# PRE-SERVICE ELEMENTARY MATHEMATICS TEACHERS' SELF-REGULATED LEARNING STRATEGIES WITHIN THE CONTEXT OF THEIR TEACHING PRACTICES

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## ABSTRACT

PRE-SERVICE ELEMENTARY MATHEMATICS TEACHERS' SELF-REGULATED LEARNING STRATEGIES WITHIN THE CONTEXT OF THEIR TEACHING PRACTICES

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The current study seeks to investigate pre-service elementary mathematics teachers' (PEMTs') self-regulated learning (SRL) strategies within the context of their teaching practices in the field work. It was aimed to explore the SRL processes and strategies of four PEMTs while preparing mathematics lessons at their practice schools. In addition to PEMTs' SRL strategies, the changes and adaptations through their teaching practices and reasons of those changes were also examined in the study. In total 22 pre-interviews and 22 post-interviews were made through the study. Observations were also performed for each teaching practice. Besides observations, PEMTs' end of semester reflection papers in the context of Teaching Practice course were examined in the study. In addition to

those multiple data sources, initial interviews representing detailed information about the participants were also analyzed.

The overall data were analyzed by using the SRL framework combined and adapted from Zimmerman's and Pintrich's SRL models. The findings of the pre-interviews revealed that PEMTs began with a 'lesson planning process' reflecting the forethought phase. This phase included searching resources, arranging and organizing the available sources, asking for help and feedback when needed, mental planning of the lesson, and setting goals for the teaching session. These strategies were considered as cognitive self-regulation strategies. In addition to cognitive SRL strategies, motivational factors such as self-efficacy, perception of task, and intrinsic interest were appeared in the study. Post-interviews reflecting the self-reflection phase revealed that PEMTs had a self-evaluation process covering various issues for their teaching sessions as a final step through the study. Finally, it was seen that contextual issues related to teaching practice played a substantial role in PEMTs' SRL strategies.

Keywords: Self-regulated learning, self-regulation strategies, pre-service elementary mathematics teachers, teaching practices.

# ÖZ


İLKÖĞRETİM MATEMATİK ÖĞRETMEN ADAYLARININ ÖĞRETİM DENEYİMLERİ BAĞLAMINDAKİ ÖZ-DÜZENLEYİCİ ÖĞRENME STRATEJİLERİ

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Bu çalışma ilköğretim matematik öğretmen adaylarının uygulama okullarındaki öğretim deneyimleri bağlamındaki öz-düzenleyici öğrenme stratejilerini incelemeyi hedeflemiştir. Dört ilköğretim matematik öğretmen adayının uygulama okullarındaki öğretim uygulamalarına hazırlanırken geçirdikleri öz-düzenleyici öğrenme süreçleri ve kullandıkları öz-düzenleyici öğrenme stratejilerinin ortaya çıkarılması hedeflenmiştir. Buna ek olarak, kullanılan stratejilerin öğretim deneyimleri boyunca değişimleri de incelenmiştir. Çalışma süresince ders anlatımları öncesinde ve sonrasında 22'şer adet görüşme yapılmıştır. Her ders anlatımı için gözlem yapılmıştır. Gözlemlerin dışında, katılımcıların Öğretmenlik Uygulaması dersi kapsamında yazdıkları dönem sonu yansıtma raporları da incelenmiştir. Belirtilen bu veri toplama araçlarının yanı sıra, katılımcılar hakkında ayrıntılı bilgi edinmek amacıyla gerçekleştirilen genel görüşmeler de dikkate alınmıştır.

Elde edilen veriler Zimmerman ve Pintrich'in öz-düzenleyici öğrenme modellerinden uyarlanan bir kuramsal çerçeveyle analiz edilmiştir. Ders anlatımı öncesi görüşmeler, katılımcıların ön düşünme evresini yansıtan ders hazırlama süreciyle başladıklarını göstermiştir. Bu süreçte, kaynak araştırma, kaynakları düzenleme, gerektiğinde yardım veya öneri için ilgili kişilere danışma, zihinsel planlama ve hedef belirleme gibi stratejilerin kullanıldığı belirlenmiştir. Bu stratejiler bilişsel öz-düzenleyici öğrenme stratejileri olarak ele alınmaktadır. Bilişsel stratejilere ek olarak öz-yeterlik, görev /değer algılamaları ve içsel ilgiler gibi güdüsel etkenler de belirlenmiştir. Uygulama sonrası değerlendirme sürecini yansıtan ders anlatımı sonrası görüşme sonuçları, öğretmen adaylarının birçok alanı içeren öz-değerlendirme süreçlerinden geçtiklerini ortaya çıkarmıştır. Son olarak, öğretmenlik uygulamasının geçtiği ortamla ilgili unsurların katılımcıların öz-düzenleyici öğrenme stratejilerinin oluşmasında önemli bir rol oynadığı görülmüştür.

Anahtar Kelimeler: Öz-düzenleyici öğrenme, Öz-düzenleyici öğrenme stratejileri, İlköğretim matematik öğretmen adayları, Öğretim deneyimleri

To My Dearest Parents

Güler and Bayram Kurt

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## TABLE OF CONTENTS

## LIST OF TABLES

TABLES

## LIST OF FIGURES

FIGURES

## LIST OF ABBREVIATIONS

**PEMTs**: Pre-service Elementary Mathematics Teachers

**SRL**: Self-Regulated Learning

**ELE**: Elementary Education

**EME**: Elementary Mathematics Education

# CHAPTER 1

## INTRODUCTION

Becoming a teacher is a complex process that involves gaining several knowledge dimensions and skills relevant to context. Dembo (2001) asserted that there should be two complementary goals stated by teacher educators for pre-service teachers: teaching pre-service teachers to become more effective learners and then making them more effective teachers. He believes that "attaining the first goal may help in the attainment of the second goal" (p.25). Explicitly, it is believed that the quality of teaching and teachers somehow has a significant impact on the quality of learning (McGrath, 2008). Considering teachers as learners, skills and abilities do not fully explain how they learn and perform. Factors such as motivation, interest, self-efficacy, and self-regulation are important determinants in learning in addition to content-area skills (Schunk, 1998; Zimmerman, 2001). Therefore, understanding the concept of self-regulation is important in the development of these skills and capabilities for teachers. In fact, the process of learning to teach inherently involves the use of strategies of self-regulated learning (SRL), to some extent. Using self-regulated learning strategies improve learners' perception of self-efficacy and control over the learning process as well as increasing their learning (Zimmerman, Bonner, & Kovich, 1996).

SRL has been gaining increasing attention among educational researchers during the last years. However, many researchers stated that little is known about self-regulated learning strategies of pre-service teachers (Endedijk, 2010). It has been known that pre-service teachers rarely use effective learning strategies as students (Gordon, Dembo, & Hocevar, 2007). Therefore, pre-service teachers should be able to be aware of their own learning by improving their self-regulation strategies before they fly solo in their own classrooms. As self-

regulation provides learners with the skills to be in charge of their own learning, it must also be valuable for pre-service and in-service teachers (Randi, 2004). In other words, SRL might be later used and taught for their future students. In this sense, current teacher education programs, implicitly or explicitly, aim to help pre-service teachers self-regulate the process of learning their profession.

### 1.1 What is Self-Regulation?

A number of definitions for self-regulation (SR) have been provided by many researchers who usually tend to take their own approach. One of the general working definition is provided by Pintrich (2005) as "it is an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and contextual features in the environment" ( p.453). Zimmerman (2002) defines SR in process terms and argues that SR is not a mental ability or an academic performance skill; on the contrary, it is a self-directive process that learners transform their mental abilities into academic skills. These definitions imply that learners create their own learning environments according to their own goals for an effective self-regulation process. Often used interchangeably with SR, a definition of SRL is stated by Boekaerts (1997). She reports that "SRL can be not only a complex, demanding, and deliberate activity, but also a simple, habitual, and automatic activity" (p.163). Boekaerts and Niemivirta (2005) underlined that SRL is not a unitary construct (p.445); rather, it covers number of phenomena, which are controlled by different mechanisms such as motivation, metacognition, and /or emotion.

A self-regulated learner is the one who is able to set task-related and reasonable goals, take responsibility for his or her learning, and retain motivation (Heikkila & Lonka, 2006). Such learners are assumed to be able to use a number of cognitive and meta-cognitive strategies. These learners are able to monitor both their strategy use and their behavior in terms of the identified goals, and, if necessary, adjust or extend their strategies on the way (Butler & Winne, 1995), which cause an increase in their self-satisfaction and motivation to continue to

improve their strategies (Boekaerts, 1999). For helping all learners become self-regulated, there is a need for a better understanding of the SRL strategies. Various self-regulated learning strategies have been proposed (Pintrich, 2000; Weinstein & Mayer, 1986; Winne & Perry, 2005; Zimmerman, 2000) in the literature. The term strategy has been used to refer to diverse cognitive processes and behaviors learners use to achieve their goals for the identified task (Garcia & Pintrich, 1994). The strategies can be either conscious and controlled by the learner or employed automatically owing to learners' practices and routines. Besides cognitive strategies, learners' focus on a variety of motivational strategies regulating their beliefs such as self-efficacy, value, and perceptions related to their self-schemas and goals (Garcia & Pintrich, 1994). Motivational strategies might be considered as personal traits or styles; however, Garcia and Pintrich (1994) denote that those strategies can be learned and changed according to the personal or contextual factors.

Self-regulated learning (SRL) has been considered as an important prerequisite in formal schooling and beyond, and it has a particular importance in terms of life-long learning (Zimmerman, 2002). For this reason, many educators and policy makers underline the importance of being aware of self-regulatory skills, which are seen as crucial for someone willing to educate himself/herself after formal schooling (Boekaerts, 1997; Zimmerman, 2002). Since the learning of teaching profession is an ongoing process after the formal university education, the theory of SRL provides an interesting and valuable lens to uncover and interpret how this learning takes place.

### 1.2 Statement of the Problems

The arguments and findings related to the need for investigating pre-service teachers' SRL strategies in the context of their teaching practices led me to conduct the current study. I tried to identify pre-service elementary mathematics teachers' (PEMTs) SRL strategies employed in the process from the beginning of the lesson preparation process to the end of it. The major outcome of the study was the SRL strategies of the PEMTs studying in the Elementary

Mathematics Education (EME) program within the context of their teaching practices at collaborating schools. Based on the major outcome, adaptations of SRL strategies throughout the study and reasons of changes were also investigated in the study.

### 1.3 Research Questions

This study mainly aims to answer the following questions:

- What are the pre-service elementary mathematics teachers' SRL strategies within the context of their teaching practices?

- What changes and adaptations do pre-service teachers make in their SRL strategies through their teaching practices?

- What are the reasons of changes and adaptations that pre-service teachers made in their SRL strategies?

### 1.4 Significance of the Study

Pre-service teachers, as future teachers, are in the process of intense learning about teaching profession. They are no longer in the students' chair while experiencing teaching at collaborating schools. Rather, they are now in the process of learning from the other side of the desk. In their field experience and later in their workplace, they frequently confront with new obstacles. They try to overcome problems related to issues such as curriculum, classroom management, or meeting administrative requirements (Veenman, 1984). Each of such experiences is also opportunities of learning for pre-service teachers (Haser, 2010). This learning process is managed and regulated by the pre-service teachers themselves. Therefore self-regulated learning is a critical issue in learning to teach and understanding how this regulation takes place is an important research goal for both theory and practice.

Most research into self-regulation was focused on students' self-regulation of their learning in academic settings. They were based on designing instructional practices and then examining their effectiveness on students' SRL. It

is important to understand learning about teaching from pre-service teachers' perspectives in shaping pedagogy of teacher education. Further, deeper understanding of the self-regulated learning is necessary in designing powerful teacher education program for supporting this development. The studies including pre-service teachers or in-service teachers mainly investigated the way of promoting self-regulated learning for their students (Niemi, 2002; Perry, 1998) and not much is known about pre-service or in-service teachers' self-regulatory behaviors. However, the focal point of the present study is to explore pre-service teachers' SRL strategies based on their preparation process for their teaching practices beyond the context of their formal course work. The crucial point here in this study is that pre-service teachers have two roles simultaneously as a teacher and as a learner. These two roles lead them to use different strategies for the regulation of their learning and teaching. Investigating and identifying self-regulation behaviors of pre-service teachers might make considerable contributions in terms of increasing the effectiveness of their teaching practices.

The goal of the practice teaching is to make the pre-service teachers learn to see and observe important aspects of mathematics teaching and to discuss their emerging ideas about meaning of teaching and learning mathematics (Mewborn, 1999). In the field experience, multiple opportunities should be provided for developing self-regulated learning behaviors of pre-service teachers (Randi, 2004). In the context of their teaching practices, several regulative activities have to be applied. In order to learn from their teaching, pre-service teachers have to reflect about their performances. Then, they should be given opportunity to diagnose weak points of their teaching and causes of them, which might lead to new ideas and intentions for their future teaching experiences (Zanting, Verloop, &Vermunt, 2001). The period of practice teaching in Turkey is limited to two semesters in the last year of the university education. The pre-service teachers are only required to teach 2 hours of class in one semester. They lack of sufficient teaching practice in the Elementary Mathematics Education program. Beginning teachers claim that although they attend two semesters of student teaching and

almost all of them teach in informal teaching contexts for years, they feel that these teaching experiences are not effective in preparing them for the real-classroom contexts (Haser, 2006). The current study will provide insight into the attempts to improve the quality of student teaching experiences in the teacher education programs in Turkey. Understanding how pre-service teachers employ SRL strategies will help teacher educators in designing quality opportunities for preservice teachers in improving existing SRL strategies and developing new ones during their studies in the teacher education programs.

### 1.5 Definitions of Important Terms

The following definitions are constitutively explained in order to provide clear understanding for the readers.

*Self-regulation (SR) and Self-regulated learning (SRL):* Self-regulation and self-regulated learning are used interchangeably through the dissertation referring to regulation processes of PEMTs for their own learning to teach.

*Self-regulated learning strategies*: SRL strategies operationalized for the current study are activities that PEMTs used when they are preparing for the teaching practice in collaborating schools.

*Pre-service elementary mathematics teachers (PEMTs)*: Pre-service elementary mathematics teachers are senior students studying at Elementary Mathematics Education (EME) Program. PEMTs also spend six hours a week at collaborating schools in the context of Practice Teaching course. PEMTs are teacher candidates who are going to teach mathematics from fourth to eighth grade students after the graduation.

*Collaborating Schools*: Collaborating schools are the schools providing teaching experiences for pre-service teachers based on an agreement with the Faculty of Education and Ministry of National Education.

*Mentor Teachers*: Mentor teachers are the teachers who guide the PEMTs in terms of their teaching practices during the semester in the context of ELE 420 Practice Teaching course.

*ELE 420 Practice Teaching course*: ELE 420 is the course including teaching practice at collaborating schools for six hours a week during the semester. The course requires class observation, active participation to educational activities, planning, and preparation for teaching.

*Teaching context*: The teaching context includes the teaching topic, grade level of students, interaction with the students, students' behavior, role and attitude of mentor teachers, and motivational practices.

The dissertation is composed of five chapters. In Chapter 1, I introduced the definitions of SR, the need for SRL in the field of education regarding pre-service teachers, and the different dimensions of SR. In Chapter 2, I combined the theoretical framework analyzing SRL processes based on different models with the related literature review. Chapter 3 reported the methodology used in the study, with descriptions of the participants, contexts, instruments, and the procedures. The findings of the study were given in Chapter 4. Finally, Chapter 5 reported the conclusions of the study and the discussion of the findings with implications and recommendations for further research.

# CHAPTER 2

# THEORETICAL FRAMEWORK and LITERATURE REVIEW

## 2.1 THEORETICAL FRAMEWORK

In this section, an overview of the concept of self-regulated learning (SRL) was represented including how it has been defined by different researchers and how it has been studied so far in the context of pre-service teachers' teaching practices and learning to teach.

### 2.1.1 Major Models of Self-Regulated Learning

Theoretical and educational relevance of SRL should receive more attention, owing to the fact that it suggests an integrative framework consisting of different components of learning. Its practical value, on the other hand, emphasizes the importance of personal efforts, self-direction, and personal responsibility (Camahalan, 2006). There exist several models of SRL which have been developed over the past two decades (Zimmerman, 2001). Each model offers an alternative perspective for SRL. In this section, two major models of SRL including those by Zimmerman and Pintrich were introduced in detail. The SRL models of Winne and Hadwin, and Boekaerts were reported briefly as well. First, a review of each model including definitions of SRL and components of the models was presented. Then these models were discussed according to their common and different aspects.

#### *2.1.1.1 Zimmerman's model of self-regulated learning*

Zimmerman's (1998) model of SRL is based on Bandura's (1986) Social Cognitive Theory. Bandura (1986) views self-regulation as reciprocal interactions among behaviors, environmental behaviors, and personal factors as seen in Figure 1. By this perspective, he asserted that self-regulation is not only affected by personal processes, it is also determined by environmental and behavioral events in a reciprocal manner (Zimmerman, 2005). Behavioral self-regulation involves

self-observing and adjusting performance strategically. On the other hand, environmental self-regulation includes observing and adjusting environmental conditions. From a social cognitive perspective, Zimmerman (2005) described self-regulation as being cyclical in nature. In this cyclical process of self-regulation, feedback acquired from prior learning experiences is used to make adaptation during current performances. These adaptations are important since personal, behavioral, and environmental factors constantly change during the learning and performance.

Zimmerman (2005) explained that covert personal regulation includes monitoring and adopting cognitive and affective states (i.e. imagery for remembering), whereas behavioral self-regulation involves self-observing and strategically adjusting performance processes (i.e. one's method of learning). Environmental self-regulation, on the other hand, refers to observing and adopting environmental conditions. In this triadic cyclical process, covert personal, behavioral, and environmental events are viewed as both separable and inseparable factors which influence one's functioning. Bandura (1986) emphasized that this triadic process should not reflect symmetry or a pattern. That is, in some contexts or in certain points, environmental influences might be stronger than behavioral or personal ones (Zimmerman, 1989). This means that self-regulation highly depends on contexts (Schunk, 2001).

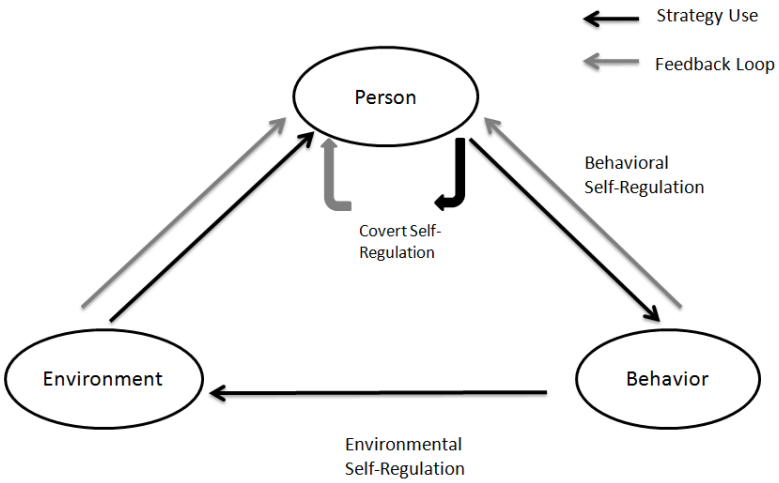


Figure 1. Triadic forms of self-regulation (Zimmerman, 2005, p. 15)

Zimmerman (2005) defined self-regulation as “self-generated thoughts, feelings, and actions that are planned cyclically adapted to the attainment of personal goals” (p.14). This definition is different from other definitions in that it points to a single trait, ability or level of competence. With this process definition, the reason of why one may not self-regulate every type of performance can be explained. The definition of Zimmerman (2005) is different from meta-cognitive views of SR which only emphasizes knowledge states. Although meta-cognition is important in explaining SR, self-beliefs and affective reaction on specific performance context are more essential. Self-efficacy, for example, is seen as an appropriate process to explain variations in personal motivation to self-regulate one’s performance (Zimmerman, 2005).

As seen in Table 1, the structure of self-regulatory processes is viewed as three cyclical phases from a social cognitive perspective: (1) forethought, (2) performance or volitional and (3) self-reflection (Zimmerman, 2005). Each phases affect subsequent processes in the cycle.

***Table 2.1 Phase Structure and Sub-processes of Self-regulation***

Cyclical self-regulatory phases

| Forethought | Performance/volitional Control | Self-Reflection |
|---|---|---|
| Task Analysis | Self-control | Self-judgment |
| - Goal Setting | -Self-instruction | -Self-evaluation |
| - Strategic Planning | -Imagery | -Causal attribution |
| | -Attention focusing | |
| | -Task strategies | |
| Self-Motivation Beliefs | Self-observation | Self-reaction |
| -Self-efficacy | - Self-recording | -Self-satisfaction |
| -Outcome expectations | - Self-experimentation | -Adaptive-defensive |
| -Intrinsic Interest | | |
| -Goal Orientation | | |

*(Source.* Zimmerman, B.J. (2005). Attaining self-regulation: A social cognitive perspective. In M.Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation*, (pp.13-39). London: Elsevier Academic Press.)

