mathematics Efficacy. *Journal of Education and learning*, *7*(1), 53-70.

Anderson, J., & Tully, D. (2020). Designing and evaluating an integrated STEM professional development program for secondary and primary school teachers in Australia. In *Integrated Approaches to STEM Education* (pp. 403-425). Springer, Cham.

Anthony, G., Averill, R., & Drake, M. (2018). Occasioning Teacher-Educators' Learning through Practice-Based Teacher Education. *Mathematics Teacher Education and Development*, *20*(3), 4-19.

Appova, A., & Taylor, C. E. (2014). Mathematics teacher educators' classroom practices: K-8 mathematics content courses. In *annual meeting of the American Educational Research Association (AERA). Philadelphia, PA*.

Ball, D. L., & Bass, H. (2000). Interweaving Content and Pedagogy in Teaching and Learning to Teach: Knowing. *Multiple perspectives on mathematics teaching and learning*, *1*, 83.

Baumert, J., Kunter, M., Blum, W., Brunner, M., Voss, T., Jordan, A., ... & Tsai, Y. M. (2010). Teachers' mathematical knowledge, cognitive activation in the classroom, and student progress. *American educational research journal*, *47*(1), 133-180.

Beswick, K., Goos, M., & Chapman, O. (2014). Mathematics teacher educators' knowledge. *Proceedings of PME 38 and PME-NA 36*, *1*, 254

Bouckaert, M., & Kools, Q. (2018). Teacher educators as curriculum developers: exploration of a professional role. *European Journal of Teacher Education*, *41*(1), 32-49.

Bobis, J., Khosronejad, M., Way, J., & Anderson, J. (2020). "Sage on the stage" or "meddler in the middle": shifting mathematics teachers' identities to support student engagement. *Journal of Mathematics Teacher Education*, *23*(6), 615-632.

Bouckaert, M., & Kools, Q. (2018). Teacher educators as curriculum developers: exploration of a professional role. *European Journal of Teacher Education*, *41*(1), 32-49.

Bishop, A., FitzSimons, G., Seah, W. T., & Clarkson, P. (1999). Values in Mathematics Education: Making Values Teaching Explicit in the Mathematics Classroom.

Braun, V., & Clarke, V. (2013). Successful qualitative research: A practical guide for beginners.

Brown, G. T., Harris, L. R., & Harnett, J. (2012). Teacher beliefs about feedback within an assessment for learning environment: Endorsement of improved learning over student well-being. *Teaching and Teacher Education*, *28*(7), 968-978.

Boaler, J., & Humphreys, C. (2005). *Connecting mathematical ideas: Middle school video cases to support teaching and learning* (No. 1). Heinemann.

Carnine, D. (1997). Bridging the research-to-practice gap. *Exceptional children*, *63*(4), 513-521.

Chauvot, J. B. (2008). Curricular Knowledge and the Work of Mathematics Teacher Educators. *Issues in Teacher Education*, *17*(2), 83-99.

Cheng, H. F., & Dörnyei, Z. (2007). The use of motivational strategies in language instruction: The case of EFL teaching in Taiwan. *International Journal of Innovation in Language Learning and Teaching*, *1*(1), 153-174.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The psychologist*, *26*(2).

Commission, E. (2013). Supporting Teacher Educators for Better Learning Outcomes. Retrieved from Brussels

Dede, Y. (2013). Examining the Underlying Values of Turkish and German Mathematics Teachers' Decision Making Processes in Group Studies. *Educational Sciences: Theory and Practice*, *13*(1), 690-706.

Doerr, H. M., & Thompson, T. (2004). Understanding teacher educators and their pre-service teachers through multi-media case studies of practice. *Journal of Mathematics Teacher Education*, *7*(3), 175-201.

Durkee, K. M. (2019). *Elementary Mathematics Methods Courses and Beginning Mathematics Teachers' Readiness to Teach Numbers and Operations* (Doctoral dissertation, University of Hawai'i at Manoa).

Fast, G. R., & Hankes, J. E. (2010). Intentional integration of mathematics content instruction with constructivist pedagogy in elementary mathematics education. *School Science and Mathematics*, *110*(7), 330-340.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methods*, *5*(1), 80-92.

Ford, P., & Strawhecker, J. (2011). Co-Teaching Math Content and Math Pedagogy for Elementary Pre-Service Teachers: A Pilot Study. *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *2*.

Geerdink, G., Boei, F., Willemse, M., Kools, Q., & Van Vlokhoven, H. (2016). Fostering teacher educators' professional development in research and in supervising student teachers' research. *Teachers and Teaching*, *22*(8), 965-982

Ghousseini, H., & Herbst, P. (2016). Pedagogies of practice and opportunities to learn about classroom mathematics discussions. *Journal of Mathematics Teacher Education*, *19*(1), 79-103

Hacıömeroğlu, G. (2013). The efficacy and classroom management beliefs of prospective classroom teachers about teaching mathematics. Journal of Uludag University Faculty of Education, *26*(1), 1-18.

Halstead, J. M., & Taylor, M. J. (2000). Learning and teaching about values: A review of recent research. *Cambridge journal of education*, *30*(2), 169-202.

