

THREE FIRST-TIME MATHEMATICS MENTOR TEACHERS
AREA-SPECIALIZED MENTORING PRACTICES DURING AN ONLINE
PROFESSIONAL DEVELOPMENT PROGRAM

by

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ABSTRACT

THREE FIRST-TIME MATHEMATICS MENTOR TEACHERS AREA-SPECIALIZED MENTORING PRACTICES DURING AN ONLINE PROFESSIONAL DEVELOPMENT PROGRAM

The aim of this qualitative study is to examine how the mentoring perceptions and practices of three first-time mathematics mentor teachers developed throughout the process of an online professional development program. The study was conducted using a multiple case study design and involved volunteer mathematics teachers who participated in a mentoring training program developed within the framework of the Mentoring for Area Specialized Teaching (MAST) Model. Data were collected through video-recorded mentoring sessions during the program, as well as through interviews conducted with each mentor before, during, and after the training. The findings indicate that the mentors showed development in both their perceptions of mentoring and their mentoring practices over the course of the program. This shows that MAST Model provides a functional framework for area-specific mentoring and could serve as a strong alternative to existing mentoring models. Furthermore, based on the results of this study, it is recommended that future research employ larger samples, include different subject areas, and use data collection methods that capture the perspectives of both mentors and preservice teachers; this would allow the impact of mentoring practices to be evaluated more comprehensively.

ÖZET

İLK KEZ MENTÖRLÜK YAPAN ÜÇ MATEMATİK ÖĞRETMENİNİN BİR ÇEVİMİÇİ MESLEKİ GELİŞİM PROGRAMI SÜRECİNDEKİ ALANA ÖZGÜ MENTÖRLÜK UYGULAMALARI

Bu nitel araştırmanın amacı, ilk kez mentörlük yapan üç matematik öğretmenin bir çevrim içi mesleki gelişim programı sürecinde mentörlük algılarının ve mentörlük uygulamalarının nasıl geliştiğini incelemektir. Araştırma Etkili Alan Eğitimi Mentörlük Modeli (ETALEM) çerçevesinde geliştirilen bir mentörlük eğitim programına katılmış gönüllü matematik öğretmenlerinden oluşmaktadır ve çoklu durum çalışması yöntemiyle yürütülmüştür. Veriler, mentörlük eğitimi sırasında kaydedilen video oturumları yanı sıra, her bir mentörle eğitim öncesi, ortası ve sonrası olmak üzere yapılan görüşmeler aracılığıyla toplanmıştır. Bulgular, eğitim boyunca mentörlerin hem mentörlük algılarında hem de mentörlük uygulamalarında bir gelişim olduğunu ortaya koymaktadır. Bulgular, ETALEM'in alana özgü mentörlük için işlevsel bir çerçeve sunduğunu ve mevcut mentörlük modellerine güçlü bir alternatif oluşturabileceğini göstermektedir. Ayrıca, çalışmanın bulguları doğrultusunda, gelecekteki araştırmalarda daha geniş örneklem, farklı branşlar ve hem mentörlerin hem de öğretmen adaylarının bakış açılarını kapsayacak veri toplama yöntemlerinin kullanılması önerilmektedir; bu sayede mentörlük uygulamalarının etkisi daha kapsamlı biçimde değerlendirilebilir.

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LIST OF ACRONYMS/ABBREVIATIONS

CSM	Clinical Supervision Model
CT	Cooperating Teachers
MAST	Mentoring for Area Specialized Teaching
MeT-PD	Mentor Teacher Professional Development
MoNE	Ministry of National Education
PCK	Pedagogical Content Knowledge
PD	Professional Development
TT	Trainee Teacher

1. INTRODUCTION

Mentoring has long been recognized as a key element in professional development, and career advancement across disciplines (Hartwig, 1999; Wright and Wright, 1987). Mentoring supports the mentee's professional growth while also offering reflection and renewal opportunities for mentors (Kram, 1985; Barondess, 1997). Implementing structured mentoring programs affect mentoring relationships positively and contribute significantly to the career growth and success of the mentee, while also enhancing the mentor's job satisfaction and overall work performance (Chun *et al.*, 2012). Also, studies on mentor education in teaching, showing that structured mentor training not only enhances mentoring practices but also positively influences mentors' own teaching and professional identities (Arnsby *et al.*, 2023; Uzunpinar *et al.*, 2023).

In Türkiye, there is a mentor teacher training prepared by the Turkish Ministry of National Education according to the Clinical Supervision Model (CSM). To be a mentor, it is necessary to participate in this program and receive a certificate by passing the exam at the end of the program. Although this program provides information about guiding mentees in lesson planning, giving feedback on lesson plans, and offering feedback after lesson observations, subject-specific differences in mentoring practices were not taken into account during the program development. (MoNE, n.d.).

Considering the limitations of the current mentor training program, a mentoring model was developed within the scope of a TÜBİTAK project (TÜBİTAK-1001, 220K086), and a mentor training based on this model was conducted. Aim of this study was introducing the mentoring model and the training. Participants of this study were teachers who served as mentors for the first time. The model has three dimensions: Practicum Triad, General Pedagogy, and Area-Specialized Teaching. The mentoring perceptions and practices of mentors were examined under three dimensions of the model.

2. REVIEW OF LITERATURE

2.1. Mentoring

Regardless of the field, mentoring is always present in environments where learning takes place. Mentors support their mentees' academic growth, career development, and success in specific fields. Hartwig (1999) defines mentoring as leaving a legacy and summarizes how the mentoring process contributes to the advancement of scientific research. He emphasizes that mentoring is a reciprocal process in which the thoughts and experiences of the mentor and mentee are shared, and the process is beneficial to both sides. While the mentor supports the mentee's career development, s/he gains insight, vision, and purpose. In the mentoring relationship, the mentee is junior to the mentor, and the mentor must take a supporting rather than a leading role. Also, Baroness (1997) emphasizes that both the mentor and the mentee benefit from the process. A strong relationship can help both parties advance in their careers. For mentees, the benefits of mentoring include establishing professional networks, engaging in professional development, and gaining self-confidence. For mentors, supporting mentees can enhance their productivity and strengthen their professional identity (Wright and Wright, 1987).

Kram (1985) outlines the four phases of mentoring relationships: the initiation phase, the cultivation phase, the separation phase, and the redefining phase. Mentoring can be understood as a process in which both the mentor and the mentee grow. The initiation phase begins with the mentor setting expectations and trust, while the cultivation phase deepens the relationship with significant guidance and support. The separation phase sees the mentee asserting independence and the relationship becoming less intensive. The redefining phase transforms the relationship, shifting from a hierarchical to a mutual respect and collegiality dynamic.

Kram and Higgins (2001) introduced a new framework for mentoring at work: Developmental Network Perspective. In the framework, mentoring is defined in a way that will benefit not only the mentee but also the mentor, unlike traditional methods. At the same time, the importance of network relationships and receiving support from more than one person, rather than a single mentor-mentee relationship, is emphasized. A community of practice perspective is consistent with this mentoring approach since developmental networks are built instead of a single relationship between mentor and mentee. Aligning with the Kram's Developmental Network Perspective, the study conducted by Billet (2003) asserts that mentors have different experiences, so instead of assigning a single mentor to a mentee, multiple mentee-mentor relationships can be facilitated. Another research conducted by Holland (2018) states that engaging in mentoring through a mentoring community of practice (M-CoP) is beneficial for mentors' development since in a community, mentors share their experiences, learn from each other and support the mentoring practices of each other.

Jacobi and Cruz examined mentoring definitions and commented on their common points and emphasized the lack of a common definition of mentoring (Jacobi, 1991, Crisp and Cruz, 2009). Dawson stated that it is normal that there is no common definition because needs and relationships may change from situation to situation. Instead of making a lot of definitions, creating a framework would be more guiding for researchers and practitioners and the framework could guide organizations who want to develop formal mentoring programs (Dawson, 2014). Eric Hartwig (1999) wrote "From the definition, one might assume that mentoring occurs naturally in all research and academic institutions; however, many institutions have begun special mentoring programs because they found it was not occurring", and he claims that institutions offering mentoring as a special program is an indication that they care about the development of young people. Formal mentoring programs have been increasingly popular as a valuable career resource for employees (Kram and Ragins, 2007). A longitudinal study conducted by Chun *et al.* (2012), collected data from the employees who participated in a standardized mentoring program which included four stages: orientation, mid-term information sharing, evaluation and follow-up. The study underscores how formal

mentoring programs are important for both mentors and mentees. Mentor-mentee relationships positively affect the intern's career success and development, while increasing the mentor's job satisfaction and performance. Furthermore, providing and receiving greater mentoring function improves affective well-being and increases organizational commitment of both parties (Chun *et al.* 2012).

2.2. Mentoring in Teacher Education

Supporting pre-service teachers' development effectively is crucial to maintaining the quality of the teaching profession (Glover *et al.*, 2024). The mentor support reduces the anxiety level of preservice teachers and contributes to the development of the professional knowledge and skills of the preservice teachers (Grima-Farrell, 2015). In the study by Ewing (2021), mentees perceived their mentors as sources of both professional and emotional support. Therefore, they identified the key qualities of an effective mentor as being non-judgmental and accessible. The importance of mentors providing emotional support to mentees was emphasized by nine out of ten mentors who participated in the study by Glover *et al.* (2024). They highlighted the necessity of establishing a trust-based relationship between the mentor and mentee for effective mentoring. Other key elements of effective mentoring, as identified by the mentors, included supporting the development of the mentee's self-reflection skills and offering opportunities for pre-service teachers to observe a variety of teaching styles.

Besides the benefits to preservice teachers' growth, mentoring fosters mentors' growth by improving communication skills of mentors, fostering leadership abilities and enhancing pedagogical knowledge (Hudson, 2013). Mentoring a preservice teacher can positively impact teachers' perceptions, helping them gain new ideas and reflect more on their own teaching methods (Smith and Nadelson, 2016). The findings of another study conducted by Walters *et al.* (2020) showed that when experienced teachers take on mentoring roles, it contributes to their own professional development by providing opportunities for professional renewal and deepening their instructional approaches. However, teaching experience alone does not ensure effective mentoring; mentors need

to receive training to be adequately prepared for this role (Ambrosetti, 2014). Therefore, well-structured mentorship programs are crucial for effective mentoring relations and sustainable teacher development (Beutel and Spooner-Lane, 2009). These programs help to build a supportive learning culture within schools and strong professional learning communities help teachers' instructional improvement (Borko, 2004).

To examine teachers' professional learning during and after completing a two-year university-based mentor education, a study was conducted by Arnsby *et al.* (2023). The results of the study showed that mentor education programs contribute to professional and personal development of teachers. 78% of the participants stated that they had developed as mentors and 63.8% indicated growth in their teaching practices. Results of the study showed that teachers can transfer the skills gained in mentor education to not only their mentoring practices but also teaching practices. Findings of another study supports the idea that mentoring programs contribute to the professional development of teachers (Uzunpinar *et al.*, 2023). The opinions of twelve teachers on the mentoring programs were taken. Statements of the teachers underlined the positive effect of mentoring programs on professional skills of teachers and training of novice teachers. It was asserted that thanks to mentoring programs collaboration and sharing among teachers increased, and teachers were encouraged to try new methods. Also, novice teachers have gained instructional abilities by guidance and emotional support of mentor teachers. Aligning with these studies, a study exploring the role of mentorship in continuous professional development for mathematics teachers (Luneta, 2006) showed that teachers participating in a mentorship program could reflect on their instructional practices, and they could enhance their teaching skills through their involvement in mentorship activities.

2.3. Teacher Mentoring in Türkiye

As part of teacher training in Türkiye, pre-service teachers typically undertake internships during their final year at university over two semesters, usually experiencing two different schools. At the beginning of the internship process, pre-service teachers

are paired with a mentor teacher, who monitors the pre-service teachers' development. Before 2018, for the pre-service teachers there were two separate courses in universities called School Experience and Teaching Practice. These courses were added to the program in 1998 as part of the "Faculty-School Cooperation" model, a collaboration between the Higher Education Council (YÖK) and the Ministry of National Education (MoNE), aiming to strengthen the practical dimension of the teacher training system (YÖK, 1998). The School Experience course was based on observation. During one semester, pre-service teachers observed the school culture, classroom dynamics, student characteristics and gained knowledge and experience about the teaching profession under the guidance of their mentor teachers. In the second semester, within the Teaching Practice course, pre-service teachers prepared lesson plans and gained experience in teaching in the classroom. Their teaching was evaluated by their mentor teachers and university advisors. Since having two separate courses caused practical inefficiencies, these two courses were combined, and the current system was adopted, spreading the duration of the internship over two semesters (MoNE, 2018).

The need for mentoring in Türkiye was addressed at the National Teacher Strategy Workshop held in 2011. Important decisions were made, such as giving certificates to teachers who effectively carry out mentoring processes, organizing training programs, and developing a system in which novice teachers can complete their first years under the guidance of a mentor (National Teaching Strategy Draft, n.d., as cited in Yıldırım and Yılmaz, 2013). In 2016, the Ministry of National Education organized the "Advisor Teacher Training Seminars for the Induction Process of Novice Teachers". In the same year, a directive outlining the induction process for novice teachers was also issued. In the directive, the primary role of mentor teachers is defined as providing guidance throughout the professional development process of novice teachers. (MoNE, 2016). In the regulation published in 2022, the role of the mentor teacher was defined as observing the novice teacher's practices, providing guidance throughout the process, and serving as a role model by demonstrating professional knowledge, skills, attitudes, and behaviors, while also sharing their experience (MoNE, 2022).

Currently, teachers who will serve as mentors complete their mentoring training online through a platform designed by the MoNE and receive a certificate upon passing an exam at the end of the training. The purpose of the training, as stated on the hosting platform, is to equip mentors with knowledge of observation, feedback, and interviewing techniques to enable effective guidance of novice teachers, to support the high-quality and well-equipped professional development of novice teachers, and to introduce the Clinical Supervision Model to mentors (MoNE, n.d.). Also, mentors are informed about the general internship process and provided information about roles of mentor, mentee, and the university professor. Besides these, the system, which is used for evaluating performance of pre-service teachers is introduced to mentors. Mentors are supposed to evaluate pre-service teachers' competencies in the following areas: subject matter and pedagogical content knowledge, planning, using teaching methods, classroom management, time management, communication with students, monitoring and assessing student learning and other professional competencies. Although mentors are informed about their responsibilities, there is no explicit guidance on how to fulfill these duties. This causes mentors to not be able to guide candidates well enough. The program remains largely theoretical and does not fully meet the practical needs of mentors in schools. There are studies showing that mentors are not aware of their own roles and responsibilities, and that this situation causes pre-service teachers to experience difficulties during the process (Aslan and Sağlam, 2018; Yılmaz and Bıkmaz, 2021).

It is necessary to know CSM to understand teacher mentoring in Türkiye. The goals of clinical supervision model include enhancing teachers' effectiveness and promoting and implementing new practices (Cogan, 1973). CSM has five stages: pre-conference with teachers, observation of classroom instruction, analyzing and interpreting the observation, post conference with teacher, critiques of previous four steps (Glickman, 2002). In the pre-conference stage, the trainee teacher shares his/her plan with the supervisor and receives feedback about lesson materials, classroom management and instructional strategies. Since cooperating teachers have knowledge of students and the curriculum, it is important for the process to make them participate in

the meetings. After the pre-conference stage, the supervisor and cooperating teacher conduct systematic, nonjudgmental observations of the teaching. Data is collected via video recording and note taking. Data analysis is the third stage in which the video record is analyzed by using notes as well. In the post conference and reflection phase, supervisor, cooperating teacher and trainee teacher have meetings and constructive feedback, and support are given to the trainee teacher. The teacher candidate is asked to evaluate his/her own teaching, and the whole process is evaluated, at the end of the process, an action plan is made to improve the teacher's performance.

The Clinical Supervision Model in which teacher candidates receive detailed feedback supports professional development of teacher candidates (Bulunuz *et al.*, 2015). Feedback should be nonjudgemental and focused on the teacher's growth (Bencherab, A. and Maskari, A. 2021). Also, it was found there is a statistically significance between supervisors who trained and used CSM and those did not in terms of their feedback to trainee teachers (TT) and cooperating teachers (CT), in terms of the quality of their interaction with TTs and CTs, and in terms of their professional behavior towards TTs and CTs (Gürsoy *et al.*, 2013). According to results of the study, Gürsoy *et al.* suggested that supervisors and cooperating teachers should receive training in the use of CSM since carrying out a more structured and reflective supervision better supports the development of preservice teachers. A follow-up study conducted in 2016 demonstrated that supervisors who received clinical supervision training conducted more structured observations, provided clearer and more constructive feedback to pre-service teachers, and were more effective in their professional guidance roles compared to those using traditional supervision methods. This facilitates the establishment of a higher-quality mentoring relationship with pre-service teachers (Gürsoy and Salihoğlu, 2016). In addition, findings from a master's thesis designed as a case study show that the use of the CSM contributes to the development of pre-service teachers' instructional skills, enhances their self-confidence, and improves their self-assessment abilities (Aksoy, 2024).

Besides the effectiveness of using CSM, it is a limitation for the model that it includes general mentoring practices. In addition to the CSM, other models such as Kram's Mentoring Model (Kram, 1985), the Five-Factor Mentoring Model (Hudson and Skamp, 2004), and the Mentor (teacher) Roles in Dialogues (MERID) Model (Hennissen *et al.*, 2008) have also been proposed in the literature. Among these models, only the Five-Factor Mentoring Model is subject-specific, and it was originally developed within the context of science education to investigate the key characteristics of effective mentoring practices in supporting pre-service science teachers (Hudson and Skamp, 2004). Five factors of the model stated as personal attributes, system requirements, pedagogical knowledge, modeling and feedback (Hudson and Skamp, 2001, Hudson, 2005). Key personal attributes that a mentor needs to have stated as being able to inspire the preservice teacher, supporting preservice teachers to develop their self-confidence, fostering a positive attitude, providing opportunities for reflection on teaching practices. System requirements are about discussing and explaining school policies, curricula, and goals. To articulate pedagogical knowledge and pedagogical content knowledge, mentors support preservice teachers in guiding lesson preparation, assisting with timetabling and setting classroom rules, assisting in planning, discussing implementation of the lesson, discussing teaching and assessment methods. Attributes and practices related to the modeling factor are displaying enthusiasm, being a model in classroom management, lesson preparation, rapport with students and using appropriate language. The last factor is feedback. It includes reviewing lesson plans before observation, expressing expectations, observing lessons, providing oral and written feedback.

2.4. Mentoring for Area Specialized Teaching (MAST) Model

The MAST Model was established as a mentoring framework aimed at offering guidance for mentor teachers in mathematics and science education programs. Unlike many existing mentoring models that are designed for general use across all disciplines, the MAST Model provides a structure tailored to the specific needs of mentors in mathematics and science education by clearly defining mentors' roles and responsibilities and

offering area-specific guidance. The model is composed of three core dimensions: The Practicum Triad, General Pedagogy, and Area Specialized Teaching. All dimensions include various themes (Aslan Tutak *et al.*, 2023; Ateskan *et al.*, 2025). Dimensions and themes are given in the Table 2.1.

Table 2.1. Dimensions of MAST model.

Mentoring for Area-Specialized Teaching (MAST) Model		
Dimension I – Practicum Triad	Dimension II – General Pedagogy	Dimension III – Area-Specialized Teaching
I.1 Practicum Requirements	II.1 Teaching Profession	III.1 Content Knowledge
I.2 Expectations from PST	II.2 Students’ Characteristics	III.2 Mentoring Practices about Teaching
I.3 Role of Mentor and Mentoring Perspective	II.3 Pedagogy of Teaching	III.3 Mentor-Mentee Interactions
I.4 Expectations from Supervisor	II.4 Assessment	III.4 Curriculum Knowledge
I.5 Mentor Characteristics and Selection	II.5 Classroom Management	III.5 Instructional Materials and Technology
		III.6 Student Ideas

The first dimension of MAST Model, known as The Practicum Triad, outlines the general structure of the teaching practicum, clarifying the roles and responsibilities of the three main stakeholders (mentors, mentees and supervisors), as well as both their collaborative and individual interactions. This dimension includes five themes: Practicum Requirements, Expectations from Mentees, Role of Mentor and Mentoring Perspective, Expectations from Supervisor, Mentor Characteristics and Selection.

The first theme, I.1 Practicum Requirements, outlines the structure of the practicum process, including the selection of schools and mentors, the duties of preservice teachers within schools, and the collaborative relationship between university supervisors,

mentor teachers, and preservice teachers. The second theme, I.2 Expectations from Mentees, addresses what mentor teachers expect preservice teachers to know and be capable of, including possessing adequate subject knowledge, pedagogical skills, reflective abilities, and a willingness to learn. The third theme, I.3 Role of Mentor and Mentoring Perspective, focuses on the characteristics of an effective mentor, highlighting their views on mentoring, being a model for teaching practices, providing mentees the opportunity to teach, engaging in reciprocal learning, monitoring mentees' development, offering constructive feedback, and being aware of theoretical approaches on teacher learning and using appropriate approaches to support the mentee. The fourth theme, I.4 Expectations from Supervisor, captures mentor teachers' expectations from university supervisors of mentee. The fifth theme, I.5 Mentor Characteristics and Selection, details the points should be considered for the mentor selection process. Key traits emphasized in this theme include mentors' motivation to support preservice teachers, their personal and professional characteristics, and their expertise in teaching content knowledge.

The second dimension of MAST Model is General Pedagogy, which includes themes and codes describe mentoring practices enhancing preservice teachers' general pedagogical competencies, such as assessment and classroom management. Themes under this dimension are grouped into five: *Teaching Profession, Students' Characteristics, Pedagogy of Teaching, Assessment, and Classroom Management*.

The first theme, II.1 Teaching Profession, covers fundamental components of the teaching profession, including teachers' professional rights and responsibilities, the operational structure of schools and departments, administrative duties, and interactions with parents.

The second theme, II.2 Students' Characteristics, outlines the mentor practices regarding what preservice teachers should know about their students. This includes mentoring practices carried out by mentor teachers to help preservice teachers recognize students' characteristics. These include providing information and sharing professional

experiences about the classroom dynamics and age-related traits of the students and guiding the mentees on how to approach and communicate with students effectively.

The third theme, II.3 Pedagogy of Teaching, focuses on general pedagogical practices designed to improve preservice teachers' instructional competence. This theme consists of three subcomponents: *Observing Student Learning*, where mentees observe mentors' lessons with a focus on how students learn; *Teaching Strategies*, where mentees observe and implement a variety of instructional methods; and *Area-Independent Teaching Skills*, which involve engaging with teaching practices across different grade levels and disciplines beyond their specialization.

The fourth theme, II.4 Assessment, addresses practices where mentor teachers give preservice teachers the opportunity to experience both traditional and alternative assessment methods. Within this theme, mentees design, use, and reflect on a range of assessment tools and techniques, including preparing and grading exam papers, as well as preparing and reviewing assignments.

The final theme, II.5 Classroom Management, refers to the skills and strategies that preservice teachers are expected to develop for managing the classroom effectively. This includes experience of classroom management techniques, using effective time management techniques, helping preservice teachers to capture students' attention and to build effective interaction in class.