The forethought phase refers to processes and beliefs that occur before efforts to act. Two distinctive categories are identified: *task analysis* and *self-motivational beliefs*. Task analysis involves *goal setting*, which is seen as an integral aspect of the forethought phase. By this aspect, one refers to decide what specific outcomes would be gained after learning or performance. Task analysis also includes *strategic planning*. Strategic planning refers to choosing appropriate methods for the task and setting. These appropriately selected strategies are believed to enhance the performance (Zimmerman, 2005).

While discussing self-regulatory skills, self-motivational beliefs should be taken into consideration. Because, if people cannot motivate themselves, there is little value in using self-regulatory skills. In this manner, goal setting and

strategic planning have some self- motivational beliefs such as self-efficacy, outcome expectations, intrinsic interest, and goal orientation. Self-efficacy is related to personal beliefs about having the means to learn or perform effectively. One's willingness to attain and sustain his/her self-regulatory behaviors heavily depends on his/her self-efficacy (Zimmerman, 2005). However, it does not have the unique influence on expected performance while requisite knowledge and skills are lacking. Outcome expectations are important since people entail activities they believe will end in positive outcomes (Schunk, 1994). Intrinsic motivation refers to motivation to employ in an activity for its own sake. That is, employing a task is its own reward and does not require any external constraints and explicit rewards (Pintrich & Schunk, 1996). Another motivational belief is goal orientation, which refers to purposes to engage in achievement behavior. It includes not only a purpose for acquiring achievement, but also a reflection to reach that goal.

The performance or volitional control phase has two major types of processes: *self-control* and *self-observation*. Self-control includes self-instruction, imagery, attention focusing, task strategies, which helps learners to concentrate on the task and maximize their efforts. *Self-instruction* refers to overt or covert verbal description of one's progress while performing a task. *Imagery* is a kind of self-control technique used for assisting encoding and performance. *Attention focusing* is related to one's concentration. This focusing filters other external events and covert processes. Another form of self-control, *task strategies*, refers to identifying necessary parts of a task by reorganizing to assist learning and performance (Zimmerman, 2005).

Self-observation, on the other hand, involves self-recording and self-experimentation processes, which refers to tracing specific aspects of one's own performance. *Self-recording* is a technique to keep personal information spontaneously and protect its accuracy, which prevent unnecessary rehearsal. Self-experimentation is derived from self-observation of natural behaviors when it does not provide accurate information. That is, one can employ a personal

experimentation systematically if there are questionable cases when self-observation is not well-informative (Zimmerman, 2005).

The last phase, self-reflection includes two processes closely related to self-observation: *self-judgment* and *self-reactions*. The first one refers to self-evaluations of the individual's own performance and causal attributions about the results. *Self-evaluation* refers to making a comparison between monitored information and a goal or standard. Zimmerman (2005) stated that people use four different types of criteria while evaluating themselves. They are mastery, previous performance, normative, and collaborative evaluations. Mastery criteria use evaluation of tests or test scores. When previous performance is used as an evaluation criterion, one compares the current performance with earlier performances. Opposing to mastery and previous performance criteria, normative criteria is based on social comparisons with other people's performances. Collaborative criteria refer to the team evaluations, which can change depending on different team endeavors. Causal attributions about the results are derived from self-evaluative judgments. Attributions are defined as beliefs concerning the causes of the outcomes (Weiner, 1979). They are seen as a key factor of self-regulation and mostly come into self-regulation during the self-reflection phase. Attributions also occur during the forethought phase before beginning to a task (Schunk, 2008).

The second process includes self-satisfaction and adaptive or defensive inferences. *Self-satisfaction* refers to perceptions of satisfaction or dissatisfaction and is related to affect with respect to one's performance. Adaptive and defensive inferences deal with necessities to change one's self-regulatory approach during his/her subsequent efforts to learn.

#### *2.1.1.2 Pintrich's model of self-regulated learning*

The conceptual framework of self-regulation posed by Pintrich was considered as a major contribution in educational psychology (Schunk, 2005). He presented his work in a table format different from other figurative

representations. Although Pintrich's model represents a framework including the elements of social-cognitive theory, it reflects the components of other theories like cognitive information processing (Zimmerman & Schunk, 2001).

Pintrich (2005) believed that self-regulatory activities mediated the relations between learners, their environments, and their overall achievement. His model is composed of four phases: forethought, monitoring, control, and reflection. For each phase, four possible self-regulatory areas are listed as cognition, motivation, behavior, and context (See Table 2). The first three areas represent learners' own cognition, motivation, behavior that he or she employs to control and regulate. These are self-regulated attempts that one focuses on controlling and regulating his or her own cognition, motivation, and behavior. However, there are people such as teachers, peers, or parents that can regulate an individual's cognition, motivation, or behavior as well. They may direct or scaffold the individual regarding of what, how, and when to do a task. That is, some contextual factors such as task characteristics, feedback systems, and/ or evaluation structures can have an effect on an individual's attempts to self-regulate his or her learning.

In Phase 1, cognitive area consists of planning, goal setting, prior content knowledge and meta-cognitive knowledge activations. Motivational processes during this phase contain goal orientation adoption, efficacy judgments, ease of learning and perceptions of difficulty, task value activation, and interest activation. Behaviors that can be self-regulated are stated as time and effort planning and planning for self-observations of behavior. Contextual regulation factors, finally, include students' perceptions of task and context. In Phase 2, cognitive monitoring consists of meta-cognitive awareness. Motivational monitoring refers to awareness and monitoring of motivation and affect. Monitoring of behaviors includes awareness and monitoring of effort, using time, and need for help. Contextual monitoring refers to monitoring task and context conditions. In Phase 3, cognitive control comprises cognitive strategies for learning and thinking. Motivational control includes selection and adaptation of

strategies for managing motivation and affect. Behavioral control embraces expending effort, persisting and seeking help when needed. Contextual control consists of attempts to change or renegotiate task. For example, "students may ask a teacher whether they can work fewer problems or read fewer pages when assignments seem lengthy" (Schunk, 2005, p.87). In Phase 4, cognitive reaction and reflection contains judgments and attributions. Motivational reactions include affective reactions and attributions. Behavioral reaction and reflection takes in one's choice of behavior. Contextual reaction and reflection, on the other hand, comprises evaluations of task and context.

Pintrich (2005) also emphasized that although these four phases present a general time-ordered sequence that learners would go through while they perform a task, there is not a necessity that the phases are hierarchically or linearly structured and earlier phases always must occur before later phases.

Pintrich (2005) contributed to SRL with his emphasis on the importance of motivational processes to SR. He considered motivation as a key factor spread through all phases. Further, motivational variables underlined by Pintrich (2005) have been regarded as critical for SR. Studies revealed that good self-regulators are different from bad self-regulators in terms of their motivational process (Pintrich, 2005). In light of these findings, characteristics of self-regulated learners have been reported as setting hierarchical goals and at the same time holding process (e.g., understanding content and strategies for problem solving) and product goals (e.g., scoring well on test and making good grades; Zimmerman, 2005). Self-regulated learners also seem more self-efficacious than less self-regulated learners, as they can use their self-regulatory skills to help them learn. Pintrich's (2005) other key factor in the definition of SRL is students' goal orientations. Goal orientations consist of mastery and performance goals. Mastery goal oriented students focus on learning, understanding, and mastering tasks. Performance goal oriented students, on the other hand, concentrate on being superior and/or being best at the task in comparison to others. Research has shown

that students with mastery orientation have better cognitive monitoring and use of learning strategies (Pintrich, 2005).

***Table 2.2 Phases and Areas for Self-Regulated Learning***

| | Areas for regulation | | | |
|---|---|---|---|---|
| Phases | Cognition | Motivation/affect | Behavior | Context |
| Forethought, planning, and activation | Target goal setting<br>Prior content knowledge activation<br>Metacognitive knowledge activation | Goal orientation adoption<br>Efficacy judgments<br>Ease of learning judgments (EOLs), perception of task difficulty<br>Task value activation<br>Interest activation | [Time and effort planning]<br>[Planning for self-observation of behavior] | [Perception of task]<br>[Perception of context] |
| Monitoring | Metacognitive awareness and monitoring of cognition (FOKs, JOLs) | Awareness and monitoring of motivation and affect | Awareness and monitoring of effort, time use, need for help<br>Self-observation of behavior | Monitoring changing task and context conditions |
| Control | Selection and adaptation of cognitive strategies for learning thinking | Selection and adaptation of strategies for managing motivation and affect | Increase, decrease effort<br>Persist, give up<br>Help-seeking behavior | Change or renegotiate task |

***Table 2.2 Phases and Areas for Self-Regulated Learning (Continued)***

| | | | | |
|---|---|---|---|---|
| Reaction and reflection | Cognitive judgments<br>Attribution | Affective reactions<br>Attributions | Choice behavior | Evaluation of task<br>Evaluation of context |

(***Source***. Pintrich, P. R. (2005). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). San Diego: Academic Press)

#### *2.1.1.3 Winne and Hadwin's model of self-regulated learning*

The model, codeveloped by Winne and Hadwin (1998), defines SRL as an event that spans three, sometimes four necessary phases. Within each phase, cognitive operations construct particular kinds of products. In this model, information can play one of the four roles: condition, product, evaluation or standard. There are two events critical to SRL: metacognitive monitoring and metacognitive control. Winne and Hadwin (1998) reported that learning occurs in four basic phases: (1) task definition, (2) goal setting and planning, (3) studying tactics, and (4) adaptations to metacognition. The fourth and the last phase, adapting metacognition, is optional (Winne, 2001). It refers to a process by which students critically examine the things they came up with in the preceding phases, in the light of their meta-level knowledge (Winne & Perry, 2005).

In order to measure SRL, Winne and Perry (2005) posed two components of SRL: event and aptitude. An event is defined as "snapshot that freezes activity in motion, a transient state embedded in a larger, longer series of state unfolding over time" (Winne & Perry, 2005, p.534), whereas an aptitude denotes a relatively stable personal attribute (Winne & Perry, 2005). They argued that their model afforded views of SRL suggesting alternative approaches to measure SRL as an aptitude and as an event. The most common protocols for measuring SRL as an aptitude include questionnaires, structured interviews, and teacher judgments. However, if SRL is considered as an event, think aloud measures, error detection tasks, trace methodologies, observations of performance methods are used for measurement (Winne & Perry, 2005).

#### *2.1.1.4 Boekaerts' model of self-regulated learning*

The Model of Adaptable Learning (MAL) is a holistic framework exploring the interaction between intertwined aspects of SRL. One of the important assumptions of the model is that individuals self-regulate their behavior regarding two basic priorities. They are extending their knowledge and skills so that they can enlarge their personal resources and maintaining their available resources by preventing loss, damage, and distortions of well being. It is also

assumed that these two priorities are already underlined by information processing approaches. However, they might differ in terms of dominance in the individual's goal hierarchy. In this model, a central role is given to the construct of appraisal. Further, it was stated that each learning situation activates a network that affects an individual's efforts and vulnerabilities. This is represented by links between the appraisal process and the contents of a dynamic internal working model (WM).

Although several similar models also emphasized that learners' expectancies and their goal setting are also influenced by both situation and personal variables, MAL differs from them in one aspect. The current model explicitly separates between two types of person variables, namely, those revealing the individual's metacognition and interacting with the content of the task, and those reflecting the individual's self and motivational beliefs. This provides to distinguish different types of higher order control processes that involve metacognitive and motivational control (Boekaerts & Niemivirta, 2005).

### 2.1.2 Discussion of Reviewed Self-Regulated Learning Models

There are a number of different models offering an alternative perspective of self-regulated learning and proposing different constructs and different conceptualization (Boekaerts & Niemivirta, 2005; Zimmerman, 2005; Winne, 2001), however these models share some general assumptions and features (Pintrich, 2005). The four models were compared with respect to three criteria: the definitions of SRL, the background theories of the authors, and the components included in the models.

When the models are reviewed in terms of definitions of SRL, two types of definitions seem to emerge. Boekaerts (1995), Pintrich (2005), and Zimmerman (2005) defined SRL as a goal-oriented process. They proposed that activities such as monitoring, regulating, and controlling one's own learning include not only cognitive but also motivational and social factors. Winne and Hadwin (1998), however, elaborated SRL from an information processing perspective, which defines SRL as a metacognitively managed process by adapting the use of

cognitive tactics and strategies to tasks. Although Winne's model does not stress the role of goal orientations, particularly in definitions, the model tends to assume self-regulated learners to be intrinsically motivated and goal-oriented (Puustinen & Pulkkinen, 2001).

In all of the models reviewed, learners are seen as active and constructive participants in the learning process. In other words, learners are not passive in receiving information from teachers or parents, but rather they are active meaning makers while learning. Further, learners are seen as active participants in constructing their own meanings, goals, and strategies from external and internal environments.

Pintrich's (2005) and Zimmerman's (2005) models resemble each other in that they are based on social cognitive theory and define SRL as a goal-oriented process that begins with a forethought phase and ends with a self-reflection phase. Although, Boekaert's (1995) model has not been described as based on social cognitive theory, it seems to show more similarities with it than Winne and Hadwin's model, since Boekaerts gives equal status to cognitive and motivational components of SRL. Another notable difference between Winne and Hadwin's (1998) model and that of Pintrich (2005) is that the process of task definition is seperated from those of goal setting and planning.

As previously mentioned, there seem similarities among models, particularly between the models of Pintrich and Zimmerman. However, the way of using the components differs from one model to another. Winne and Hadwin (1998), for example, tended to use meta-cognitive monitoring process, accompanied by internal feedback in any phase of the SRL process, while others use it during the performance phase and feedback occurring in the appraisal phase (Puustinen & Pulkkinen, 2001).

Based on the discussion of the The SRL framework for the current study is explained in the following section.

### 2.1.3 Combined SRL Framework of the Current Study

Several models and frameworks have explained the structure and functioning of SRL (Bandura, 1986; Boekaerts & Niemivirta, 2005; Pintrich, 2005; Winne, 2001; Zimmerman, 1998). The framework used to analyze the data (interview transcripts of PEMTs) and interpret the findings in this study integrates two SRL models by Zimmerman (2005) and Pintrich (2005). As reported before, both models have similar theoretical backgrounds in terms of considering learners as active and constructive in the learning process and both of them include forethought, performance, and self-reflection phases. However, it is clear that Pintrich's SRL model has an extended, detailed, and clear framework of SRL when compared with that of Zimmerman SRL modes. Pintrich's framework displays four phases, and for each phase, areas for regulation are stated in a 4x4 dimension format (see Table 2.2). It can be inferred that Zimmerman's second phase, performance or volitional control, may be divided into two parts, namely monitoring and control in Pintrich's model.

As seen from the Table 2.3 the framework of the current study consists of phases and areas for self-regulation. The two phases, forethought and self-reflection, reflect Zimmerman's SRL model. The two areas, cognition and motivation, represent Pintrich's SRL model. The SRL strategies reflected in pre-interviews and post-interviews refer to the SRL strategies in the forethought and self-reflection phases of the current model respectively. Zimmerman's (1998) model was used as the main analysis framework of the present study, since the it could draw a general picture of PEMTs' SRL strategies. Besides Zimmerman's phases of SRL, the combined and adapted framework also represents the *context* representing "various aspects of the task environment or general classroom or cultural context" (Pintrich, 2005, p.456) identified in Pintrich's SRL model. The context issue emerges in each phase and area as shown in Table 2.3 The perception of the context is stated in the forethought phase, while the evaluation of context is stated in the self-reflection phase for both cognitive and motivational areas. Thus, the PEMTs' SRL strategies are interpreted from the contextual

aspects as well as cognitive and motivational areas. Table 2.3 represents the combined and adapted model displaying the SRL phases and areas for PEMTs' teaching practices.

***Table 2.3 Combined and Adapted SRL Framework of the Current Study***

| **Phases / *Areas*** | **Forethought** | **Perception of Context** | **Self-Reflection** | **Evaluation of Context** |
|---|---|---|---|---|
| ***Cognition*** | ***Task Analysis***<br>Goal Setting<br>Strategic Planning | | Self-evaluation<br>Causal attribution | |
| ***Motivation*** | ***Self-Motivation Beliefs***<br>Self-efficacy<br>Perception of task<br>Intrinsic Interest | | Self-satisfaction<br>Adaptive-defensive | |

## 2.2 REVIEW OF RELATED LITERATURE

There have been numerous investigations conducted into self-regulation are presented in this section. The current study mainly focused on pre-service elementary mathematics teachers' (PEMT) self-regulated learning (SRL) strategies for their teaching practices at collaborating schools. Further, it was aimed to examine whether PEMTs had changing and /or adapting SRL strategies through the study and the rationale of those changes and adaptations. The purpose of this chapter is to review the literature that is most pertinent to the proposed study. The chapter includes 3 sections. The first section involves research studies investigating SRL within the context of pre-service and in-service teachers. The second section is devoted to pre-service teachers' perspectives on SRL. The next

section involved pre-service teachers' beliefs about learning to teach. The fourth section presented the summary of the literature review.

### 2.2.1 Pre-service teachers' self-regulated learning

The common promoting idea in the related literature is that learners should be provided to self-regulate their learning. Regarding pre-service teachers as learners, they should also be supported to self-regulate their learning about teaching. While underlying the importance of self-regulated learning, Kremer-Hayon and Tillema (1999) asserted that SRL needed to be examined regarding the pre-service teachers' perspectives as a major part of teacher education. The researchers based their study on the assumption that understanding of perception is an important condition for an effective SRL. From this view, they investigated the meaning of SRL among 48 pre-service teachers and 42 teacher educators who participated from Holland and Israel. In the semi-structured interviews, the researchers asked questions about the meaning of SRL, types of activities to implement SRL, and the expected role behaviors of the participants. The results of the interviews considering pre-service teachers revealed that pre-service teachers in both countries primarily focused on the amount of self-study represented by their programs, planning skills, and becoming more independent in their learning when being asked about their perceptions of SRL. Teacher educators, on the other hand, focused on goal orientation, reflection, self-management, and self-study while presenting their perceptions. Dutch pre-service teachers' perceptions of SRL included managing resource, motivation and freedom of thought. However, Israeli pre-service teachers noted their perceptions focusing on learning by discovery and theory and practice integration. All pre-service teachers also considered SRL as a satisfying factor for their curiosity and motivation to learn.

For a closer look at the meaning of SRL for teacher educators and how their conceptions affect the improvement of their students' SRL, Tillema and Kremer-Hayon (2002) conducted another cross-cultural study with Israeli and Dutch teacher educators. They hypothesized that if teacher educators are aware of their own professional learning and teaching practices, they are more likely to

understand students' SRL which also facilitate their efforts to develop students' SRL skills. For this manner, they investigated how teacher-educators perceive themselves as self-regulated learners and their dilemmas and/or problems they experience while introducing SRL. The findings from the interviews conducted with 29 teacher educators participants from both countries agreed on considering SRL as a reflective approach based on gaining knowledge for themselves and for their students. As a different approach, Dutch teacher educators perceive SRL as an independent learning, knowing oneself, self-study, learning from work, whereas Israeli teacher educators comprehend SRL as planning, goal selection, time management, meta-cognition, and evaluation. An interesting finding the researchers stated was that the teacher educators' perceptions of their own SRL were more general than those of their students' SRL. This finding indicated that teacher educators had more awareness in dealing with their students' SRL than with their own. Regarding problems teacher educators encountered, similar responses were noted. They generally had problems in the domain of theory and practice. They stated that they primarily dealt with theory and spend little time for practice.

Having similar concerns with Kremer-Hayon and Tillema (1999), Zanting, Verloop, and Vermunt (2001) studied pre-service teachers' perceptions and interpretations of their own learning. They aimed to examine pre-service teachers' beliefs about their own learning, particularly within the context of their practice teaching when a mentor is available. Their aim was based on the assumption that pre-service teachers should not be passive consumers of books or mentors' suggestions. Rather, they should reflect on the lesson given, to identify deficiencies and their causes as regulative strategies for their teaching experiences in training schools. The researchers formulated two research questions: one is about pre-service teachers' beliefs of good mentoring and the other is about beliefs for their own responsibilities for learning-to-teach process when being supervised by a mentor teacher. As the second question is directly related to my research purpose, I concentrated on it while presenting the findings of the study.

The results of the structured interviews with pre-service teachers revealed that some of the participants explicitly talked about self-regulation of learning for their teaching processes by calling it as taking the initiative. What they meant by taking initiative was to present questions and problems to a mentor and indicate points for classroom discourse. This meaning led to the idea that the mentor teacher was not seen as the only role model for pre-service teachers' teaching.