Heid, M. K., & Lee, H. S. (2008). Using technology in teaching and learning mathematics: What should doctoral students in mathematics education know. *US doctorates in mathematics education: Developing stewards of the discipline*, 117-125.

Hutner, T. L., & Markman, A. B. (2016). Proposing an operational definition of science teacher beliefs. *Journal of Science Teacher Education*, *27*(6), 675-691.

Jaworski, B., & Huang, R. (2014). Teachers and didacticians: Key stakeholders in the processes of developing mathematics teaching. *ZDM*, *46*(2), 173-188.

Jaworski, B. (2008). Mathematics teacher educator learning and development: An introduction. In B. Jaworski & T. Wood (Eds.), The international handbook of mathematics teacher education (Vol. 4, pp. 1-13). Rotterdam, The Netherlands: Sense Publishers

Jones, M. G., & Leagon, M. (2014). Science teacher attitudes and beliefs: Reforming practice. In *Handbook of Research on Science Education, Volume II* (pp. 844-861). Routledge.

Kameenui, E. J., & Carnine, D. W. (1998). *Effective teaching strategies that accommodate diverse learners*. Prentice-Hall Inc., Order Processing, PO Box 11071, Des Moines, IA 50336-1071.

Kilpatrick, J. Swafford, & B. Findell (Eds.), Mathematics Learning Study Committee, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Li, W., & Castro Superfine, A. (2018). Mathematics teacher educators' perspectives on their design of content courses for elementary preservice teachers. *Journal of Mathematics Teacher Education*, *21*(2), 179-201.

Lougran, J. (2014). Professionally developing as a teacher educator. Journal of Teacher Education, 65(4), 271-283.

Lunenberg, M., Korthagen, F. & Swennen, A. (2007). The teacher educator as a role model. Teaching and Teacher Education, 23(2007), 586-601.

Ma, L. (1999). Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Masingila, J. O., Olanoff, D. E., & Kwaka, D. K. (2012). Who teaches mathematics content courses for prospective elementary teachers in the United States? Results of a national survey. Journal of Mathematics Teacher Education, 15(5), 347-358.

Max, B., & Welder, R. M. (2020). Mathematics teacher educators' addressing the common core standards for mathematical practice in content courses for prospective elementary teachers: A focus on critiquing the reasoning of others. *The Mathematics Enthusiast*, *17*(2), 843-881

Miller, S. P., & Mercer, C. D. (1997). Educational aspects of mathematics disabilities. *Journal of learning disabilities*, *30*(1), 47-56.

McCrory, R., & Cannata, M. (2011). Mathematics classes for future elementary teachers: Data from mathematics departments. *Notices of AMS*, *58*(1), 29-35.

National Research Council. (2001). Adding it up: Helping children learn mathematics.

Philipp, R. A., Ambrose, R., Lamb, L. L., Sowder, J. T., Schappelle, B. T., Sowder, L., et al. (2007). Effects of early field experiences on the mathematical content knowledge and beliefs of prospective elementary school teachers: An experimental study. Journal for Research in Mathematics Education, 38(5), 438–476.

Raths, L. E., Harmin, M., & Simon, S. B. (1987). Selections from values and teaching. *Value theory and education*, 198-214.

Robinson, S. O., & Adkins, G. L. (2002). The Effects of Mathematics Methods Courses on PreService Teachers' Attitudes toward Mathematics and Mathematics Teaching.

Saran, R., & Gujarati, J. (2013). Moving toward Positive Mathematics Beliefs and Developing Socio-Mathematical Authority: Urban Preservice Teachers in Mathematics Methods Courses. *Journal of Urban Learning, Teaching, and Research*, *9*, 100-111.

Seah, W. T., & Wong, N. Y. (2012). What students value in effective mathematics learning: A 'Third Wave Project'research study. *ZDM*, *44*(1), 33-43.

Superfine, A., & Bragelman, J. (2018). Analyzing the impact of video representation complexity on preservice teacher noticing of children's thinking. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(11)

Seaman, C. E., & Szydlik, J. E. (2007). Mathematical sophistication among preservice elementary teachers. *Journal of Mathematics Teacher Education*, *10*(3), 167-182.

Strawhecker, J. (2005). Preparing elementary teachers to teach mathematics: How field experiences impact pedagogical content knowledge. *Issues in the Undergraduate Mathematics Preparation of School Teachers*, *4*.

Superfine, A. C., & Li, W. (2014). Exploring the mathematical knowledge needed for teaching teachers. Journal of Teacher Education, 65(4), 303-314.

Taylor, C. E. (2011). *Facilitating the development of elementary prospective teachers' pedagogical content knowledge: A case study of a mathematics teacher educator's actions and purposes* (Order No. 3533859). Available from ProQuest Dissertations & Theses A&I. (1262380945). Retrieved from http://search.proquest.com/docview/1262380945?accountid=13158

Zopf, D. A. (2010). *Mathematical knowledge for teaching teachers: The mathematical work of and knowledge entailed by teacher education*. University of Michigan