The third dimension of the MAST Model, Area Specialized Teaching, focuses on mentoring practices aimed at enhancing preservice teachers' pedagogical content knowledge. Unlike the first two dimensions, which address general teaching practices, this dimension specifically targets area-specialized teaching knowledge, skills, and approaches. The themes under this dimension are *Content Knowledge*, *Mentoring Practices about Teaching*, *Mentor-Mentee Interactions*, *Curriculum Knowledge*, *Instructional Materials and Technology*, *Student Ideas*.

The first theme, III.1 Content Knowledge, involves the practices through which mentor teachers help preservice teachers develop their subject matter knowledge, use accurate mathematical language, and gain awareness of students' misconceptions. It also includes involving preservice teachers in departmental meetings to support their professional growth within the subject area.

The second theme, III.2 Mentoring Practices about Teaching, includes seven codes. *Teaching in the Authentic Context (III.2.a)* involves preservice teachers participating in real classroom experiences such as observing lessons, preparing and revising lesson plans, conducting learning activities, and teaching full lessons. *Designing and Implementing Instructional Tasks (III.2.b)* describes p mentoring practices in which mentors guiding mentees while they create and deliver learning activities. *Evaluation, Reflection, Revision (III.2.c)* involves practices where mentor teachers support preservice teachers in self-evaluating, reflecting on, and revising their teaching. Additionally, two codes reflect content-specialized mentoring practices. In science education, *Laboratory Instruction (III.2.d)* focuses on supporting mentees in developing skills for organizing and conducting experiments and gaining laboratory teaching skills. *Inquiry-Based Learning (III.2.e)* describes mentoring practices that help mentees to recognize the value of inquiry-based and hands-on learning. It includes providing opportunities for the mentees to observe and implement inquiry-based instructional methods, follow laboratory activities, and evaluate laboratory reports. For mathematics, *Conceptual Learning (III.2.d)* addresses mentors' efforts to help mentees prioritize conceptual understanding over procedural knowledge. *Teaching for Mathematical Skills (III.2.e)* involves guiding mentees to develop and implement instructional approaches that focus on mathematical processes like problem-solving and reasoning into their teaching.

The third theme, III.3 Mentor-Mentee Interactions, which describes the nature of interaction between mentors and mentees has seven codes. *Modeling (III.3.a)* involves mentees observing their mentor's lessons to recognize the instructional methods and techniques used and adopting these practices as models when planning and delivering their own teaching. *Mentor Sharing (III.3.b)* involves mentors offering their resources,

teaching materials, and personal experiences to mentees. *Designing and Implementing Together (III.3.c)* describes collaborative lesson planning and activity design, where both mentor and mentee contribute ideas and learn from one another. *Reflection (III.3.d)* highlights the importance of mentees critically reflecting on their teaching, while *Feedback (III.3.e)* refers to mentors providing constructive feedback based on classroom observations. *Balancing Intervention and Guidance (III.3.f)* emphasizes finding the right balance between intervening mentees' teaching and guiding them to develop their teaching. In this context, it is important not to intervene while the preservice teacher is teaching, unless there is a situation that threatens student safety, and to provide feedback after the lesson.

The fourth theme, III.4 Curriculum Knowledge, underlines mentors' emphasis on preservice teachers becoming familiar with curriculum content and course frameworks, understanding the scope and limits of the topics they are expected to teach.

The fifth theme, III.5 Instructional Materials and Technology, focuses on how mentors guide mentees in using diverse instructional materials, particularly integrating technology.

Finally, the sixth theme, III.6 Student Ideas, includes the practices designing by the mentors to make preservice teachers recognize and interpret field-specific student ideas. Also, understanding how students grasp field-specific concepts and being aware of common misconceptions are included in this theme.

2.5. Mentor Teacher Professional Development Program

Mentor Teacher Professional Development (MeT-PD) Program is an online professional development program designed as part of the TUBITAK project-220K086, titled "Developing a Model for Area Specialized Effective Mentoring and Implementing Professional Development for Mentors". MeT-PD was structured based on the dimensions of the MAST Model (Aslan Tutak *et al.*, 2023; Aslan Tutak *et al.*, 2025).

To improve mentoring practices, mentor teachers from Istanbul, Ankara and Trabzon participated in the program in weekly online sessions via Zoom, starting in October and concluding in December. Each of these online meetings which lasted approximately one-hour, mentoring practices and discussions in mathematics teaching were held. The content of the sessions was designed to encourage active participation from mentors. Interactive elements, including whole-group discussions, small-group discussions, and individual reflections was used. In each session, at least one case (real-life scenario) on mentoring practices was shared with mentors, and mentors were asked to comment on and discuss these cases. For example, in the 4th session, a case on law of cosines were shared with mentors. In the case, a pre-service mathematics teacher, is preparing a lesson on the cosine theorem, which will be observed by a university faculty member, making her feel excited and nervous. Her mentor teacher notices the anxiety of the mentee and asks her how the lesson preparation is going. The mentee shares that she selected questions from books and watched YouTube videos about the proof of cosine theorem. And she shares her plan to make proof on board by following the steps on one of the YouTube videos. Mentor encourages her to think about how students will engage with the proof and suggests using a GeoGebra activity for better visualization. The mentee shares that she has never used GeoGebra before. After the case read by the mentors, they were asked to answer the question, “What do you think the mentor should do at this point”? and mentors shared their opinions individually or in a group discussion.

3. SIGNIFICANCE OF THE STUDY

Effective mentoring requires teachers to be supported through well-designed, structured mentoring programs (Ambrosetti, 2014; Beutel and Spooner-Lane, 2009). These programs help teachers develop their mentoring skills and become more beneficial to pre-service teachers (Hairon *et al.*, 2020; Öngöz, 2019). This study contributes to the literature by introducing a mentoring model that emerged in response to the inadequacy of the mentor training as well as the mentor training program, MeT-PD, developed based on this model. Although mentors believe they have received sufficient training, they agree on the challenges they face in implementing what they learned in practice (Gardiner and Weisling, 2018). The use of real-life cases in MeT-PD program may help reduce these challenges by allowing mentors to engage with authentic classroom situations (cases). This approach is supported by studies showing that case-based learning enhances teachers' ability to connect theory with practice (Merseth, 1998; Darling-Hammond *et al.*, 2005).

This study focused on first-time mentor teachers, as the changes in their perceptions and mentoring practices resulting from the MeT-PD were more likely to be detected due to their limited prior experience in mentoring preservice teachers. Thus, the effectiveness of the program can be better understood. This study is significant as it examines the impact of a structured online professional development program on the development of mentoring skills, with a particular focus on subject-specific mentoring practices.

4. STATEMENT OF THE PROBLEM

The target group of this study is first-time mentor mathematics teachers who took part in MeT-PD program for developing mentor teachers' area-specialized mentoring practices and perceptions. This research aims to explore how three first-time mathematics mentor teachers experience area-specialized mentoring throughout the program.

4.1. Research Questions

RQ-1: What are area-specialized mentoring practices of three first-time mentor mathematics teachers throughout the online professional development program MeT-PD?

RQ-2: How do three first-time mentor mathematics teachers' area-specialized mentoring perceptions change throughout the online professional development program MeT-PD?

5. METHOD

This section includes detailed information about the research design, research group, data collection tools, data collection process and data analysis.

5.1. Research Design

The design of the study is a multiple case study in which the mentoring practices and perceptions of three first-time mentor teachers participating in the MeT-PD are monitored. A multiple case study approach was selected as it facilitates an in-depth analysis of each individual case. Additionally, it allows for a cross-case analysis to identify common themes and variations. (Yin, 2018).

5.2. Participants

Purposeful sampling was used to select participants. Among the nine mathematics mentor teachers who attended the online professional development sessions in 2023, three were selected as the focus of this study because it was their first year serving as mentor teachers. This criterion was chosen to understand how their initial perceptions of mentoring and mentoring practices evolved throughout the sessions.

The characteristics of the participants are given below. To prevent participants from being identified, all participants are referred as “she”. Also, pseudonym names are used.

Introducing Mentors

Esra: She is a mathematics teacher with thirteen years of teaching experience, currently employed at a private school where the language of instruction is English. She has always worked in private schools since the beginning of her career. Although preservice teachers regularly complete internships at her school, she has never officially

taken on a mentoring role before. However, she has had the opportunity to observe the mentoring processes of her colleagues and contributed to the professional development of preservice teachers by inviting them to observe her lessons and sharing her feedback with them. She has not received any formal training in mentoring. Within the scope of this study, she mentored two preservice teachers.

Merve: She has twenty-two years of experience in mathematics teaching and currently working at a public school. The school is an Anatolian High School that admits students through a selective entrance exam and has a well-structured system. She has worked in public schools since the beginning of her career. Many preservice teachers have come to her school for internships in previous years, she interacted with the mentees, like lesson observation or having conversation in department room, but she has never officially served as a mentor before. Additionally, she completed the online “Teaching Practice Mentorship Training Course” prepared by the Ministry of National Education; however, in the pre-interview, she stated that the course was not beneficial to her at all and that the content was not sufficient to guide a pre-service teacher who would be working with high school students. As part of this study, she mentored five preservice teachers.

Sevil: She is a mathematics teacher with nine years of teaching experience, currently working at a private school where the language of instruction is English. She has always worked in private schools since the beginning of her career. She has not received any formal training in mentoring and, although preservice teachers have previously come to her school for internships, she has not directly worked with any preservice teacher before. However, in previous years mentees observed her lessons and she had discussions with them about teaching. In the context of this study, she mentored one preservice teacher.

The participation of the three mentors in the training sessions and interviews varied. Table 5.1 presents these participation details.

Table 5.1. Participation of mentors in PD sessions and research interviews.

Mentor	Esra	Merve	Sevil
Session 1	✓	✓	✓
Session 2	✓	✓	✓
Session 3	✓	✓	X
Session 4	✓	X	X
Session 5	✓	✓	✓
Session 6	✓	✓	✓
Session 7	✓	✓	X
Session 8	✓	✓	✓
Session 9	✓	✓	X
Pre-Interview	✓	✓	✓
Mid-Interview	✓	✓	X
Post-Interview	✓	✓	✓
Note. ✓: Attended, X: Did not attend			

5.3. Research Setting

This study was conducted within the MeT-PD, a nine-session online program designed to develop area-specialized mentoring practices among first-time mentor teachers in Türkiye. The duration of each session was approximately one hour and during these sessions, various activities such as whole-group discussions, small-group tasks, and individual reflections were conducted. Real-life mentoring cases were presented by the facilitators to encourage participants to reflect on and discuss effective mentoring practices. The topic of each session of MeT-PD program is given in Table 5.2.

Table 5.2. Session topics of MeT-PD program.

Session Number	Topic of the Session	Focus Areas
1	Content Knowledge	Assessing and improving content knowledge and pedagogical content knowledge of mentee

Table 5.2 Session topics of MeT-PD program. (cont.)

Session Number	Topic of the Session	Focus Areas
2	Mentor-Mentee Interaction	Balancing intervention and guidance Making mentee reflect on their teaching
3	Mentor-Mentee Interaction	Giving effective feedback to Mentee Relation between feedback and reflection
4	Mentor-Mentee Interaction	Being a model Sharing experience Designing and implementing together
5	Mentoring Practices about Teaching	Designing and implementing instructional tasks Evaluation, Reflection, Revision Guiding mentees to pay attention to student ideas
6	Mentoring Practices about Teaching	Designing and implementing instructional tasks Evaluation, Reflection, Revision Giving effective feedback to improve lesson plan
7	Mentoring Practices about Teaching	Helping mentees design tasks based on conceptual learning and develop mathematical skills Guiding mentees to pay attention to student ideas
8	Curriculum Knowledge and Instructional Materials and Technology	Guiding mentees to learn the curriculum Guiding mentees to integrate technology in classroom to support student learning
9	General Evaluation	-

5.4. Data Collection

Data for this study were collected from three mathematics teachers who mentored pre-service teachers in 2023-2024 fall semester as part of TÜBİTAK-220K086 scientific research project. The data were obtained from video recordings of MeT-PD program, along with semi-structured interviews with mentor teachers held before, during, and after the program. The data were gathered over the course of a nine-week MeT-PD program in addition to three follow-up interviews. Although not all mentors attended every session and every interview due to personal reasons or workload, their overall participation across the program and interviews provided sufficient data to capture their general perceptions and practices. Details about these data collection process will be given below.

5.4.1. Data from Online PD Sessions

To examine the mentoring practices and track the development of the three mentor teachers, two primary data sources were used from online MeT-P sessions: video recordings of all nine sessions and written responses collected via Nearpod. The video recordings were taken by the project supervisor with participants' consent. While participants shared their ideas verbally in whole-group discussions, responses from small-groups and individual activities were collected in written form via Nearpod which is an application that is generally used for K-12 learning. It consists of open-ended questions, polls, quizzes, collaborative boards, and gamified activities, this interactive nature promotes the active engagement of all participants (Nearpod, n.d.). In MeT-PD, open-ended questions and collaborative boards features were used to collect the ideas of participants. The Figure 5.1 demonstrate an example of open-ended question that ask the opinions of the participants to a mentoring case.

Class board				
Open Ended Question				
Burak ders anlatımı sırasında kavramsal bir hata yapmıştır. Ders anlatımı sırasında hiç farkında olmadan logaritma fonksiyonun tanım kümesini açıklarken yanlışlıkla "Gerçel (reel) sayılar" demiştir. Sizce bu noktada Arzu Öğretmen nasıl bir yol izlemeli?				
Date	Nickname	Other	Response	Poll Stats
11/02/2023			Ders süresi bittikten sonra Burak ile görüşülmeli.	
11/02/2023				
11/02/2023				
11/02/2023			ders esnasında müdahale doğru olmaz, ders sonrası en yakın zamanda düzeltmeyi yapmak gerekir	
11/02/2023			Sınıfta bunu farkeden öğrenci olursa,Burak öğretmen tekrar gözden geçirecektir.Farkeden öğrenci olmazsa,O sırada öğrencilerin duyacağı şekilde müdahale etmezdim.Oğrencilere bir soru verdiğim anda,öğrenciler soruyu çözerken,öğrencilerin görmeyeceği bir şekilde öğretmenimize yanlış verdiği bilgiyi söyledim ve sakayla karışık öğrencilerin doğruyu farketmesi için yönlendirmesini sağlamaya çalıştım	
11/02/2023			Beklemeli, müdahale etmemeli. Gerekirse bir sonraki ders sınıfa üzerinden geçilmeli. Burak'la ders çıkışında, yansıtma esnasında bu konuya gelmeli.	
11/02/2023			teknik bir hata varsa müdahale etmem. Ama bu hatasını bir sonraki ders başında düzeltmesini isterim.	
11/02/2023				
11/02/2023			Ders akışı sırasında fonksiyonun reel sayılarda tanımlı olduğunu fark edecektir. Grafiği çizerken ya da ilerleyen tanımları yaparken... O nedenle ben müdahale etmezdim bunu kendinin fark etmesini beklerdim. Kendi hatasını düzeltecektir.	

Figure 5.1. Example of an activity report in Nearpod.

5.4.2. Individual Interviews

To explore changes in participants' practices and perceptions over time, semi-structured interviews were examined before, during, and after the sessions. The interview questions were prepared, and the interviews were conducted online via Zoom by the project researchers.

The aim of the pre-interview was to meet the mentors, ask whether they had any prior mentoring experience, and learn what kind of practices they planned to implement to support the professional development of the pre-service teachers they would work with. In the mid-interview, the purpose was to obtain an evaluation by asking how their work with the pre-service teacher was progressing, to learn about the types of activities they conducted, and to investigate any changes in their practices and perceptions by comparing their current experiences with their initial plans at the beginning of the term. The final interview aimed to gather an overall evaluation of

mentoring process, to learn about the activities the mentors carried out in relation to the topics of the PD sessions, and to explore the changes in their mentoring practices and understandings throughout the program. The interview protocols are provided in Appendix A.

5.5. Data Analysis

5.5.1. Analysis of Online PD Sessions

To analyze the online PD sessions, the video recordings were transcribed verbatim by the researcher to capture the participants' contributions. All participant responses, both from the transcripts and the Nearpod reports, were examined. Statements reflecting mentoring actions, strategies, or attitudes were identified through a line-by-line examination. Mentoring-related expressions were coded inductively by the researcher by assigning open codes. To ensure the reliability of the coding, the open codes were reviewed by the project supervisor. Later, the researcher matched open codes with the codes of the MAST Model which served as the analytical framework of the study. The project supervisor checked the code- matching process. All open codes generated from the data were successfully matched with the codes of the MAST Model without any unmatched code. The codebook for the MAST Model is presented in Appendix B.

Some of the data were collected during group discussions, where mentors collaborated with other teachers. Therefore, while the group responses reflect the participants' engagement and thinking processes, they may not always represent the individual mentor's voice directly. This was taken into consideration during the analysis and interpretations.

5.5.2. Analysis of Interviews

To analyze the interviews, the interview transcripts were systematically reviewed, and statements related to mentors' experiences, perceptions, and mentoring practices

were identified by the researcher. These expressions were inductively analyzed, and open codes were assigned based on the content and meaning of each statement. Following the open coding process, the codes derived from the interview data were compared with the themes and codes of the MAST Model to explore how the mentors' experiences corresponded to the framework. All codes generated from the interview data were successfully associated with the relevant MAST Model themes by the researcher.

The interviews were also coded by one of the project assistants. To ensure coding reliability, the codes assigned by the researcher and the assistant were compared. Each code was compared one by one with those of the project assistant. In cases where discrepancies occurred, sometimes my coding was adopted, while in other cases the assistant's coding was accepted. Through this process, consensus was achieved on approximately 92% of the codes.

5.6. Role of the Researcher

As a mathematics teacher with ten years of classroom experience, I have developed a deep understanding of mathematics pedagogy and the professional challenges encountered by teachers at different stages of their careers. In addition to my teaching background, I have prior experience as a mentor teacher and have completed the Ministry of National Education's mentor training program. While these experiences equipped me with valuable insights into effective mentoring, they also carried the potential to influence my interpretation of the participants' practices and perceptions, particularly by aligning my evaluations with approaches I personally value. This was especially relevant given the nature of my data, which included video recordings of mentoring sessions, written responses to open-ended questions collected through an online platform, and interview transcripts. To minimize potential researcher bias, I grounded all coding and interpretation in established literature and the MAST Model framework, used verbatim excerpts from participants to support findings. Also, the video data coded by the researcher were checked by the thesis supervisor. Additionally, for the interview data, interrater reliability was ensured by having a project assistant in-

dependently code the transcripts and compare the codes with those of the researcher. Discrepancies were discussed until agreement was reached, which minimized the influence of individual bias and strengthened the credibility of the analysis.

5.7. Trustworthiness of the Study

To ensure the trustworthiness of the study, four criteria were addressed: credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985). Credibility was supported by triangulation of multiple data sources (session recordings, interviews, and Nearpod reports), member checking, and supervisory review of the coding process. Transferability was ensured by providing thick descriptions of the research context, participants, and findings, which enable readers to assess the applicability of the results to other settings. Dependability was strengthened by documenting all stages of data collection and analysis in detail, while the coding procedures were cross-checked by the project supervisor and research assistant to provide consistency. Finally, confirmability was ensured by comparing independent coding results, resolving disagreements through discussion until reaching a 92% agreement rate, and keeping an audit trail of codes and themes. In addition, the researcher's role and potential biases were critically reflected to minimize subjectivity.

These strategies collectively enhanced the overall trustworthiness of the findings.

6. FINDINGS

6.1. Mentors Perspectives Before MeT-PD

To examine the mentoring practices and perceptions of three first-time mentors, pre-interviews were conducted before the online professional development program began. Data were categorized according to the MAST Model within the framework of three main dimensions, various themes, and codes. Frequency tables which show themes and codes the mentor teachers emphasized in their statements was created. Common themes mentioned by mentors and different aspects of their statements were examined and the data evaluated separately for each of the three dimensions. Since the MAST Model was used as the analytical framework, all of its codes were included in the tables. However, some codes were not represented in the participants' contributions and were reported with a value of 0 to indicate that no instances were observed.

Table 6.1. Theme frequency table across three dimensions.

	Esra	Merve	Sevil	Total
Dimension I – Practicum Triad	8	10	13	31
Dimension II – General Pedagogy	14	4	5	13
Dimension III – Area-Specialized Teaching	0	1	9	10

6.1.1. Dimension I: Practicum Triad

Dimension I was the most mentioned dimension with a total frequency of 31. This dimension defines the general process of the practicum and the roles of the three main actors (mentor, preservice teacher and supervisor) in this process, what is expected from them and collaboration between them. There are five themes under first dimension: *Practicum Requirements*, *Expectations from Mentees*, *Role of Mentor* and

Mentoring Perspective, Expectations from Supervisor, Mentor Characteristics and Selection.

Table 6.2. Theme and code frequency table in dimension I before MeT-PD.

	Sevil	Merve	Esra	Total
Dimension I Practicum Triad	8	10	13	31
Theme I.1 Practicum Requirements	1	2	2	5
I.1.a Internship process	1	2	0	3
I.1.b School and mentor selection	0	0	0	0
I.1.c Preservice Teacher Doing Practices	0	1	1	2
I.1.d University- Mentor-Preservice Teacher Collaboration	0	0	1	1
Theme I.2 Expectations from PST	0	0	2	2
I.2.a Content Knowledge	0	0	0	0
I.2.b Pedagogical Knowledge	0	0	0	0
I.2.c Being Reflective Teacher	0	0	2	2
I.2.d Eager to Learn	0	0	0	0
Theme I.3 Role of Mentor and Mentoring Perspective	2	3	8	13
I.3.a: Mentoring perception	0	0	6	6
I.3.b Being an Example	1	2	0	3
I.3.c Requiring Practices	1	1	1	3
I.3.d Reciprocal Learning	0	0	0	0
I.3.e Tracking and Feedback	0	0	1	1
I.3.f Beliefs on Teacher Learning	0	0	0	0
Theme I.4 Expectations from Supervisor	0	0	0	0
Theme I.5 Mentor Characteristics and Selection	5	4	2	11
I.5.a Motivation	2	1	2	5
I.5.b Personal Attributes	0	3	0	3
I.5.c Professional Attributes	1	0	0	1
I.5.d Area Specialized Teaching Competency	2	0	0	2

Role of Mentor and Mentoring Perspective was the most emphasized theme with a total frequency of 13. Each mentor teacher referred to this theme, Esra referred to this theme eight times, making her the mentor who mentioned on this theme most frequently. The code she emphasized the most within this theme was “mentoring perception” (f=6). Notably, the other mentors did not address this code. Esra stated that:

“I would try to understand the concerns of the person in front of me and guide them accordingly after introducing the student profile at the school”.

These statements illustrate that Esra approaches her mentees with empathy. While mentoring them, she would be supportive and comforting by taking into consideration of the emotional needs of her mentees.

While Esra did not express an opinion matching the code of “Being an Example”, Merve and Sevil expressed their opinions on this issue and emphasized the importance of the observation on the preservice teachers’ learning process. Merve stated:

“... So, with my own experiences, that’s how I am teaching. I have something in my mind like I recommend this to the mentee, or I make her/him to do that staff”.

Sevil also emphasized that for mentees, observing behaviors of mentors both inside and outside the classroom is a good way to learn how to behave as a teacher. Mentees may observe the mentors’ relationships with students and their approaches to parents, observing these behaviors contributes to their development.

All three mentors shared views corresponding to the codes for “Requiring Practices”. Although they had not yet received mentoring training and had no mentoring experience, all three had clear expectations about the kinds of practices preservice teachers should engage in. It might be because they observed their colleagues while they were mentoring. Sevil remarked:

“... you can help us with homework, maybe you can share your ideas when we prepare exams, you can observe other teachers’ lessons besides mine, if you ask them, they will not say no. I suggested that observing their lessons would also be beneficial for you in terms of variety”.