In her dissertation, Endedijk (2010) conducted a series of research examining the pre-service teachers' self-regulation of learning in the context of their teaching practices. The major concern stated in the study was the necessity to conduct more research investigating pre-service teachers' self-regulation processes for their own learning. Endedijk argued that little has been known about self-regulation in the context of pre-service and in-service teacher learning. Thus, the researcher concentrated on identifying categories to describe the variety of pre-service teachers' regulation of learning experiences, the relations among those categories, and the differences in the nature of SRL between two different contexts, the teacher education institute and practice schools. Weekly reports asking ten questions to describe self-regulation activities of six self-chosen learning experiences were administered to 28 pre-service teachers. Findings revealed that there were eight variables describing pre-service teachers' self-regulated learning, some of which were description of the learning object, learning goal orientation, self-efficacy beliefs, monitoring the learning results, self-evaluation of the learning process, and forethought on a new learning experience. Rather than reporting each category, I preferred to present the most related three findings with the current study. First, learning goal orientation category took place when the planned learning experiences had been reported. Within the category, pre-service teachers stated a judgment of the current situation and an explicit or an implicit goal to be reached. Self-efficacy beliefs, reported as another category, were seen when pre-service teachers' argumentations concerning the confidence and experience with the teaching / learning topic, method of learning, or the related context learning took place. Another

argumentation was about pre-service teachers' confidence in their own qualities or efforts. The next category was self-evaluation of the learning process in which pre-service teachers were asked to reflect on their learning experience. They reported that they wanted to change some mistakes they made or solve problems they met to get better results for the next time.

Özturan-Sağırlı and Azapağası (2009) determined whether the university students studying in elementary mathematics education program use their self-regulation capabilities and investigated which methods they use to arrange their self-regulation competence. The participants were 19 students from junior to senior classes from two public universities in Turkey. The selection of participants was based on their academic averages by considering the relation with self-regulated learning. Individual and focus group interviews were conducted while collecting the data. The findings of the study showed that he participants mostly used the codes arranging the time and study environment, elaboration, organizing and seeking help, and effort regulation. From the motivational perspective, the most common opinions were given for test anxiety. This was followed by controlling learning beliefs, self efficacy, and extrinsic goal orientation.

Pre-service teachers, as being senior undergraduate students, have two roles simultaneously as a teacher and as a learner. These two roles lead them to learn to teach their subject for the fieldwork. Bearing this in mind, a study exploring the connections of three pre-service mathematics teachers made between fieldwork and course work conducted by Ebby (2000). She examined pre-service teachers' two roles as learners of mathematics in the method course and their conceptions of themselves as teachers in the field work underlying the relationship between them. Participants had a 12-month program in which they spent two days per week in the fieldwork classroom while taking method courses at the university. In the methods course, pre-service teachers discussed about the purpose of mathematics education regarding the reform movements, investigated students' learning in mathematical subjects, and reflected their own beliefs about teaching and learning mathematics. Besides these goals, pre-service teachers were

required to reflect on their own learning, conduct a teacher-research project in the fieldwork classroom, and do some other tasks identified by the university instructor as well. Different data gathering techniques such as interviewing, conferencing with university supervisors, keeping journals, and writing course essays were used to reveal what they learnt in the coursework and field work. According the findings of the study, for each participant, the relationship between what they learnt at the university and in the fieldwork classroom was bidirectional. One of the participants, for instance, had a mutually reinforcing relationship between the two contexts. That is, the experience in the method course made her envision an active role for students in the learning process and understand the mentor teacher's way of structuring the lesson. For the second participant, her observations in the fieldwork showed that the mentor teacher's practices were somehow ineffective for different students. This view caused her to develop a new notion for the teacher's role. For the last participant, it was seen that the method course did not lead her to change her ideas about teaching and learning in any significant way. Yet, the assignments in the course helped her reconsider her assumption about teaching and learning as it required observations to children while doing and talking about mathematics in the fieldwork classroom. Actually, the author stated that the coursework helped each participant think about the students in the fieldwork classroom from a different perspective.

Similar concern with my study Hsu, Ching, Mathews, and Carr-Chellman (2009) examined what undergraduate students' SRL experiences in a web-based learning environment were. They aimed to explore five undergraduate students' SRL behaviors through their lived experiences while they were taking an online science course. The participants' SRL behaviors were analyzed after in depth interviews and observations. According to the findings, digital formats of the course and online calendar were found effective in planning and their study routines. Online gradebook, on the other hand, provided participants to monitor their learning performance. Further, e-mails and online help forums were helpful for the participants to seek help from their instructors.

Mewborn (1999) conducted a study which was undertaken in the context of a mathematics methods course for pre-service teachers. As a purpose of the study an extensive field experience in a fourth-grade classroom was added to the course. The aim of the study was to examine how pre-service (early childhood) teachers try to make sense of what they observe in a fourth-grade classroom during mathematics instruction. Analyses of interviews with the participants prior to the school year and during the eight weeks of the study revealed that they could think reflectively about diverse aspects of mathematics teaching. This pointed out that early field experiences had a positive effect on their learning about teaching mathematics. For instance, they were able to see themselves as having the authority to generate, reason about, and test hypotheses about mathematics teaching and learning. The author also reported the contributions of the fieldwork to pre-service teachers as they became reflective learners both for their teaching and learning.

Reflection is described in the sense of self-direction of one's own learning process in terms of a regulatory activity. Thus, it is assumed as a powerful tool by teacher educators enabling pre-service teachers to make appropriate decisions about their own development and their teaching practice (Korthagen, 2001). Reflection is also considered as having a self-regulatory function in the learning process of pre-service teachers. Thus, regarding the regulatory aspect of reflection, Mansvelder-Longayroux, Beijaard, Verloop, and Vermunt (2007) conducted a study investigating functions of the learning portfolio as a powerful reflection tool in pre-service teachers' learning process. Twenty-one pre-service teachers from different content area participated in the study while they were attending the university courses and doing their teaching practices in a school. They were required to keep a learning portfolio during the course to encourage them to reflect on how they progress in terms of their professional development, what experiences were important to them, and what they had learned. In order to examine those experiences, structured retrospective interviews were conducted. Analysis of interviews showed that most of the pre-service teachers reported

several functions of the portfolio, some of which were recollecting and structuring experiences, evaluating development, understanding experiences, understanding the learning process, and understanding themselves as a teacher. These functions referred to the underlying processes playing a role in action in teaching practice and learning to teach. Pre-service teachers noted that they gained insight into themselves as prospective and learning teachers. They reflected that they had opportunity to relate experiences important to them to other experiences in their teaching.

In another study, Mansvelder-Longayroux, Beijaard, and Verloop (2007) aimed to analyze the content of the portfolios which were produced by the same participants, twenty one pre-service teachers, reported in the previous research. The primary purpose was stated as investigating the nature of the reflection emerging from the portfolios. Thirty-nine portfolios of pre-service teachers were gathered and analyzed on the basis of the learning activities identified by Vermunt and Verloop (1999). Six learning activities emerged from the analyses: recollection, evaluation, analysis, critical processing, diagnosis, and reflection. First two learning activities were seen frequently in many portfolios among pre-service teachers. Those learning activities were interpreted in either separate situations or related situations over a period of time. To clarify, when pre-service teachers express their opinions about an occurred situation, this referred to evaluation/situation. However, when they examined what they found difficult in the beginning of their training, this referred to evaluation/related situation. As a general finding, it was stated that those learning activities increased pre-service teachers' awareness of their own actions and development. Keeping portfolio encouraged them to see their progress, situations they came across, and how they dealt with them.

In a current experimental study, Arsal (2010) asserted that diaries as a kind of reflection like portfolios can be used to measure self-regulation behaviors of learners. The author investigated the effect of diaries on self-regulation strategies of pre-service science teachers. The results showed that pre-service science

teachers' in the experimental group, who kept diaries, intrinsic motivation, task value, meta-cognition, and time management strategies were significantly different from those in the control group. However, participants' in both groups extrinsic motivation, control of beliefs, self-efficacy, test anxiety, and efforts were not significantly different from each other.

Concerning the role of reflection, Freese (1999) conducted a study in which pre-service teachers were guided systematically to reflect on their lessons before, during, and after teaching in the fieldwork. As a guiding framework she used the Loughran's (1995) three-part reflective framework focusing on the cognitive aspects of reflection, on how teachers process information, and how they make decisions about their teaching and their students' learning. Freese (1999) devoted her study to help pre-service teachers and the mentor teachers collaboratively study their teaching and reflect on their practice. Eleven secondary pre-service teachers from different content areas and 13 mentor teachers participated to the study. In the first semester, before the teaching session, the mentor teacher talked to the pre-service teacher about his/her thinking while planning the lesson and his/her anticipation that might occur during the lesson. That is, the mentor explicitly represented his/her thinking. Further, the mentor teacher asked pre-service teachers' reflections. After the lesson the mentor teacher addressed their reflections and talked about specific events that they observed. In the second semester, pre-service teachers began to attend the teaching sessions, and thus engaged to analyze their own teaching by using the framework. There were informal talks before and after the lessons similar to the ones in the first semester concentrating on pre-service teachers' thinking. After the individual interviews with the pre-service teachers, analyses of responses resulted four themes. Those themes were related to the different meanings of reflection. Pre-service teachers sometimes gave meaning to reflection as a self-evaluation to improve teaching, as spontaneous 'on the spot' decision making, as part of a community, and as integral to the teaching profession. The author reported that using the Loughran's (1995) framework provided mentors, pre-service teachers,

and the author herself with a common language and an understanding how to reflect about their teaching practices. The framework presented them an organizing model to examine their practice simultaneously. It was also stated that those learning activities were important for structuring and restructuring of student teachers' own practical knowledge.

### 2.2.2 Promoting SRL for students

Being a successful teacher requires reflective and analytical thinking about one's own beliefs and practices. Further, it acquires a deep understanding of cognitive and motivational principles of learning and teaching (Paris & Winograd, 2001). In this manner, Paris and Winograd (2001) examined how teachers can model and promote SRL for their students and suggested a guideline to enhance self-regulation for both teachers and students. They addressed SRL with three features, namely awareness of thinking, use of strategies, and situated motivation. They stated their primary purpose as emphasizing teachers' need to understand their own thinking to become more effective in becoming a required model for their students. Understanding the nature of self-regulation will be helpful in emphasizing how teachers design and scaffold experiences to help their students better understand themselves.

Similar to the research of Paris and Winograd (2001), how teachers structure classroom environments to promote opportunities for students to use self-regulated learning strategies was investigated by Randi (2004). She presented a program that combined modeling with explicit instruction for students to understand SRL and encouraged teachers to invent ways to teach their students self-regulation. This program differed from the other intervention programs by encouraging teachers to design their own ways of promoting self-regulation such as designing curriculum for their students and/or choosing the topic themselves. The program included a 13-week field experience for teaching as another opportunity for developing SR. Although the research considered that the field experience provided opportunities for developing SR, pre-service teachers might not develop it to the same degree. Some of them might show more or less

productive work in the same environment. During field experience, student teachers were required to develop and implement lesson plans, which were reviewed by mentor teachers and university instructors. After conducting teaching, they wrote reflective journals to analyze their lessons and students' learning. Besides writing journals, student teachers discussed their lessons with the instructor who observed the teaching session. With the help of these activities, student teachers were provided an explicit instruction about using SRL and gaining an intellectual understanding about it. As a finding of the study, Randi (2004) reported one of the student teacher's experiences to show how she employed her opportunities to develop self-regulated learning. She emphasized that without an intellectual understanding of SRL, the student teacher could not facilitate recognition of her learning opportunities for her teaching experience.

The importance of SRL brings the necessities to teachers, both in-service and pre-service, of being a model to promote self-regulated learning for students. From this view, Butler, Novak Lauscher, Jarvis-Selinger, and Beckingham (2004) underlined the importance of collaborative efforts to suggest teachers to promote their self-regulations in the context of teaching experiences and defined their professional development model. With collaborative efforts, they meant to define common goals, monitor success, and interpret outcomes to reveal implication for both theory and practice. In this two-year collaborative research project they aimed to explore whether teachers actively reflected on practice, construct new perspectives for teaching revisions, and if there were positive changes related to their performance. After administering multiple data sources to 10 teachers, the data revealed that teachers actively reflected and revised their teaching practices. The researchers stated that teachers' learning was parallel to students' learning. As students became active learners and reflect on their learning processes, teachers were engaged in revising and reflecting their teaching practices. Teachers' and students' attempts to be aware of their learning and teaching processes triggered each other. Another finding of the research was that teachers gained new insights about teaching by using the special techniques offered by the

research group. Finally, teachers reported positive outcomes and shifts related to their teaching performance.

As well as promoting pre-service teachers' to develop their SRL processes for both their learning and teaching, Van Eekelen, Boshuizen, and Vermunt (2005) noted that in-service teachers were also expected to self-regulate their learning for teaching. Therefore, they wondered how experienced teachers self-regulated their learning by focusing on their learning strategies. For the purpose of the study they conducted semi-structured interviews and asked teachers to keep a diary. The results showed that teachers had four types of learning strategies, namely learning by doing, learning in interaction, learning by reading, and learning by thinking. With these strategies, it was revealed that teachers mostly learned by interaction with students and colleagues. Concerning how teachers self-regulated their learning, three types of regulation were described: spontaneous learning (external regulation), non-linear learning (external /self regulation), and planned learning (self-regulation). The most frequent regulation type was non-linear learning. It referred that a learner would not define a learning goal; rather there would be a working goal such as solving the problem or doing the task. The problem or the task usually would come from an external factors and the learner him /herself. The second most frequent self-regulation type was planned learning. This type of self-regulation included creating the learning activity and stating the learning route as well as the learning goal. Finally, the least frequent regulation type was spontaneous learning. In this regulation, the learner would not actively influence learning, but suddenly he /she would learn something. In fact, these learning experiences would occur during or after a meeting or a conversation.

Several quantitative studies considering SRL as an aptitude (Winne, 2005) have been stated in the literature. Some of those studies aimed to investigate the relationship between learners' SRL strategies and their academic achievement in different subjects. For example, Hwang and Vrongistinos (2002) examined whether high achieving elementary in-service student teachers tended to use

various SRL strategies. They found that using SRL strategies, such as intrinsic goal orientation, task value, self-efficacy, and elaboration was closely related with the participants' academic performances. Other studies have attempted to reveal a model reflecting the relation among SRL constructs. A study addressing the correlations among three SRL variables, meta-cognition, academic strategy use, and motivation was conducted by Sperling, Howard, Staley, and DuBois (2004). Findings indicated that junior college students' measures of meta-cognition and strategy use and meta-cognition and motivation were positively and significantly correlated. Another research conducted by Gordon, Dembo, and Hocevar (2007) explored the possible influence of in-service teachers', who also took graduate course at a university, own learning behaviors on their classroom goal orientations. The results demonstrated that teachers having better self-regulation of their own learning were more likely to use mastery goal orientation rather than performance goal orientation.

### 2.2.3 Summary of Review of Literature

Current research on SRL has shown that students, teachers, and teacher educators are expected to be aware of their own learning, teaching practices, and professional development. Teachers' perceptions and interpretations are considered as important determinants in terms of improvement of their students' SRL behaviors. Therefore, most of the studies have attempted to identify pre-service and in-service teachers understandings and their perceptions as a crucial step for further research on self-regulated learning.

There are few studies focusing on the pre-service teachers' SRL strategies in the context of their own learning practices for teaching. The studies usually focused on pre-service teachers' role of promoting students' SRL strategies with classroom applications. While discussing about pre-service teachers' SRL strategies, the effect of reflections and experiences in the field work has also been investigated. The importance of reflecting on their performances has been underlined in the literature. From this view, the critical role of teacher educators

in assisting pre-service teachers to reflect upon their teaching performances has been mentioned in the studies.

# CHAPTER 3

# METHODOLOGY

This chapter provides information about the design of the study, participants, data collection tools, data analysis procedures, trustworthiness, and the limitation of the study.

## 3.1 Restatement of the Purpose and Research Questions

The current study seeks to investigate pre-service elementary mathematics teachers' (PEMTs') self-regulated learning (SRL) strategies within the context of their teaching practices in the field work. It is aimed to explore the SRL processes and strategies of the four pre-service teachers while preparing mathematics lessons at their practice schools. With this aim, the central research question guiding the study was:

What are the pre-service elementary mathematics teachers' SRL strategies within the context of their teaching practices?

In addition to the main research question, the following two sub-questions were also addressed:

(1) What changes and adaptations do pre-service elementary mathematics teachers make in their SRL strategies through the study?

(2) What are the reasons of changes and adaptations that pre-service elementary mathematics teachers made in their SRL strategies?

## 3.2 Design of the Study

Self-regulated learning has been conceptualized as an aptitude over the past quarter century (Patrick & Middleton, 2002; Perry, 2002). Aptitudes, as defined by Winne and Perry (2005), are "relatively enduring attributes of an individual that can be aggregated over or abstracted from behavior across multiple

events" (p.534). Previous investigations of SRL, generally, based on survey methods to measure students' responses through actions generalized among settings and situations (Perry, 2002). They have tended to measure SRL with likert type questionnaires or instruments to investigate cause and effect relationship or correlations among dimensions of SRL. Although those survey methods provide significant aspects for the understanding of SRL, they seem to lack pointing some important factors such as nature of learning tasks, instructional contexts, and the environment students interact with each other (Patrick & Middleton, 2002). For this reason, SRL has recently been seen as a series of events, each one temporally bounded and contextually embedded (Winne & Perry, 2005). For the current study, which considered SRL as an event, employing qualitative methods such as interviews and observations was considered as appropriate. With these methods, it was aimed to provide rich and holistic descriptions of the participants' SRL strategies within the context of their teaching practices without making any manipulation in their natural settings. In this manner, as in a typical qualitative research, I am interested in understanding how pre-service teachers interpret their teaching experiences and what meanings they ascribe to those experiences (Merriam, 2009) from the perspective of SRL. Because of focusing on those experiences, the design of the study fits the phenomenological research. Further explanations related to the phenomenological research are stated in the next section.

### 3.2.1 Phenomenological Research

The phenomenological approach seeks to identify the meaning of experiences people have had and present a comprehensive description of those experiences (Moustakas, 1994). In a phenomenological research the focus is on "describing what all participants have in common as they experience a phenomenon" (Creswell, 2007, p.58). Van Manen (1990) stressed the description of basic lived experiences while defining the phenomenology and considered those lived experiences as a starting point. The major aim of the approach is to make general meanings from the individual descriptions. From this perspective,

the design of the study is based on phenomenology, because I investigated what meanings four PEMTs attributed to the phenomenon (Creswell, 1998), SRL strategies regarding their teaching practices, according to their lived experiences (Creswell, 2007). I described the qualitative differences the participants had and tried to conceptualize SRL strategies of pre-service teachers. Based on the phenomenological research, it was assumed that the participants, whether they use SRL strategies or not, shared a common experience while preparing mathematics lessons for the fieldwork. That is, as a typical phenomenological research, the present study aimed to present a deep understanding of SRL strategies in terms of teaching practices as possessed by PEMTs.

### 3.3 Selection of Participants

The participants were selected among the pre-service teachers who volunteered to participate in the study based on their free time and their mentor teachers' availability. Selection and identification of the participants were actually based on two criteria. The primary criterion was that, to the extent possible, the mentor teachers in the collaborating schools would allow pre-service teachers to teach individual lessons, completing 8 class-hours through the semester. I informed five mentor teachers from three collaborating schools whom I had known before about the purpose of the study and reflected my intentions to conduct it with pre-service teachers within the context of ELE 420 Teaching Practice course (detailed information for ELE 420 course was given in the following sections). They were kindly asked to give an opportunity for pre-service teachers to function as a regular teacher, under normal and existing conditions, teaching 8 class-hour mathematics lessons of any subjects identified and approved by them. The five mentor teachers who were informed about requirements and the process of the study kindly accepted to contribute to the study. Thus, they positively responded by allowing pre-service teachers to teach 8-class hour mathematics lessons.

After informing five mentor teachers from three collaborating schools and getting their permission to conduct the study, I contacted the pre-service teachers

assigned to those three schools in which I had informed mentor teachers. The second criterion for selection of the participants was student teachers' availability at the time the study, since the study required spending more time in the practice schools. For this manner, I decided to talk to pre-service teachers who seemed to be willing to teach depending on the suggestions of the instructors and my own observations in the courses for which I had been a teaching assistant. I informed eight (8) pre-service teachers at my office in different times specifying the requirements of the study to make them clear about my intention and purpose. Among eight pre-service teachers, five of them accepted to participate in the study voluntarily. Other three pre-service teachers who were working at examination preparation centers [Dersane] at that time refused to attend to the study as they had no extra time to spend for teaching at practice schools. After a while, however, I had to remove one of the pre-service teachers from the study since his teaching schedule would present serious limitation for the study by getting approval of my dissertation supervisor (by considering the researcher who is monitoring the study), as he completed the eight class-hour teaching task in subsequent two days (4+4 hours). Because of completing 8 class-hours teaching in two days, 2 pre-interviews and 2 post-interviews could be conducted. This situation was considered as a serious limitation, as the identification of SRL strategies throughout 4+ 4= 8 class hours might have been difficult to notice. However, other 4 participants performed their 8-class hours teaching experiences within two or three months through the semester. Finally, 4 pre-service teachers providing the required conditions participated in this study.

### 3.3.1 Participants

The participants of the study were four senior students (2 male and 2 female) studying at an Elementary Mathematics Education (EME) program in the spring semester of 2008-2009 at a public university in Ankara. All of them would graduate at the end of the semester when the study was ongoing. They had almost the same elementary mathematics major background as they had taken the same courses in the department.