Merve noted:

“... I looked at my colleagues and I saw how they treated their interns in the past years, taking them to class, making them teach lessons, making them prepare exams...”.

Esra stated:

“... I think it would be more appropriate for them to observe first, and if they feel ready after a few weeks of observation, I do not see any problem in them giving lectures and I would support them”.

Theme I.5 Mentor Characteristics and Selection (f=11) is the second most frequently mentioned theme. In this category, Sevil (f=5) highlighted the importance of “Area Specialized Teaching Competency” (f=2), “Professional Attributes” (f=1) and “Motivation” (f=2) in mentor selection. Merve emphasized on “Personal Attributes” (f=3) and “Motivation” (f=1), while Esra solely focused on “Motivation” (f=2).

None of the mentors expressed an opinion about the University Internship Process. However, all mentors emphasized Theme I.1 Practicum Requirements. Additionally, only Esra addressed Theme I.2 Expectations from Mentees by stating that she expected mentees to critique the lessons they observed. This expectation aligns with the mentee’s characteristic of being a reflective teacher.

It was predictable that, in the pre-interview, the first dimension was the one most frequently emphasized by the mentors, as this dimension covers the general structure of the practicum process and the roles and responsibilities of the three stakeholders (mentor, mentee, and supervisor). While Sevil and Merve referred to the codes and themes at similar frequencies, Esra’s frequency was higher than both. The main fac-

tor contributing to this difference was the theme of “*Role of Mentor and Mentoring Perspective*”. Esra made several comments indicating that she empathized or intended to empathize with the mentees. This suggests that her mentoring practice is likely to be shaped in this direction. Furthermore, being the only mentor to comment on the code related to “*Expectations from Pre-service Teachers*” indicates that she believes in a reciprocal interaction between mentor and mentee.

6.1.2. Dimension II: General Pedagogy

The second dimension, general pedagogy, was the second most frequently mentioned dimension with a total frequency of 23. This dimension includes the non-area specific teaching knowledge and skills of preservice teachers like assessment and classroom management. Effective mentoring practices under this dimension are grouped under five themes: *Teaching Profession, Students’ Characteristics, Pedagogy of Teaching, Assessment, and Classroom Management*.

Table 6.3. Theme and code frequency table in dimension II before MeT-PD.

	Sevil	Merve	Esra	Total
Dimension II General Pedagogy	14	4	5	23
Theme II.1 Teaching Profession	9	0	1	10
Theme II.2 Students’ Characteristics	3	0	3	6
Theme II.3 Pedagogy of Teaching	1	1	0	2
II.3.a Observing Student Learning	0	0	0	0
II.3.b Teaching Strategies	1	0	0	1
II.3.c Area Independent Teaching Skills	0	1	0	1
Theme II.4 Assessment	1	0	0	1
Theme II.5 Classroom Management	0	3	1	4

Theme II.1 Teaching Profession (f=10) is the most emphasized theme. Notably, Sevil made extensive comments (f=9) regarding the importance of informing preservice teachers about their professional roles, responsibilities, and departmental practices. In contrast, Merve did not express any opinion on this theme, while Esra only briefly

referred to this theme. Following quotation exemplifies how Sevil guide his mentee in this regard:

“... he came this Monday. I welcomed him, showed him around the department a little bit... I introduced him to my colleagues. I wanted to give him some information about how the department works... You can help us when we prepare homework, maybe you can share your thoughts when we prepare exams”.

Theme II.2 Student Characteristics ($f=6$) is the second most frequently emphasized theme. While Esra and Sevil mentioned this theme equally, Merve did not emphasize this theme. Sevil highlighted the importance of informing mentees about the academic expectations of the students, whereas Esra emphasized that it is crucial to share information with mentees about student behaviors, common challenges, and the overall student profile.

Theme II.3 Teaching Pedagogy ($f=2$) is the least emphasized theme of this dimension. Merve expressed that she aimed to help preservice teachers gain teaching skills through experience and this view aligns with the area independent teaching skills code. Sevil, on the other hand, emphasized that mentees can learn teaching strategies by observation.

“They need to learn how to conduct the lesson without panicking. They need to learn how to transfer the lesson objectives. I want to give them this experience” (Merve).

“In my opinion, mathematics teaching techniques can partly be learned by observing others” (Sevil).

Only Sevil commented on Theme II.4 Assessment, whereas Theme II.5: Classroom Management was notably emphasized by Merve ($f=4$) and Esra ($f=1$). Both focused on conducting the lesson, attracting and maintaining students' attention, and ensuring effective communication with students.

While Sevil made more prominent comments on professional responsibilities, Merve put emphasis on classroom management, and Esra focused on understanding student characteristics. These differences may provide indications of the areas that each mentor prioritizes within their conceptualization of mentoring.

6.1.3. Dimension III: Area-Specialized Teaching

The third dimension, Area-Specialized Teaching, which includes the themes of *Content Knowledge, Mentoring Practices about Teaching, Mentor-Mentee Interactions, Curriculum Knowledge, Instructional Materials and Technology, Student Ideas* was the least frequently mentioned dimension with a frequency of ten.

Among the mentors, Esra addressed the themes in this dimension most frequently (f=9), especially focusing on Theme III.3 Mentor-Mentee Interactions (f=7). She expressed views aligning with the codes ‘Feedback’ (f=5) and ‘Mentor Sharing’ (f=2). These findings indicate that Esra attaches particular importance to sharing her experience with mentees and offering effective feedback.

“... when providing feedback, it’s crucial to use encouraging language that helps them but also avoids making them feel upset” (Esra).

Table 6.4. Theme and code frequency table in dimension III before MeT-PD.

	Sevil	Merve	Esra	Total
Dimension III: Area-Specialized Teaching	0	0	9	9
Theme III.1 Content Knowledge	0	0	0	0
Theme III.2 Mentoring Practices about Teaching	0	0	2	2
III.2.a Teaching in the Authentic Context	0	0	0	1
III.2.b Designing and Implementing Instructional Tasks	0	0	0	0
III.2.c Evaluation, Reflection, Revision	0	0	2	2
III.2.d Conceptual Learning	0	0	0	0

Table 6.4 Theme and code frequency table in dimension III before MeT-PD. (cont.)

III.2.e Teaching for Mathematics Skills	0	0	0	0
Theme III.3 Mentor-Mentee Interactions	0	0	7	7
III.3.a Modeling	0	0	0	0
III.3.b Mentor Sharing	0	0	2	2
III.3.c Designing and Implementing Together	0	0	0	0
III.3.d Reflection	0	0	0	0
III.3.e Feedback	0	0	5	5
III.3.f Balancing Intervention and Guidance	0	0	0	0
Theme III.4 Curriculum Knowledge	0	0	0	0
Theme III.5 Instructional Materials and Technology	0	0	0	0
Theme III.6 Student Ideas	0	0	0	0

Another theme addressed within this dimension was Theme III.2 *Mentoring Practices about Teaching* (f=2), Esra mentioned the code of “Self-Assessment-Reflection-Regulation” (f=2). While the other mentors did not address this issue at all, the fact that Esra mentioned it twice shows the importance she gives to this issue. She noted that mentees’ observations and critiques of her lessons could also contribute to her own professional development.

“For instance, after they observe my class, I want them to criticize my lesson and share what they notice. As we gain more experience, we tend to focus mainly on the lesson itself. . . So, I would like them to help me revise my approach as well. Their contributions would be very valuable” (Esra).

Only two out of the six themes in this dimension were addressed in the comments, most of which came from a single mentor. The reason why this dimension received the least emphasis may be that the data were collected during the pre-interviews and the mentors had not yet received any formal mentoring training. Therefore, it is likely that the mentors focused more on the general practicum procedures and general pedagogical aspects rather than subject-specific issues. Although all mentors observe interactions of their colleagues with the pre-service teachers assigned to their schools

and what they do during the practicum process, when asked what kind of practices they plan to implement with their mentees, they were unable to propose a specific plan including area-specialized mentoring practices because of their lack of readiness about this concept. Instead, they tend to share their views on general pedagogy, such as classroom management and understanding student characteristics, or on the general structure of the practicum process.

6.2. Mentor Teacher Experiences during PD

To examine the changes in the mentors' perceptions and mentoring practices, each session was analyzed separately, open codes were generated for the mentors' statements related to mentoring perceptions and practices. These codes were then matched with the codes of the MAST Model. The codes and themes that emerged during the session were presented according to the flow of the session and the codes and themes were presented in visual form through tables to enhance clarity and comparison.

Session 1:

The goal of the first session was for the mentor teachers understand what kind of mentoring practices could be done to develop the mentee's content knowledge and pedagogical content knowledge. Themes and codes mentioned by the three mentors in this session were presented in the Table 6.5.

Table 6.5. Themes and codes emerged from the first session.

Themes	Codes	Mentors
I.1 Practicum Requirements	I.1.c Preservice Teacher Doing Practices	S
I.3 Role of Mentor and Mentoring Perspective	I.3.c Requiring Practices	E; S

Table 6.5 Themes and codes emerged from the first session. (cont.)

Themes	Codes	Mentors
II.3 Pedagogy of Teaching	-	S
II.4 Assessment	-	M
III.1 Content Area	-	E; M; S
III.2 Mentoring Practices about Teaching	III.2.a Teaching in the Authentic Context	M
III.3 Mentor-Mentee Interactions	III.3.a Modeling	S
	III.3.b Mentor Sharing	E; S
	III.3.c Designing and Implementing Together	E; M; S
	III.3.d Reflection	E; S
	III.3.e Feedback	E
	III.3.f Balancing Intervention and Guidance	E
III.5 Instructional Materials and Technology	-	S
III.6 Student Ideas	-	E; S
Note. S = Sevil, M = Merve, E = Esra.		

At the beginning of the session, a case was shared with mentors:

“A pre-service teacher gives her students the following system of equations and asks them to solve it: $2x - 4y = 8$ and $-x + 2y = -4$. Then, a student named Esra comes to the board and says, ‘We get $0 = 0$, so the solution is all real numbers. After that, the pre-service teacher approves Esra’s solution and thanks her”.

Mentors were asked to answer following questions:

- In your opinion, what could the preservice teacher have done differently?
- If you were the mentor of this preservice teacher, what kind of feedback would you give her?

While Merve did not participate the discussion, Sevil and Esra shared their opinions which matched with the theme III.1 Content Area. Both made detailed comments on the solution to the problem in the case.

Sevil mentioned the reflection code (III.3.d) by saying that he would make the mentee question mathematical ideas, and Esra also mentioned that the mentee could notice the mistake in her solution when examining the problem together step by step after class. Since the lesson evaluation was conducted with the preservice teacher after the lesson, and ideas were discussed step by step with the mentee, encouraging the mentee to reflect on the subject matter, Esra's opinion also corresponds to the reflection code.

"I would like him to draw the graph of this, have it drawn and ask what it means to be real. Maybe he could visually show that there are infinite common points, so lines are coincident... The solution is not a real number, the solution is the idea that there are infinite points" (Sevil).

"...each point on these two coincident lines is the solution set for this. We cannot say that the solution is all real numbers. At the end of the lesson with the mentee, I would rather go from here. I would prefer to examine these two lines. The properties of these two lines. Maybe when she looks at them one by one, she will get the idea" (Esra) .

After discussing the case, Esra also asked whether feedback was given during the lesson or afterwards, the facilitator asked her which she would prefer to do, Esra stated that she would prefer to wait the end of the lesson, also she stated if there was a part of the lesson the mentee explained incorrectly, she could go back and correct it later. These ideas are aligning with the codes III.3.e Feedback and III.3.f Balancing Intervention and Guidance.

After this discussion, the facilitators explained the concepts of content knowledge and pedagogical content knowledge, which are the main topic of this session, with examples. Then, the session continued with the following questions:

- Do you think is it possible to identify a pre-service teacher's content knowledge deficiencies before they enter the classroom?
- As mentors, what can we do to raise pre-service teachers' awareness of the impact of their content knowledge on lesson planning and instructional practices?
- What can mentor teachers do before and after lessons to support the development of pre-service teachers' content knowledge?

Of the three mentors, only Sevil contributed to this discussion and shared ideas that could be related not only to the third dimension but also to the other two dimensions. The reason why Sevil mentioned pedagogy while discussing content knowledge is that these dimensions are intertwined in practice. Sevil's answers to above questions and codes related to her answers are given below.

Table 6.6. Sevil's Quotes with Themes and Codes (Session 1).

Quotation	Theme and Code
The main reason for being at the school and doing an internship is to make this kind of preparation in advance.	I.1.c Preservice Teacher Doing Practices
During lesson observations, the pre-service teacher likely realizes it as well - for example, "I'm not confident in this topic; I need to study this". This could be related to the content itself or to a pedagogical issue.	II.3 Pedagogy of Teaching III.3.d Reflection III.1 Content Knowledge
For example, my mentee once said, "Could you recommend a source I could work on about the TI calculator"? So, I showed him a video on YouTube and said, "Look, you can follow this - it explains everything step by step".	III.5 Instructional Materials and Technology III.3.b Mentor Sharing

Table 6.6 Sevil's Quotes with Themes and Codes (Session 1). (cont.)

Quotation	Theme and Code
I think we can minimize these kinds of issues by having the pre-service teacher reflect on what they notice during observations and by discussing them together throughout the process, or by providing guidance when needed. But eliminating these deficiencies is not realistic.	III.3.d Reflection III.3.a Modeling

She stated that when preservice teachers come to the school for the internships and conduct observations, they are able to recognize their own deficiencies in both content knowledge and pedagogical knowledge. She also emphasized that sharing resources with the mentees is important for supporting the development of their content knowledge. Furthermore, he highlighted the importance of discussing the lesson after observations, exchanging ideas, and providing guidance when needed to help mentees address their deficiencies before their teaching experience.

For the final discussion of the session, mentors divided into breakout rooms and the discussion was held in small groups. The instruction given to the groups was: "Define the type of knowledge that pre-service teachers need to have to teach mathematics topics effectively. Then, describe the strategies you would implement to support them in developing this knowledge. What types of activities or tasks would you assign to facilitate this process? Please write your response".

Sevil and Esra were in the same group whereas Merve worked in another group. Answers of both groups and codes related to these answers are given below.

Table 6.7. Group Work Quotes with Themes and Codes (Session 1).

Mentors	Quotation	Theme and Code
Group 1 Esra & Sevil	Instead of thinking about content knowledge in general, we defined it as focusing specifically on the topic being taught and developing a deeper understanding of that particular subject.	III.1 Content Knowledge
	Possible student questions and common misconceptions related to the topic can be addressed beforehand.	III.6 Student Ideas
	We can provide general information about the structure of the class.	III.3.b Mentor Sharing
	Informing the pre-service teacher about grade-level meetings and, if possible, involving them in these meetings to include them in the lesson planning process.	III.3.c Designing and Implementing Together
	Encouraging them to use resources from different levels related to the topic and to create their own general framework.	III.3.b Mentor Sharing I.3.c Requiring Practices
Group 2: Merve and another participant	They should be competent in the subject area, demonstrate proficiency in mathematical language, and be able to convey it effectively.	III.1 Content Knowledge

Table 6.7 Group Work Quotes with Themes and Codes (Session 1). (cont.)

Mentors	Quotation	Theme and Code
	They should prepare and try out the materials they will use for the lesson in advance. The lesson plan should be developed collaboratively.	III.2.a Teaching in the Authentic Context III.3.c Designing and Implementing Together
	The written assessment and its answer key should be collaboratively prepared.	III.3.c Designing and Implementing Together II.4 Assessment

Esra and Sevil's group emphasized the importance of providing information about student knowledge and the general structure of the classroom, as well as encouraging preservice teachers to use a variety of resources to support the development of their mathematical content knowledge. On the other hand, Merve's group focused on trying lesson material before the class and including preservice teachers in the written exam preparation process. Both groups highlighted the importance of collaboratively preparing lesson plans.

All in all, during the session, Merve participated only in the small group discussions and did not contribute to the individual response questions or the whole group discussions. While it is uncertain whether the ideas shared within the small group discussion were entirely her own, it is inevitable that these interactions influenced her perception of mentoring. At the beginning of the small group work, she stated, "*I benefit from my group members' experiences. Any knowledge I can get will be to my advantage*". This indicates a clear learning motivation and shows that, as a first-time mentor, in contrast, Sevil actively participated throughout the entire session, responded to all the questions, and contributed to the discussions. She made comprehensive comments addressing four of the six sub-themes in Dimension III: Content Knowledge, Mentor-Mentee Interactions, Instructional Materials and Technology, and

Student Ideas. Similarly, Esra made detailed comments under three sub-themes: Content Knowledge, Mentor-Mentee Interactions, and Student Ideas. Notably, she placed particular emphasis on Theme III.3: Mentor-Preservice Teacher Interactions, offering reflective insights on the mentor-mentee relationship.

Session 2:

Maintaining a balance between intervention and guidance and making reflection were topics of the second session. For mentors, making reflection was defined as creating opportunities for pre-service teachers to reflect on their teaching actions. It was emphasized that mentors should avoid intervening during the lesson unless absolutely necessary like security issues, and instead provide guidance through feedback before and after the lesson. Besides the codes III.3.d Reflection and III.3.f Balancing Intervention and Guidance which were the main topic of the session, all themes and codes were shown in the following table.

Table 6.8. Themes and codes emerged from the second session.

Themes	Codes	Mentors
III.1 Content Area	-	E
III.2 Mentoring Practices about Teaching	III.2.c Evaluation, Reflection, Revision	E; S
Theme III.3 Mentor-Mentee Interactions	III.3.a Modeling III.3.b Mentor Sharing III.3.d Reflection III.3.e Feedback III.3.f Balancing Intervention and Guidance	S E; M E; S E; S E; S
Theme III.5 Instructional Materials and Technology	-	S
Theme III.6 Student Ideas	-	E; S

Table 6.8 Themes and codes emerged from the second session. (cont.)

Themes	Codes	Mentors
Theme I.3 Role of Mentor and Mentoring Perspective	I.3.a: Mentoring perception I.3.f Beliefs on Teacher Learning.	E; S E; S
Theme II.1 Teaching Profession	-	E
Theme II.2 Students' Characteristics	-	E
Theme II.4 Assessment	-	M
Theme II.5 Classroom Management		E; S
Note. S = Sevil, M = Merve, E = Esra.		

After sharing the objectives of the session, it began with the following question:

“During the internship process, various types of interactions may occur between mentor teachers and pre-service teachers. What kinds of interactions do you have with your pre-service teachers?”

While Sevil did not express an opinion on this issue, Esra and Merve shared their perspectives. Esra identified several areas of interaction, including responsibilities during duties, attitudes towards students' individual differences, experience sharing, and strategies for coping with challenging situations. Merve, on the other hand, stated that they spent almost the entire day together, both inside and outside the classroom, engaging in continuous discussions. Additionally, she shared working on tasks such as preparing written exams and developing answer keys for them. Both mentors mentioned mentoring practices which aligns with the second and the third dimensions: III.3.b Mentor Sharing Theme II.2 Students' Characteristics, Theme II.4 Assessment, Theme II.5 Classroom Management, Theme II.1 Teaching Profession.

Since the question did not address any specific topic, these answers could be indicator of mentoring conception of mentors. While Merve put emphasis on sharing experiences both inside and outside the classroom, Esra mainly focused on the student characteristic.

After the introduction question, a case was shared with mentor. In the given case, Arzu, the mentor teacher, and Burak, the pre-service teacher, prepared a lesson on the graph of the logarithmic function. When Burak became very nervous and his voice started to tremble while teaching, Arzu intervened by asking the students, “What do you think Mr. Burak expects you to do regarding the graph of the logarithmic function”? *If you were the mentor teacher in this situation, would you let Burak continue, or would you intervene? Why?*

Esra, suggested that intervention during a pre-service teacher’s lesson should generally be avoided. However, in cases where the teacher becomes overly nervous, a brief, unrelated comment could help reduce the tension. If intervention is necessary, it should be done in a supportive manner that affirms the pre-service teacher’s effort and helps them feel more confident. (Code I.3.a: Mentoring perception) This comment showed her empathetic mentoring approach, her attitude was supportive, and she will have tendency to comfort mentee in that kind of situation.

In similar way, Sevil stated that no intervention should be made, and that the pre-service teacher should cope with the difficulty and draw conclusions from the experience. This interpretation is related to the self-evaluation code (III.2.c Evaluation, Reflection, Revision).

Additionally, he mentioned that possible issues that might arise during the lesson should be addressed beforehand. For example, if the issue is the pre-service teacher’s excitement, it would be good to have a conversation to calm and motivate them before the lesson. If the issue involves the use of a potentially dangerous material for students, safety conditions should be discussed in advance. In this conversation, Sevil’s sugges-

tion to make a supportive and relaxing talk with the pre-service teacher is associated with the *mentoring approach* code (I.3.a: Mentoring perception), while her emphasis on making necessary plans before the lesson is connected to the feedback code (III.3.e Feedback).

Apart from first question, Merve did not participate any of the discussions in this session even she did not comment on questions that participants supposed to answer individually.

A situation in which a pre-service teacher made a mathematical mistake during a lesson was shared with the participants, and they were asked how they would respond if they were this teacher candidate's mentor. Sevil stated that she would not intervene during the lesson, believing that the mentee would realize the mistake at some point and correct it on their own. She also mentioned that even experienced teachers make mistakes, and this is natural. Her belief that the pre-service teacher could recognize their own mistake is associated with Code III.2.c: Evaluation, Reflection, Revision, while his emphasis on the message that even experienced teachers make mistakes relates to being a model for mentee (Code III.3.a: Modeling).

Additionally, Sevil posed a question to the facilitator:

“For example, the effect on students of us, as teachers, saying ‘I made a mistake here yesterday’ versus saying ‘the trainee teacher made a mistake here yesterday’ would not be the same. We expect students to view them as teachers and to respect them. I’m not quite sure how this would affect that”. Here, the general approach of the mentor was that the mentee was perceived as a teacher by the students. (Code I.3.a: Mentoring perception).

Esra's response involved Code III.2.c: Evaluation, Reflection, Revision, Code III.3.d: Reflection, and Code III.3.f: Balancing Intervention and Guidance. She stated:

“One should wait and not intervene. If necessary, it can be addressed with the class in the next lesson. This issue should also come up during the post-lesson reflection with the trainee”.

While both teachers emphasized that mistakes are natural and can be corrected later, Esra, unlike Sevil, particularly stressed the importance of making mentee reflect on their own lesson.

As a continuation of the previous case, the mentor teacher posed the following question to the mentee who made mistake during the lesson: “If you were to teach this lesson to the same class again, what would you do the same and what would you change?” The facilitators then asked the mentor teachers about the purpose of this question. Both Esra and Sevil stated that the aim was to encourage the pre-service teacher to reflect and think critically about their own teaching. Esra further emphasized that such mistakes might not be solely caused by excitement; they could also be related to content knowledge, and the best way to understand this was making reflection. Similarly, both mentors highlighted the importance of self-evaluation which would contribute to the mentee’s professional growth.

In addition, Sevil, unlike Esra, emphasized being a role model. He mentioned that he records his own lessons and evaluates his own performance afterward. This self-example and habit of self-evaluation indicate that Sevil, as a mentor, could effectively guide her mentee through reflection processes.