While the pre-service teachers were taking the Teaching Practice course, they were also spending 4 hours a week in the cooperating schools. The two cooperating schools were private elementary schools in Ankara. One of the schools had one mathematics teacher, while the other had four mathematics teachers at the time of the study. Detailed information about the teaching background of the participants is stated in the next section.

#### *3.3.1.1 Teaching background of the participants*

The participants of the study were graduated from Anatolian Teacher High School. All of them were offering private tutoring for students from different grade levels such as elementary, high school, and university to prepare them for national examinations or to enhance their academic achievement at school. Two male participants had working experiences at examination preparation centers as tutors before the data collection period. Differing from other participants, Selin (pseudonym) had been tutoring the students whose parents had low salary as a part of a task of a student club. Table 3.1 shows background information of the participants related to their prior and current teaching experiences and the classes they were teaching at collaborating schools. All names are pseudonym.

***Table 3.1 Background Information of Participants***

| Name | Prior teaching experience | Fieldwork school |
|---|---|---|
| Selin | Private mathematics lessons, teaching experience at collaborating school in previous semester, voluntarily teaching for the student club | Private Elementary School (School A) Grade 6, 7, and 8 |
| Beril | Private mathematics lessons, teaching at collaborating school in previous semester | Private Elementary School (School A) Grade 6, 7, and 8 |
| Taner | Private mathematics lessons, Examination Preparation Center | Private Elementary School (School B) Grade 5, 6, and 8 |
| Nihat | Private mathematics lessons, Examination Preparation Center | Private Elementary School (School B) Grade 5, 6, and 8 |

As seen from the table, the female participants Selin and Beril taught at School A, while the male participants Taner and Nihat completed their field experience at School B. School A and School B were private elementary schools in Ankara. There was one mathematics teacher who was called as Teacher A in School A; while there were three mathematics teachers who were called as Teacher B, Teacher C, and Teacher D in School B. School A had two sections for three grade levels. However, School B had three sections for three grade levels.

Selin and Beril conducted their teaching practice at the same collaborating school; however the grade level and the sections they taught were totally different and they did not have any interaction during lesson preparation. On the other hand, Taner and Nihat had their teaching practices at almost the same sections of same grades most of the time. Thus, their preparation processes for the teaching sessions were parallel to each other.

In the subsequent sections, more information about the participants was given for the purpose of forming a clear understanding for interpreting the results of the study. Besides that, considering the transferability of the findings, detailed description of the participants is necessary. For this reason, information for each participant gathered from initial interviews conducted before the research was reported in the following section.

*3.3.1.1.1 Selin*

Selin had been tutoring almost all grade levels from elementary to high school, even to university students, since her junior year at the university. However, she specified that she was teaching better specifically to students at grade levels 6-8. She thought that a preparation process for tutoring was necessary. For example, she claimed that she reviewed the mathematical topics before private tutoring session. However, she noted that the duration of her preparation had been decreased because of gaining experience in time. Selin also stated the benefits of tutoring, such as speaking more accurately, reviewing mathematical subjects, becoming aware of her deficiencies in terms of content knowledge and/or teaching ability, and following the new curriculum and its' requirements. Yet, she stressed that one-to-one tutoring and teaching at a class were actually different from each other. Selin also noted that she had no experience at examination preparation centers as a tutor.

Selin had completed her first classroom teaching experience at the same private school in the previous semester. Her mentor teacher in the study was the same teacher, Teacher A (pseudonym) in the previous semester. Selin noted that she liked the way her mentor teachers controlled the students and her teaching style depending on her previous observation in the last semester. Selin indicated the mentor teacher's serious stance/position to the students in her talks. She also seemed satisfied with the mentor teacher's encouragement for her and her friends to the teaching task. She stated that she had taught at 6th and 7th grade classes in the previous semester. She had liked the lessons with sixth graders as they were asking very good questions and seemed interested in the subject.

Selin stated that she would like to work at a private school rather than at a public school. She thought that she could use her enthusiasm and her knowledge by working at schools with resources such as laboratory, computer equipment, and more opportunities for students in sports, art, and various social activities like in private schools. Further, she noted that although she liked to work at a public school, she had little chance to be assigned to a central school in a large city after the graduation because of the official regulations of Turkish public school system.

*3.3.1.1.2 Beril*

Beril had been tutoring almost all grade levels from elementary to high school, even to university students, since she had been a junior student at the university. She was tutoring two students during the data collection for the current study. She stated that she always reviewed the topic she would be teaching before the tutoring for specifically students who were preparing for the university entrance examinations. Beril mentioned about benefits of tutoring, such as being obliged to review the subject before the lesson and being aware the students' difficulties or misconceptions in mathematical subjects. Further, she stated that those tutoring experiences helped her to detect her deficiencies, as a pre-service teacher, in terms of mathematical content knowledge.

Beril noted that she had not worked at examination preparation centers and did not want to work at any time in her teaching life. She mentioned that according to her prior observations at different collaborating schools, knowing classroom culture was very important in teaching. She also reported the necessity to be well prepared for the lesson and getting experience for the teaching profession in time.

Beril mentioned about her prior teaching experience in the previous semester. She noted that it was a successful teaching session as she had been able to control the class properly. Like Selin, Beril's mentor teacher was also Teacher A. Beril reported that Teacher A seemed to use new teaching methods rarely while teaching according to her observations in the last semester. She stressed that

although the school was a private school, the instruction was mostly a teacher-centered. She further stated that she would expect the mentor teacher to encourage her for the teaching task.

After graduation from the teacher education program, she wanted to work at a private school especially in her early years in teaching. Because she believed that working at a private school always required a dynamic pace she had at that time. She thought that public schools did not require such an enthusiasm and were not able to provide desirable conditions. Beril added that she wanted to have more teaching practice in this semester rather than simply observing the mentor teacher to gain experience in teaching.

*3.3.1.1.3 Taner*

Taner had been private tutoring mathematics for two years. As he noted, his students were from different grade levels such as elementary, high school, and university. His university students were those who were taking Calculus course. He mentioned that he did not need to make a preparation for tutoring students of grade levels 5 to 8. For high school and university students, however, he used to look at the mathematics content and prepare worksheets including various questions for the related subjects identified by students. He noted that he did not solve those questions he had prepared before tutoring; rather he used to solve them during tutoring.

Taner stated that private tutoring provided him with the opportunity to apply theoretical knowledge learned in method courses into practice with real cases. He added that private tutoring was also important for him in terms of gaining experiences in learning various types of students' responses, their frames of mind, and their misunderstandings in some mathematical topics. Taner also stressed that he learnt much more things during private tutoring than as a pre-service teacher. Since he had different students, he used to teach various mathematics subjects which made his mind fresh in terms of mathematical content knowledge.

He had also worked at examination preparation centers for two years during his first and second year of in the teacher education program. He thought that it was a useful experience leading him to increase his confidence in teaching. Taner stated that those experiences in private tutoring and at a examination preparation center provided him with the skills to teach any mathematics subjects to students at any grade level.

His mentor teacher was Teacher B (pseudonym). Taner liked the mentor teacher's teaching style. He said that the mentor teacher achieved to balance fun and seriousness in the classroom. He also stated that Teacher B was always trying to help him and his peer Nihat and behaved friendly.

*3.3.1.1.4 Nihat*

Nihat had been private tutoring in mathematics to students at all grade levels from elementary to university for two years. He noted that he usually did not have a preparation process before tutoring as he already possessed the mathematical content knowledge. Nihat mentioned that private tutoring provided him significant improvements in terms of knowledge and skills for how to teach, what to teach, what should teach, and the placement of subjects in the curriculum. Besides stating the positive outcomes of tutoring, he stressed its ineffectiveness regarding the classroom management because of dealing with one student. He also worked at an examination preparation center for ten months during the second year of the teacher education program. During our conversations, Nihat emphasized his deficiency in managing classroom based on his prior teaching experience at the examination preparation center. He stated that he had had difficulties in controlling the higher grade level of students.

Like Taner, Nihat's mentor teacher was also Teacher B. Nihat stated that he and his peer Taner had a good relationship with Teacher B. He said that Teacher B always tried to help and respond them in any issue related to teaching or being a teacher at a private school. Nihat stated that he usually observed the

mentor teacher's way of controlling the classroom. He tried to analyze which methods should be used while managing students during his observations.

### 3.4 ELE 420 Teaching Practice Course

The Higher Education Council (HEC) identifies two courses related to field experience, School Experience and Practice Teaching, at the seventh and eighth semesters in Elementary Mathematics Education program. The objectives of these courses stated in the EME program are to provide student teachers to make observations and have teaching experience by active participation in selected cooperating schools (Middle East Technical University, 2007). The first field experience course, ELE 435 School Experience offered in the seventh semester is based mostly on observation of the classroom including pre-service students' and teachers' behaviors, interactions among them, and teaching methods. The second teaching practice course, ELE 420 Teaching Practice in Elementary Education offered in the eight semester is also based on observation, but this time by giving emphasis on teaching practice. Some of the learning outcomes stated in the EME Program are "(1) developing and sequencing math lessons for the elementary school pre-service teachers and being familiar with classroom management techniques; (2) selecting and using appropriate instructional strategies and equipment; (3) designing activities which promote the development of concepts, process skills, and a positive attitude toward mathematics; (4) being aware of specific mathematics topics taught in each of the grades 6-8 and know where to gather resources to aid in the teaching of those topics" (Middle East Technical University, 2007).

#### 3.4.1 Content of the ELE 420

The Practice Teaching course in the spring semester of 2009 had three sections conducted by three instructors. Two of four participants were assigned to the section for which I was the instructor. Other two participants were separately assigned to the other sections. The syllabus of the course prepared by the three instructors is in Appendix A. It represents the outline of the course, assignments, and requirements. The assignments given for the ELE 420 course were designed

to be carried out during the fieldwork in the practice classrooms. University instructors and the pre-service teachers met on a weekly basis for two hours to discuss about what had happened in their last practice teaching and share their experiences with their peers and the instructor. The form of the discussions was shaped by the weekly assignments described in the course syllabus.

As noted in the syllabus, pre-service teachers were required to teach as a regular teacher for at least three hours at practice schools one of which would be observed by the instructor. Within this task, pre-service teachers were required to prepare and submit three lesson plans including date, school, grade, section/subject information as well as the following steps during the lesson. Further, they were required to write expectation paper at the beginning of the semester and reflection paper at the end of the semester. Pre-service teachers were also requested to present a micro teaching during the course hours. Moreover, they were wanted to prepare a learning center at their collaborating schools. Besides all these assignments, pre-service teachers were asked to write weekly reflections based on their experiences with the mentor teachers and students and talk about observations from the practice teaching in the collaborating school in each course in the faculty.

### 3.5 Data Collection Process

The data for this study were collected in 2008-2009 Spring Semester. First of all, initial interviews were conducted with the participants to gather detailed and more information about them and their prior teaching experiences. After getting general information about the participants, they were interviewed before and after each teaching session and observed during the teaching to investigate the research question. In addition to interviews and observations, end of semester papers of the participants assigned in the ELE 420 course were also analyzed. Since the current study was based on the SRL models of Zimmerman and Pintrich, the data collection process was planned to uncover pre-service teachers' thoughts and actions before (forethought) and after (self-reflection) each teaching sessions. Entire data collection process took about three months (See Table 3.2).

Interviews were conducted before and after each teaching practice to identify participants' SRL strategies. The interviews were conducted at different places such as my office, school cafeteria, or school meeting room depending on the schedule of the participants. I made sure that there was nobody else in the place and no interruptions were made during the interviews. Initial interviews took about an hour; while each of the pre and post interviews took about 30 minutes. All interviews were audio-recorded after getting participants' consent forms and transcribed verbatim.

***Table 3.2 Data Collection Period for Each Participant***

| Participants | Data Collection Period (Date) |
|---|---|
| Selin | March 9th, 2009- June 3rd, 2009 |
| Beril | April 10th, 2009- June 3rd, 2009 |
| Taner | April 27th, 2009- June 8th, 2009 |
| Nihat | April 27th, 2009- June 8th, 2009 |

The participants completed their 8-class hours teaching experiences in different days and time intervals with different classes at their practice schools. Table 3.3 shows the number of sessions they taught, grades, and the sections of classes.

***Table 3.3 Number of Observed Class Hours Taught by Each Participant***

| Participants | Number of class hours they taught in each observation | Grade levels/ Sections |
|---|---|---|
| Selin | 2, 1, 1, 1, 1, 2 hours | 8/B, 8/B, 7/A, 8/A, 6/A, 6/A |
| Beril | 1, 2, 1, 1, 2, 1 hours | 7/A, 8/A, 8/A, 7/B, 7/A, 6/B |
| Taner | 2, 2, 1, 1, 2 hours | 8/B, 8/B, 6/B, 8/A-B-C (mixed sections*), 5/B |
| Nihat | 2, 2, 1, 1, 2 hours | 8/A, 8/A, 6/B, 8/A-B-C (mixed sections*), 5/A |

*: Three sections were brought together in a class as they were few students in each section.

The following table represents the number of interviews and observations conducted with the participants. As can be seen from the Table 3.4., 6 pre-interviews and 6 post-interviews conducted with Selin and Beril; while 5 pre-interviews and 5 post-interviews were carried out with Taner and Nihat. Depending on the number of interviews, female participants were observed 6 times and male participants were observed 5 times in the study. The distribution was due to the teaching schedule of the participants but not to the gender. In total 48 interviews with 22 observations were conducted throughout the study.

***Table 3.4 Numbers of Interviews and Observations with Each Participant***

| | # of Interviews and Observations | | | | |
|---|---|---|---|---|---|
| Participants | Initial Int. | Pre-int. | Post-int. | Total | Obs. |
| Selin | 1 | 6 | 6 | 13 | 6 |
| Beril | 1 | 6 | 6 | 13 | 6 |
| Taner | 1 | 5 | 5 | 11 | 5 |
| Nihat | 1 | 5 | 5 | 11 | 5 |
| Total= 48 | | | | | Total= 22 |

### 3.6 Data Collection Tools

The data of this study were collected through interviews, observations, and the pre-service teachers' reflection papers in order to explore pre-service elementary mathematics teachers' self-regulated learning strategies regarding their teaching practices at collaborating schools. The following section represents major data sources of the study.

#### 3.6.1 Interviews

The primary data collection method was one-on-one semi-structured interviews that were constructed to find out PEMTs' self-regulated learning strategies for their teaching practices. Considering the combined and adapted SRL framework of the present study (see Table 2.3), interviews were conducted before and after each teaching performance. The aim of conducting the interviews was to lead participants to think about their own learning process related to teaching practice. The interviews before participants' teaching session emphasized their self-regulated learning strategies regarding the process of mathematics lesson preparation. On the other hand, the interviews after teaching practices aimed to ascertain participants' self-reflections about what had happened in the classroom. By these interviews, not only the participants were enabled to think aloud while they were reflecting upon their experiences, but also the researcher was able to

check the accuracy of her observation notes. All interviews including initial interviews, pre and post- interviews were explained in the following section.

#### *3.6.1.1 Initial Interviews*

Initial interviews were conducted with each pre-service teacher immediately after they were identified as the participants of the study. The main purpose of doing initial interviews was to have detailed personal information about the participants and learn more about their prior teaching experiences. Some demographic information such as type of graduated high school, cumulative grade point average, place of residence (at home or dormitory), and pedagogical content courses they had taken were asked to the participants. These questions were asked to have a general view of the participants. Besides general information, the questions related to the participants' teaching backgrounds were also stated in the interview. They were asked whether they had ever worked at an examination preparation center or worked as a private tutor. Some follow up questions were asked depending on the participants' responses. For instance, they were asked to express one of their prior teaching experiences considering the preparation process with an emphasis on the SRL strategies. In addition to their prior teaching experiences, they were also asked about the teaching practices at collaborating schools at fall semester and their first year of the university. Their personal opinion about the mentor teacher and the role of them based on their prior observations were also asked in the interview. As well as their prior experiences, their expectations from the current practice teaching were asked to the participants. Finally, the participants' views about being an ideal teacher and their future expectations from the teaching profession were mentioned during the interview. Table 3.5 shows the content of the questions in the initial interview. The complete questions in the interview protocol are given in the Appendix C.

*Table 3.5 Selected Examples from the Initial Interview Protocol*

| Content of the questions from the initial interview |
|---|
| Date of birth |
| Type of graduated high school |
| Cumulative Grade Point |
| Place of residence (At home/dormitory) |
| Pedagogical content courses being taken |
| Working at a Examination Preparation Center/ as a private tutor |
| Prior teaching experiences at previous semester |
| Personal opinions about prior mentor teachers |
| Expectations from the current teaching practice |
| Personal opinions about preparation for an ideal lesson |

#### *3.6.1.2 Pre-interviews*

A semi-structured interview was conducted with the participants prior to the each teaching session to identify their preparation process based on the SRL framework of the current study. Pre-interviews included fourteen open-ended questions (see Appendix B) which were occasionally directed depending on the responses of the participants. That is, according to the given responses, probing and follow-up questions (Patton, 2002) were also asked to the participants. In the beginning of the interview, information about grade level, class section, teaching duration, and the subject being taught was sought. The participants were asked whether they had observed or taught at that section before. Their reflections upon subject they would teach were also mentioned while interviewing. After getting initial information, they were requested to identify the process they had while preparing the course materials (such as lesson plan and worksheets) for the teaching session. Leading questions based on the SRL framework of the current study were used while interviewing. Selected examples for those questions are shown in Table 3.6. The complete interview protocol is given in Appendix B.

*Table 3.6 Selected Example Questions from the Pre-interview*

| **Selected Questions from the Pre-interview** |
|---|
| - Have you ever made observation or had teaching experience at this school? |
| - In which grade you are going to teach at? |
| - Which mathematical subject you are going to teach? |
| - What do you think about the mathematics subject you will teach? |
| - Have you been prepared for the lesson? |
| - What kind of preparation for the lesson you have done? |
| - Do you have any positive or negative outcomes for the lesson? Explain. |
| - Are you ready for the teaching now? Why (not)? |

As reported, pre-interviews were conducted before the PEMTs perform their teaching practices. After the teaching performances post-interviews were conducted with the PEMTs.

#### *3.6.1.3 Post-interviews*

Post-interviews were conducted to assist the participants to reflect about their teaching sessions. They were asked whether they were able to conduct the lesson as they had planned. While responding, they were asked to consider the statements mentioned in the pre-interviews with the help of my probing questions. Depending on their responses, possible concerns related to the effectiveness of the lesson were questioned. They were also directed with the observation notes I took during the teaching session to ask follow-up questions. The open-ended questions in the post-interviews were designed to give participants an opportunity to think aloud for their own teaching process. Some of the selected example questions from the post-interview are given in Table 3.7 (See Appendix B for all questions).

*Table 3.7 Selected Example Questions from the Post-interview*

| Selected Questions from the Post-interview |
| --- |
| - What do you think about the lesson you have taught?<br>- Were you able to conduct the lesson as you planned? Why (not)?<br>- Did you encounter any unexpected events /cases? What did you do?<br>- Were there any positive or negative events? What were they?<br>- How did you feel while teaching?<br>- What do you think about the effectiveness of the lesson as a pre-service teacher? |

### 3.6.2 Observations

In addition to interviews, participants were observed while they were teaching at collaborating schools. The major purpose of making observations was to enhance the findings of the study as well as to stimulate the recall of teaching experience during the post interviews. Another reason to conduct observations was to gather information about the classroom context, physical conditions, relationship with the pre-service teachers, pre-service teachers' behaviors, and role of the mentor teacher. The observations also helped me to ask probing questions related to the events in the classroom and to direct the interviews. A sample observation note of a participant was given in the Appendix D.

Observation notes included a model (figure/shape) of the physical settings of the classroom and information about the number of students, teaching subject, and duration of the lesson. The main concern of the observation was identifying the details of what was going on in the classroom focusing on the pre-service teachers' behaviors. Therefore, the comments of the researcher related to pre-service teachers' planned and unplanned activities during the teaching constituted the major part of those observation notes. Pre-service teachers' responses and role of the mentor teacher during the teaching were also reported. Follow-up questions were produced from those observations and asked in the post-interviews.

Observation notes also included sample conversation of students and the pre-service teachers.

### 3.6.3 End of Semester Reflection Papers

The participants were required to write a reflection paper at the end of the semester within the context of ELE 420 Practice Teaching course. End of semester reflection papers were mostly based on the pre-service teachers' experiences at collaborating schools. They were generally asked to mention about the contributions of practice teaching to their future experiences.

## 3.7 Role of the Researcher

The participants of the study were four pre-service teachers studying in the Elementary Mathematics Education (EME) program in the fourth and the last year of their university education. I had been a graduate assistant in the same program and took responsibilities in some of their courses during their first, third, and fourth year in the EME program. I had a close contact with pre-service teachers during my assistantship in the Department of Elementary Education. This relationship had positive impact on the study that the participants tried to provide me indepth information in both pre-interviews and post-interviews. They seemed to be highly motivated to give longer and detailed responses for the questions I asked.