Following this reflection discussion, the facilitators asked the mentors whether they currently provided opportunities for their mentees to reflect. Esra stated that she first expects her mentees to make a general evaluation, then she poses guiding questions, and finally shares the points where she agrees or disagrees with the interpretations of the mentees. She also noted that if there were any issues the mentee did not mention, she would be sure to state those as well (Code III.3.d: Reflection, Code III.3.e: Feedback, Code III.2.c: Evaluation, Reflection, Regulation).

Sevil, on the other hand, explained that since her mentee had not yet conducted a lesson, she engaged in reflection activities with the mentee based on her own lessons. She described an experience related to classroom management (Theme II.5: Classroom Management, Code III.2.c: Evaluation, Reflection, Regulation) and said:

“...Then I talked about it with my mentee. Did you notice it? What would you have done if you were in my place? Should I perhaps have intervened during the lesson break instead of during the lesson? What do you think”?

This comment highlights Sevil’s strength as both a teacher and a mentor in terms of her self-evaluation and reflective skills. By providing the mentee with an opportunity to reflect on a real classroom incident and encouraging them to make comments about her own behaviors, Sevil demonstrates a mentoring practice she is likely to use frequently.

This session provided valuable insights into the importance of maintaining a balance between intervention and guidance, as well as encouraging reflective practices with pre-service teachers. When the ideas of mentors are examined, it is clear that mentors’ approaches to classroom incidents and mistakes directly reflect their mentoring beliefs and attitudes. While Esra adopted a more empathetic and supportive attitude, emphasizing reflection and emotional support, Sevil prioritized self-evaluation, modeling, and allowing mentees to learn from experience. Merve’s lack of active participation in most of the discussions highlighted the varying levels of engagement among mentors.

Session 3:

This session was a continuation of the second session, the participants had discussion about providing effective feedback to mentees. Even main topic was feedback (Code III.3.e), there were comments aligned with various themes and codes which were presented in the Table 6.9.

Table 6.9. Themes and codes emerged from the third session.

Themes	Codes	Mentors
III.1 Content Area	-	M; E
III.2 Mentoring Practices about Teaching	III.2.c Evaluation, Reflection, Revision	M; E
Theme III.3 Mentor-Mentee Interactions	III.3.a Modeling III.3.d Reflection III.3.e Feedback	M E M; E
Theme III.6 Student Ideas	-	E
Theme I.3 Role of Mentor and Mentoring Perspective	I.3.a: Mentoring perception I.3.f Beliefs on Teacher Learning.	M; E M; E
Theme II.3 Pedagogy of Teaching	II.3.b: Teaching Strategies	E
Theme II.5 Classroom Management	-	M; E
Note. S = Sevil, M = Merve, E = Esra.		

The session began with a brainstorming activity where participants individually wrote down their initial thoughts on effective feedback using Nearpod. Sevil was unable to attend this session due to personal reasons. Esra wrote “*sandwich method*” and “*both strengths and areas for improvement*”, while Merve wrote “*by making sure the mentee also realizes the situation themselves*”. Esra’s comment focused on the manner of delivering feedback, whereas Merve’s emphasized the importance of self-evaluation (Code III.2.c: Evaluation, Reflection, Regulation, Code III.3.e: Feedback).

After the brainstorming, the ideas were discussed, and the facilitators summarized the characteristics of effective feedback. Then, the mentors were asked what kind of feedback they typically gave to their mentees. Neither Esra nor Merve contributed to

this part of the discussion. Since it was their first experiences as mentors, they may have preferred to listen to the sharing of more experienced mentors. Afterwards, the mentors were given a case in which a mentor teacher provided feedback to her mentee about the use of her voice, and they were asked to write their individual responses on Nearpod. Merve noted that in the case, the mentor gave feedback about classroom management using a judgmental tone, which led the pre-service teacher to become defensive. She shared that if she gave feedback to such a lesson, she would first ask, “*Do you think the noise level in the classroom was appropriate?*”, thus providing an opportunity for the mentee to self-evaluate (Code III.3.e: Feedback, Code III.2.c: Evaluation, Reflection, Regulation, Code I.3.a: Mentoring Approach, Theme II.5: Classroom Management). On the other hand, Esra wrote the following comment on Nearpod:

“I guess the mentor did not have much time and wanted to quickly address the issue and solve the problems they noticed. It would have been better to give opportunities for reflection. If the pre-service teacher was not aware of these issues, the mentor could have asked more specific questions about the noise level”.

Following the Nearpod activity, the issue was discussed in a whole group discussion. In this discussion, Esra emphasized that both the strengths and weaknesses of the lesson should be mentioned in feedback. She also pointed out that the mentor in the case focused solely on classroom management, whereas a lesson should be considered as a whole. She suggested that feedback should also address other aspects such as capturing students’ interest and preparing lesson according to the level of students. Esra added that through reflection, difficulties in classroom management could be addressed by trying different instructional methods. She found the mentor’s feedback in the case harsh and judgmental, which indicates her empathy for the pre-service teacher and her consideration to the mentee’s emotional well-being (Code III.3.e: Feedback, Code I.3.a: Mentoring Perception, Theme II.5: Classroom Management, Code III.2.c: Evaluation, Reflection, Regulation, Code III.3.d: Reflection, Theme III.6: Student Ideas, Code II.3.b: Teaching Strategies).

The mentors were asked what areas they would give feedback to their mentees, and they listed items such as understanding students' thinking, preparing a lesson plan, and using time effectively. Esra, on the other hand, stated that attention should be paid to whether the lesson designed according to students' different senses, and she emphasized the importance of flexibility skills (Theme III.6: Student Ideas, Code II.3.b: Teaching Strategies, Theme III.1: Content Knowledge). Here, we can see that Esra prioritizes student learning in her mentoring perception, as she highlights the use of different instructional strategies and underlines the importance of flexibility skills, which require considering multiple solution paths to a problem and making transitions between different representations.

Merve asked a question which was not related to feedback. She shared that one of her students considered the content knowledge of pre-service teacher is insufficient based on a conversation between them, and Merve asked whether such a prejudice was normal. This question was aligned with Content Knowledge and Mentoring Perception since Merve wanted to make her students see the mentees as teachers.

As the final question of the session, the mentors were asked whether there was anything they would change about the feedback they had previously given to their mentees, after today's discussion on feedback. Merve and Esra stated that they had not yet given feedback to their mentees, but that the mentees had already given feedback to them, and they shared their experiences which are given below.

Table 6.10. Mentor Quotes with Themes and Codes (Session 3).

Mentor	Quotation	Theme and Code
Merve	Up to this point, my mentees have given me feedback. While they were evaluating a nd criticizing me, they were also drawing lessons for themselves for the future.	III.3.a Modeling III.3.e Feedback I.3.f Beliefs on Teacher Learning

Table 6.10 Mentor Quotes with Themes and Codes (Session 3). (cont.)

Mentor	Quotation	Theme and Code
Esra	I have not given feedback to the mentees yet, but after my own lesson, I considered myself as a mentee and reflected on my own lesson. In fact, it became an example of reflection, but there was no other lesson available for me to give feedback on.	III.2.c Evaluation, Reflection, Revision III.3.e Feedback I.3.f Beliefs on Teacher Learning

These quotations shows that both mentors found a way to discuss classroom practices with their mentees, they did not wait until mentees conduct a lesson and they make their mentees experience the feedback process.

This shows both mentors gave importance to feedback process, and they believed the benefit of the process on the teaching skills of the mentees. Besides feedback, Merve focused on being a model, while Esra put emphasis on the self-evaluation and reflection.

This session included mentoring practices on how to give effective feedback. The discussions revealed that while both mentors recognized the importance of feedback, their approaches reflected distinct priorities. Esra focused on delivering balanced, empathetic, and student-centered feedback.

On the other hand, Merve gave importance to being a model for mentees. It was especially meaningful to observe that both mentors initiated informal feedback conversations with their mentees before they even started teaching, reflecting their dedication to fostering reflective and interactive mentoring practices. Also, this session may show that feedback in mentoring is not a one-way evaluation but a reciprocal and dynamic learning process, where both mentor and mentee grow professionally.

Session 4:

Only Esra participated in this session. The focus of the session was on mentoring practices that support mentees in developing their teaching mathematics skills. The themes and codes came from all the three dimensions were shown in the Table 6.11.

Table 6.11. Themes and codes emerged from the fourth session.

Themes	Codes	Mentors
I.3 Role of Mentor and Mentoring Perspective	I.3.a: Mentoring perception	E
	I.3.c Requiring Practices	E
	I.3.f Beliefs on Teacher Learning	E
I.5 Mentor Characteristics and Selection	I.5.d Area Specialized Teaching Competency	E
II.2 Students' Characteristics	-	E
Expectations from PST	I.2.d Eager to Learn	E
III.1 Content Area	-	E
III.2 Mentoring Practices about Teaching	III.2.c Evaluation, Reflection, Revision	E
	III.2.d Conceptual Learning	E
III.3 Mentor-Mentee Interactions	III.3.a Modeling	E
	III.3.b Mentor Sharing	E
	III.3.c Designing and Implementing Together	E
	III.3.d Reflection	E
	III.3.e Feedback	E
III.6 Student Ideas	-	E
Note. S = Sevil, M = Merve, E = Esra.		

The session began by asking what essential things a preservice teacher must do in order to learn how to teach mathematics, and the mentors shared their views via

Nearpod. Esra, as in the previous session, emphasized a student-focused perspective in her comment instead of making comments about the content knowledge, preparing lesson plan, or benefitting from different resources while preparing lesson plans.

A sample case was presented to the teachers, in which a mentor teacher reviews the questions prepared by a preservice teacher. The mentor notices that there are no real-life context questions and asks the mentee to add some. When the mentee says they could not find any, instead of directly giving the questions to the mentee, the mentor suggests reviewing the book previously recommended, where the mentee could find suitable examples. Then, the participants were asked why the mentor in the case did not directly provide the questions to the mentee. Esra defined solving question as a part of teaching process, not the whole thing. This behavior of the mentor directed the mentee to search different sources, and this would support the development of the mentee. Also, she added that besides solving question, working on how to explain the solution steps of the question to students is important (I.3.a: Mentoring perception, I.3.c Requiring Practices, I I.3.f Beliefs on Teacher Learning, II.3.b Mentor Sharing, III.3.c Designing and Implementing Together, III.1: Content Knowledge, III.3.d: Reflection).

Afterwards mentors answered the following question individually on Nearpod: “What kind of activities did you do with the mentees during the process of learning to teach?” Esra stated that:

“After deciding on the lesson topic, they talk about how they taught it and what could be possible ways to teach it. They can also discuss how a topic can be explained by connecting it to previous topics. In other words, they can try to prepare a teaching plan together”.

(III.1: Content Knowledge, III.3.c Designing and Implementing Together, III.3.d: Reflection, III.2.d Conceptual Learning, I.5.d Area Specialized Teaching Competency)

At the end of session, there was a question-answer and experience sharing part, in that part Esra shared her ideas about the importance of development reflection skills

by criticizing own teaching experience. Also, she added that even after making mistake, reflect on the own teaching and being aware of that mistake, provide confidence to the teachers (III.2.c Evaluation, Reflection, Revision, I.2.d Eager to Learn, III.1: Content Knowledge).

The session offered the ideas on mentoring practices that develop mentees' mathematics teaching skills. Esra's emphasis on the importance of understanding student thinking in developing mentees' mathematics teaching skills highlighted her learner-centered mentoring approach. Also, her sharing about the designing and constructing lesson plans with the mentee but not providing direct answers for them reflected a commitment to fostering independent professional growth. Besides her emphasis on the importance of practices such as connecting the topic to previous topics and thinking of different ways of teaching a topic show that she plans mentoring practices to support development of mentee's pedagogical content knowledge.

Session 5:

Helping mentees to design effective tasks was the main topic of the fifth session. The discussions covered a wide range of themes which were presented in the Table 6.12.

Table 6.12. Themes and codes emerged from the fifth session.

Themes	Codes	Mentors
I.3 Role of Mentor and Mentoring Perspective	I.3.d Reciprocal Learning	S
II.2 Students' Characteristics		E; M; S
II.3 Pedagogy of Teaching	II.3.b: Teaching Strategies	E
II.5 Classroom Management		M; E
III.1 Content Area	-	E; M; S
III.2 Mentoring Practices about Teaching	III.2.b Designing and Implementing Instructional Tasks III.2.d Conceptual Learning III.2.e Teaching for Mathematical Skills	S E E; M; S

Table 6.12 Themes and codes emerged from the fifth session. (cont.)

Themes	Codes	Mentors
III.3 Mentor-Mentee Interactions	III.3.b Mentor Sharing III.3.c Designing and Implementing Together III.3.d Reflection III.3.e Feedback III.3.f Balancing Intervention and Guidance	E; M; S S E; S E; M; S M; S
III.4 Curriculum Knowledge	-	S
III.5 Instructional Materials and Technology	-	E
III.6 Student Ideas	-	E; M; S
Note. S = Sevil, M = Merve, E = Esra.		

The session began with a question which participants answer individually on Nearpod. The question was “What kind of activities would you do with mentees to help them prepare tasks/questions for teaching the topic of parabolas”?

Table 6.13. Mentor Quotes with Themes and Codes (Session 5).

Mentor	Quotation	Theme and Code
Sevil	They should know the students' readiness levels. We can ask them to look for real-life examples of quadratic functions. To make them understand that function graphs are not a separate topic, I would also remind them about the different representations of functions. I ask them to explore how these concepts are connected.	III.1: Content Knowledge III.2.d Conceptual Learning III.4 Curriculum Knowledge III.6 Student Ideas

Table 6.13 Mentor Quotes with Themes and Codes (Session 5). (cont.)

Mentor	Quotation	Theme and Code
Esra	They can start a discussion by asking what the standard form of a quadratic equation is and how it differs from a linear equation. Then, they can use Desmos to graph both types of equations and discuss with the class why they differ.	III.1: Content Knowledge III.2.d Conceptual Learning III.2.e Teaching for Mathematical Skills III.5 Instructional Materials and Technology

Merve did not answer instead of that she asked a question that showed us she had tendency to provide guidance for the mentee introducing the topic at the beginning of the lesson.

“While introducing this topic, should we have students focus on the graph of the parabola first, or should we begin by discussing the concept of a quadratic equation”? (III.1: Content Knowledge, III.3.b Mentor Sharing, III.2.d Conceptual Learning).

Mentors were asked how they would give feedback to their mentees to help them grasp the main idea of the topic while designing a lesson. Among three first-time mentors, only Sevil responded to this question. She stated, “I would share our lesson notes first. Then, we would review these notes together and discuss how we could improve the notes... encouraging the mentee to engage more deeply with the topic...

While doing this, it’s important not to send the message like ‘this is how I do it, and you should do something similar.’ Instead, the mentee should take the message as ‘how can we develop this together?’” (III.1: Content Knowledge, III.3.b Mentor Sharing, III.2.d Conceptual Learning, III.3.c Designing and Implementing Together)

The mentors were asked, “*If you asked your mentee what they would do if students did not respond or did not answer your question as expected during a lesson, how*

would your mentee respond?” Sevil said that her intern would probably reply, *“I would guide the students toward the answer I wanted by asking them different questions”* (II.2 Students’ Characteristics, III.6 Student Ideas, III.3.f Balancing Intervention and Guidance).

Merve, on the other hand, shared that she experienced this situation during a lesson observation. The mentee asked a question to the class, but when the students did not respond, the mentee only said “Just think about it” without providing any additional guiding questions or explanations. After the lesson, Merve told that if the students do not respond, it is important to guide questions to support them (II.2 Students’ Characteristics, III.6 Student Ideas, III.3.e Feedback, III.3.f Balancing Intervention and Guidance).

In the following part of the discussion, mentor teachers were presented with a case in which a preservice teacher, while teaching parabolas, failed to establish the connection between the graph and the equation and did not actively engage the students. The mentors were asked how they would guide the candidate in such a situation.

Sevil emphasized mentoring practices like working collaboratively on the lesson plan, exchanging of ideas and instructional methods, and providing feedback on the final version of the plan. Additionally, she highlighted the importance of informing the mentee about the classroom structure, students’ prior knowledge, and discussing possible student responses and ideas in advance (III.1: Content Knowledge, II.2 Students’ Characteristics, III.6 Student Ideas, III.3.c Designing and Implementing Together, III.3.d Reflection, III.3.e Feedback, I.3.d Reciprocal Learning).

Esra noted that in the lessons she observed, preservice teachers often became so focused on their own explanations and the flow of the lesson plan due to excitement. They tended to overlook students’ comments and answers. She stressed the significance of discussing potential student responses before the lesson to better prepare the mentee for in-class interactions. She added:

“I do not think it’s possible to predict every single student response. Sometimes students may offer insightful comments, and other times they might give irrelevant ones. At least we can discuss possible situations beforehand. For example, if an excellent comment comes up, how should you respond? Or if a very ordinary answer is given, what should you say to encourage other students to participate? Sometimes, preservice teachers are so excited, and they do not really pay attention to the content of what the student says” (III.1: Content Knowledge, II.2 Students’ Characteristics, III.6 Student Ideas, III.3.e Feedback, III.3.b Mentor Sharing).

Later in the session, the mentors were asked how they would respond, as mentors, to a case where a mentee planned to present a set of difficult questions on the board to capture students’ attention, expecting them to solve them. If no one succeeded, the mentee intended to solve them on their own. The mentor realized that all the questions targeted the same learning outcome and were above the students’ current level.

The mentors were asked how they would address this situation to support the mentee’s pedagogical content knowledge. Sevil stated that rather than directly pointing out the inappropriateness of the questions, she would guide the mentee by asking reflective questions, as if she were a student, helping them realize that the students might not be ready for those questions. She added that following such a conversation, the mentee would likely revise the questions (III.1: Content Knowledge, II.2 Students’ Characteristics, III.6 Student Ideas, III.3.e Feedback, III.3.b Mentor Sharing).

This response demonstrates Sevil’s preference for mentoring practices that promote reflection, encouraging mentees to recognize students’ readiness levels and the conceptual relationships within mathematics through guided questioning.

At the end of the session, facilitator directed the following question to mentors to take their final thoughts:

“What types of activities would you carry out with your mentees to support them in designing activities and questions for teaching parabolas?”.

Esra had low internet connection at the end of the session, that's probably why she did not participate in this part of the discussion. Sevil summarized her approach as making the mentee understand the lesson's main objective, considering how to effectively convey this objective to students, and developing a lesson plan aligned with this objective. She emphasized the importance of maintaining continuous dialogue with the mentee by discussing and reflecting on lesson materials together and making collaborative adjustments to the plan. Sevil also underlined the value of mutual development that is a result of exchanging ideas with the mentee. She stated that this sharing broadens her own perspective and contributes to creating a more effective lesson plan.

"I believe we can only reach the ideal through continuous communication and mutual growth throughout the process".

Her approach aligns with the reciprocal learning (I.3.d), where reflective feedback and co-construction of teaching practices are central (III.1: Content Knowledge, III.3.c Designing and Implementing Together, III.6 Student Ideas, III.3.e Feedback, III.2.b Designing and Implementing Instructional Tasks, III.4 Curriculum Knowledge).

Merve, in contrast, focused solely on how the mentee might approach the introduction of the topic and how to continue the topic based on her own teaching experience. Her comment was about the flow of the topic, there was no explanation about student learning. She stated:

"I would recommend starting with the relationship between quadratic equations and functions, then moving to real-life examples of parabolas. I would ask them to observe how y changes in relation to x , and then examine how the shape changes according to the coefficients" (III.1: Content Knowledge, III.3.b Mentor Sharing).

This session provided insights into how mentors can effectively guide pre-service teachers in designing effective instructional tasks in mathematics. Sevil exhibited a mentoring style based on mutual development by mentioning cooperative lesson preparation and directing mentee to think about mathematical concepts deeply. Esra's emphasis on talking about possible student responses before the lesson demonstrates

her focus on preparing mentees for dynamic classroom interactions. Merve's focus on lesson sequencing rather than student-centered approaches highlighted the diversity of mentoring perspectives within the group. Overall, it becomes clear that effective mathematics mentoring requires not only strong content knowledge, but also teaching pre-service teachers how to convey this knowledge to students, encouraging them to reflect on their teaching and develop their own instructional style in the process.

Session 6:

The sixth session was centered on what effective mathematics teaching should look like, what types of mentoring activities mentor teachers can implement to develop pre-service teachers' instructional competencies, and how feedback, self-evaluation, reflection, and revision processes function within the lesson planning process. The themes and codes came from all the three dimensions were shown in the Table 6.14.

Table 6.14. Themes and codes emerged from the sixth session.

Themes	Codes	Mentors
I.2 Expectations from PST	I.2.b Pedagogical Knowledge	M
I.3 Role of Mentor and Mentoring Perspective	I.3.a Mentoring perception	E; M; S
I.5 Mentor Characteristics and Selection	I.5.d Area Specialized Teaching Competency	S
II.3 Pedagogy of Teaching	II.3.b: Teaching Strategies	E
II.4 Assessment	-	M
II.5 Classroom Management	-	E; M; S
III.1 Content Area	-	E; M; S
III.2 Mentoring Practices about Teaching	III.2.a Teaching in the Authentic Context	M
	III.2.d Conceptual Learning	M; S
III.3 Mentor-Mentee Interactions	III.3.b Mentor Sharing	E; S
	III.3.c Designing and Implementing Together	S
	III.3.e Feedback	E; M; S

Table 6.14 Themes and codes emerged from the sixth session. (cont.)

Themes	Codes	Mentors
III.5 Instructional Materials and Technology	-	M
III.6 Student Ideas	-	E; M; S
Note. S = Sevil, M = Merve, E = Esra.		

The session began with a discussion on what constitutes effective mathematics teaching. It was discussed that two important components of effective mathematics instruction are identifying the main ideas of the topic to be taught and planning the lesson by integrating students' ideas into pedagogical content knowledge. The importance of pre-service teachers preparing a written lesson plan was emphasized. None of the three first-time mentors contributed to this discussion.

After this discussion, mentors were divided into groups to work on a case about the feedback of a mentor to a pre-service teacher before and after the lesson. Each of the three first-time mentors worked in different groups and examined the feedback of the mentor in the case and discussed whether the feedback was comprehensive, and feedback notes were detailed. Also, groups were supposed to prepare lesson feedback for that pre-service teacher.

Sevil's group found the mentor teacher's observation notes detailed but predominantly negative. They noted that the mentor focused solely on the graphical representation of functions, overlooking other representations. The group stated that, in giving feedback, they would highlight positive aspects to support mentees' development. Additionally, they suggested preparing feedback that begins with positive comments, followed by constructive suggestions about teaching mathematical concepts, and evaluating classroom management and student relations. Esra's group found the observation notes comprehensive and carefully recorded throughout the lesson. However, they noted that apart from comments on classroom movement, there was little emphasis on pedagogical content knowledge, the feedback was focused mainly on content knowledge. The group stated they would include both positive aspects and areas for improvement,

such as graph drawing and addressing students' misconceptions, offering constructive suggestions. Additionally, they emphasized the importance of using supportive and encouraging language when giving feedback. On the other hand, Merve's group found the mentor teacher's written notes to be clear and well-summarized. They observed that the mentor focused primarily on function graphs and visual representations. The group stated they would have followed a similar approach but identified weaknesses in how the lesson was introduced. They suggested beginning with the domain and range when teaching inverse functions, then discussing intervals for which an inverse exists, and demonstrating it both algebraically and graphically. Additionally, they noted the lack of student understanding during the lesson and pointed out that the lesson was not effectively summarized or concluded.

In this case, the main themes of feedback and content knowledge codes appeared in all three groups (III.1 Content Knowledge, III.3.e Feedback). Esra and Sevil's group focused on mentioning both the strengths and weaknesses while providing feedback, demonstrating an empathetic mentoring approach (I.3.a Mentoring perception). In contrast, Merve's group predominantly emphasized the negative aspects of the lesson. Additionally, while the other groups made comments on general pedagogical aspects such as the mentor's connection with students, capturing their interest in the lesson and using board effectively, Merve's group did not provide any remarks on these areas (II.3 Pedagogy of Teaching, II.5 Classroom Management). Both Sevil's and Merve's groups highlighted the importance of incorporating mathematical questioning into feedback practices and making the mentee think mathematical concepts deeply (III.2.d Conceptual Learning). Additionally, Esra's and Merve's groups focused on understanding students' thinking (III.6 Student Ideas). Moreover, Merve's group emphasized the necessity of checking whether students had understood the topic, highlighting the importance of incorporating evaluation practices into the lesson (II.4 Assessment).

At the end of the session, mentor teachers worked on the same groups to discuss their own cases and they responded to the following questions:

- (i) As a mentor, how did you guide your preservice teacher to improve their lesson plan? What were your mentee's strengths and weaknesses, and how did you provide feedback on these aspects?
- (ii) When the mentee teaching the lesson a second time, what mentoring practices would you prefer to keep the same and what would you do differently?

After the group work, Sevil summarized their work on behalf of the group. She stated that instead of a lesson plan, they discussed an assignment prepared by a pre-service teacher. In the initial version of the assignment, the questions designed by the mentee were not appropriate for the students' current level. Therefore, she mentioned that they revised these questions together with the mentee. Later, they realized that the set of questions lacked multiple representations and real-life context examples, so they added those as well. She also explained that, since the mentee did not follow the lessons every day, she was not fully aware of what the students knew and did not know, so which is why the necessary information about the students' learning levels was shared with the mentee. Sevil emphasized that rather than a single feedback session, there was a material preparation process designed step by step in collaboration with the mentee. Although the response did not directly address the questions asked in the session, we can clearly observe the mentor's feedback steps throughout the process. After examining first draft of the homework prepared by mentee, the mentor identified the weaknesses such as considering student readiness and including questions with multiple representations during feedback sessions, and the gaps addressed through discussions and, material was produced collaboratively (III.1 Content Knowledge, III.3.b Mentor Sharing, III.3.c Designing and Implementing Together, III.3.e Feedback, III.6 Student Ideas).

Esra provided a summary of their group work, indicating that before the lesson, they had discussed possible student questions, anticipated responses, and potential misconceptions that might arise. However, she noted that they did not address how the preservice teacher should respond to these questions during the lesson, nor how she might react when a student offered an insightful answer. Esra emphasized that

redirecting a student's question back to the class, rather than answering it immediately, could serve as an effective instructional strategy by creating opportunities for further student engagement and discussion. She also recommended that, before the preservice teacher's next lesson, it would be valuable to hold a conversation on how to respond student questions and how to manage classroom interaction effectively (III.1 Content Knowledge, III.3.b Mentor Sharing, III.3.e Feedback, III.6 Student Ideas).

Before Merve presented her group summary, duration of the session ended. Her presentation was postponed to the following meeting. However, to maintain continuity, her report was presented in this session. Merve reported that the group discussed the lesson implementations of three pre-service teachers. She noted that one mentee delivered the lesson at an excessively fast pace, whereas another mentee insisted on using GeoGebra but experienced technical and practical challenges, which prevented her from completing the planned materials. Additionally, Merve shared she asked the pre-service teachers to implement a quiz which was already prepared. Her stated aim was to have the mentees manage the classroom independently. However, she noted that the mentees encountered difficulties in managing the classroom effectively (III.5 Instructional Materials and Technology, III.2.a Teaching in the Authentic Context, II.5 Classroom Management, II.4 Assessment, I.3.a: Mentoring perception, I.2.b Pedagogical Knowledge).

The sixth session offered valuable insights into how mentors manage feedback process. Sevil shared that rather than providing feedback on her mentee work in a single session, she met with the mentee several times to discuss the lesson plan and materials, exchanging ideas to improve them. This demonstrates that Sevil values collaborative work and open dialogue in her mentoring practice. His feedback focused not only on the mathematical content but also on the appropriateness of the materials for the students' level. Esra, on the other hand, displayed a mentoring perspective centered on student thinking. She emphasized the importance of preparing preservice teachers to effectively respond to students' questions and answers during lessons. Her approach highlighted the value she places on anticipating student ideas and fostering classroom

interaction. Merve's mentoring, in contrast, focused more on general teaching skills beyond subject-specific content. Her feedback addressed the preservice teachers' use of technology, lesson pacing, and the ability to design effective lesson plans.

Session 7:

The 7th session mainly focused on mentoring practices to support mentees in understanding student thinking and in promoting students' conceptual understanding and mathematical skills. Themes and codes emerged in this session were presented in the Table 6.15.

Table 6.15. Themes and codes emerged from the seventh session.

Themes	Codes	Mentors
III.3 Mentor-Mentee Interactions	III.3.f Balancing Intervention and Guidance	M
III.6 Student Ideas	-	M
II.2 Students' Characteristics	-	M
II.5 Classroom Management	-	M
I.3 Role of Mentor and Mentoring Perspective	I.3.a Mentoring perception	M
Note. S = Sevil, M = Merve, E = Esra.		

The session began with the discussion of the final question from the previous session's group work: "What kinds of activities can be carried out to support the pre-service teacher in learning how to teach mathematics?" Since Sevil was absent from this session, another group member shared the ideas they had discussed. She stated that beyond gaining experience through teaching lessons, it would be valuable to guide the preservice teacher to search various resources, focusing on how the topic is taught and which mathematical representations are commonly used.

Esra's group partner emphasized the importance of lesson experience, as well as practices that help preservice teachers better understand student thinking. She

suggested mentoring practices like sharing general student thinking about the lesson topic and taking notes during lesson observations to have discussions after the class.

When Merve was asked to summarize their group's ideas, she explained that they had not discussed that question during the session. However, her group partner shared the suggestion that, in addition to lesson experience, allocating 10 minutes for preservice teachers to solve a couple of questions during the lesson would be an effective strategy to support their learning of how to teach mathematics.

After this discussion, mentoring practices to support preservice teachers in fostering students' conceptual understanding and mathematical process skills were discussed through a sample case. In the case, the mentor assessed the preservice teacher's prior knowledge on logarithmic functions, identified gaps, recommended resources, suggested using Desmos, and requested the preparation of an activity. The mentee planned to have students work in pairs to reflect an exponential function graph over the line $y = x$ to construct its inverse. The mentor approved this plan.

Mentors were asked how they would have approached this plan with a focus on conceptual learning and process skills. Esra and Merve did not participate in the discussion. Other mentors expressed that drawing graph could be too demanding for students initially and suggested beginning with the definition of inverse functions and solving related equations. They also recommended questioning the need for inverse functions and integrating real-life problems to enhance students' conceptual understanding, problem-solving, and reasoning skills.

In response to a mentor's remark emphasizing that class size can significantly affect the implementation of a lesson plan and that lessons may not always proceed as intended on paper, Merve shared an example from her own experience. She noted that in a recent case, preservice teachers had allocated twenty minutes for an activity in their lesson plan, yet they were unable to complete it within a whole class period. This example highlighted the importance of using time effectively by considering the factors

may influence the duration of an activity like classroom size, students' readiness (II.5 Classroom Management).

The final discussion topic of the session focused on mentoring practices to help preservice teachers understand student thinking. The discussion began with a sample case, and participants were asked how they would provide feedback on a preservice teacher's lesson plan that failed to consider students' thinking. Responses were collected via Nearpod. While Esra and Merve did not contribute to this discussion, other mentors shared that they would address common misconceptions they had encountered in class according to their own experiences and explain the potential negative impact of not identifying and addressing misconceptions on student learning.

After that, the facilitator shared three strategies they had developed to help preservice teachers become more aware of student thinking and it was announced that a group activity focusing on this topic would be conducted in the next session.

Merve stated that during the mentee's teaching, the students did not challenge the pre-service teacher or ask any questions. She shared that although some students quietly asked her questions during class, when she encouraged them to direct their questions to the pre-service teacher, they did not feel confident enough to do so. She also mentioned that she planned to make a few students ask questions to preservice teacher during the lesson. However, facilitators advised that this would interfere with the natural flow of the lesson and suggested that it would be better simply to remind students that they are free to ask the pre-service teacher questions. This situation indicates that Merve was concerned about the lack of student participation during the preservice teacher's lessons and was trying to find a solution. It also shows that she wants preservice teachers to experience the authentic dynamics of a real classroom, but she is uncertain about how to create such opportunities effectively (II.2 Students' Characteristics, III.6 Student Ideas, III.3.f Balancing Intervention and Guidance, I.3.a: Mentoring perception).

Mentor engagement in the seventh session was quite limited, but the few comments shared still reflected their usual mentoring styles. Sevil could not attend the session, but her group suggested that preservice teachers should be encouraged to use different resources and representations, showing a supportive and collaborative attitude. Esra did not take part in the discussions, but her group partner mentioned ideas about helping preservice teachers understand student thinking, which is aligned with Esra's earlier mentoring approach. Merve's comments, which focused on problems with managing class time and increasing student interaction, reflected a mentoring perspective that prioritized classroom management.

Session 8:

The main topics of the eighth session were mentoring practices that support the curriculum knowledge of mentees and directing mentees to use instructional materials and technology for effective mathematics teaching. Besides these two topics, the topic of understanding student thinking, which was covered last week, was continued. Codes and themes emerged from this session were shown in the Table 6.16.

Table 6.16. Themes and codes emerged from the eighth session.

Themes	Codes	Mentors
I.2 Expectations from PST	I.2.c Being Reflective Teacher	E
II.3 Pedagogy of Teaching	II.3.b: Teaching Strategies	S
III.1 Content Area	-	E
III.2 Mentoring Practices about Teaching	III.2.d Conceptual Learning	E
III.3 Mentor-Mentee Interactions	III.3.a Modeling	S
	III.3.b Mentor Sharing	E
	III.3.d Reflection	E
	III.3.e Feedback	E

Table 6.16 Themes and codes emerged from the eighth session. (cont.)

Themes	Codes	Mentors
III.4 Curriculum Knowledge	-	E; M
III.5 Instructional Materials and Technology	-	E
III.6 Student Ideas	-	E; S
Note. S = Sevil, M = Merve, E = Esra.		

The session had started with last week's topic. The facilitator shared that they had developed three strategies to help the preservice teacher understand students' thinking. The strategies were as follows: First, the preservice teacher would observe the mentor's lesson on the same topic - for example, in class 9A - paying particular attention to students' ideas and taking notes, then review these notes together with the mentor to recognize possible student thoughts. Second, before the whole class teaching, the preservice teacher would work with a small group of students to discover their ideas in a more focused setting. Third, the preservice teacher would teach the lesson, experience difficulties in real time, and reflect on these moments afterward. The facilitator then asked the mentors work in groups to decide which strategy they would choose or to suggest an alternative approach if they preferred. Esra stated that they chose the third strategy, which involves taking notes during the lesson on the moments when the preservice teacher either successfully or unsuccessfully identified student thinking, and then discussing these instances afterward. She believed this would support the preservice teacher's professional development (III.1 Content Knowledge, III.3.d Reflection, III.3.e Feedback, III.6 Student Ideas). Sevil mentioned that they also chose third strategy. He shared that they discussed how it would be helpful for preservice teachers to observe how students respond to the teacher's questions and how the teacher reacts to students' questions - whether they answer immediately, redirect the question to the class, or handle it in other ways - in order to develop an understanding of student thinking (III.3.a Modeling, II.3.b Teaching Strategies, III.6 Student Ideas). On the other hand, no comments from Merve regarding this discussion could be found in either the video transcript or the Nearpod responses.

Afterward, the discussion focused on what it means for a preservice teacher to be familiar with the curriculum and why this is important. Among the three first-time mentors, only Esra contributed to the discussion and said:

“...I believe the preservice teacher also needs a framework while working with students. They do not have to answer every question a student asks right at that moment. Sometimes responding might disturb the flow of the lesson or lead to losing the attention of the rest of the class. For example, if a student asks an advanced question beyond the current topic, it’s perfectly fine to appreciate the question while explaining that it will be discussed in a future lesson or next year. This would be a more appropriate response for the whole class” (III.1 Content Knowledge, III.4 Curriculum Knowledge, III.6 Student Ideas).

With this thought, Esra highlighted how knowing both the current year’s curriculum sequence and the vertical progression of topics enables a preservice teacher to understand student ideas and direct them more appropriately.

After that, mentor teachers were asked what could be done to improve the curriculum knowledge of their preservice teachers if they had deficiencies in this area. The mentors responded individually via Nearpod. While Sevil did not provide any comments, Merve stated that the preservice teacher should review the curriculum and annual plans (III.4 Curriculum Knowledge). Esra mentioned that she would inform the preservice teachers that the official curriculum is published by the Board of Education and Discipline (Talim ve Terbiye Kurulu) and would recommend that they check these documents. She also added that she would expect the preservice teacher to know the curriculum at the grade level they are teaching. While Merve’s comment focused only on what the preservice teacher should do, Esra went a step further by sharing where to access the curriculum (III.4 Curriculum Knowledge, III.3.b Mentor Sharing).

For the final topic of the session, mentors were asked which instructional materials and technologies they used. Applications and tools such as interactive whiteboards, Geogebra, EBA, Sebit, and Quizizz were discussed. Among the three mentor teachers, only Esra contributed to this topic. She shared that although she used to work with Geogebra in the past, she now prefers Desmos, finding it more practical. She mentioned

that she uses Desmos to quickly write equations with students and check which type of graph they produce, or to verify the correctness of a question she creates by graphing it. Her using of Desmos for multiple representation of equations is related to supporting conceptual learning of students (III.2.d Conceptual Learning, III.5 Instructional Materials and Technology).

A case was shared in which a mentor teacher has a conversation with a preservice teacher who is preparing to teach a lesson on the sine function. The preservice teacher wants to use Desmos, but only to capture students' attention. The mentors were asked how they would support the preservice teacher in using effective instructional materials, or technology during the lesson if they were the mentor. The mentors responded individually via Nearpod, sharing their suggestions for teaching the sine function. Among the three first-time mentors, only Esra responded to this question. She suggested that the preservice teacher should try Desmos individually before the class, define a function, and explore how the graph changes when modifying the function - for example, seeing what happens to $\sin x$ when it becomes $\sin 2x$ or $\sin x+1$. She added that she would want the preservice teacher to evaluate their competency for using Desmos and understanding the relations in equations and graphs (III.4 Curriculum Knowledge, III.5 Instructional Materials and Technology, III.3.b Mentor Sharing, I.2.c Being Reflective Teacher).

While Esra actively participated in the eighth session, Merve and Sevil made only limited contributions. Sevil shared her views solely on practices that could help preservice teachers better understand student thinking, while Merve only took part in the curriculum discussion. Esra, on the other hand, explained how she guided preservice teachers in learning the curriculum and emphasized that curriculum knowledge is necessary for understanding student thinking. She also described the practices she used to support preservice teachers in integrating technology to enhance mathematics learning and highlighted the importance of classroom observations and post-lesson discussions to help them interpret student thinking. These contributions are consistent with Esra's student-centered approach both as a teacher and as a mentor.

Session 9:

The aim of this session was making general evaluation of the term, no new topics were discussed, and mentors shared their experiences. Sevil had not participated in this session. Codes and themes emerged from this session were presented in the Table 6.17.

Table 6.17. Themes and codes emerged from the ninth session.

Themes	Codes	Mentors
I.2 Expectations from PST	I.2.a Content Knowledge	M
	I.2.d Eager to Learn	M
I.3 Role of Mentor and Mentoring Perspective	I.3.a: Mentoring perception	E; M
	I.3.e Tracking and Feedback	E
I.5 Mentor Characteristics and Selection	I.5.a Motivation	E; M
II.2 Students' Characteristics	-	E; M
II.3 Pedagogy of Teaching	II.3.a Observing Student Learning	E; M
	II.3.c Area Independent Teaching Skills	E; M
II.4 Assessment	-	E
II.5 Classroom Management	-	E; M
III.1 Content Area	-	E; M
III.2 Mentoring Practices about Teaching	III.2.a Teaching in the Authentic Context	E; M
	III.2.c Evaluation, Reflection, Revision	E
III.3 Mentor-Mentee Interactions	III.3.b Mentor Sharing	E
	III.3.d Reflection	E
III.4 Curriculum Knowledge	-	M
III.6 Student Ideas	-	E; M
Note. S = Sevil, M = Merve, E = Esra.		

The first mentor making an evaluation of the term was Esra. She stated that the entire term was characterized by continuous reflection, stating that she not only encouraged preservice teachers to reflect but also approached the process with a reflective mindset, frequently evaluating her own mentoring practices. Esra explained that she consistently considered and planned which issues to address during her conversations with the preservice teachers to provide meaningful support. Additionally, she observed noticeable progress in the preservice teachers' practices when comparing their initial and final lessons. She concluded her speech by adding that participating in this program had been a motivating experience for her (III.2.c Evaluation, Reflection, Revision, III.3.d Reflection, III.2.a Teaching in the Authentic Context, I.5.a Motivation, I.3.e Tracking and Feedback).

Following this answer, the facilitator asked Esra which topics she tended to emphasize during her conversations with the preservice teachers. In response, Esra explained:

"I realized that I consistently emphasized student thinking and students' responses. We also talked about the student thinking in our meetings. At first, our focus was mostly on what the preservice teachers would explain and what kinds of reactions or questions they might get from students. But later, we noticed that also the students' questions and responses were valuable... Another point we often reflected on was that, as teachers, especially in our early years, we tend to conduct our teaching without considering individual student needs. However, during this term, we frequently found ourselves discussing specific student needs... These student-centered discussions became a significant part of our conversations". (III.1 Content Knowledge, III.3.b Mentor Sharing, II.2 Students' Characteristics, II.3.a Observing Student Learning, III.6 Student Ideas).

Following Esra's, Merve stated that pre-service teachers were lack of curriculum knowledge. She noted that the mentees often struggled to identify which topics students had already learned in previous years or what the scope of a given topic is. Additionally, she mentioned that during lesson presentations, when students directed them questions, mentees would sometimes ask her whether students had the prerequisite knowledge to understand the answers. She stated:

“...When they were teaching a topic, they glanced at me. Meaning - how much do the students know? How much should we explain... Sometimes they even asked me in class: ‘Teacher, do they know this topic?’ Occasionally, a student would ask a question which was not expected for the mentee... but the mentee did not know how much students know so they had difficulties to answer it. They lacked that type of the knowledge. We experienced this several times”.

It seems that Merve’s mentees needed guidance on how to handle a question when they were not sure about its scope. Merve did not mention whether she gave feedback or not, it was necessary to give feedback to mentees about keeping the flow of the lesson (III.4 Curriculum Knowledge, I.2.a Content Knowledge, III.3.f Balancing Intervention and Guidance). Merve also added that she greatly enjoyed the mentoring process and observed that the pre-service teachers completed their practicum with increased self-confidence (I.5.a Motivation, I.2.d Eager to Learn).

Other mentors also shared their experiences. In one of these sharing, the topic of pre-service teachers observing classes with students at different levels was mentioned, Merve noted that during this term, the mentees gave lessons in a different class each week. She expressed that it might be more beneficial if they taught the same class consistently. She argued that this would allow the mentees to get to know the students better, improve interaction, and establish stronger classroom management. Additionally, she argued that it would help the mentees develop better subject matter knowledge (II.3.c Area Independent Teaching Skills, II.2 Students’ Characteristics, II.5 Classroom Management, III.1 Content Knowledge). Esra shared her experiences about this topic as:

“...They had the opportunity to observe the students’ characteristics, their mathematical backgrounds, their attitudes towards the lesson, and their general behavior... They also experienced teaching the same class themselves once. I believe being in a familiar classroom creates a safer and more comfortable environment for them. They can roughly anticipate what kind of questions or issues might come from certain students...” (II.2 Students’ Characteristics, III.6 Student Ideas, II.5 Classroom Management, II.3.a Observing Student Learning, III.2.a Teaching in the Authentic Context, I.3.a: Mentoring perception).

After this discussion, it was mentioned that observing different grade levels is beneficial for the professional development of prospective teachers. Merve shared her experience with following words:

“...For example, our tenth-grade classes are quite crowded... and the students are a bit different. The mentees experienced that as well. They also observed tenth and eleventh grades, and we discussed how to control such a crowded class and how to teach them effectively. In fact, after one mentee taught a lesson and repeatedly tried to explain a concept but students did not get the idea, the mentee asked me, ‘Teacher, why did not they understand?’ I felt a little sorry for him, but I said, ‘This is also an experience - you will learn how to convey your knowledge effectively’ (II.2 Students’ Characteristics, II.5 Classroom Management, III.6 Student Ideas, II.3.a Observing Student Learning, III.2.a Teaching in the Authentic Context, I.3.a: Mentoring Perception).

Merve also shared something about the mentees’ lectures, saying that almost after each lecture conducted by the mentees, she had to explain the topic again upon the students’ request, but while doing this, she always used the examples the mentee used to give the message that she was not re-telling the subject, but reminding. Otherwise, students would think that teacher would explain it again and there was no need to pay attention to mentees’ lecture.

This attitude was related to the mentoring perception of Merve, she had tried to make students see the mentees as teachers (I.3.a: Mentoring Perception). Merve shared similar experience in session three, it appears that the students’ prejudiced attitudes towards the pre-service teachers could not be overcome. This situation may be attributed either to the lack of a trusting and supportive classroom environment between the pre-service teachers and the students, or the pre-service teachers were not sufficiently competent in delivering the lessons. As Merve worked with five different pre-service teachers, it is not clear with which ones these situations occurred or how their lesson delivery processes went. Nevertheless, it is noteworthy that Merve reported encountering this situation following almost every lesson.

In response to the question “What would you do differently if you had a pre-service teacher next term”?, Esra shared that, due to her school’s policy this term, she

did not have the mentees prepare any instructional materials. However, she mentioned that next year she might ask them to prepare an exit ticket that students could complete without taking notes, or to engage them in the exam preparation process by asking them to prepare exam questions. She also noted that although school policy does not allow them to share actual exam papers with the mentees, she could share the students' ideas and misconceptions to reflect on students' thinking (II.4 Assessment, III.6 Student Ideas, III.3.b Mentor Sharing).

The final session offered valuable insights into the mentors' overall mentoring approaches and priorities throughout the term. Esra's contributions reflected her consistently reflective and student-centered mentoring approach. She emphasized the importance of preservice teachers noticing student thinking and individual needs, and she valued ongoing reflective conversations. On the other hand, Merve's contributions largely centered on practical challenges observed during the practicum like preservice teachers' curriculum knowledge and their struggles with anticipating students' prior learning. She noted mentees often lacked clarity on what students already knew, which led to difficulties in responding to unexpected student questions. Merve's comments reflected her mentoring tendency to prioritize operational aspects of teaching, such as classroom management and lesson planning. A recurring theme in both mentors' reflections was the value of preservice teachers observing and teaching students at different levels. Esra emphasized that consistent experiences in the same classroom could build preservice teachers' confidence, familiarity with students, and classroom management skills, while Merve focused on how preservice teachers struggled with more crowded and challenging classes and the importance of learning through such experiences.