During the interviews, I tried to make them feel comfortable by stressing that there were no correct answers for the questions. They sometimes wanted me to approve some of their comments, personal opinions, or decisions. However, I underlined that I was only interested in their reflection about their own learning and teaching process, rather than judging them. For the aim of making participants feel comfortable, I let them to identify the date of teaching according to their and the mentor teachers' availability. They also decided in which class they would teach with their mentor teachers. Then, they informed me about the date, time, and the class sections. In this process, I tried to help the participants in transportation by picking them up from their dormitories to the practice school, so that they would not spend much time on the school way.

The role of researcher in a qualitative study should be made clear as the interactions between the researchers and the participants constitutes important piece of the study. As stated before, two male participants were assigned to the section in which I was the instructor; however, no instruction for using SRL strategies in the context of teaching was given during the course. Therefore, all participants of the study were in same condition that they did not have an explicit instruction related to the SRL.

As reported in the content of the ELE 420 course, one of the course assignments was one class-hour teaching at collaborating school which would be observed by the university instructor. In order to prevent biases to the participants, I requested one of the instructors of other sections to observe and evaluate them on behalf of me for the course purposes. Thus, I did not evaluate and give marks for the two participants about their teaching.

The following section presents the process of pilot interviews and observations.

### 3.8 Pilot Interviews and Observations

Pilot interviews and observations were conducted in order to identify the process of the current study and to form the final interview protocols. The pilot data were gathered within the context of ELE 435 School Experience II course which was a prerequisite course for ELE 420 Practice Teaching. Pre-service teachers were only required to make (40 hours) observations during the ELE 435 School Experience II course during the semester at collaborating schools. However, some of the mentor teachers could ask them to teach one or two class hours mathematics. The participants of the pilot study were those who were required to teach one or two class hours of mathematics lessons during ELE 435. From those, five pre-service teachers who informed me about the date of their teaching sessions, were interviewed before the teaching and observed during the teaching. Pilot interviews helped in shaping some of the questions for the current study. Pilot observations showed that revealing and understanding the participants' self-regulated learning strategies for their teaching were impossible

through observations since the participants acted as a teacher rather than a learner during the teaching. That is, the teaching process reflecting the performance phase of Zimmerman's and Pintich's SRL model could not identified in this study. For this reason, it was decided that observation notes should be used for making sense of participants' verbal expressions about their teaching.

With pilot interviews, the categories emerging from the data were first grouped based on the Zimmerman's SRL model. However, depending on the findings from the pilot interviews, the framework of the study was formed by combining and adapting the two SRL models of Zimmerman's (1998) and Pintrich's (2005) (see Table 2.3).

### 3.9 Data Analysis Procedure

For the analysis of data, as a first step, the interviews were transcribed verbatim by the researcher. Then, all written transcripts were read several times to obtain an overall understanding of the data. As Merriam (2009) stated, data analysis process refers to making sense from the data. To make meaning out of the data requires moving back and forth through the data to reach meaningful insights to answer the research questions. After reading and managing the data, from each transcript significant phrases or sentences directly related to the participants' SRL strategies for teaching mathematics were identified. Additionally, reflective notes were written in the margins of the transcripts to explore the data in detail. Those notes were short phrases or key concepts that helped describing the data. This process was followed by reducing the data into meaningful categories through making out codes (Creswell, 2007). The initial codes were considered as tentative until they frequently appeared through the data. After coding data, I formed the categories reflecting the SRL strategies of the participants which were the main concern of the study.

The original data were gathered and transcribed in Turkish. Personal reflective notes written in the margins of the transcription were also written in Turkish. English language was begun to be used when codes were being defined,

since the theoretical framework related to the codes was in English. Writing the codes in English provided me to relate the codes identified in the literature without difficulty.

While analyzing the data, a faculty member in the Department of Elementary Education who has been experienced with qualitative research and analysis, looked over the data and validated the assigned codes and defined categories. He jotted down additional notes to the margins in transcripts while reviewing the coded data. After his review of the data, we had extensive discussions for developing and assigning names of codes and reached over 90% agreement.

### 3.10 Trustworthiness of the Study

In qualitative research, the issue of trustworthiness is related to "how can an inquirer persuade[s] his or her audience (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?" (Lincoln & Guba, 1985, p.290). There are four criteria to ensure the trustworthiness of a qualitative research: credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

The credibility issue which matches with the internal validity in quantitative approach (Lincoln & Guba, 1985) deals with whether research findings match with reality (Merriam, 2009). In other words, whether the results of qualitative research are credible or believable when the perspective of the participant is considered. In this study, in order to address and increase credibility, three strategies stated by Merriam (2009) were utilized.

The first technique was to triangulate the data by using more than two methods with a view to triple checking results, since it is believed that no single source of information could provide a comprehensive view of the study. Thus, in the current study, initial interviews, pre and post interviews, observations and finally participants' reflection papers were used to confirm the findings of the study. Pre and post interviews were the main data sources, while initial

interviews, observations, and reflection papers were used to clarify and validate the main data sources.

The second technique to increase credibility was member checking also called as "respondent validation" (Merriam, 2009, p.217). This is a kind of validation in order to prevent misinterpreting the meaning of what participants say and identifying the possible misunderstandings of what the researcher observed (Merriam, 2009). After the interviews, the researcher went back to the data while interpreting and trying to emerge the reasonable statements for data coding process and asked participants whether the interpretations of their responses were plausible. That is to say, the researcher asked questions to each participant to clarify and check the accuracy of interpretations of the interviews. For unclear responses, the researcher tried to ask the question once again with different sentences in order to lead them to express their responses before moving the next question. Member checking was tried to be used continuously throughout the study. These validations of respondents after the interviews helped me to identify some of preliminary findings regarding the participants' SRL strategies.

The third technique to enhance credibility was peer examination, which matches with the interrater reliability in quantitative research. This strategy provides an external control of the research process (Lincoln & Guba, 1985). Two faculty members (my thesis advisor and co-advisor) reviewed the instruments and commented on the items of interviews and observations. Depending on their comments and suggestions, I reviewed the interview questions once again and formed their final versions. Further, during the data analysis process, my supervisor, a researcher experienced in SRL research, also analyzed my ongoing data analysis and coding process. He asked me some questions about meanings and interpretations of the identified codes and categories reflecting the participants' SRL strategies. Depending on his feedbacks and suggestions, I utilized different data analysis techniques and reviewed the codes and categories again.

Transferability issue refers to the degree to which the results of qualitative research can be generalized/transferred to other settings (Miles & Huberman, 1994). Although, the current study did not have a generalizability concern, it seemed to be possible to talk about some degree of generalizability. Transferability was achieved by thoroughly detailed descriptions of the participants, the research process, and the methodology. Therefore, the readers will be able to identify to what extent they would apply the findings of the study and generalize those findings to pre-service teachers in similar context.

Dependability and confirmability issue which matches with the reliability in quantitative research refers to the consistency and stability of the study process over time and across researchers (Miles & Huberman, 1994). This issue was achieved by the condition that a different researcher coded the same data in order to examine the inter-rater reliability similar to the credibility issue. This technique enabled to cross-check of the findings of the study. Therefore, the data were coded by a second coder, who was a graduate assistant in the ELE department and had qualitative data coding experience before. The second coder was trained about SRL strategies within the context of teaching practices by the researcher. While training, the current SRL model was explained to the second coder and given a codebook representing a list of each category concerning the SRL strategies. The second data coder was familiar with the literature of the SRL as she had taken a related graduate course. Although she had background content knowledge for SRL, it was found necessary to analyze an interview together to make a practice for coding SRL strategies. She coded data with pseudonyms for the participants in order to eliminate the bias. The data coding process ended with almost full consensus between me and the second coder.

### 3.11 Limitations of the Study and Future Research

There are some limitations of the current study that should be recognized. It is important to interpret the findings based on these limitations associated with the study. One is the small number of participants which caused limitation of the generalizability issue. Second is the limited amount of teaching practices (8 class-

hours) at collaborating schools. Another, considering the validity issue, the participants were not required to write self-reports for each teaching practice which might have been important for triangulation of the data. Further, the process of pre-interviewing and post-interviewing might make some influence on the PEMTs' thinking about their individual process. However, there was not any intervention or manipulation aimed and conducted by the researcher, since the purpse of the study was merely to identify the PEMTs' self-regulated learning strategies when they were preparing for their teaching practices. Despite all of these conditions the study itself might influence the PEMTs' thinking process and their awareness for the teaching practices. In order to minimize the influence of the study, the role of the researcher and the data collection process were deeply reported in the previous sections.

# CHAPTER 4

# FINDINGS

This study had three main goals. First was to identify PEMTs' SRL strategies within the context of their teaching practices. Second was to find out PEMTs' adapting and changing strategies to the new challenges/ situations they face during their teaching practices. The third aimed to identify the reasons of those adaptations and changes.

As stated in the method section, 22 pre-interviews and 22 post-interviews were conducted through the study. Observations were also performed for each teaching practice for each participant. Besides observations, participants' end of semester reflection papers assigned within the ELE 420 course were examined in the study. In addition to those multiple data sources, initial interviews representing detailed information about the participants were also analyzed and reported in this section. Thus, in the following sections overall findings gathered from those multiple data sources by stating direct quotations drawn from the participants were reported.

## 4.1 Pre-interview Findings Representing the Forethought Phase

The SRL model of the current study began with the forethought phase. This phase dealt with the 'lesson planning processes' for PEMTs teaching session as a first step. The findings of this study indicated that the PEMTs were involved in substantial amount of thinking in this phase by using different SRL strategies. The strategies employed used by the participants in this phase included searching resources from related sources, arranging and organizing the available sources, asking for help and feedback from the university instructors, peers, and the mentor teachers, mental planning of the lesson, and setting goals for the teaching session. These strategies were considered as cognitive self-regulation strategies. In addition to cognitive SRL strategies, motivational factors such as self-efficacy,

perception of task, and intrinsic interest were included in the study. The following section begins with the cognitive self-regulation strategies used by the participants in planning a lesson.

### 4.1.1 Cognitive strategies in planning a lesson

#### *4.1.1.1 Searching for related sources*

The data clearly indicated that one of the first steps that the PEMTs were pursuing was to prepare the course material, such as worksheets, hands on activities, and/or slides (electronic files) to be used on smart board. One strategy they used in preparing such materials was to seek relevant sources. The sources used by the participants were the textbooks published by Ministry of National Education (MONE) for teachers, internet resources through search engines, question banks [*soru bankası*], supplementary self-study books [*yardımcı kitaplar*], and their peers' as well as their mentor teachers' ideas.

The teachers' guidebook accompanied to the student textbook published by the MONE was considered as a primary data source for all participants. This book includes information about the elementary mathematics curriculum, sample lesson plans, and information about how to conduct an activity for a specific subject. All of the participants used the MONE's teachers' books for the major purpose of identifying and following the order of topics of the main subject as stated in the curriculum. They also used the teachers' guide book in order to check students' prior knowledge by reviewing the content of the subjects. Selin in her first pre-interview stated that:

> First of all, I directly clinged to the teachers' guide book, to see the order of the topics [and] whether I had gaps in those. But, still that book itself certainly is not enough as a source (*pre-1*).
>
> [*İlk olarak öğretmen kılavuzuna sarıldım direk. Konu sıralaması nedir ne değildir, konularda eksiğim var mı diye, ama kesinlikle öğretmen kılavuzu tek başına kaynak olarak yeterli değil yine.*]

Nihat commented about the use of the MONE's teachers' guide. He specified that:

> Normally, when we are going to lecture, I look at the teachers' book to understand what the boundaries of the topic are. We (*he and his peer Taner*) check it as if we go through a curriculum guide to learn what the boundries of the subject are, what we should teach, and what we should not mention. But we do that at the time we are going to lecture
> [*Normalde konu anlatacağımız zaman, sınırı ne konunun ona bakıyorum. Milli eğitim kitabına onun için, aslında programa bakar gibi, açıyoruz sınırı ne, kazanımı ne, ne anlatmamız lazım, ne anlatmamamız lazım. Ama bunu konu anlatacağımız zaman yapıyoruz*.]

In another pre-interview with Nihat, he stated that "We looked at both seventh and eighth grade teachers' guide to learn what students have known from the topics of the previous year. Then, from there we looked for an activity about the education at the eighth grade." [*Milli Eğitimin kılavuz kitabını 7. ve 8. Sınıf, oradan konulara baktık, hangi konuyu ne kadar biliyorlar ona baktık. Sonra, 8. sınıfta eğim konusunda bir etkinlik vardı, o etkinliği işte oradan baktık.]*

Internet was another commonly used source especially by Selin and Beril. They usually used internet in order to prepare the course materials, specifically to search for hands on activities, questions, and lesson plans. Beril used the internet to find pictures of visual objects while teaching a subject related to three dimensional shapes in her lessons. In one of her pre-interviews she stated that she would use Google Earth to show pictures taken from different perspectives of a building to visualize and represent the topic "drawing perspectives" with real life objects. She added that she used that kind of visuals taken from the internet to take students' attention to the subject. Beril also stated that she used the internet in order to search information from the National Council of Teachers of Mathematics' (NCTM) web site. She searched for finding any relevant resource that would help her in teaching. From that web site, she looked at activities and learning goals for specific subjects.

Selin used the internet as one of her primary sources for each of her teaching session. She used it to search especially from foreign web sites, since she thought that they had rich sources regarding the student-based activities and development of different ideas about specific mathematical subjects. She also used internet to find sample lesson plans when she had little time to prepare a new one by herself. She said that "I tried to find lesson plans for the teaching session, since I didn't want to spend much time on it as I had an examination in the faculty today." In this case internet was used for the purpose of saving time in planning.

For Taner and Nihat, internet was the least frequent resource while searching for the teaching subject. In only one of his interviews, Nihat reported that he briefly checked an internet resource, but did not use it for the course material.

Besides using the MONE's textbook and internet, all participants, except Beril, used additional sources such as books covering different teaching methods and ideas in terms of conducting an effective lesson for mathematics teachers and books covering various mathematics tests. Selin stated that "As well as searching from the internet, I looked at a book including teaching methods that I bought last year for the method course (ELE 436 Methods of Teaching). I have already searched from the teachers guide book to choose good questions."

Question banks from the library in the mathematics department [*zümre odası*] at the collaborating school were used by Taner and Nihat. They usually searched for finding different and interesting questions aimed especially for high stake test (SBS) preparation while preparing the course material. Thus, they noted that they used a lot of books from their personal library and library in the mathematics department. In our informal conversations before the interviews, they usually stated that they were lucky to conduct their teaching practices at that school as they were provided with all kinds of opportunities like using the books in the mathematics department whenever they needed.

Taner and Nihat were going to the same collaborating school, mostly teaching at different sections of the same grade levels, and they usually had similar/parallel planning process for their individual teaching sessions. Thus, they

had similar process for searching resources as well. They mostly researched the subject to be taught through the books that provided question banks including various types of questions.

Worksheets and activities taken from their peers were also the sources especially used by Selin and Beril. Selin reported that she used the activity prepared by one of her friends for a presentation at the university course, as it seemed in good quality:

> As an additional source, I used the activity that Nihan conducted for the micro teaching session last week in the Practice Teaching course. I remembered that activity at the last moment while preparing the lesson plan. Actually I thought that I would prepare something by myself when I could not find anything from the internet. I was also thinking to make students find formulas as an activity. Then, however, I remembered Nihan's activity for the subject to teach and decided to use it since it included quality questions. (*pre-3*)
>
> [*Ek bir kaynak olarak, geçen hafta Nihan'ın practice teaching'de yaptığı etkinliği kullandım. O etkinlik ders planını hazırlarken son anda aklıma geldi. Aslında etkinlik internetten bulamayınca kendim uydurayım diye düşündüm. Hatta buna benzer çocuklara formüller çıkarttırayım diye de düşünüyordum. Ama sonra konu olarak Nihan'ın aktivitesi aklıma geldi ve onu kullanmaya karar verdim sorular da gayet kaliteli olduğu için.*]

Similar to Selin, Beril used the lesson plan that one of her friends prepared and conducted the day before for another section of the same grade level at her school. Beril stated during the conversation between her and the researcher (R) that:

> B: Ezgi represented the relationship between volume and liquid measures in this way (by pointing the lesson plan). I am going to follow the same way as her.

R: Okay, have you taken the lesson plan with its exact version prepared by Ezgi?

B: Yes. Teacher A told me that the same subject was taught by Ezgi yesterday. Then, I immediately called Ezgi to ask what she did for the subject. She said that she prepared a worksheet and delivered to the students as homework by the permission of Teacher A. Therefore, I am going to implement the same worksheet as I will teach at a different section. (*pre-6*)

[*Elif ders planında bu şekilde hacimle sıvı ölçüleri arasındaki ilişkiyi bu şekilde vermiş. Ben de bu şekilde gideceğim.G: Tamam. Peki Elif'in planını aynen mi aldın? B: Evet, evet. Hocam dedi ki bir önceki ders Elif anlattı. Ben de hemen aradım, onunla konuştuk, nasıl anlatayım ne yapayım diye. Zaten o bir çalışma kâğıdı dağıtmış, hoca da ödev vermiş. O yüzden ben de farklı bir şube olduğu için aynı planı uygulayacağım.*]

Besides the reported sources, all participants, except Beril, stated that they also rely on their own knowledge of the subject, as they prepared some questions for the worksheets without using any sources. Taner and Nihat frequently reported that most of the questions in the worksheets were prepared by themselves.

The below table represents the different resources used by the participants based on their pre-interviews through the study.

***Table 4.1 Types of Resources and Purpose of Use***

| Resources | Purpose of Use |
|---|---|
| MONE's text book and Teachers' Guide | -Identifying and following the order of the sub topics/titles of the main subject as stated in the curriculum<br>-Learning about the borders of the teaching subject<br>-Learning about students' prior and existing knowledge |
| Internet | - Searching for hands on activities, questions, and lesson plans.<br>- Finding examples of pictures, visual objects, and three dimensional shapes |
| Question Banks | - Searching for different questions |
| Additional Sources (supplementary self-study books) | - Looking at different sources covering diverse teaching methods<br>- Searching for different questions |
| Worksheets, activities, and lesson plans taken from the peers | - The quality of the questions/ activities was confirmed before in the faculty courses |
| Books of Mentor Teachers | - Searching from different types of sources |

It can be summarized from the Table 4.1 that all the participants used MONE's teachers' book as a guide while preparing their lesson plan. Their most common purposes for using that book were to learn how the mathematical subjects/contents were stated in the curriculum and what important components of the subject should have been discussed in the lesson. They also searched the internet to find interesting and different types of activities or questions. The internet was also used for finding visual shapes depending on the real life examples. Another common resource was question banks that were used to choose different questions. Moreover, some of the participants used their peers' course materials, such as worksheets or activities, prepared for a prior teaching session. Participants also noted that they used different textbooks of their mentor teachers when they needed.

The following table represents the types of resources that the participants used while preparing their course materials according to the conducted pre-interviews.

#### *4.1.1.2 Organizing the related resources to form the course material*

Another self-regulation strategy that participants used while preparing for a lesson was the process of organizing and interpreting the gathered information from different resources such as textbooks, internet, or question banks. They organized the gathered information in order to form a course material like worksheets or student-centered activities. All participants stated that arranging the gathered information both for the students and for themselves was the major task to be achieved during the lesson planning process. They asserted that while organizing the available information they should also consider students' behaviors and their reactions to and interests in the lesson, which might have an influence on the organization of the gathered information. For this reason, all the available information gathered from resources such as MONE's textbooks, internet, and question banks were reviewed once again to organize the content of the course material. While forming the course material, the participants noted that they certainly took into account the objectives identified by the mentor teachers. They repeated that this process was one of the main parts of the lesson planning process as they spent remarkable time on it. Beril exemplified this process:

> Arranging the gathered information from different sources takes quite some time. I interpret them in my mind during 1 or 2 hours, and then it is easy to write down. I write down in half an hour; but interpreting takes longer. *(pre-1)*
>
> *[Kaynaklardan bulunanların şekillenmesi biraz zaman alıyor, 1-2 saat kafamda yorumluyorum, sonra dökmesi kolay. Yarım saate döküyorum, ama yorumlama süreci daha uzun...]*

Similar to Beril, Taner talked about the process of organization of the gathered information and how to begin and conduct the lesson.

> Actually, at first, I could not decide where to begin to the subject Measures. Since the teacher (mentor teacher) said me only to teach Measures and did not say anything else. I had various sources that I thought over how to organize them, even thought about it all weekend. Then I decided to begin with the Liquid Measures. First of all, I decided to prepare a little reminding of the subject and then prepare a worksheet for the purpose of evaluation. (*pre-3*)
>
> [*Aslında ilk önce, Ölçüler konusuna nereden başlayacağıma karar veremedim. Çünkü hoca sadece Ölçüleri anlatacaksınız dedi, başka da bir şey söylemedi. Elimde bir sürü kaynak vardı, onlardan nasıl toparlama yapacağımı uzun uzun düşündüm, hatta bütün hafta sonu onu düşündüm. Sonra ilk etapta Sıvı Ölçüleriyle başlamaya karar verdim. İlk önce konu bazında küçük bir hatırlatma, sonra da değerlendirme amacıyla bir worksheet hazırlamaya karar verdim…*]

Selin explained for which purpose she used the gathered information and how she arranged it in the following way:

> I have searched more about what I should teach and where I should deal within the topic. Thus, I have found the history of the topic and an in-class activity. However, I thought about how to arrange those materials so that students would not loose their focus on the lesson and how to conduct a fluent lesson. It took some time to organize these kinds of issues. *(pre-1)*
>
> [*Daha çok, dersin neresinde nereye değinmeliyim şeklinde araştırdım. Yani, aslında etkinliği buldum, tarihçeyi buldum. Ama neyi nerde, nasıl bağlayayım ki çocuklar kopmasın. Akıcı bir şekilde ders işleyebileyim diye düşündüm. Onu hani planlamak da zaman aldı*.]

While organizing the related sources to form course materials like worksheets or student-centered activities, all participants tried to arrange the steps to be proceeded from easier to more complex according to the learning objectives. They considered the students' achievement levels by giving special attention to the difficulty level of the questions and/or tasks. Selin, Taner, and Nihat explicitly stated that they specifically put emphasis on the order of the questions or tasks in an activity while organizing the course material. The following quotation illustrates Taner's statement regarding the order of the questions being asked in the worksheet:

> We paid special attention to the difficulty level of the questions to ignore very easy or very difficult ones according to the students' achievement levels. Of course, the questions should be able to discriminate students' understanding rather than leading to memorization. So, the level of questions should be appropriate for both students with high and low achievement level. This is also important for gaining each student's attention in the class. *(pre-1)*
>
> [*Soruların zorluk seviyesine göre çok zor ya da çok kolay olmamasına özellikle dikkat ettik. Onların seviyesine göre. Tabii ki sorular, öğrencileri ezbere yönlendirmek yerine ayırt edici olmalı. O yüzden, soruların seviyesi yüksek düzeyli ve düşük akademik düzeydeki öğrencilee uygun olmalı. Bu ayrıca her öğrencinin dikkatini çekmek için de önemli...*]

As a similar concern, regarding organization of the order of the questions to be asked during the lesson, Nihat noted that

> [Let's say] two questions were successively asked. If we ask, for example, the volume of an object in the former one, we asked a more complex question on the later. We tried to make the former question easier than the latter one. […] We ordered the questions according to their difficulty levels.
>
> *[İki tane soru arka arkaya geliyor. Birincisinde mesela yarıçapını, yüksekliğini verip hacmini soruyorsak; ikinci soruda daha*

*karmaşık sorular sorduk. Bir önceki sorunun, bir sonraki soruya göre daha kolay olmasını sağladık. G: Zorluk derecelerine göre mi sıralamış oldunuz? M: O şekilde zorluk derecelerine göre sıraladık.*]

To summarize the arranging and organizing resource process, the most common finding was spending remarkable time on organizing the gathered information than searching for the related sources. The importance of this process was also mentioned by each participant in terms of flow of the lesson. While forming the course material, they put emphasis on ordering the questions from easy to more complex. Also, they wanted to prepare a striking content to take students' interest in the lesson.

#### *4.1.1.3 Taking personal notes*

Besides organizing the resources to form the course material, the PEMTs usually prepared written notes to be used during the lesson including issues that should be discussed and directions or steps to be followed during the lesson for their personal use. Those notes usually included important points about reminding the previous knowledge of the subject or presenting an alternative solution of a question that should be mentioned during the lesson. These notes also covered some issues to be recalled during the flow of the lesson. Selin's expressions from her 2nd interview exemplified how participants use notes:

> From the beginning of the lesson, I took some notes about what I would say and ask to students. I prepared the lesson plan covering the teaching subject, introduction to the topic, and the questions as a formality. However, I took my notes about how to precede the lesson on another sheet. (*pre-2*)
>
> [*Baştan itibaren çocuklara hangi soruları soracağım, şunları söyleyeceğim diye bir kağıda not aldım. Ders planını da işte, dersin girişi... ya aslında formalite icabı hazırladım hani ders, dersin*

*girişi, dersin işlenişi filan. Sorular yer alıyor ders planında, ama kendim ders planıyla ilgili notları ayrı bir yere aldım*.]

Selin reported in her that 4th interview that she decided not to take notes in addition to the lesson plan. Rather she stated that she wrote every detail on the lesson plan. On the other hand, Beril used to prepare formal lesson plan in her early teaching practices. However, she gave up preparing formal lesson plans and began to take some personal notes after her third teaching session.

Taner and Nihat stated that they needed to take some personal notes in order not to forget about mentioning important issues during the teaching. Both participants decided to take notes after having some difficulties in their prior teaching sessions.

#### *4.1.1.4 Preparing a course material*

Another strategy for preparing the course was to work on the materials to be used in the class. Participants followed different ways while preparing the course materials. As mentioned in the prior section, while some of the participants preferred to take notes, others prepared a formal lesson plan for most of their teaching sessions. Selin, for instance, insisted on the importance of having a written lesson plan whether it was formal or not. She added that having a lesson plan made her feel confident during teaching. Selin stated in her initial interview that she prepared formal lesson plans for almost all her teaching sessions:

> I never teach without having a lesson plan. I usually prepare lesson plans according to the knowledge I got from the faculty courses. I try to form a formal lesson plan including topic, lesson duration, learning objectives, how to proceed during the lesson, the evaluation part, and so on. Whether it is formal or not, I believe that, a teacher should always have a lesson plan for her/his teaching session.
>
> [*Ben ders planı olmadan asla ders anlatmam.Genellikle fakültedeki derslerden öğrendiklerime göre ders planı hazırlıyorum. Ders*

*planını konu, ders süresi, kazanımlar, dersin işlenişi, değerlendirme bölümü gibi bölümleri içerecek şekilde hazırlamaya gayret ediyorum. İster formal olsun ister olmasın, bir öğretmenin mutlaka dersi için bir ders planı olması gerektiğine inanıyorum*.]

Beril, on the other hand, prepared formal lesson plans in her early teaching practices. Then, after her third teaching practice, she gave up preparing lesson plans since she thought that she was not able to conduct the prepared plan in the classroom with distracting students. She claimed that:

> Yesterday I prepared the lesson plan. Later I decided to take some notes for myself, because, as far as I observed yesterday, I won't be able to conduct my plan at that classroom. As I would not be able to carry out my plan, I preferred to plan [the lesson] in my mind. I think I will decide at that time, for example, if they (students) are distracted from the lesson while working on the worksheet, I may change my plan, begin to write on the board, and ask them to write everything on their notebooks. Because the students of the class are very naughty… (*pre-4*)
>
> [*Dün akşam, ders planını hazırladım. Daha sonra da kendime ait bir not çıkartmaya karar verdim, çünkü dün gördüğüm kadarıyla çok uygulayabileceğimi düşünmüyorum. Uygulamayacağım için kafamda planlamayı... Çünkü o anda karar vereceğim, mesela kağıtta çok dağıtırlarsa dersi, bu sefer direk tahtaya yazacağım her şeyi, defterlerine yazmalarını isteyeceğim. Çok sakat bir sınıfa girdiğim için hani tam olarak...*]

Taner and Nihat, however, never prepared formal lesson plans for their teaching practices. They considered their course materials such as worksheets and smart board slides as their lesson plans. Nihat stated that:

> As we will use the smart board, we have prepared an electronic file including questions which can be considered as a lesson plan. It

will show us the steps we should follow. But it doesn't include objectives and the time, as we already know about them.

[*Akıllı tahta kullandığımız için, soruları içeren elektronik bir dosya hazırladık ders planı olarak kullanabileceğimiz. O bize izlememiz gerek adımları gösterecek. Ama işte bizim hep bildiğimiz kazanımlar, ders süresi gibi şeyleri içermiyor*.]

Nihat also commented about having a formal lesson plan regarding its necessity. In his 1st interview, he asserted that he never needed to have a lesson plan to follow. He generally thought that it was unnecessary to have a written formal lesson plan for his teaching practices:

Even if there wasn't a smart board, I still wouldn't prepare a lesson plan. I think in my mind and then prepare the activities, presentations, or any kind of materials… Then I review it to check for any missing parts. Then if I realize that I have missed some points I just take notes. I usually take notes on a piece of paper. (*pre-1*)

[*Ya ben hatta akıllı tahta olmasaydı bile yine de ders planı hazırlamazdım. Düşünürüm kafamdan, sonra da etkinlik, sunum ya da işte her türlü materyal neyse onu hazırlarım. Sonra, unuttuğum bir nokta var mı diye bir gözden geçiririm. Eğer unuttuğum noktalar olduğunu fark edersem öyle notlar alırım, genelde böyle küçük bir kağıda*.]

Similar to Nihat, Taner also talked about having a formal lesson plan:

The worksheet including various questions and the smart board files can be considered as our lesson plan. It just doesn't have the duration, objectives, and assessment part like in a typical lesson plan. Actually, I and Nihat prepare the course material which is usually a worksheet to be used as a lesson plan. (*pre-1*)

[*Çalışma yaprağı ve akıllı tahta dosyaları bizim ders planımız olarak görülebilir. Bunda sadece tipik bir ders planındaki gibi süre, kazanımlar, değerlendirme bölümü gibi şeyler yok. Aslında Nihat'la ben çalışma yaprağı gibi derste kullandığımız materyalleri ders planı olarak kullanıyoruz.*]

The findings showed that there was not a common way of preparing lesson plans among the PEMTs. The views of the participants were somehow different and tended to change through the study. Some of them stressed the importance of having a lesson plan, while others regretted to prepare it. They actually considered it as a kind of formality rather than a useful document for the teaching task. The most obvious opinion was prefering to have written notes which might be in a formal lesson plan format when it was necessary.

#### *4.1.1.5 Reviewing the course material before the teaching session*

Another strategy used by all the participants was reviewing the course materials like lesson plans and/ or worksheets before the teaching session. The reviewing process could be either thinking about the identified steps or making a rehearsal of the lesson. While reviewing the course material, PEMTs usually mentioned about doing solutions of the questions in the worksheets or activity sheet. In their early interviews Nihat and Beril, however, emphasized that they never reviewed the questions before the lesson and needed to prepare a kind of answer key for the questions. Later on, as their teaching practices continued through the semester, they stated that it would better to make a review of the planned process by especially preparing an answer key for the questions in the worksheet or preparing small notes including important issues to be discussed in the lesson. Taner noted that he solved some of the questions in the worksheet as if he was an eighth grade student:

> I didn't solve some of the questions which were too easy; however for some questions I solved them as if I was an eighth grade student. I did it in order to see where the students might have

> difficulties. It is for understanding the difficulty level of the questions. If I had thought that one of the questions was too difficult for students, I would have removed it. I solve different kinds of problems but not the easy ones (*Pre-1*).
>
> [*Çok kolay düzeyde olan soruları çözmüyorum, ama bazı sorularda bir 8. sınıf öğrenciymiş gibi çözüyorum. Acaba nerede zorlanabilirler diye görmek için. Yani zorluk olayını anlamak için. Eğer baktım zorlanıyorsam o soruyu almıyorum. Değişik sorular çözüyorum, basit olanları çözmüyorum.*]

An exception was mentioned for the teaching sessions in which the PEMTs did dril and practices. Taner and Nihat reported that they did not need to have a look at the course material before the class, since they just would do practices and exercises about the topic. They only had a quick scan of the questions in the worksheet.

Selin, however, stated that she tried to review the course material and the mathematical task before her each teaching session not to face an unexpected event during the lesson. She also noted that she reviewed the course material by doing rehearsal in front of her friends and solving the questions in the worksheet before the lesson. She reported those efforts for three times in her six pre-interviews. The following conversation took place between Selin and the researcher:

> R: Well, have you made a rehearsal for the current teaching session?
>
> S: No, I haven't made it yet. But, if I have extra time, I will make a rehearsal today. I specifically do not want to make rehearsal by myself; rather I try to do it in front of some of my friends. Because they sometimes ask such unordinary questions that as if they are real elementary students (laughing). So I am kind of prepared for unexpected questions during the teaching. (*pre-2*)

[*R: Peki, bu anlatacağın dersle ilgili tekrar ya da prova yaptın mı? T: Yok henüz yapmadım, ama eğer fırsatım olursa yaparım bugün. Çünkü özellikle kendi başıma yapmıyorum. Arkadaşlarıma yapıyorum ki onlar bazen böyle çok uçuk sorular soruyorlar gerçek öğrencilermiş gibi (gülüşmeler). Ben de bir nevi beklenmeyen sorular için hazırlık yapmış oluyorum.*]

Later in her teaching practices, Selin was asked about whether she always made a rehearsal before each of her teaching practices or not. She responded that she didn't make a rehearsal by speaking aloud by herself in front of the mirror anymore; however she certainly thought what she would do and say during the teaching before her each teaching practice.

The other participants underlined that they never did rehearsal as they considered it as a nonsense strategy. Their common view of doing rehearsal was stable through the study. To exemplify, Nihat stated that:

> I never make rehearsal. I think it is not logical to do it in front of the mirror by oneself. Moreover, I don't believe that the tasks written in the formal lesson plan would be same with the practice in the classroom. *(pre-1*)
>
> [*Ben asla prova yapmam. Bence mantıklı değil öyle aynanın karşısına geçip de kendi kendine prova yapmak. Ayrıca ben zaten ders planındaki şeylerin sınıf ortamındaki pratikle bir olacağına inanmıyorum.*]

#### *4.1.1.6 Asking for suggestion or feedback*

Asking for help was another self-regulation strategy used in different contexts by each participant in the study. All the participants reported that they asked for suggestions and feedback from their university instructors, mentor teachers, and peers. They mostly needed to ask their mentor teachers to get information about the classroom environment, students' background knowledge related to the subject they would teach, and their opinions about the organization

of tasks or the quality of the course materials. Selin, Taner, and Nihat also asked feedback from their mentor teachers about the course material or the lesson plans they had prepared. In his fourth pre-interview, Taner told me that he asked his mentor teacher to review the worksheet in terms of representativeness of the objectives of the topic. He asked his mentor teacher to learn whether the content of the worksheet was appropriate:

> I and Nihat showed the worksheet to the mentor teacher to be reviewed. She analyzed and asked us whether students would get some inferences related to the subject 'Division' with those questions in the worksheet… After analyzing the worksheet, she liked it as it provided her requirements identified before the session. (*post-5*)
>
> [*Nihat'la ben worksheeti hocaya gösterdik bir gözden geçirmesi için. Hoca şöyle bir baktı; worksheetteki sorularla öğrencilerin Bölme işlemiyle ilgili çıkarımlara varıp varamayacaklarını sordu. Worksheeti inceledikten sonra, dersten once belirttiği isteklerini sağladığı için beğendi.*]

Taner also added that the mentor teacher wanted to see the worksheet before the class to check whether the questions were consistent with the objectives of the class identified before the class. Moreover, the two other mathematics teachers, Teacher B and Teacher D, preferred to review the course material that Taner and Nihat prepared before the teaching session. Both participants asked for feedback of their mentor teachers for each of their teaching practices when they were encouraged by the mentor teachers. The most common feedback was related to the type of questions asked in the worksheet. Teacher B, for example, wanted to see the items in order to check their difficulty levels for the students. As reported before, the questions being asked to the mentor teachers by Taner and Nihat were usually related to the adequateness of the content of the topic and difficulty levels of the items for the students.

Beril talked about her help seeking from the faculty instructor giving Guidance course about a problematic student in one of the classes she would teach. She stated that she realized from her prior observations that there was a student who was continously trying to disturb the lesson while Teacher A was teaching. Thus, she reported that she decided to ask for suggestion from the Guidance instructor about how to behave to that problematic student:

> My Guidance instructor told me that it would be unrealistic to expect desired behaviors from the problematic student in just one class hour. Thus, she suggested me that the only thing I could do is to ignore that student's undesired behaviors. Otherwise, other students in the class might be affected *negatively from the problematic student. (pre-1)*
>
> [*Guidance hocam dedi ki: bir saatte hiçbir şey değiştiremem, o öğrenciyi kazanamam ya da kaybedemem. O yüzden yapabileceğim tek şey tepkilerini görmezden gelmek, çünkü çok umursarsam diğerlerini kaybederim. O yüzden diğerlerini kazanabilmek adına dersimi anlatmaya çalışacağım.*]

Beril asked for a professional suggestion from her Guidance course instructor about a specific problem of a student. She said that she did not prefer to ask Teacher A about what should be done for that student, since the teacher seemed unsuccessful in making that student silent either. However, Beril stated that she asked for information from Teacher A about different issues such as the classroom environment, the characteristics of the students, and their academic levels before the teaching session. In terms of the content of the lesson plan, Teacher A did not want to review or check it before the lesson. Rather she just used to give some verbal suggestions related to the teaching subject via e-mail or telephone. Thus, Beril and Selin prepared the course material without reviewing it with their mentor teacher opposite to Taner and Nihat.

After her second teaching practice, Beril noted that she did not need help from anybody else in terms of the content of the lesson and characteristics of the students as she began to gain confidence from her prior teaching experiences. She

added that she did not have questions in her mind about students' behavior or the teaching task anymore.

Selin, in her 1st pre-interview, noted that while preparing the course material for her teaching practice at collaborating school, she asked the instructor of the Practice Teaching course about the content of her lesson plan for a feedback. As reported before, in this course, students were required to prepare a 15-minute micro teaching session for their friends. Selin wanted to teach the same subject that she would teach at the faculty to get some feedback from the course instructor and her friends before practicing at the collaborating school. In her talk, she stated that

> This week I am going to do micro teaching at the [Practice Teaching] course. I volunteered to teach [this week]. As I will teach at the collaborating school at the same time, I thought that the feedback I get from my friends and the instructor about my micro teaching session would be helpful for me to improve myself because we do not get much feedback at the [collaborating] school. For this reason and I asked Teacher A about next week's topic. (*pre-1*)
>
> [*Bu hafta ODTÜ'de ders anlatacaktım. Hani gönüllü olarak ben anlatayım dedim. Aynı zamanda orada… Kolejinde de, ders anlatacağım deyince, ortak konu olmasını, hani orada sonuçta çok fazla bir dönüt alamıyoruz, hani nasıl bir ders işlediğimize dair, ama burada arkadaşlarıma anlatınca biraz yorum olur, eleştiri alırım. O yüzden kendim de belki hani farklılaşmalar olur ders anlatırken diye düşündüm ve hocama sordum hani önümüzdeki hafta hangi konu, nereye geliriz diye.*]

In her second teaching experience, I asked Selin about whether she asked for feedback from her faculty instructor or her friends taking the same course as in the prior teaching. She stated that she did not ask for help from the teaching assistant or her friends' about lesson plans and instructional materials she

prepared anymore. Another question was about whether she needed help from her mentor teacher in terms of lesson plan or how to conduct the lesson. She responded that Teacher A just looked at the first two lesson plans at the beginning of the study. Then, the teacher told Selin only which subject she would teach and whether she would do lecturing or drill and practice. In her last pre-interview, the dialog between the researcher and Selin was:

> R: Did you talked with your mentor teacher about your plans for the following lesson?
>
> S: No! (Smiling)
>
> R: So, she did not see your lesson plan beforehand, did she?
>
> S: No, she did not. Actually, she had only seen the first two of my lesson plans that I taught at this semester. Except those, she completely saw them during the class (Smiling). Fortunately, we did not falter.
>
> R: But I guess you talk on the phone to make a decision about which subject you will teach, don't you?
>
> S: Yes. For example I called her yesterday to ask whether I can teach today's lesson. She accepted and then just told me which subject I am going to teach. That's all! (Smiling)

As understood from the conversation, Selin did not need to show her lesson plan or other course materials to get feedback from her mentor teacher in her later teaching practices. She just talked to her mentor teacher to learn which of the teaching subject she would teach. Besides learning about the subject, Selin wanted to get some information about the classroom environment and students' behavior. She stated that "Teacher A always informed me about the class I would teach, such as types of students and/or possible problems related to the classroom management issue."

Regarding the help seeking strategy Taner and Nihat seemed to be more ambitious to take feedback about their course materials from their mentor teachers. Almost before all of their teaching practices, they used to ask to the mentor teachers to review the course material they prepared. In some cases, their

mentor teachers asked them if they would need help from them as well. They stated that the attitude of the mentor teachers might have led them to make the seeking help strategy routine. Nihat stated that:

> Whenever I and Taner asked Teacher B, Teacher C, or Teacher D about which subject we would teach for the next session, they immediately provided some information about how to conduct the lesson, what we needed to emphasize during the lesson, or what we would not need to discuss. Further, they suggested us how to handle misbehaving students during the lesson. Thus, we are provided with all kinds of information by our mentor teachers.

Overall findings regarding help seeking showed that PEMTs tended to ask for feedback from the mentor teachers more frequently than the university instructors. They mostly sought to learn about the characteristics of the students, the general classroom culture, whether there was a problematic student in the class, and/or the adequateness of the teaching material to be used. They stated that they needed that kind of information in order to take precautions mostly for controlling the classroom effectively and adaptation of the instructional strategy based on the suggestions gathered from the mentor teachers. For example, if the mentor teacher said that the students were misbehaving and had disturbing behaviors, they might suggest to the PEMTs not to conduct student-centered activities.