6.3. Findings from Mid and Post-Interviews

6.3.1. Mid-Interviews

Mid-interviews were conducted with the mentors participating in the MeT-PD to capture the changes in their views, understandings and practices on effective mentoring.

Sevil did not participate in this interview. During the mid-interview, mentors were asked about how their work with the pre-service teachers was progressing, what kinds of practices they had carried out with them so far, and in what ways these practices contributed to the pre-service teachers' development as effective mathematics teachers. Additionally, mentors were invited to reflect on any similarities and differences between the practices they had initially planned at the beginning of the term and those they had actually implemented, as well as the possible reasons for any discrepancies.

Within the framework of the MAST Model, the data were categorized under three dimensions, each containing multiple themes and codes. Frequency tables summarizing the themes and codes frequently addressed by the mentors were developed. The analysis involved identifying both shared and differing themes in the mentors' statements, with the data interpreted independently for each dimension.

6.3.1.1. Dimension I -Practicum Triad. Among five themes under this dimension, Theme I.3 Role of Mentor and Mentoring Perspective was the most emphasized theme with a total frequency of 20.

Table 6.18. Theme and Code Frequency Table in Dimension I during MeT-PD.

	Merve	Esra
Dimension I -Practicum Triad	17	15
Theme I.1 Practicum Requirements	4	2
I.1.a Internship process	1	0
I.1.b School and mentor selection	0	0
I.1.c Preservice Teacher Doing Practices	3	2
I.1.d University- Mentor- Preservice Teacher Collaboration	0	0
Theme I.2 Expectations from PST	0	1
I.2.a Content Knowledge	0	0
I.2.b Pedagogical Knowledge	0	0
I.2.c Being Reflective Teacher	0	1
I.2.d Eager to Learn	0	0

Table 6.18 Theme and Code Frequency Table in Dimension I during MeT-PD. (cont.)

	Merve	Esra
Theme I.3 Role of Mentor and Mentoring Perspective	10	10
I.3.a: Mentoring perception	5	6
I.3.b Being an Example	3	0
I.3.c Requiring Practices	1	1
I.3.d Reciprocal Learning	0	1
I.3.e Tracking and Feedback	0	1
I.3.f Beliefs on Teacher Learning	0	1
Theme I.4 Expectations from Supervisor	0	0
Theme I.5 Mentor Characteristics and Selection	4	2
I.5.a Motivation	4	2
I.5.b Personal Attributes	0	0
I.5.c Professional Attributes	0	0
I.5.d Area Specialized Teaching Competency	0	0

This theme provides insights into the mentors' perceptions of mentoring. Merve emphasized the importance of being a role model for the pre-service teacher and shared that she was motivated by a desire to "teach them everything she knows". This indicates that Merve's perception of mentoring was shaped by a master-apprentice relationship model. While acting as a role model, she also expressed that it is not enough for pre-service teachers to merely observe; instead, they should gain experience in various practices such as teaching lessons, taking attendance, and being on duty. Her motivation to provide opportunities for them to experience everything stems from her own difficulties at the start of her teaching career, as she had not tried such practices during her own internship period. Merve stated that she wants pre-service teachers to start the profession more prepared by learning these responsibilities in advance. Merve stated that:

"Whatever I know, I'll tell and show you".

"So that when they start teaching, they will not feel inexperienced at first".

Esra, on the other hand, shared that she was very pleased when her lessons were observed by pre-service teachers and that she encouraged them to criticize her teaching. Highlighting that, since their theoretical knowledge is still fresh, they might notice problems or aspects she might have overlooked in class, she revealed a mentoring approach based on discussing problems together and collaboratively generating solutions.

She stated that:

“I told them today as well. I said: you can criticize me now - please say something. Because I’m also looking for solutions for my lesson”.

Esra’s emphasis on wanting mentees to criticize her teaching is also related to the code 1.2.c Being a Reflective Teacher. By wanting mentees to criticize an observed lesson, she would give the message being open to feedback and development is a part of teaching. In addition, both mentors expressed how their mentees felt upset when their lessons did not go as expected, and how they tried to support them through these feelings or help them avoid such situations. These reflections indicate that both mentors display an empathetic and supportive mentoring approach. None of the mentors mentioned the Theme I.4 Expectations from Supervisor, both mentors stated that the pre-service teachers observed their lessons, delivered their own lessons, and had the opportunity to observe other teachers’ classes as well (I.1.c Preservice Teacher Doing Practices).

In addition, the mentors mentioned their mentoring motivations during the interviews. Merve’s motivation primarily centered around a desire to share her own experiences with the pre-service teacher, while Esra expressed that her motivation was to cultivate teachers who value collaboration and idea-sharing in their professional practices. Both mentors also mentioned their own negative internship experiences during the conversations. Esra stated:

“Sometimes we can reflect and comment on something that happens in class. And there are situations when I think, ‘I wish someone had told me this earlier as well’.

These findings indicate that while both mentors provided teaching opportunities for their preservice teachers, their mentoring approaches were shaped by different personal motivations and professional experiences. Merve adopted an experience-sharing approach by being a model for her mentees, while Esra prioritized collaboration and making discussions about profession. Despite these differences, both mentors demonstrated empathetic and supportive attitudes toward their mentees, especially when preservice teachers encountered difficulties in their teaching practices.

6.3.1.2. Dimension II: General Pedagogy. Although the frequency of the mentors' references to practices related to the second dimension was quite similar, the topics they prioritized differed noticeably. Merve primarily emphasized the responsibilities of teachers apart from lesson delivery ($f = 5$), while Esra focused on the importance of knowing students' individual characteristics ($f = 5$).

Merve explained that she made a conscious effort to teach preservice teachers even about seemingly minor profession-specific habits, such as how to use their voice properly during duties, in order to protect their health in the long term.

“For example, when we're on duty in the corridor and calling out to students, I tell them, ‘Do not use your throat, you need our voice for years. Do not damage it. It's a teacher's disease.’ I even try to teach them things like this”.

Table 6.19. Theme and Code Frequency Table in Dimension II During MeT-PD.

	Merve	Esra
Dimension II – General Pedagogy	9	11
Theme II.1 Teaching Profession	5	2
Theme II.2 Students' Characteristics	1	5
Theme II.3 Pedagogy of Teaching	1	4
II.3.a Observing Student Learning	0	2
II.3.b Teaching Strategies	0	1
II.3.c Area Independent Teaching Skills	1	1
Theme II.4 Assessment	1	0
Theme II.5 Classroom Management	1	0

Esra, on the other hand, highlighted that she tried to make preservice teachers recognized that the most important factor in a classroom is the students. She emphasized that making observations and having conversations about students' characteristics helped preservice teachers to understand the value of considering students' individual differences.

“By experiencing this firsthand - both in my classes, in the lessons they teach, and during our conversations - I believe they realize that the most important factor here is the students, and they see the importance of considering their individual differences”.

In addition, since Esra adopts an approach that places student differences at the center, she explained to the preservice teachers how she develops different strategies for students according to their learning needs, and the preservice teachers had the opportunity to observe how these students learn.

While both mentors shared that they provided opportunities for preservice teachers to observe different grade levels, only Merve made comments about classroom management and assessment practices.

These findings indicate that mentoring priorities of mentors reflected different professional values. Merve focused on preparing preservice teachers for the roles and responsibilities apart from teaching like taking attendance. In contrast, Esra prioritized student-centered practices, emphasizing the importance of recognizing individual differences and adapting instructional strategies accordingly. This difference reveals how mentors' individual experiences and values shape their mentoring styles, offering preservice teachers different viewpoints on effective teaching practices.

6.3.1.3. Dimension III: Area-Specialized Teaching. Evaluating the data according to third dimension of MAST Model, Merve placed significant emphasis on providing feedback and guidance related to mathematical content knowledge. This suggests that she was attentive to identifying her mentees' content knowledge gaps and aimed to support

their improvement in this area. She noted that preservice teachers often struggled to set appropriate lesson objectives and had difficulty responding to unexpected student questions because they do not know the flow of the topic. In contrast, Esra did not address this theme at all, which aligns with her known tendency to prioritize student thinking.

Table 6.20. Theme and code frequency table in dimension III during MeT-PD.

	Merve	Esra
Dimension III: Area-Specialized Teaching	34	19
Theme III.1 Content Knowledge	4	0
Theme III.2 Mentoring Practices about Teaching	6	4
III.2.a Teaching in the Authentic Context	2	2
III.2.b Designing and Implementing Instructional Tasks	0	0
III.2.c Evaluation, Reflection, Revision	4	2
III.2.d Conceptual Learning	0	0
III.2.e Teaching for mathematical Skills	0	0
Theme III.3 Mentor-Mentee Interactions	14	10
III.3.a Modeling	0	0
III.3.b Mentor Sharing	0	3
III.3.c Designing and Implementing Together	0	0
III.3.d Reflection	5	1
III.3.e Feedback	5	6
III.3.f Balancing Intervention and Guidance	3	0
Theme III.4 Curriculum Knowledge	3	0
Theme III.5 Instructional Materials and Technology	1	0
Theme III.6 Student Ideas	6	5

Both mentors discussed preservice teachers' lesson planning and implementation processes. Merve mentioned that she gave her mentees multiple opportunities to teach, which might explain why her frequency for Evaluation, Reflection, Revision (III.2.c) was higher (4) compared to Esra's (2). She naturally engaged in more post-lesson feedback sessions.

The most frequently coded theme within this dimension was Mentor-Mentee Interactions (III.3). Both mentors primarily focused on feedback practices given before and after lessons. Additionally, Merve explained how she encouraged preservice teachers to reflect on both the lessons they observed and their own teaching, trying to balance providing feedback and making intervention to the lesson. While Merve did not mention any mentor sharing practices, Esra frequently discussed how she shared her experiences with her mentees, particularly on topics like student thinking, student characteristics, and the general nature of the teaching profession.

Unlike Esra who made no comments on curriculum knowledge, Merve emphasized this issue several times. For example, she shared how she advised mentees to consider what students had previously learned in middle school or earlier grades when planning high school lessons.

“For example, I tell them - when you’re teaching a topic in 10th grade, what have these students learned before? What did they learn in middle school? You need to know these too”.

Merve also made a comment about a mentee’s use of the board, referencing the code Instructional Materials and Technology (III.5). Moreover, both mentors reflected on student thinking and emphasized the importance of encouraging preservice teachers to consider students’ ideas. For instance, Esra remarked:

“Even though we talked about potential student questions and answers, we never discussed how the teacher should respond to those. It could be an opportunity to motivate the student - like saying ‘that’s a great idea’ - rather than just confirming whether it’s right or wrong”.

6.3.2. Post-Interviews

After the mentor training sessions were completed, final interviews were conducted to capture the mentors’ opinions, perspectives, and any changes in their mentoring practices.

In the final interview, mentors were asked to reflect on their overall experiences of working with pre-service teachers throughout the term and to describe the types of practices and activities they carried out. They were invited to share examples of mentoring practices they considered particularly effective and to explain how the practices they conducted supported the professional development of the pre-service teachers as effective mathematics teachers. Additionally, mentors were asked whether they worked with their pre-service teachers on various key areas, including the development of subject matter knowledge, instructional practices such as preparing activities, delivering lessons, and curriculum knowledge. Their interactions such as being a model for the mentee, sharing professional experiences, and providing feedback were also explored. Moreover, they were asked about their use of instructional materials and technology, as well as their approaches to understanding student thinking and identifying misconceptions. Finally, mentors were invited to comment on whether they had integrated any new practices into their mentoring as a result of the mentor training program, and whether there were any practices from this term they would like to continue or further develop in future mentoring experiences.

Within the framework of MAST Model, frequency tables which show themes and codes the mentor teachers emphasized in their statements was generated. Common and different themes and codes were examined, and the data for each of the three dimensions were evaluated separately.

6.3.2.1. Dimension I - Practicum Triad. Findings from the final interview indicated several differences in how mentors reflected on practicum processes and mentoring practices. While Esra did not mention the general operation of the practicum process, both Sevil and Merve shared their experiences on this topic. The most frequently addressed theme within the first dimension was Theme I.3: Role of Mentor and Mentoring Perspective. The frequency of codes from Merve ($f=6$) and Esra ($f=7$) were close to each other, while Sevil's frequency ($f=13$) was considerably higher than the others. Sevil particularly shared statements that provided insights into her mentoring approach, adopting a supportive stance that prioritized the mentee's learning and

practical experience. It was understood that he integrated several mentoring strategies simultaneously, such as being a role model, promoting reciprocal learning, and regularly tracking the mentee's development.

Table 6.21. Theme and code frequency table in dimension I after MeT-PD.

	Merve	Sevil	Esra
Dimension I -Practicum Triad	20	26	16
Theme I.1 Practicum Requirements	6	4	0
I.1.a Internship process	3	0	0
I.1.b School and mentor selection	1	0	0
I.1.c Preservice Teacher Doing Practices	1	2	0
I.1.d University- Mentor- Preservice Teacher Collaboration	1	2	0
Theme I.2 Expectations from PST	4	3	2
I.2.a Content Knowledge	0	0	1
I.2.b Pedagogical Knowledge	3	1	0
I.2.c Being Reflective Teacher	0	1	1
I.2.d Eager to Learn	1	1	0
Theme I.3 Role of Mentor and Mentoring Perspective	8	13	7
I.3.a: Mentoring perception	2	7	5
I.3.b Being an Example	2	2	1
I.3.c Requiring Practices	2	0	0
I.3.d Reciprocal Learning	1	1	1
I.3.e Tracking and Feedback	1	3	0
I.3.f Beliefs on Teacher Learning	0	0	0
Theme I.4 Expectations from Supervisor	0	0	0
Theme I.5 Mentor Characteristics and Selection	2	6	7
I.5.a Motivation	2	4	7
I.5.b Personal Attributes	0	2	0
I.5.c Professional Attributes	0	0	0
I.5.d Area Specialized Teaching Competency	0	0	0

Findings from the final interview indicated several differences in how mentors reflected on practicum processes and mentoring practices. While Esra did not mention the general operation of the practicum process, both Sevil and Merve shared their experiences on this topic. The most frequently addressed theme within the first dimension was Theme I.3: Role of Mentor and Mentoring Perspective. The frequency of codes from Merve ($f=6$) and Esra ($f=7$) were close to each other, while Sevil's frequency ($f=13$) was considerably higher than the others. Sevil particularly shared statements that provided insights into her mentoring approach, adopting a supportive stance that prioritized the mentee's learning and practical experience. It was understood that he integrated several mentoring strategies simultaneously, such as being a role model, promoting reciprocal learning, and regularly tracking the mentee's development.

Merve, on the other hand, displayed a mentoring approach centered on transferring all the knowledge and practices she possessed. She explained that she supported the mentees' learning by demonstrating various practices related to teaching as a profession. She also emphasized the importance of having pre-service teachers engage in lesson planning and teaching and stated that she closely monitored these processes.

Esra adopted an empathetic approach that prioritized the emotional experiences of the pre-service teachers. She highlighted the importance of learning through experience and emphasized that she did not guide the mentees through every situation, instead allowing them the freedom to find their own path in some cases. This reflects her mentoring stance as a guide rather than a direct role model.

“Because the reality is that they will eventually teach in classrooms. There will be situations like this, but still, I tried to hold myself back from giving everything at once - not to tell them everything but let them discover some things on their own too”.

Regarding mentoring motivation, Esra stated that her motivation stemmed from a sense of responsibility for the development of pre-service teachers and a personal desire to contribute to teacher education. Sevil explained that his motivation was influenced

by her own negative practicum experience, and that he aimed to offer better guidance so that her mentees could benefit more from the process.

“They had the chance to work with different teachers and observe various teaching styles. I think this was very valuable. For instance, when I was a pre-service teacher, I could only observe one teacher”.

Merve’s motivation, meanwhile, appeared to be a combination of supporting the professional development of the mentee and contributing to her own personal and professional growth through this mentoring experience.

In terms of expectations from pre-service teachers, Merve emphasized pedagogical knowledge, particularly the importance of adapting lessons to the students’ level and attracting their attention. Both Sevil and Merve highlighted the importance of the mentee being eager to learn. Esra, on the other hand, emphasized that the pre-service teachers lacked strong content knowledge, they needed to work on this area. Sevil also stressed the importance of pedagogical knowledge and being a reflective teacher for the pre-service teacher.

6.3.2.2. Dimension II - General Pedagogy. In the second dimension, which focused on general pedagogy, Merve was the mentor who emphasized this dimension the most (f=24), while the numbers of codes for the other two mentors were relatively close. This difference mainly stemmed from the Teaching Profession theme. Merve frequently shared that she involved pre-service teachers in various responsibilities such as attendance and duty and provided detailed information about teachers’ professional roles and responsibilities.

Table 6.22. Theme and code frequency table in dimension II after MeT-PD.

	Merve	Sevil	Esra
Dimension II – General Pedagogy	24	14	15
Theme II.1 Teaching Profession	10	2	0

Table 6.22 Theme and code frequency table in dimension II after MeT-PD. (cont.)

	Merve	Sevil	Esra
Theme II.2 Students' Characteristics	3	1	7
Theme II.3 Pedagogy of Teaching	1	4	2
II.3.a Observing Student Learning	0	0	0
II.3.b Teaching Strategies	0	3	1
Theme II.4 Assessment	5	3	0
Theme II.5 Classroom Management	5	3	6

Merve stated:

“During attendance, for example, if a mistake was made, it would not be crossed out. It would be initialed and corrected - they observed all these procedures”.

In the second theme, Students' Characteristics, Esra was the mentor who expressed the most views ($f=7$). As revealed in earlier interviews and sessions, one of the most prominent aspects of Esra's teaching and mentoring was her student-centered approach. A notable point here was that Merve, who had previously shared limited opinions on this theme in earlier sessions and interviews, mentioned it three times during the final interview. She stated:

“They realized that it's important to adapt to the students' level, to engage their attention, to maintain their interest throughout the lesson, and to behave according to the student, because what you have in your mind and what happens in the classroom often do not perfectly match”.

Within the Pedagogy of Teaching theme, all three mentors mentioned the importance of area-independent teaching skills. However, regarding Teaching Strategies, Merve did not make any comments, while Sevil made the highest number of contributions on this topic ($f=3$).

“In terms of teaching techniques as well, they got to see different methods - for example, using technology. They had no idea about TI before”.

All three mentors shared opinions about classroom management whereas on the assessment topic, Esra did not comment. She explained that, due to her school's rule of using standardized materials across all classes, she did not have the opportunity to conduct any assessment-related work with the pre-service teachers. However, she stated that for the next term, she plans to make mentees prepare non-graded activities such as exit card and homework.

6.3.2.3. Dimension III – Area-Specialized Teaching. Within the third dimension most mentioned theme was Mentor-Mentee Interaction. The emphasis placed by the mentors on this theme was quite similar, and all three mentors mainly discussed the importance of sharing experiences and providing feedback. While Sevil and Merve emphasized the practices they implemented to act as role models for the pre-service teachers, Esra did not mention such practices. Instead, reflection practices were prominent in her statements (f=5).

Notably, Merve made more references to Mentoring Practices about Teaching compared to the other mentors. This may be due to the fact that she worked with five pre-service teachers and gave them the opportunity to teach more lessons than the minimum requirement. She stated:

“I made them teach a lot”.

“They were really enthusiastic. For them, teaching practicum was almost equal to teaching a lesson. They were eager every time. If I allowed them, they would even ask for my other two hours of classes too”.

All mentors expressed views about the importance of content knowledge and how they supported the development of pre-service teachers' content knowledge. The emphasis was slightly higher for Esra (f=6) and Sevil (f=8) compared to Merve (f=4).

Regarding curriculum knowledge, Merve and Sevil made a similar number of comments. Merve shared that she frequently realized pre-service teachers did not know the

students' prerequisite knowledge or what would be covered next, and she guided them to examine the curriculum in detail. Sevil, on the other hand, mentioned that besides the national curriculum, their school implemented a different curriculum in which they teach higher level mathematics, and she provided opportunities for the mentee to experience both. Esra explained that they reviewed prior knowledge and subsequent topics before mentees implemented their lessons, and that she had previously taught her mentees where to access the official curriculum document.

Table 6.23. Theme and code frequency table in dimension III after MeT-PD.

	Merve	Sevil	Esra
Dimension III: Area-Specialized Teaching	48	57	44
Theme III.1 Content Knowledge	4	8	6
Theme III.2 Mentoring Practices about Teaching	14	8	10
III.2.a Teaching in the Authentic Context	5	4	2
III.2.b Designing and Implementing Instructional Tasks	3	1	2
III.2.c Evaluation, Reflection, Revision	3	1	4
III.2.d Conceptual Learning	2	1	3
III.2.e Teaching for Mathematical Skills	1	1	0
Theme III.3 Mentor-Mentee Interactions	18	18	20
III.3.a Modeling	2	3	0
III.3.b Mentor Sharing	6	5	7
III.3.c Designing and Implementing Together	1	2	2
III.3.d Reflection	2	1	5
III.3.e Feedback	7	7	6
III.3.f Balancing Intervention and Guidance	0	0	0
Theme III.4 Curriculum Knowledge	5	4	2
Theme III.5 Instructional Materials and Technology	5	9	3
Theme III.6 Student Ideas	2	10	3

In the Instructional Materials and Technology theme, all three mentors discussed the practices they conducted with their mentees. The notably higher frequency of

references made by Sevil (f=9) was mainly associated with the use of a graphing calculator (TI) as part of the advanced mathematics course. In this context, Sevil not only introduced the calculator to the mentee but also provided learning resources for self-study. The pre-service teacher was given the chance both to observe and to implement, delivering a lesson in which the graphing calculator was used.

In the final theme of this dimension, Understanding Student Thinking, all three mentors shared comments. Sevil's higher frequency of mentions was likely related to their department culture in which teachers make mathematical discussions including student reasoning. Additionally, since she was teaching advanced mathematics classes, she frequently informed the mentee about topics students typically struggled with, common misconceptions, and potential mistakes students might make.

7. DISCUSSION

In this section, the findings of the study will be discussed under three different headings: the MeT-PD Program, the mentoring practices of the mentors, and the mentoring perceptions of the mentors. The results are interpreted and supported in relation to the existing literature.

7.1. Mentoring Practices

The findings of this study reveal clear differences in how the three mentors approached mentoring, particularly in balancing general pedagogy, subject-specific pedagogy, and student thinking. These differences highlight the ways in which mentors' contexts, experiences, and priorities shaped their practices.

First, Merve's mentoring practices mainly emphasized general pedagogy, such as classroom management and professional responsibilities, while her guidance on subject-specific pedagogy and student thinking was less prominent. Although she reviewed lesson plans and provided feedback, her focus remained largely on ensuring coverage of the curriculum rather than developing mentees' capacity to interpret and use it effectively. This may partly stem from her working with a relatively large number of mentees, which led her to prioritize offering teaching opportunities over deep engagement with planning and student thinking. Such an emphasis limited opportunities for mentees to develop pedagogical content knowledge (PCK). As suggested by Appleton (2008) and Barnett et al. (2015), engaging with student misconceptions and thought processes is essential for building PCK. In this sense, Merve's practices demonstrate that simply reviewing lesson content without highlighting student thinking may not adequately prepare mentees for responding to learners' needs.