The overall findings also showed that the PEMTs' help seeking strategies related to the teaching mostly depended on the mentor teachers' interests in giving suggestions and/or feedback. Thus, depending on their interests, all participants adapted their help seeking strategies through the study. They either gave up asking for feedback from mentor teachers or continued to ask for suggestions more eagerly.

#### *4.1.1.7 Mental preparation of the planning process*

All participants had a tendency to make a mental preparation for the flow of the lesson by specifying the details that should be mentioned during the teaching. They noted that thinking about each step they would follow during the teaching session became a typical strategy for them. They emphasized that reviewing what they would do for the next lesson in their mind was necessarily important for them. Nihat, for example, mentioned about his mental preparation process in almost all of his pre-interviews. He reported that he used to begin to the mental planning process by reviewing his previous knowledge about the teaching subject. Contrary to other participants, Nihat exemplified his mental lesson planning process as in the below statement taken from his 2nd pre-interview.

> Regarding the preparation process, while preparing the lesson, I mostly prepare myself by thinking in my mind. That is to say, I think about what I am going to do for the subject rather than looking at related textbooks. After forming something by thinking, it would be easy to continue to the remaining part. (*pre-2*)
> [*Hazırlanma süreci olarak, ben genelde bir derse hazırlanırken en çok kafamda bir şeyler düşünerek hazırlanırım. Yani açıp kitapları karıştırmak yerine, o konuyla ilgili ne yaparım diye düşünürüm. Ondan sonra zaten kafamda bir şeyler oluşturduktan sonra, gerisi çok kolay olur.*]

Similarly Nihat explained in his 5th pre-interview that "I have an unwritten note in my mind that I will remind students about the meaning of deleting zeros while dividing by 10. I am planning to remind this." [*Yazılı olmayan, ama kafamda olan şey mesela, sıfırı siliyoruz, ama sıfırı niye siliyoruz veya 10'a bölerken sıfır silmek ne demek, onu hatırlatmayı düşünüyorum*].

Selin perceived mental planning process differently from the others. As stated before, Selin prepared lesson plans for almost all of her teaching sessions. However, she noted that she had a mental planning process including details such as how to control the students, how to conduct the student-centered activities, or

how to call students during an activity. These kinds of details were not identified in the written lesson plan. Thus, she noted that:

> I have plans that are not written on the lesson plan but designed in my mind. These can be related to the classroom management. These plans are not about the content of the lesson, but they are about calling students with their names or making duo-trio groups due to the current classroom conditions. I thought about such kind of details… (*pre-1*)
>
> [*Yazılı ders planında olmayan, fakat kafamda tasarladığım planlar var… Mesela, sınıf yönetimi hakkında… sonra ders hakkında, içerik olarak değil ama hani öğrencilere isimleriyle hitap etmem ya da grup etkinliği sırasında belki 2'şer kişilik grup oluşturun desem, ama o anki sınıfın durumuna göre belki 3'er kişilik grup oluşturmam gerekecek. O tarz detayları düşündüm*.]

Beril's mental planning process did not seem constant through the study. In case of having a detailed lesson plan, she did not need to have a mental planning process. She stated that if she had prepared a formal lesson plan including every kind of detail even related to the classroom management issues, she would not think about details of the lesson before the teaching session. However, if she thought that the lesson plan only covered the issues about the content of the teaching subject, she had a mental planning process to identify other issues in order to continue to the lesson.The researcher asked Beril in her 2nd interview about whether she had a mental planning process while planning the lesson. She responded that she did not have a mental planning process since she had a lesson plan written in detail:

> I have prepared a 3-pages lesson plan. I have identified each detail in it. It is more detailed when compared to the previous ones. The lesson plan shows all the directions that I can use/look up when I feel trouble in remembering what I will do. I have also prepared an alternative part. But the lesson plan is really full. (*pre-2*)

[*3 sayfalık bir ders plan hazırladım. İçerik olarak bütün adımlarım yazıyor. Diğer ders planıma göre daha detaylı. Bana bütün yönergeleri veriyor. Çok dara kaldığımda bakabileceğim bir plan oldu, geçenkine nazaran. Ek bir kısım da koydum. Ama plan gerçekten yüklü.*]

#### *4.1.1.8 Setting goal*

PEMTs had been doing a significant amount of informal planning process. This process also involved setting several goals related to the different aspects of the entire experience. Establishing goals and using planning strategies for how to reach those goals are reported with sample quotations in this section. PEMTs usually set goals regarding three different dimensions: (1) student learning outcomes, (2) classroom and time management, and (3) instructional procedures.

Goals for the student learning outcomes were related to participants' intentions or aims prioritizing certain learning outcomes for the teaching session. A major purpose of each lesson set by the participants was to create and provide positive learning opportunities for the students to enable them to increase/develop their meaningful understanding of a specific concept. They mostly concerned what their students were going to learn at the end of the lesson that they would not know at the beginning. For some of the participants, it was important to better visualize a concept by using concrete materials and computer tools that most of the students had't experienced before.

Another goal frequently mentioned by each participant during the interviews was to prepare students for the high stake national test (called SBS) or an in-class examination as well as improving their testing skills. Selin said that "While preparing questions, I hope that students will be able to solve all questions asked in-class examination which will be administered in this week, which is my primary aim for this lesson."

While talking about PEMTs' goals for their teaching session, Taner and Nihat stated that they needed to recall students' previous knowledge before beginning a new concept, which became a primary goal later through their

teaching practices. However, they emphasized that this primary goal was formed by the suggestions of the mentor teacher.

The management issue was a great concern of the participants. They frequently set implicit or explicit goals about effective management of the class and, more frequently, the instructional time. During the 2nd pre-interview before his teaching session, Nihat stated that "This time, my most central aim is to better manage the time by watching the clock and also to better control the class." Such concerns were expressed by the participants in almost all pre-interviews. Most of their management goals, as seen in Nihat's statement, were shaped by their prior experiences, where they sometimes aimed to avoid a prior problem came up during a previous teaching task. While talking about controlling the students effectively, all participants noted that they tried to make students focus on to the lesson. This goal somehow affected their lesson planning process which will be discussed later in the *Adapting and changing SRL strategies* section.

Regarding having difficulties in classroom management as a pre-service teacher at collaborating school, the participants had similar comments. A sample quotation drawn from Beril's 2nd pre-interview was "Gaining the same respect from the students as the 'real teacher' [mentor teacher] is really difficult for me. This is actually a big challenge to take over the classroom from their real teacher." That is, they considered their possible managing problems as 'normal' since they are not the 'real' teachers of the students. Selin, differing from other participants noted that if there were extreme classroom management problems, they would wait for the interference of the mentor teacher. They stated that as they were not the regular teacher of those students, the students might not consider them seriously and might continue to the disrupting behaviors. Thus, PEMTs claimed that they would accept the interruptions of the mentor teachers, since they would only interfere with the controlling issue rather than PEMTs' way of teaching. Beril said that: "It is not a problem for me if she interferes, since she interferes for the behaviors *of students*. Since it is not directly related to my teaching." [*Yine müdahale etsin benim için sorun değil, çünkü davranışlara müdahale ediyor. Direk benim işleyişime olmadığı için*]. However, Selin represented a different

reaction from the others by saying that she would prefer to take all responsibility by herself without the interferences of the mentor teacher. She even wanted to conduct the lesson without the mentor teacher as she confided herself in managing the students as well as in teaching. After an observation of her teaching session, the conversation between the researcher (R) and Selin was as following;

> R: Are you affected by the interferences of the mentor teacher for handling the control of the students?
>
> S: I am affected by her interferences. If I am doing my teaching practice in this school, it is very likely to have such a class in the future. As I am here to gain experience, I should begin to learn how to manage them now. There might be situations in the class that I will not be able to manage. Yet, I must learn something from this as well. Thus, I don't want mentor teacher to interfere during the lesson…. I actually cannot be sure about the mentor teacher's reaction when I attempt to control the class with my own way… Thus I certainly want to teach in a class without the mentor teacher".
>
> [*R:Hocanın müdahalelerinden etkileniyor musun? S: Hocanın müdahalelerinden etkileniyorum. Eğer ben bu okulda staj yapıyorsam, ileride böyle bir sınıfım olma ihtimali var. Ben deneyim kazanmak için buradaysam, onları nasıl kontrol edebileceğimi şimdiden öğrenmeliyim. Sınıfta kontrol edemeyeceğim durumlar da olabilir. Yine de ondan da bir şeyler öğrenmeliyim. Bu yüzden rehber öğretmenin ders esnasında müdahale etmesini istemiyorum…Aslında sınıfı kendi yöntemlerimle kontrol etmeye kalksam, hocanın nasıl bir tepki vereceğinden de emin olamıyorum… sonuç olarak ben kesinlikle rehber öğretmenin olmadığı bir sınıfta ders anlatmak isterim*.]

Regarding the management of the instructional time, all PEMTs stated that thinking about using the time properly was already an unavoidable concern for

them as they lacked experience in teaching. Although they made plans to use the time effectively, they needed to take some precautions for the next time as they had difficulties in it.

The final dimension of PEMTs' goals refers to their intentions regarding the instructional procedures, involving what they would do during the class. This category of goals was obviously the most crucial dimension of their thoughts. While they were preparing for a teaching session, they intended to teach topics in an order. Two of the participants, Beril and Nihat stated that they needed to consider the prerequisite relationship among the topics, which led them to follow a step-by-step lesson. As an instructional goal, all participants, except Beril, intended to use software for teaching a specific subject. Taner's and Nihat's intentions were continuous as their cooperating school had the required conditions in terms of technological tools. Taner expressed that:

> Students usually have difficulties in making 3-D objects such as prisms and pyramids concrete in their mind. Further, the subject is hard to show by drawing on the board and/or to the notebooks. However, we [he and Nihat] will use some figures on the computer to make them concrete. (*pre-1*)
>
> [*Öğrenciler genellikle prizma ve piramit gibi üç boyutlu cisimleri somutlaştırmada güçlük çekiyorlar. Bir de konu olarak bunları tahtada veya defterde çizerek göstermek de zor. Ama biz bilgisayardaki bazı şekilleri kullanarak onları somutlaştıracağız*.]

In their early teaching experiences, Selin and Beril intended to conduct engaging and attention-gaining activities in the classroom to gain students' interests to the lesson. They thought that if students enjoyed the course material, they would make less noise and so they could manage them easily. Thus, it seemed that classroom management concerns of the participants sometimes led them to adapt their instructional goals. They, for instance, preferred not to use student-directed activities in class due to the possibility of having management difficulties. For instance, Beril argued that in order to better control the class, she

wanted to do lecturing, instead of a hands on activity. She added in her 4th interview that if she would make an activity with unit cubes, students might want to play with them which possibly would cause a chaos in the class. She reported that "No matter how much I would try, students may still attempt to play with cubes. In another words, no matter how much I give directions, it might still be negative since they haven't dealt with any unit cube previously." [*Ben ne kadar da uğraşsam da birim küplerle oynamaya kalkışabilirler. Yani ben ne kadar yönergemi verirsem vereyim, çocuklar daha önceden haşır neşir olmadıkları için...olumsuz olabilir diye düşünüyorum.*]

Another goal stated by Selin was intention to be appreciated for her teaching performance by the mentor teacher. In two of her pre-interviews, she noted that besides her primary goals such as students' learning and effective classroom management, she wished to put on a good performance in front of the mentor teacher.

### 4.1.2 Motivational beliefs in planning a lesson

As mentioned earlier in the theoretical framework, both cognitive and motivational self-regulation strategies play role in the learning process. Thus, as well as having cognitive strategies, participants had motivational beliefs influencing their task analysis and decisions regarding their teaching processes. My data analysis resulted in three different motivational factors which were self-efficacy, perception of task, and intrinsic interest. The following section presents the findings for motivational factors.

#### *4.1.2.1 Self-efficacy*

The analysis of data indicated that PEMTs' self-efficacy beliefs about teaching related tasks were one of the most obvious dimensions of their thoughts. Their self-efficacy beliefs representing their judgment about the capabilities related to adequateness of mathematical content knowledge, effectiveness in teaching any mathematics subjects, having prior experience in teaching, managing the classroom, using computer-based tools, and /or preparing student-based

activities. These aspects were explained further and exemplified in the following sections.

All the participants stated that they had no chance to choose which topic to teach, since they were supposed to teach the specific topic identified by the mentor teachers. However, they added that teaching a topic identified by the mentor teacher was not a problem for them in their early interviews. For example, Selin mentioned in her 1st pre-interview that "It does not matter for me that which topic I am going to teach… As I never go to the class without making preparation for it, I can teach any mathematics topics." However, there were opposite statements reported in the following interviews. For instance, Selin stated her hesitations about the topic she was assigned by the mentor teacher and possible questions of students during the lesson.

> I have not been studying for 3-D objects for a long time. For this reason, I solved some questions before the class. I have been a private tutor for years, but I realized that I have never taught geometry previously. Therefore, I don't know what kinds of questions that might come from the students. (*pre-2*)
> [*Bu konu üzerine uzun zamandır pek şey yapmadım, dün akşam o aklıma geldi. Oturdum, soru çözdüm. İşte özel ders veriyorum senelerdir mesela, ama geometrik cisimlerle ilgili hiç ders vermemişim mesela, onu fark ettim. Dedim hani gelebilecek soruları bilmiyorum öğrencilerden.*]

Similar to Selin, Beril mentioned her hesitations about the topic to be taught. She thought that she might cause misconceptions since she did not have adequate knowledge about the topic.

> I mean, if I give details… I do not want to cause students to have misconceptions, because I don't have that much experience. Last night I checked it throughly, okay, I know it, but what we learn here is different than what we had learned at the university. (*pre-5*)

[*Yani ben detaylara girersem eğer, kafalarında o kadar misconception oluşturmak istemiyorum, çünkü benim de o kadar deneyimim yok. Dün akşam şöyle bir baktım, tamam biliyorum, ama bizim burada öğrendiklerimiz, üniversitedeki dersle geçen dönem aldıklarımızla farklı.*]

One of the most frequent statements of all participants related to their self-efficacy beliefs was having teaching experience and having observed the class before the actual teaching session. When the participants were asked whether they were ready for the teaching session, they immediately mentioned whether they had observed that class before and had some ideas about the group of students. Participants' judgements about their readiness for the class were highly influenced by what they already knew about the class they would teach. Depending on the information they got from their prior observations, they felt comfortable or uncomfortable specifically regarding the classroom management issue. If the class seemed to be hard to control, they expected to have difficulty in managing the class which directly affected their self-efficacy beliefs. Or, if they did not have any information about the class, they felt hesitant as they were expecting possible management problems. Nihat's expressions illustrated this:

> In terms of the classroom management, I guess there will be some problems at this time. In general, I have been teaching in the same class sections that I have observed and thought before. I have not had management problems; rather I have conducted management well. However, for this time there may be some problems since three sections would have been together at one class. There will be students from different sections that I haven't seen before. I have hesitations about that. (*pre-4*)
>
> [*Sınıf yönetimi konusunda girdiğim sınıf, yalnız girdiğim sınıf sorun olacak bu sefer. Normalde girdiğim sınıfı tanıdığım için, hep de aynı sınıfa giriyordum. O yüzden sınıf yönetiminde bir problem yaşamıyordum yani rahat olarak sınıfa hakim olabiliyordum. Bu*

*sefer o tip problemler olabilir, sınıfın karma olmasından dolayı. Farklı şubelerden daha önce görmediğim öğrenciler olacak orada. O konuda tedirginlik var yani.*]

As mentioned before, all the participants had teaching practices either through private tutoring or working at examination preparation centers before. These prior experiences seemed to have some effects on the participants' efficacy beliefs in terms of which grade level they would prefer to teach. Beril and Taner noted that they would like to teach higher grade level students such as eighth graders rather than teach younger students. They indicated their reasons as their past teaching practices at eight or higher grade levels. A sample quotation drawn from Beril's 1st pre-interview illustrated this:

> I, for example, would like to teach to eighth graders rather than to fourth and fifth graders, because I got used to teaching higher grade level students from my private tutoring sessions. Because, I made students to prepare the high-stakes tests. I have never had students from sixth, seventh, third, fourth, and fifth classes. That's why I would prefer to teach to eighth graders if I have the chance to select. (*pre-1*)
>
> [*Ben mesela 8'lere anlatmayı daha çok severim hocam. Hani 4-5 lerdense büyük sınıflarla uğraşmayı daha çok alıştım, özel derslerimden de. Çünkü bütün öğrencilerimi hep sınava hazırladım ben. Hani 6-7-3-4-5 hiç öğrencim olmadı...O yüzden seçme şansım olsa 8 lere ders anlatmayı isterim.*]

In another occasion, Beril mentioned her ability in drawing three dimensional shapes. She said that "I am very good at drawing 3-D objects on the board, which makes me feel confident." Similar to Beril, Taner talked about the good questions he prepared for the worksheet. "I feel proud of myself as I prepared very well questions." Nihat showed his self-efficacy in using computer based visual aids and/or graphics in teaching a specific

concept effectively. He noted that "I specifically want to use geometry's sketchpad on the smart board while teaching the slope of lines. I confide myself in using it effectively as I took a course related to using geometry sketchpad."

The overall findings showed that self-efficacy beliefs of PEMTs seemed to have paramount importance regarding various dimensions of their teaching practices. For instance, most of the PEMTs did not note any concerns about conducting an effective lesson in their early interviews. They also seemed confident about their mathematical content knowledge as they had prior experiences in teaching. However, as their teaching experiences continued, they began to feel some hesitations about especially controlling the students. Depending on their prior teaching experiences and observations, they sometimes assumed that they would face difficulties in managing the classroom. Further, it was observed that the PEMTs felt more comfortable and ready for the teaching session if they had prior teaching experience in the class they would teach or observed it before. Another issue regarding the self-efficacy beliefs was having prepared a detailed course material. If they had a written lesson plan or personal notes covering how to conduct the flow of the lesson, they taught with a greater confidence. Selin in her initial interview stated that: "As long as I have a lesson plan, I feel comfortable for the teaching session. Because, I know that I have a plan showing me the steps I follow during the course. This makes me feel confident."

#### *4.1.2.2 Perception of task*

PEMTs' perceptions of the teaching task were directly related to their self-efficacy beliefs and their motivations to conduct it. They usually talked about their personal ideas related to the topic assigned to them to be taught. When I asked to the participants that which subject they were going to teach for the following teaching session, they stated some comments about the task. As well as stating their personal perceptions about the task, they also commented from the perspectives of the students. They usually labeled the teaching subject as

enjoyable, boring, difficult, and/or leading to memorization both for students and themselves. Beril commented about the teaching task stating that "I love the subject 'drawing perspective with unit cubes.' I actually love all topics related to the spatial sense." Taner noted that:

> Actually, division operation is a good subject if it is taught from the very beginning. However, the part we are going to teach is one of the most boring parts of the Division both for us and for the students. Because most people, including me in the first place, don't like making estimation (*pre-5*).
> [*Bölme işlemi, aslında sıfırdan anlatılıyorsa güzel bir konu, ama bizim anlatacağımız bölüm işin sıkıcı bölümü sanki hem öğrenciler için hem bizim için. Çünkü tahmin etmek insanların çok hoşuna giden bir şey değildir, benim de başta olmak üzere.*]

The PEMTs pointed that they usually find it difficult to teach simple subjects such as d*ivision* to especially lower grade levels. Nihat stated that:

> I think the subject *division* is more difficult to teach compared to the other subject we have thought. We are going to make them make inferences; we prepared the worksheet in that way. Since the numbers are too big, we would not be able to use concrete materials such as base ten blocks or anything else. (*pre-5*)
> [*Konu bence diğer anlattığımız, bundan önce anlattığımız konulara göre anlatması zor olan bir konu… çıkarımlar yaptıracağız, elimizdeki çalışma kağıdını o şekilde hazırladık. Çünkü sayılar büyük olduğu için 1 milyon 376 bini 270'e bölme var diyelim. Bunun için bir materyal kullanamazdık, yani onluk taban bloğu da olmazdı, başka hiçbir şey de…*]

In sum, overall findings indicated that PEMTs' perceptions of the teaching task were based on their personal opinions. The grade level that they

would teach seemed to have some influence on the perceived difficulty of the teaching task as they stated the difficulty of teaching to lower grade levels.