In contrast, both Esra and Sevil engaged more explicitly with subject-specific pedagogy and student thinking. Sevil tended to incorporate content-oriented discus-

sions, often encouraging mentees to design activities and questions that connected concepts to real-life contexts or multiple representations. Her emphasis on deep conceptual understanding appears to be related to the academic profile of her students, where mathematical reasoning and cause-effect relationships were highly valued. These practices resonate with Zubaidah et al. (2018), who found that co-planning lessons and reflecting on student responses support the development of PCK.

Esra, on the other hand, placed student thinking at the core of her mentoring. She consistently encouraged her mentees to reflect on students' misconceptions, strategies, and prior knowledge when analyzing lessons. By aligning discussions of content knowledge with students' characteristics, Esra modeled how to integrate curriculum knowledge with understanding of learners. This approach is supported by research highlighting that mentoring which prioritizes student thinking contributes not only to mentees' PCK but also to their ability to adapt instruction to diverse learners (Barnett et al., 2015).

Taken together, these findings suggest that mentors' professional contexts (e.g., number of mentees, student profiles) influenced their mentoring practices and shaped the extent to which mentees were exposed to content-specific and student-centered guidance. While Merve's emphasis on general pedagogy ensured broad teaching opportunities, it also risked limiting mentees' development of PCK. Conversely, Esra's and Sevil's practices demonstrated how integrating curriculum, content, and student thinking can foster deeper professional growth. Overall, this indicates that mentoring which deliberately balances general pedagogy with student-focused subject-specific guidance is more effective in supporting mentees' professional learning.

7.2. Mentoring Perception

The study showed that all three mentors entered the program with different initial perceptions of mentoring, but their understandings developed in meaningful ways throughout the process. Merve initially equated mentoring with simply providing

teaching experience and relied on external support to navigate the process. However, as the program progressed, she broadened her perception to include modeling, feedback, and professional responsibilities, illustrating how structured support can help first-time mentors expand their view of mentoring (Hudson, 2013).

Esra, by contrast, started the process with a reciprocal learning perspective and maintained this throughout, deepening her practice through reflective dialogue with mentees. This aligns with Smith and Nadelson's (2016) findings that mentoring enhances not only mentees' but also mentors' own professional growth. Similarly, Sevil entered the program with a broader conceptualization that encompassed professional responsibilities beyond teaching, and this orientation developed further as she integrated elements such as exam preparation and classroom dynamics. Her perception partly reflected the dimensions of the MAST model and Hudson's five-factor model, suggesting that even first-time mentors can hold complex understandings of mentoring when their own professional experiences are diverse.

Mentors' motivations also shaped their perceptions. While all three emphasized professional development as a key motivation (Luneta, 2006; Hudson, 2013), Sevil and Merve were driven by negative practicum experiences, aiming to ensure better opportunities for their mentees, aligning with findings by Iancu-Haddad and Oplatka (2009). Esra's motivation was derived from her positive experience of a collaborative school culture, which she aimed to transfer to her mentees, indicating the influence of prior experiences on mentoring orientations.

Overall, these findings suggest that first-time mentors' perceptions are dynamic, influenced by both personal experiences and professional development opportunities. Structured programs like MeT-PD appear to strengthen and expand these perceptions, while individual motivations play a key role in shaping how mentors frame their roles.

7.3. MeT-PD Program

The MeT-PD is a professional development program specifically designed to promote and sustain active participant interaction. Three types of interactions are important to online learning: learner-content interaction, learner-instructor interaction, and learner-learner interaction (Hu and Potter, 2012; Moore, 1989). The MeT-PD program aimed to promote these interactions in the following ways: by posing questions through Nearpod that required individual responses, by increasing participant interaction through small-group discussions; and by having the facilitators direct questions to the mentors, respond to their inquiries, and guide the discussions. Additionally, in each session, at least one case related to mentoring practices was presented and discussed to enhance participants' learning about mentoring practices. An advantage of using cases in this training might be that it creates an environment where participants feel more comfortable expressing their ideas (Jenkins *et al.*, 2010; Sampson, 2020). Also, situated learning theory suggests that knowledge is best acquired in authentic contexts where learners engage with real-life problems (Lave and Wenger, 1991). While participants analyzed case scenarios during the sessions, they also experienced similar situations with their mentees. They were encouraged to share these experiences with other participants during the program sessions. Also, this group of mentors can be associated with the concept of community of practice, defined by Wenger (1988) as having three dimensions: mutual engagement, joint enterprise, and a shared repertoire of practices. Mutual engagement is defined as the mutual relationships and interactions between participants that create a unified social group; joint enterprise or the shared purpose is that members are collectively committed to which in this case, the development of mentoring practices for this group. Whereas shared repertoire is the accumulated knowledge and resources developed and shared by the community in which participants shared their experiences, and they learned from each other, also they worked on some documents that could be a guide for mentors on issues like strategies to make mentees aware of student thinking.

Despite the fact that all three teachers participating in this study were first-time mentors and none had received any comprehensive mentoring training prior to this program, their levels of participation in the sessions varied. When participation is considered in two dimensions — (1) attendance in the sessions and (2) contribution to the discussions during the sessions — it was observed that while Esra attended all sessions, Merve missed one session, and Sevil was unable to attend four sessions due to personal reasons. When we examined the video transcripts and Nearpod records to understand the mentors' participation in large-group discussions, individual question responses via Nearpod, and small-group activities, we found that Esra actively participated in all three areas throughout all sessions. Similarly, Sevil also played an active role in both individual and group activities in the sessions she attended. On the other hand, overall, Merve showed limited participation in these activities. In the mid-program interview, she explained this by saying that she preferred to listen to other participants first, and sometimes, felt that the answers she had in mind did not align with those shared by others. However, she expressed that she learned a lot about mentoring from those responses and discussions. She also frequently mentioned that when paired with a more experienced mentor in small-group activities, she chose to listen to their ideas and benefited from their insights. This suggests that similar to the master-apprentice approach she would adopt in her own mentor-mentee relationship, she may have established a similar dynamic here by positioning herself as the apprentice within a master-apprentice relationship formed with more experienced participants.

Merve had two more colleagues participated in MeT-PD, and she emphasized in the some of the sessions and interviews that her colleagues gave her support in mentoring process especially the one who mentored before. Garet et al. (2001) offered a framework for creating effective professional development program, it was asserted teachers from the same school or department encourages a culture of collaboration and shared learning which support their professional development. Like Merve, Esra also had a colleague in the program, but they did not collaborate. Collaboration of Merve with her colleague was probably related to the school culture rather than MeT-PD.

8. CONCLUSIONS AND IMPLICATIONS

This study explored how three first-time mathematics mentor teachers' practices and perceptions evolved during a nine-week professional development program (MeT-PD). The findings revealed that mentors' approaches varied, yet all experienced growth in how they understood and enacted mentoring. Their perceptions shifted from limited views such as providing teaching experience only to broader understandings that included feedback, professional responsibilities, and reciprocal learning.

A key conclusion is that mentors' contexts and prior experiences strongly shaped both their practices and perceptions. While workload and student profiles influenced the focus of mentoring, structured professional development provided opportunities to expand perspectives. The study also shows that emphasizing student thinking is central for developing preservice teachers' pedagogical content knowledge, suggesting that mentoring programs should go beyond classroom management and lesson planning to include strategies for engaging with student reasoning.

Mentors' motivations ranging from professional growth to improving mentees' practicum experiences intersected with their evolving perceptions. Past experiences, whether negative or positive, shaped how mentors framed their roles, confirming findings in earlier research.

Overall, the study highlights that mentoring is a dynamic process, influenced by both individual and institutional factors. For teacher education, the results imply that targeted, subject-specific professional development can strengthen mentors' capacity to guide preservice mathematics teachers. Practical steps include integrating student thinking into mentor preparation, fostering reciprocal learning, and providing institutional support to enable deeper engagement with mentees.

9. LIMITATIONS AND SUGGESTIONS

This study has several limitations that should be acknowledged. First, part of the data was derived from group discussions rather than individual statements. While collaborative settings can encourage the sharing of diverse ideas, they may also blur individual perspectives. As a result, the findings may not fully capture the unique voices of each mentor but rather reflect collective contributions.

Second, the participants were not present in every professional development session. Their occasional absence meant that some experiences and reflections were missed, which may have influenced the depth and continuity of the data. Moreover, the mentoring practices described in this study were primarily self-reported. Direct classroom observations or recordings of mentoring interactions were not included; therefore, it was not possible to fully verify the actual mentoring practices.

Third, all three mentors voluntarily enrolled in the MeT-PD program and were serving as mentor teachers for the first time. Their high level of motivation and willingness to participate may have positively influenced the outcomes. Future studies could include randomly selected mentor teachers to account for varying levels of motivation and prior mentoring experience.

Finally, the small number of participants and the specific focus on mathematics limit the generalizability of the findings. Broader studies involving larger samples and multiple subject areas would provide a more comprehensive understanding of mentoring practices.

Based on these limitations, several suggestions can be made for future research. Studies could adopt a multi-perspective design by collecting data not only from mentors but also from preservice teachers, using pre-, mid-, and post-interviews with both parties. This would allow mentoring practices to be explored from complementary

viewpoints. Additionally, incorporating direct observations of mentoring sessions could provide richer insights into actual practices beyond self-reports.

Lastly, the findings indicate that the MAST Model offers a strong alternative to the current mentoring framework in Türkiye. Future research could test its applicability across different contexts, school settings, and subject domains to further validate its effectiveness.



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APPENDIX A: INTERVIEW PROTOCOL

This protocol includes the purposes and descriptions of the pre-, mid-, and post-interviews to guide the data collection process.

Mentör Öğretmen Bireysel Ön Görüşme Soruları

Amaç: MÖGP'e katılan öğretmenlerin alan eğitiminde etkili mentörlük üzerine

(i) görüşleri-anlayışlarındaki ve (ii) uygulamalarındaki değişimi yakalamak.

Mentör Öğretmen Mesleki Gelişim Programı (MÖGP) katılmayı kabul ettiğiniz için teşekkür ederiz.

- (i) Sizi tanımak istersek kaç yıldır öğretmenlik yapıyorsunuz ve bu sürenin ne kadarında öğretmenlik adaylarına mentörlük yaptınız?
- (ii) Bu dönem staj öğrenciniz olacak mı? Onlarla tanıştınız mı? Nasıl geçti ilk tanışma?
- (iii) Staja gelen matematik öğretmen adaylarının iyi birer öğretmen olabilmeleri için dönem içinde onlarla ne tür uygulamalar yapmayı düşünüyorsunuz?

Bize sormak istediğiniz veya öneride bulunmak istediğiniz bir konu var mı? Zamanınız için teşekkür ederiz.

Mentör Öğretmen Bireysel Ara Görüşme Soruları

Amaç: MÖGP'e katılan öğretmenlerin alan eğitiminde etkili mentörlük üzerine

- (i) görüşleri-anlayışlarındaki
- (ii) uygulamalarındaki değişimi yakalamak
- (iii) çevrimiçi mesleki gelişim programı etkinliği (etkileşim ve iş birliği)

Mentör Öğretmen Mesleki Gelişim Programı (MÖGP) katılmayı kabul ettiğiniz için teşekkür ederiz.

- (i) Bu dönem öğretmen adayları ile nasıl gidiyor? Şu ana kadar ne tür çalışmalar yaptınız?
- (ii) Öğretmen adayları ile yaptığınız çalışmaların, onların iyi birer matematik öğretmeni olmaları için nasıl destek olduğunu düşünüyorsunuz?
- (iii) Öğretmen adayları ile yaptığınız çalışmaları düşündüğünüzde, daha önceki yıllar ile ne tür benzerlikler ve farklılıklar var? Farklılıklar varsa bunların sebebi ne olabilir?

Bize sormak istediğiniz veya öneride bulunmak istediğiniz bir konu var mı? Zamanınız için teşekkür ederiz.

Mentör Öğretmen Bireysel Son Görüşme Soruları

Amaç: MÖGP'e katılan öğretmenlerin alan eğitiminde etkili mentörlük üzerine

- (i) görüşleri-anlayışlarındaki
- (ii) uygulamalarındaki değişimi yakalamak
- (iii) çevrimiçi mesleki gelişim programı etkinliği (etkileşim ve iş birliği)

Mentör Öğretmen Mesleki Gelişim Programı (MÖGP) katılmayı kabul ettiğiniz için teşekkür ederiz.

- Bu dönem öğretmen adayları ile nasıl geçti? Onlarla ne tür çalışmalar yaptınız?
- Etkili mentörlük olduğunu düşündüğünüz bir örnek uygulama/çalışma paylaşıyor mısınız?
- ÖA Yoksa: adayınız yok biliyorum, adayınız olursa ne tür çalışmalar yapmış olurdunuz neler planlıyorsunuz?

- Öğretmen adayları ile yaptığınız çalışmaların, onların etkili birer matematik öğretmeni olmaları için nasıl destek olduğunu düşünüyorsunuz?
- Öğretmen adaylarıyla yaptığınız çalışmaların şu konularda çalışmalar yaptıysanız açıklar mısınız?
- Alan bilgisi gelişimi (mat/fkb bilgisi)
- Öğretim üzerine uygulamalar
- etkinlik hazırlama
- öğretim yapma, ders anlatma
- özdeğerlendirme,
- kavramsal öğrenme, matematiksel becerilerin öğretilmesi
- Öğretmen adayı ile etkileşiminiz
- model olma,
- paylaşım yapması,
- birlikte tasarlama ve uygulama,
- Dönüt
- müdahale-yönlendirme dengesi,
- yansıtma yapma
- Öğretim Programları
- Araç-gereç teknoloji kullanımı
- Öğrenci düşüncesini anlama, kavram yanlışlarını anlayabilme
- Öğretmen adayları ile yaptığınız çalışmaları düşündüğünüzde, daha önceki yıllar ile ne tür benzerlikler ve farklılıklar var? Farklılıklar varsa bunların sebebi ne olabilir?
- Gelecek sene tekrar öğrenciniz olsa bu dönemden devam etmek istediğiniz bir uygulama
- ÖA Yoksa:MÖGP'e katılmadan önceki düşüncelerinizi hatırlamaya çalışırsanız, MÖGP'e şu ana kadar katılınca stajyeriniz olsaydı neleri farklı yapmış olurdunuz acaba?

Bize sormak istediğiniz veya öneride bulunmak istediğiniz bir konu var mı? Zamanınız için teşekkür ederiz.

APPENDIX B: THE MAST MODEL CODE BOOK

This codebook outlines the themes and codes applied in the analysis, with explanations to support consistent interpretation.

B.1. I. BOYUT -ÜÇLÜ İŞBİRLİĞİ

ETALEM'in ilk boyutu olan Üçlü İşbirliği- Triad stajın genel sürecini ve bu süreçteki üç temel aktörün rollerini, onlardan beklenenleri ve bütünsel ilişki kadar onların ikili ilişkilerini tanımlamaktadır. Bu boyut altında beş tema yer almaktadır: Staj Süreci, ÖA Beklentiler ve Özellikler, Mentörün Rolü ve Mentörlük Anlayışı, Süpervizör Beklentileri, Mentör Özellikleri ve Seçimi

Tema I.1: Staj Süreci: Staj süreci staja hazırlık ve staj sırasında gerçekleştirilen işlemler.

Kod I.1.a: Süreç işleyişi

- Bakanlık, üniversite ve uygulama okulu iş birliği ile öğretmenlik uygulaması sürecindeki genel (idari/akademik) işleyiş.
- Staj başlangıcında bir tanışma görüşmesi yapılması ve adayın okuldaki tüm paydaşlar ile tanıştırılması
- Adayda okula aidiyet duygusunun geliştirilmesi için mentör öğretmen tarafından gerekli uygulamaların staj başında ve sırasında yapılması
- Birden fazla akademik dönem içeren uzun süreli öğretmenlik uygulaması ile mentör ve aday öğretmen arasında verimli bir ilişkinin inşa edilmesi
- Adayın staj sürecinde uygulama okulunda daha fazla vakit geçirebilmesine olanak sağlanması
- Adayın staj sürecinde daha fazla uygulama yapmasına olanak sağlanması

- Adayın ders anlatımı öncesi ve sonrasında mentör öğretmen ile geri dönüte dayalı toplantıların düzenli olarak yapılması
- Mentör öğretmen tarafından adayın takibinin düzenli olarak yapılması ve MEBBİS sistemine işlenmesi

Kod I.1.b: Okul ve Mentör Seçimi

- Öğretmenlik uygulaması kapsamında okul ve mentör öğretmen ataması için karar verme mekanizmasının genel yapısı ve idari işleyişi.
- Staja hazırlık sürecinde okul ve mentör öğretmen seçiminin mentörlerin ders ve idari yükleri gözetilerek yapılması
- Mentör öğretmenin öğretmen adayına daha fazla zaman ayırabilmesi (evrak işlerinin fazla olmasından dolayı) mentörlerin iş yükünün hafifletilmesi
- Öğretmen adaylarının staj sürecinde farklı uygulama okulları görmesine olanak sağlanması
- Mentör öğretmene kapsamlı bir mentörlük eğitiminin verilmesi
- Mentör öğretmen seçimi için belirli kriterlerin belirlenmesi ve mentör öğretmen seçiminin bu kriterler göz önünde bulundurularak yapılması

Kod I.1.c: Öğretmen Adayı (ÖA) Uygulamaları

- Öğretmenlik uygulaması boyunca öğretmen adayının uygulama okulunda yapması gereken gözlem, planlama, ders anlatımı ve yansıtma gibi temel uygulamalar.
- Öğretmen adayının plan-uygulama-değerlendirme döngüsü kapsamında çalışmalar yürütmesi
- Öğretmen adayına ders gözlemi yapması için fırsat sağlanması
- Öğretmen adayının stajın ilk haftalarından itibaren ders anlatımı yapması ve ders anlatımlarının mentör öğretmen ve/veya süpervizör tarafından gözlemlenmesi

- Öğretmen adayına farklı mentor öğretmenlerle çalışma fırsatının sağlanması

Kod I.1.d: Süpervizör-Mentör-ÖA işbirliği

- Uygulama boyunca, mentor öğretmen, öğretmen aday ve süpervizörün gerekli işbirliğini sağlayarak birlikte çalışması.
- Staj kapsamında yapılan uygulamalar mentor öğretmen, öğretmen aday ve süpervizör işbirliğinde ortak bir program dahilinde gerçekleştirilmesi
- Mentor öğretmen ve süpervizör arasında sürekli ve etkili iletişim kurulması
- Süpervizörün uygulama okulundaki süreçte dahil olması ve aday öğretmenin ders anlatımlarını gözlemlemesi

Tema I. 2: ÖA beklentiler: staj öncesinde ve süreçte profesyonel kimlik/kişilik ile ilişkili genel beklentiler

Kod I.2.a: Alan bilgisi

- Öğretmen adayının gerekli alan bilgisine hakim olması üzerine beklentiler.
- Öğretmen adayının öğretim programında yer alan içeriğe hakim olması
- Öğretmen adayının uygulama için gerekli becerilere sahip olması (laboratuvar becerileri vs.)

Kod I.2.b: Pedagojik bilgi

- Öğretmen adayının gerekli genel pedagojik bilgiye (öğrenciyi tanıma, iletişim, sınıf yönetimi, sınıf hakimiyeti, zaman kullanımı vb.) hakim olması üzerine beklentiler.

- Öğretmen adayının temel düzeyde de olsa alana özgü konu ve kavramların öğretimine yönelik deneyim sahibi olması
- Öğretmen adayının öğretim etkinliklerinde teknolojiyi etkin ve verimli kullanması
- Öğretmen adayının öğretim yöntem çeşitliliğine sahip olması ve derslerde kullanma konusunda istekli olması
- Öğretmen adayının öğrenci seviyesine uygun ders planı hazırlayabilmesi
- Öğretmen adayının öğrenci seviyesine uygun materyal hazırlayabilmesi
- Öğretmen adayının öğrenci ile iletişiminin güçlü olması

Kod I.2.c: Yansıtıcı öğretmen olma

- Öğretmen adayının öğretmenlik mesleği önemseme, gelişime açık olma, dönüt veren ve dönütü alarak yansıtıcı düşünme becerisine sahip olması üzerine beklentiler.
- Öğretmen adayının dönüte açık olması
- Öğretmen adayının öğrenmeye ve gelişime açık olması
- Öğretmen adayının iletişime açık olması
- Öğretmen adayının kendi ders anlatımları ve/veya ders gözlemlerine ilişkin kanıta dayalı spesifik değerlendirmeler yapması
- Öğretmen adaylarının birbirlerini değerlendirmesi
- Öğretmen adaylarının öz değerlendirme yapması
- Öğretmen adayının yansıtıcı düşünme becerisine sahip olması
- Öğretmen adayı ve mentor öğretmenin yansıtıcı düşünme odaklı ders değerlendirmesi yapması

Kod I.2.d: Öğrenmeye Açık sorumluluklarını bilen

- Öğretmen adayının staj sürecinde öğrenmeye açık, meraklı ve işbirlikçi olması üzerine beklentiler.
- Öğretmen adayının öğrenmeye açık olması

- Öğretmen adayının öğretme işini öğrenmeye istekli olmalı
- Öğretmen adayının soru sormaktan ve yargılanmaktan çekinmemesi
- Öğretmen adayının sürece devamlılık ve süreç ile ilgili sorumluluklarını yerine getirme konusunda dikkatli olması
- Öğretmen adayının özgüvenli olması
- Öğretmen adayının staj sürecini ciddiye alması
- Öğretmen adayının öğretmenlik mesleğinin bütün sorumluluklarının farkında olması

Tema I.3: Mentörün Rolü ve Mentörlük Anlayışı: mentörlerin rolü, mentörlüğün alan eğitiminden bağımsız genel özellikleri, ÖA ile ilişkileri ve süreci nasıl yönetecekleri

Kod I.3.a: Mentörlük yaklaşımı

- Mentör öğretmenin mentörlük kavramına genel yaklaşımları ve bu yaklaşımlar doğrultusunda öğretmen adayı ile ilişkileri.
- Mentör öğretmen öğretmen adayı ile empati kurması
- Mentör öğretmenin öğretmen adayına destek olması
- Mentör öğretmenin öğretmen adayı üzerinde rahatlatıcı bir etkiye sahip olması
- Mentör öğretmenin öğretmen adayının mesleki gelişimini desteklemesi
- Mentör öğretmenin öğretmen adayına paylaşımlarda bulunması
- Mentör öğretmenin öğretmen adayı ile profesyonel bir düzeyde etkileşimi olması

Kod I.3.b Örnek Olma

- Mentör öğretmenin, staj sürecinde öğretmen adayına mesleki anlamda örnek olması adına yürüttüğü uygulamalar.
- Öğretmen adayının mentör öğretmeni izleyerek öğrenmesi

- Öğretmen adayının mentör öğretmeni öğretmenlik mesleğinin tüm boyutları için rol model alması (öğrenci ile ilişkileri, sınıf içindeki ve dışındaki davranışları vb.)
- Mentör öğretmen sınıf içi ve dışı uygulamalarının aday tarafından örnek alınması

Kod I.3.c Uygulama Fırsatları

- Mentör öğretmenin öğretmen adayına uygulama yapabilmesi için olanak sunması.
- Öğretmen adayının mentör öğretmen tarafından öğretim sürecine dahil edilmesi
- Öğretmen adayının kendi öğretim yöntemini bulması adına mentör öğretmen tarafından adaya uygulama fırsatı sunulması
- Mentör öğretmenin farklı öğretim yöntemleri kullanmalarında öğretmen adaylarına destek olması

Kod I.3.d Mütalaa ile Karşılıklı Öğrenme

- Mentör öğretmenin, öğretmen adayı ile yapacağı çalışmaların karşılıklı öğrenme ve mütalaa üzerine dayandırılması.
- Staj sürecinde, mentör öğretmen ile öğretmen adayının fikir mütalaasında bulunması
- Staj sürecinde, mentör öğretmen ile öğretmen adayının arasında karşılıklı öğrenme ortamının inşa edilmesi
- Staj sürecinde, mentör öğretmen ile öğretmen adayı arasında karşılıklı paylaşımların yapılması

Kod I.3.e: Takip ve Dönüt

- Mentör öğretmenin öğretmen adayının öğrenme sürecini takip etmesi ve öğretmeyi öğrenme süreci üzerine dönüt vermesi.
- Mentör öğretmenin adayın gelişimini bireysel olarak takip etmesi
- Mentör öğretmenin öğretmen adayına zamanında dönüt vermesi
- Mentör öğretmenin adaya verdiği dönütün takibini yapması

Kod I.3.f Öğretmen Öğrenmesi Görüşler

- Mentör öğretmenin öğretmen öğrenmesi üzerine kuramsal yaklaşımların farkında olması ve uygun olan yaklaşımları öğretmenlik uygulaması sırasında öğretmen adayını mesleki anlamda desteklemek adına kullanması: teoriyi pratik ile bütünleştirme, beklenmedik durumlara hazırlık, fark etme/yansıtma.

Tema I.4: Üniversite Staj İşleyişi

Kod I.4.a Süpervizör beklentileri

- Mentör öğretmenin, süpervizör ile arasındaki iletişim ve işbirliğinin kuvvetlendirilmesi için üniversite ve süpervizörden beklentileri.
- Süpervizör ile mentör öğretmen arasında ortak öğretmen yetiştirme planının olması
- Staj sürecinde süpervizörün uygulama okuluna gelmesi
- Mentör öğretmen ile süpervizör arasındaki ilişkinin kuvvetlendirilmesi
- Süpervizörün, öğretmen adaylarının geliştirilmesi gereken yönler hakkında bireysel olarak mentörü bilgilendirmesi
- Süpervizörün mentör öğretmenden beklentilerini açık bir şekilde ifade etmesi
- Mentör öğretmenler üniversitede öğretmen adayına verilen eğitim hakkında bilgi sahibi olması.

Kod I.4.b Öğretmenlik uygulaması dersi gereklilikleri

Tema I.5: Mentör Özellikleri ve Seçimi, Öğretmenlerin arasından mentör seçimi yapılırken dikkat edilmesi gereken hususlar bu tema altında toplanmıştır. Mentör özellikleri net olmalı, öğretmenlikten ayrışmalı.

Kod I.5.a Motivasyon

- Mentör öğretmenin mentör olmak için sahip olması gereken içsel ve dışsal motivasyon kaynaklarını kapsar.
- Mentör öğretmenin bu işi isteyerek ve gönüllü olarak yerine getirmesi
- Motivasyon kaynakları: kendi mentörlük deneyimleri, adaylara yardımcı olma isteği, tecrübe aktarma isteği, ülkeye hizmet, sorumluluk hissetme, bölüm başkanı yap der yaparsın, devlete borç olarak görme

Kod I.5.b Kişisel özellikler

- Mentör öğretmenin öğretmenlik özelliklerinin dışında sahip olması gereken genel kişilik özelliklerini kapsar.
- Mentör öğretmenin paylaşımcı ve deneyimli olması
- Mentör öğretmenin iletişiminin güçlü olması
- Mentör öğretmenin yeni yöntem ve teknikleri deneyimlemeye açık olması,
- Mentör öğretmenin rehber olması,
- Mentör öğretmenin araştırmacı bir kişiliğe sahip olması,
- Mentör öğretmenin yapıcı ve motive edici olması,
- Mentör öğretmenin iyi bir gözlemci olması ve öğretmen adayının ihtiyaçlarını açık bir şekilde belirleyebilmesi
- Mentör öğretmenin sorumluluk sahibi ve planlı olması,
- Mentör öğretmenin sabırlı ve güvenilir olması

- Mentör öğretmenin iletişime açık olması
- Mentör öğretmenin destekleyici olması
- Mentör öğretmenin iyi niyetli ve yardımsever olması

Kod I.5.c Mesleki özellikler

Mentör öğretmen olabilmek için gerekli motivasyon ve kişisel özellikler haricinde mentör öğretmenin sahip olması beklenen genel mesleki özellikleri kapsar.

- Mentör öğretmenin deneyimli olması
- Mentör öğretmenin sınıf içi etkileşiminin güçlü olması
- Mentör öğretmenin mesleki paylaşıma (yöntem, teknik vb.) açık olması
- Mentör öğretmenin teknolojiyi sınıf içinde kullanabilecek donanıma (teknik-pedagojik) sahip olması
- Mentör öğretmenin teknolojik gelişmeleri takip etmesi
- Mentör öğretmenin sınıf ve zaman yönetiminde iyi olması
- Mentör öğretmenin öğrenciyi odaklı (öğrenciyi iyi tanımalı, derse motive etmeli) bir öğretim strateji izliyor olması
- Mentör öğretmenin planlı ve programlı olması

Kod I.5.d Alan Öğretimi Donanımı

Mentör öğretmenin sahip olması gereken alan öğretimi özelliklerini kapsar.

- Mentör öğretmenin öğretim müfredatına hakim olması
- Mentör öğretmenin alan bilgisinin iyi olması
- Mentör öğretmenin matematiğin değeri ve öneminin farkında olması
- Mentör öğretmenin güncel bilgileri takip etmesi

- Mentör öğretmenin disiplinler arası düşünebilmesi
- Mentör öğretmenin teknoloji kullanımında yetkin olması

B.2. II. BOYUT- GENEL PEDAGOJİ

ETALEM kapsamında, öğretmen adaylarının öğretmenliği öğrenmesi için etkili mentörlük uygulamaları arasında pedagojik bilgi boyutu yer almaktadır. Bu boyutta ÖA'larına alan eğitimi deneyimleri ile sınırlı olmayan öğretmenliğe özgü öğrenme deneyimleri sunulması bulunmaktadır. Bu bilgi-becerilerin gelişmesi için etkili mentörlük uygulamaları dört tema altında toplanmıştır: Öğrenciyi Tanıma, Genel Öğretim Pedagojisi, Ölçme-Değerlendirme, Sınıf Yönetimi.

Tema II.1: Mesleği Tanıma

- Mentör öğretmenlerin öğretmen adaylarının genel anlamda öğretmenlik mesleğini tanımaları için yaptığı uygulamaları kapsar.
- Mentör öğretmenin öğretmenlik mesleği ve okulun işleyişi (idari işler) hakkında adaylara genel bilgilendirme toplantısı yapması
- Öğretmen adaylarının MEB işleyişi konusunda bilgilendirilmesi
- Öğretmen adaylarının okul yönetimi görev ve sorumlulukları hakkında bilgilendirilmesi
- Öğretmen adaylarının mesleki hak ve sorumluluklarının tanıtılması
- Öğretmen adaylarına zümre yapısının ve çalışmalarının deneyimlettirilmesi
- Öğretmen adaylarının sınıf dışı akademik ve idari etkinliklere katılabilmesi için fırsat sunulması
- Öğretmen adayına veli ile iletişimi gözlemlene fırsatı sunulması

Tema II.2: Öğrenci Özelliklerini Bilme

- Mentör öğretmenin öğretmen adayının öğrenci özellikleri tanınması için yapılan uygulamalar.
- Mentör öğretmenin öğretmen adayının uygulama yapacağı sınıfın dinamiği ve öğrenci yaşının özellikleri hakkında bilgi ve tecrübe paylaşımında bulunması
- Mentör öğretmenin öğretmen adayına öğrenciye nasıl ulaşabileceği ve konuşabileceği konusunda yol göstermesi

Tema II.3: Öğretim Pedagojisi: Bu tema öğretmen adaylarının alan bağımsız genel pedagojik donanımlarını geliştirme amaçlı yapılan mentörlük faaliyetleri kapsamaktadır.

Kod II.3.a Öğrenci öğrenmesini gözlemleme

- Mentör öğretmenin, öğretmen adayının öğrenci öğrenmesini gözlemlemesine olanak sağlayan uygulamaları kapsar.
- Öğretmen adaylarının öğrencileri gözlemleyebilmesi için olanak sunulması
- Öğretmen adaylarının temel düzeyde öğrenci öğrenmesini gözlemlemesi
- Öğretmen adaylarının farklı sınıf düzeylerini gözlemesi
- Öğretmen adaylarının aynı öğrenci grubunu farklı branşlarda gözlemlemesi
- Öğretmen adaylarının öğrencilerin ihtiyaçlarının ve kavram yanılgılarının farkına varması
- Öğretmen adaylarının öğrenmeye ilişkin temel durum/sorunları deneyimlemesi

Kod II.3.b: Öğretim stratejileri

- Mentör öğretmenin, öğretmen adayının farklı öğretim strateji/ yöntem/ tekniklerini gözlemlemek ve etkililiklerini değerlendirmek için yaptığı uygulamaları kapsar.

- Mentör öğretmenin ders anlatımı sırasında geleneksel öğretim stratejilerinden (formül verip soru çözmek) uzaklaşarak farklı öğretim stratejileri (konuyu kurgulama, oyunlaştırma, öğrenciye soru sorma, günlük hayat örneği kullanma, akran eğitimi gibi) kullanması ve öğretmen adayının gözlemlemesi
- Mentör öğretmenin öğretmen adayına gözlemlediği farklı öğretim strateji/ yöntem/ tekniklerini uygulamak için olanak sağlaması

Kod II.3.c: Tüm alanlarda öğretim becerileri

- Mentör öğretmenin, öğretmen adayının öğretmenlikte branş bağımsız uygulamaları gözlemlemesine fırsat tanımak için yaptığı uygulamaları kapsar.
- Öğretmen adayının farklı branşlardan öğretmenlerin derslerini gözlemlemesi
- Öğretmen adayının farklı sınıf seviyelerinde ders gözlemi yapması
- Öğretmen adayının öğretmeye ilişkin temel durum ve sorunları deneyim etmesi

Tema II.4: Ölçme-Değerlendirme

- Mentör öğretmenin, öğretmen adayının geleneksel ve alternatif ölçme ve değerlendirme yaklaşımlarını deneyimlemelerine fırsat sunacak uygulamaları kapsar.
- Mentör öğretmenin öğretmen adayına ölçme değerlendirme konusunda deneyim kazanması için sınav kağıdı hazırlama ve okuma gibi uygulamalar yapmasına fırsat tanınması
- Mentör öğretmenin öğretmen adayına ölçme değerlendirme konusunda deneyim kazanması için ödev hazırlama ve okuma gibi uygulamalar yapmasına fırsat tanınması

Tema II.5: Sınıf Yönetimi

- Mentör öğretmenin, öğretmen adayının sınıf yönetiminin temel öğelerine odaklanmalarını sağlamaya yönelik uygulamalarını kapsar.
- Mentör öğretmenin, öğretmen adayına çeşitli sınıf düzeyi ve öğrenme ortamlarında (laboratuvar, kütüphane) sınıf yönetimi tekniklerini uygulaması ve akran gözlemi yapması için fırsat vermesi
- Öğretmen adayı ile öğrencinin dikkatini toplama üzerine uygulama yapılması
- Öğretmen adayı ile zamanın etkili kullanımı üzerine uygulama yapılması
- Öğretmen adayı ile sınıf içi etkileşimi değerlendirme üzerine uygulama yapılması

B.3. III. BOYUT- ALANA ÖZGÜ ÖĞRETİM

Bu boyutta ÖA'larının alana özgü öğretimi öğrenmesi, pedagojik alan bilgisinin nasıl geliştirilebileceği üzerine mentör öğretmenin yapması gereken uygulamalar yer almaktadır. Bu boyut beş temadan oluşmaktadır: Öğretim Üzerine Uygulamalar, Mentör-Öğretmen Adayı Etkileşimleri, Öğretim Programı Bilgisi, Araç-Gereç ve Teknoloji Kullanımı, Öğrenci Düşüncesini Anlama/ Kavram Yanılgıları.

Tema III.1: Alan Bilgisi:

- Mentör öğretmenin, öğretmen adaylarının alan bilgisini geliştirmeye yönelik yaptığı uygulamaları kapsar.
- Mentör öğretmenin öğretmen adayının alan bilgisini tamamlaması amacıyla çeşitli uygulamalar yapması
- Mentör öğretmenin öğretmen adayının doğru matematiksel/bilimsel dili kullanması amacıyla çeşitli uygulamalar yapması

- Mentör öğretmenin öğretmen adayının öğrenci kavram yanılgıları konusunda bilgi kazanması amacıyla çeşitli uygulamalar yapması
- Mentör öğretmenin öğretmen adayını zümre toplantılarına dahil etmesi

Tema III.2: Öğretim Üzerine Uygulamalar: Etkili mentörlük için öğretmen adaylarının mutlaka öğretim yapımları ama bunun tek başına değil de bir öğrenme deneyimi halinde sunulması bu tema altında yer almaktadır.

Kod III.2.a: Öğretim Dinamiği /Practices of Instruction

- Mentör öğretmenin, öğretmen adaylarının sınıf içi alan öğretimi yeterliliklerini geliştirmeye yönelik yaptığı uygulamaları kapsar.
- Mentör öğretmenin öğretmen adayına ders planlanması, uygulaması ve değerlendirmesi için olanak sunması
- Öğretmen adayının birden fazla ders planı hazırlaması
- Öğretmen adayının birden fazla ders anlatımı yapması
- Öğretmen adayının birden fazla kez ders değerlendirmesi yapması
- Mentör öğretmenin öğretmen adayının hazırladığı ders planına ne derece uyduğunun takibini yapması

Kod III.2.b: Deney/Etkinlik Tasarımı ve Uygulanması

- Mentör öğretmenin, öğretmen adayının deney/etkinlik tasarlayıp uygulayabilmesi üzerine yaptığı uygulamaları kapsar.
- Mentör öğretmenin öğretmen adayına etkili deney/etkinlik tasarımı konusunda önemli noktalara değinerek yol göstermesi (basitten zora doğru, sınıf ve öğrenci düzeyinin dikkate alınması vb.)
- Mentör öğretmenin öğretmen adayı ile birlikte etkinlik/deney tasarlaması
- Mentör öğretmenin, öğretmen adayına çevrimiçi uygulamaları da kapsayan deney/ etkinlik tasarlamasına olanak sunması

- Mentör öğretmenin, öğretmen adayına çevrimiçi uygulamaları da kapsayan deney/ etkinlik uygulamasına olanak sunması

Kod III.2.c: Regulation of Instructional Practice (Öz) değerlendirme- Yansıtma- Düzenleme

- Mentör öğretmenin, öğretmen adayının öğretmenlik uygulamasında özdeğerlendirme-yansıtma ve düzenleme yapabilmesi üzerine yaptığı uygulamaları kapsar.
- Mentör öğretmenin, öğretmen adayına kendi ders anlatımı üzerine özdeğerlendirme yapmasına destek olması
- Mentör öğretmenin öğretmen adayına kendi ders anlatımı üzerine yüzeysel olmayan yansıtma yapmasına destek olması
- Mentör öğretmenin öğretmen adayına kendi ders anlatımı üzerine düzeltme yapmasına destek olması
- Mentör öğretmenin öğretmen adayına sınıfta içinde gerçekleşen durumları neden-sonuç ilişkisi çerçevesinde değerlendirmesine destek olması

Kod III.2.d: Kavramsal Öğrenme

- Mentör öğretmenin öğretmen adayının kavramsal öğrenme odaklı öğretim yapabilmesi amacıyla yaptığı uygulamaları kapsar.
- Mentör öğretmenin, öğretmen adayında kavramsal öğrenmeye yönelik farkındalık yaratması
- Mentör öğretmenin, öğretmen adayının öğrencilerle kavram yanılgıları üzerine tartışmanın önemini fark etmesini sağlama

Kod III.2.e: Matematiksel Süreç Becerileri

- Mentör öğretmeninin öğretmen adayının matematiksel süreç becerileri odaklı öğretim (akıl yürütme- ispat öğretimi) yapabilmesi amacıyla yaptığı uygulamaları kapsar.

Tema III.3: Mentör - ÖA etkileşimleri: Mentör öğretmenlerin, ÖA'ların alan öğretimini öğrenme süreçlerinde onlarla yaptıkları etkileşim ve doğası; yapılan çeşitli uygulamaların “nasıl” yapıldığı üzerine kodlar yer almaktadır.

Kod III.3.a Model olma

- Mentör öğretmeninin öğretmen adayı ile alan öğretimi uygulama sürecinde gelişim odaklı ve mentör öğretmeninin model olmasını gerektiren uygulamaları kapsar.
- Öğretmen adayının mentör öğretmeninin dersini gözlemleyerek, mentörün kullandığı öğretim yöntem ve teknikleri fark etmeleri
- Öğretmen adayının mentör öğretmende fark ettiği yöntem ve teknikleri kendi uygulamaları için model alması

Kod III.3.b Mentörün Paylaşım yapması

- Mentör öğretmeninin öğretmen adayının alan öğretimi uygulama sürecinde çeşitli konularda paylaşımda bulunması amacıyla yaptığı uygulamaları kapsar.
- Mentör öğretmeninin öğretmen adayı ile deneyim paylaşımında bulunması
- Mentör öğretmeninin öğretmen adayı ile kaynak paylaşımında bulunması
- Mentör öğretmeninin öğretmen adayı ile ders anlatımı öncesinde sınıf ve öğrenci yapısı hakkında genel yapıyı paylaşması
- Mentör öğretmeninin öğretmen adayı ile ders sonrasında ders anlatımı üzerine paylaşımda bulunması

Kod III.3.c Birlikte tasarlama ve uygulama

- Öğretim tasarımı üzerine mentor öğretmen, öğretmen aday ile birlikte tasarlama ve uygulama yapmasını kapsar.
- Mentor öğretmenin öğretmen aday ile birlikte ders tasarlaması
- Mentor öğretmenin öğretmen aday ile birlikte öğretim materyali tasarlaması
- Mentor öğretmenin öğretmen aday ile birlikte tasarladıkları dersi uygulaması ve birlikte değerlendirmesi

Kod III.3.d Yansıtma

- Mentor öğretmenin, öğretmen adayının alan öğretimi uygulama sürecinde yansıtma yapmasını gerektiren mentörlük uygulamalarını kapsar.
- Mentor öğretmenin, öğretmen adayına alan öğretimi üzerine düşünme fırsatı vermesi
- Mentor öğretmenin, öğretmen aday ile birlikte alan öğretimi sürecinde detaylı yansıtma yapması
- Mentor öğretmenin, öğretmen adayının ufuk açıcı sorularla bakış açısını geliştirmesi
- Mentor öğretmenin, ders gözlemlerinden ve ders anlatımlarından sonra öğretmen aday ile ders değerlendirmesi yapması

Kod III.3.e Dönüt

- Mentor öğretmen ve öğretmen aday arasındaki etkileşimde öğretmen adayının uygulama yapma sürecinde mentor öğretmenin nasıl dönüt vereceğini kapsar.
- Mentor öğretmenin, öğretmen adayına rehberlik etme, yol gösterme amaçlı dönütler vermesi

- Mentör öğretmen, öğretmen adayı uygulama öncesinde ve uygulama sonrasında dönüt vermesi
- Mentör öğretmen, öğretmen adayının uygulama yapacağı zaman ders planının içeriğine dönüt vermesi
- Mentör öğretmen, öğretmen adayının dönüt alıp uygulamasını yaptığı ders planı için ders anlatımına dönüt vermesi
- Mentör öğretmen, öğretmen adayının uygulamasına dengeli, alana özgü öğretimin geliştirilmesi yönünde yazılı ve sözlü dönüt vermesi

III.Kod 3.f Müdahale-Yönlendirme Dengesi

- Mentör öğretmen ve öğretmen adayı arasındaki etkileşimde öğretmen adayının uygulama yapma sürecinde mentör öğretmenin yönlendirmelerinin nasıl olabileceği üzerine yapılan çalışmaları kapsar.
- Mentör öğretmenin, öğretmen adayı uygulama yaparken, ders anlatırken öğrenci güvenliğini tehdit eden bir durum olmadığı sürece müdahale etmemesi
- Mentör öğretmenin, öğretmen adayı uygulama yaparken, ders anlatırken gözlemci rol üstlenmesi, öğretim sonrasında dönüt vererek öğretmen adayını yönlendirmesi, daha iyiyi yapmaya teşvik etmesi
- Mentör öğretmenin, öğretmen adayı ilk kez uygulama yaparken, ders anlatırken destek olması için birlikte öğretim yapması

Tema III.4: Öğretim Programı Bilgisi

- Öğretmen adayının, kendi branşı için ulusal ve uluslararası öğretim programları hakkında bilgiye sahip olması için yapılan çalışmaları kapsar.
- Mentör öğretmenin, öğretmen adayının MEB matematik/FKB programı kapsamında öğretim değerlendirmesi yapabilmesi üzerine çalışmalar yapması
- Mentör öğretmenin, öğretmen adayının MEB matematik/ FKB programı doğrultusunda öğretimi düzenleyebilmesi üzerine çalışmalar yapması

- Mentör öğretmen, öğretmen adayının ulusal öğretim programlarının sınav (AYT/ TYT) odaklı olduğunun farkına varması üzerine çalışmalar yapması
- Mentör öğretmen, öğretmen adayının uluslararası öğretim programlarını (IB programı) tanıtılması üzerine çalışmalar yapması
- Mentör öğretmen, öğretmen adayının ulusal veya uluslararası öğretim programlarını kazanımlarını inceleme, değerlendirme araçlarını tanıma üzerine çalışmalar yapması

Tema III.5: Araç-Gereç ve Teknoloji

- Öğretmen adayının, alana özgü öğretim için çeşitli araç-gereç, uygun teknolojik araçları ne zaman ve nasıl kullanacağını deneyimlemesi için —apılan çalışmaları kapsar.
- Mentör öğretmen, öğretmen adayının araç-gereç seçimi üzerine çalışmalar yapması.
- Mentör öğretmen, öğretmen adayının teknolojiyi tanıma üzerine çalışmalar yapması.
- Mentör öğretmen, öğretmen adayının teknolojiyi ile öğrenci öğrenmesini zengin- leştirme/ düzenleme üzerine çalışmalar yapması.
- Mentör öğretmen, öğretmen adayının çevrimiçi araç-gereç (animasyon, simülas- yon, web 2.0 araçları) seçimi üzerine çalışmalar yapması.

Tema III.6: Öğrenci Düşüncesini Anlama/ Kavram Yanılgıları

- Öğretmen adayının, alana özgü öğrenci düşüncelerini tanıması, yorumlayabilmesi üzerine yaptığı çalışmaları kapsar.
- Mentör öğretmen, öğretmen adayının öğrenci matematik/FKB düşüncelerini tanımasını sağlaması

- Mentör öğretmenin, öğretmen adayının öğrenci matematik/FKB düşüncelerini yorumlamasına olanak sunması
- Mentör öğretmenin, öğretmen adayının farklı gruplara (örn. üst seviye öğrencilere) aynı konu nasıl farklı anlatılabilir üzerine çalışmalar yapması