#### *4.1.2.3 Intrinsic interest*

As mentioned in the prior section, all participants were supposed to teach the mathematical subject identified by their mentor teachers. Although they stated their self-efficacy in terms of teaching any subject, they also emphasized that there were some mathematical subjects that they eagerly would like to teach. That is, they pointed their intrinsic interests to the subjects which they could teach better. Taner, for instance, stated that when he liked the subject to be taught, he felt more comfortable and confident: "Since I liked the subject and doing exercises by solving questions related to the subject, I feel quite comfortable for the teaching. But for the inverse condition, I know I would feel irritated." Similarly, Nihat stated that he always wanted to teach the subject by using computer tools such as overhead projector or smart board. He added that he was very happy to use smart board in his teaching practices at that collaborating school as any technological equipment were provided to them. Regarding his general view of using computer and its tools, Nihat stated in his initial interview that:

> According to me, if I became a teacher in a school, in the most ideal way, there should, at least, be an overhead projector if there could not be a smart board. Therefore, even I would serve at a state school; I think I could set this environment. Then I would use it for the general processing of the lesson. I would prepare an organized file in my computer for how to precede the lesson. If there were some additional animations that I might show later on, I would prepare them separately and keep them ready to be used. Afterwards, I would show the main process of the lesson on the computer. I don't think that I would use too much concrete material. I generally would try to concretize the subject by using computer.

[*Kendi açımdan en ideal şekilde, ben bir yerde öğretmenlik yapacaksam bir akıllı tahta olmasa bile en azından projeksiyon olması gerekir. Onun için ben devlet okulunda bile görev yapsam orada en azından bana bir sınıf verilirse bu ortamı kurabilirim diye düşünüyorum. Daha sonra dersin genel işleyişinde kullanacağım, dersin nasıl gideceğini bilgisayarımda bir dosyada hazırlarım. Bunları düzenli şekilde... Daha sonra, göstereceğim ek animasyonlar filan varsa bunları da ayrı bir yerde hazırlarım, hazır tutarım. Ondan sonra dersin ana işleyişini bilgisayar üzerinde gösteririm. Somut materyalleri de çok fazla kullanacağımı sanmıyorum. Genel olarak bilgisayar üzerinde konuyu somutlaştırmaya çalışacağım*.]

Taner and Nihat also stated in their initial interviews that they would like to solve questions as a habit from their private tutoring sessions rather than doing lecturing. They added that if they had the chance to choose which subject they would teach, they would teach any subject requiring making practices. Besides their preferences, their mentor teacher, Teacher B, already required them to do exercises in their teaching practices. During theconversations between me and Teacher B, the teacher stated that it was more suitable to allow pre-service teachers to do some mathematical exercises as a practice after he finished lecturing. The mentor teacher added that since the school was a private school, it was not preferable to make pre-service teachers teach a mathematical subject from its beginning, as there might be some complaints from the parents since their children were taught by pre-service teachers.

Beril and Selin, on the other hand, dealt with a different concern related to their intrinsic interests. Both of them specifically noted that they would prefer to teach two class-hours successively beginning from introduction to the end of the subject. When they were allowed to teach two hours successively, they reported that they felt better as they started and finished the subject by themselves. Both participants also stated that they wanted to teach the concept rather than doing

drill and practice. They specified that they could make exercises as long as they were allowed to do lecturing one class hour before it. Selin stated that:

> Let me do lecturing, not drill and practice (laughing). Let me also make the students resolve questions, but I need two hours. Let me do lecturing for one hour and solve questions in other hour. I don't feel like as if I teach when I do not lecture. One hour class is not enough. (*pre-2*)
> [*Ben konu anlatımı yapayım, soru çözdürmeyeyim (Gülüyor). Soru da çözdüreyim, ama 2 saat olsun. Bir saat konu anlatayım, bir saat soru çözdüreyim. Konu anlatmayınca sanki ders işlemiyormuş gibi hissediyorum. Tek saat yetmiyor.]*

### 4.2 Post-Interview Findings Representing the Self-Reflection Phase

PEMTs' thought processes after their teaching sessions also contributed to our understanding of their self-regulated learning process. For this manner, post-interviews with the participants reflected upon different aspects of their teaching experiences. Regarding the self-reflection phase, the PEMTs were involved with a self-evaluation process covering various issues for their teaching sessions as a final step through the study. In the following part, the PEMTs' self-reflective thoughts including various strategies such as self-evaluation, self-satisfaction, and adaptation were reported. These dimensions of reflections were generally parallel with the goals that were identified during the forethought phase.

PEMTs evaluated their teaching performances regarding different issues based on their personal opinions. As well as making evaluations for their own teaching performance, they also expressed the reasons based on their reflections related to the teaching sessions. That is, not only the participants' self-reflections, but also their reasoning behind those reflections was reported. PEMTs also gave information about their motivational strategies such as the degree of their satisfaction about the teaching session with stating reasons. Moreover, they reflected what they would have done differently or would have done for the next

session. In other words, the participants' adapting strategies for their future teaching sessions were reported in the following sections.

### 4.2.1 Self-reflective thoughts of the participants regarding their teaching experiences with the reported reasons

In this phase, PEMTs reflected about their own performances depending on a beginning and a major question about what they thought about their teaching session and how it was according to their personal views/opinions. They discussed and reported different dimensions based on the post-interview questions and the notes from my observation during the teaching while reflecting about their performances. The most common self-evaluations participants reported in their post-interviews were related to whether they were able to complete the prepared course material in the given course hour(s) and/or conducting the course as planned. They also mentioned about the use of the instructional time and classroom management issues by referring to the effectiveness of the lesson. They specified that if they were able to use the instructional time properly and they could manage the classroom, the lesson was considered effective. Another evaluation regarding the effectiveness of the course was related to the students' learning at the end of the lesson which was perceived through the students' active participation to the lesson and responses toward questions being asked. Finally, they talked about whether they accomplished the goals identified in the pre-interviews or not. Sample quotations of the participants representing the above issues were stated in the following parapraphs.

Regarding accomplishing the identified goals, Beril reported in her most post-interviews that she was able to achieve her goals as she could complete each task in the course material at the end of the lesson. Similarly, Taner talked about how he conducted the course based on giving information about whether he could solve all the questions being prepared during the course. His statement showed that he achieved his goals at the end of the course:

> I think the the lesson was very effective. Because, the students had already known something about the subject; yet they needed to review it once again. We achieved to strengthen their knowledge about the Coordinate System. Thus, I can say that I reached my goals, since all the questions could be solved and understood by the students...Anyhow, I had aimed to solve 5-6 questions in a class hour and I solved already five questions. (*post-2*)
> [*Bence bu ders çok etkili oldu... Çünkü çocuklar zaten az çok biliyorlardı… ama bir kez daha gözden geçirmeleri gerekiyordu. Biz onların Koordinat sistemiyle ilgili bilgilerini sağlamlaştırmış olduk. O yüzden hedefime ulaştım diyebilirim, bütün sorular çözüldüğü ve anlaşıldığı için.. Zaten bir ders saatinde 5-6 soru çözmeyi hedeflemiştim ve zaten beş soru çözdüm*.]

The PEMTs also reported about the reasons that caused positive or negative findings during the course as they perceived. Most common reasons for negative or unexpected results included students' lack of background knowledge about the topic and their lack of sufficient interest in the course, and spending too much time in making students comprehend the meaning of the teaching subject. They rarely based on their reasons to themselves. For example, Selin reported in her 1st and 5th post-interviews that she could not achieve all of her purposes since she spent much time on introducing content of the topic. She emphasized that she usually had to recall the teaching subject which caused time loss. One of Selin's statements taken from her 5th post-interview exemplified the reasons why she was not able to conduct the course fully as she planned:

> I had planned to mention the land measures. I put myself on the conditions that at least I was going to start to the subject even I might not have done the exercises. Unfortunately, the time was not enough and I could not do it. However, there was nothing happened which I had not planned. I had thought that the activity would end earlier. But students dealt too much with the calculations. There

was a trapezoid, for example, I had thought that students would have immediately calculated the region of trapezoid by dividing it into rectangles and triangles. However, almost all of them said that they did not know how to calculate the region of it. Thus, I needed to explain to each of them, one by one, that they had to draw a line to make triangles and rectangles (*post-5*).

*[Arazi ve alan ölçüleri konusuna değinmeyi planlamıştım. En azından bir giriş yaparım, soruyu çözemesem de giriş yaparım diye kendime şartlandırmıştım. Ama zaman yetmedi maalesef, o yüzden yapamadım. Onun dışındaki yerlerde ama planladığım dışında hiçbir şey olmadı... Ama etkinliğin daha az bir zaman içerisinde biteceğini düşünmüştüm. Ama çocuklar biraz fazla uğraştılar hesaplamak için. Yamuk vardı mesela onu hemen dikdörtgen ve üçgen diye ayırabileceklerini düşündüm ben. Hemen hemen hepsi de hocam yamuğun alanını bilmiyoruz dediler. Hepsiyle tek tek ilgilenip, evet buradan bir çizgi çizerseniz üçgenle dikdörtgen şeklinde göreceksiniz diye açıklama yapmak zorunda kaldım.]*

Nihat, on the contrary, reported that he was not able to conduct the lesson as he planned because of students' high level of content knowledge. For the second teaching practice Nihat said that:

There were problems and unwanted situations at the end of the lesson. One of them for example is the fact that students know the subject. Some of the students had not only known 'Slope' but also know that the slope was the coefficient of the X. The students who know everything about the subject started not to listen to the lesson causing the rest of the class not to focus on too. There were such problems; some students did not follow the lesson.

*[Dersin sonunda, sınıfta sorunlar vardı yani istenmeyen durumlar vardı, mesela bunlardan birisi konuyu biliyor olmaları. Bazı öğrenci eğimi tamamen biliyor, bilmesinin yanında hem eğimi*

*biliyor hem de denklemde direk x'in katsayısı olduğunu biliyor. Anlatacağım her şeyi biliyor olmaları bu sefer dersi dinlememelerine sebep oldu. Dersi dinlememesi demek sınıfın tam olarak yoğunlaşamamasına sebep oldu, öyle problemler vardı, yani bazı öğrenciler takip etmedi dersi.]*

For the same teaching practice stated above, Taner rationalized why he was not able to conduct the lesson as he planned as not knowing students' prior content knowledge for the teaching subject rather than presenting a reason causing from students' actual level of knowledge. He criticized himself in terms of the inappropriate content of the course material for the actual performance of the students and the duration of the lesson.

Further, attitudes and behaviors of the mentor teachers and the relationship with the students during the course were presented as reasons that affected the teaching process and thus their self-evaluations. For instance, in her 4th post-interview Selin stated that she reached her goals, however, with some exceptions. She said that one of her goals was to solve 5 questions and then to start the new subject 'Inequalities'. However she noted that she could solve 4 of those 5 questions and could just make a little introduction to the new subject. In her talk, she asserted that besides students' lack of interests and indifference to the lesson, the mentor teacher's homework checking caused her not to fully employ her plan.

There were other reasons for not conducting the lesson as planned. The activities took unexpectedly long time than participants planned. For example, Beril stated that:

> I could not accomplish everything I planned. I finally showed the relationship between circumscribed angle and central angle. I could not do any practices. Later, I was going to mention major and minor angles, but I couldn't. Because, I wanted each student cut the circles by themselves which caused a lot of time loss since there were a limited number of scissors. (*post-1*)
>
> [*Planladığımın hepsini gerçekleştiremedim. En son çevre açıyla merkez açının arasındaki ilişkiyi verdim. Hiçbir örnek soru da*

*çözemedim. Daha sonra majörle minör açıya değinecektim, ona da değinemedim. Çünkü, orada öğrencilerin kesmelerini istedim ya çemberleri, orada sınırlı sayıda makas olduğundan dolayı bayağı bir zaman kaybı oldu*.]

The stated reasons causing negative results were sometimes based on the personal failures by the participants. Yet, they usually presented other reasons in addition to personal faults. Regarding the same concern, the two male participants reported that they were not able to conduct the lesson as they planned due to some defects just before the teaching session. They criticized themselves as they had forgotten to upload the electronic files to the smart board, which caused time loss. The reflection of Taner about his teaching performances and reasons affecting the flow of the lesson was as follows:

> I could not conduct the lesson as I aimed. At first there were many failures that we had never thought before. We came to the school early in the morning. However, we totally forgot to upload the electronic files to the smart board. I needed to make many questions in my mind. Then, after the smart board repaired, I wrote the same questions on the board which took a lot of time. We already had started to the lesson late and also spent some time for closing the window, etc. caused me not to continue to ask the remaning question. For the others, I think I passed them quickly. If I could continue to solve that question, I would have thought that I could achieve my planning. Consequently, I could not finish asking one remaing question and probably passed the other questions very quickly, or perhaps I felt that way. In any case, I could not reach my goals at all, not even get close to them. (*post-3*)
>
> *[Dersi hedeflediğim şekilde yürütemedim! İlk başta bir sürü olan aksaklık, hiç aklımıza gelmeyen, sabah onun için erken geldik, ama elimizde olan soruları smart board'a aktarmayı yapabilirdik, onu unutmuşuz tamamen. Bir sürü soruyu akıldan yapmak zorunda kaldım. Sonra, akıllı tahta onarıldıktan sonra da aynı soruları*

*tekrar sorarak cevabı tahtaya yazdım, orada bir sürü vakit kayboldu. Zaten geç başladık derse, camı kapatacağız filan derken 1 tane soruyu yetiştiremedim. Diğerlerinde çok hızlı geçtim gibi oldu, ben belki öyle hissettim gerçi ama. Hani onu da yetiştirmiş olsaydım, tam istediğim, hayalimdeki şeye ulaşamadım yani, ona yakın bile olmadı.*]

As mentioned in prior sections, PEMTs aimed to use the instructional time properly during the teaching sessions. They considered the time management issues while reflecting about the effectiveness of the teaching practices. They usually stated some of the reasons of negative events to the lack of time or not being able to use the instructional time properly during the course. As they mostly talked about the time controlling issues, the current section presents detailed information about how PEMTs used the instructional time in their courses.

All participants reported that there was a problem in terms of controlling the time in their post-interviews. They usually based their reasons for the problems in using the time on students' lack of content knowledge. For example, Selin, in her three of post-interviews, pointed out that since students had low level of content knowledge, she needed to give more details during the course rather than conducting her actual planning. Thus, she said that she had to spend considerable time for reviewing the subject, which caused her not to conduct the identified plan. Another reason to the time controlling problem was stated by Beril. She said that since the students were spending too much time for the activity, she would not be able to employ her plan. Taner talked about the time using problems by referring to the reason caused by the students who spent much time in making calculations and could not make an inference of the rule of divison:

> First items took some time since the students did not find the solutions as in the Nihat's sections. Even though, one student attempted to explain, no body understood him. Thus, I waited for the others to understand. It took somehow a long time. Then, I

emphasized the issue to explain the rule in general; therefore I lost quite a lot of time. (*post-5*)

[*Şu ilk işlemler biraz uzun zaman aldı. Hani diğer sınıftaki gibi (Nihat'ın sınıfı) budur filan diyen olmadığı için. Gerçi bir kişi çıktı, ama onun açıklamasını kimse anlamadı. O yüzden diğerlerinin anlamasını bekledim. Orada biraz uzun oldu… Sonra genel olarak kuralı anlatmak için üzerinde çok durdum, o yüzden de bayağı bir zaman kaybettim*.]

PEMTs' one of the major goals was related to their effective controlling of the students. Almost in all of their post-interviews they stated whether they controlled the class effectively and they had good relationship with the students. According to their reflections in the post-interviews and my observations during the courses, it was seen that all the participants had classroom management problems during their teaching sessions. Most of them stated the reason for their difficulties in controlling the students as being the pre-service teachers rather than being regular teachers of those students. Although managing the classroom was considered a crucial dimension of teaching, most participants tended not to take the responsibility of controlling students' unwanted behaviors since it was the mission of the regular teacher. Beril, in her fourth interview, noted that:

The intervention of the mentor teacher facilitates the process. Otherwise, I can not control the class anyway. It is actually the task of the mentor teacher. If it would be a process from the beginning, maybe… Because, they [the students] have accepted her [mentor teacher]; she [mentor teacher] was their teacher. I am a guest at that classroom. (*post-4*)

[*Hocanın müdahalesi işleyişi kolaylaştırıyor, hakim olamadığımdan sınıfa ki olamam da zaten. Zaten o hocanın rutin işi. Başından bir süreç olsa belki… Çünkü onlar kabullenmişler, çünkü o onların hocaları. Ben orada bir misafir.*]

Beril and Selin stated that they observed the mentor teacher's way of controlling the students. They saw that the mentor teacher had also problems in controlling the classroom during the lesson. A sample quotation taken from Beril's post-interview about the management of the class showed that she addressed the reasons of management problems as the nature of the students' behaviors:

> As the students of this class are very disobedient, I tried to make them focus on the lesson rather than conducting my teaching plan. I am not the only one who has problems in controlling the students; the mentor teacher has similar problems too during the lesson. (*post-1*)
>
> [*Bir de sınıf çok hareketlive yaramaz bir sınıf olduğu için planımı ilerletmekten çok, sınıfın bana odaklanmasını sağlamaya çalıştım. O konuda problem yaşadım ki onu da sadece ben yaşamıyorum sınıf hocası da yaşıyor.*]

Nihat also stressed his difficulties in controlling the students properly. In his last teaching practice, for instance, he criticized himself: "I had many difficulties in managing the classroom. The first session was good; however, the second session was bad. In fact, I did the same things in the second session with the first one. Still, students got out of control after a while". Selin mentioned similar concerns. She stated that she would give more attention to classroom management issues since she usually did not know how to behave uninterested students or the students who never participated in the lesson.

Selin and Beril seemed to be pleasant by the interventions of the mentor teacher in terms of controlling the students when they were teaching. Both of them thought that they were not the real teachers of those students. Thus, they needed such kind of helps from the mentor teacher. Actually, they expressed that they mostly felt hesitant about intervening students to control them when Teacher A was stated in the classroom. They were also unsure about Teacher A's reactions if they attempted to admonish students. Thus, they let the mentor teacher manage the classroom for them. Selin, in her later teaching practices began to change her

opinion about interventions of the mentor teacher in terms of controlling the students and checking the homework. In her 4th post-interview she complaint about being considered as a 'second teacher' from the view of the students when Teacher A attempted to interfere any kinds of issue during the class. I asked that whether students might have been affected by the teacher's intervention. She responded that "They must certainly be affected from her interventions. If students consider me as a pre-service teacher, they would not care and listen to me no matter how much I try. [*Kesinlikle etkiliyordur. Dersin dinlenmesini sağlayan birinci öğretmen. Eğer öğrenci orada seni öğretmen olarak göremezse o dersi dinlemez ki. Ben ne kadar kendimi zorlasam da öğrenci seni öğretmen olarak görmesi zor yani.]*

Another issue considering classroom management was reflected by the PEMTs while they were talking about the relationship with the students. They usually mentioned about students'attitudes and behaviors during the lecturing and whether they participated in the lesson. Regarding the relationship with students, Taner stated that he tried to behave friendly to the students to make them feel comfortable during the lesson:

> When I asked questions to students or talked to them I tried to behave friendly rather than acting distant. They are more comfortable and ask questions easier as long as I behave like that. If I am more serious, they don't understand; however they behaved as if they understood. (*post-1*)
>
> [*Öğrencilere sorular sorduğumda, onlarla tartışırken ya da konuşurken çok böyle mesafeli değil, sıcak davranmaya çalıştım. Çünkü öyle olunca onlar daha rahat oluyorlar, daha rahat anlamadıkları yerleri sorabiliyorlar. Biraz daha ciddi olunca, anlamıyorlar, ama anladım deyip geçiştiriyorlar*.]

However, two of the participants believe that they, as pre-service teachers, should seem serious to students until the students accept them as their teacher. Selin, for example, stated in her first post-interview that she tried to seem down

faced to students as a kind of preventive toward students' unexpected behaviors. She thought that if she would smile to student they would make too much noise as they were already not behaving well. Similar to Selin, Beril stated that most of the students, even the most silent ones, tended to make fun with them, especially when the students found a small mistake.

Besides giving information about relationship with the students, the participants also talked about the classroom environment emphasizing the students' behaviors while evaluating their teaching sessions. They considered that it was an advantage if there was a good atmosphere in the classroom in which students were silent and interested to the lesson. Selin in her 3rd post-interview stated that the students provided an appropriate teaching environment for her and were engaged in learning. Nihat, for example, stated that he felt comfortable depending on students' good behaviors during the lesson. In his quotation, he stated that "At first, I was worried if there would be noise in the class. Later on, when I saw that things were going well, I got calm down" [*İlk başta sınıfta bir ses olur mu, gürültü olur mu diye düşünüyordum. Daha sonra baktım sınıf güzel gidiyor, her şey iyi gidince rahatladım diyebilirim.*].

For the inverse situation, one of the participants stated that she was negatively affected by students' unwillingness to participate in the course. Even, she noted that the reason of her low energy based on students' unresponsive behaviors. In her 5th post interview, she said that

> My energy was not very high; I realized it while I was teaching. The reason for this is that I could not take reactions from students; I felt like…to whom I was talking. It took my energy. Students were talking too no matter how much I shout. However, it did not affect my mood; it was just caused my motivation to decrease (*post-5*).
> [B*enim enerjim pek yüksek değildi, onu fark ettim anlatırken. Onun nedenini de şuna bağlıyorum, tepki alamayınca böyle kendimi şey gibi hissettim yani nereye konuşuyorum?...konuşuyorlar, o çok kötü, benim enerjimi o tüketti biraz, ne kadar da bağırsam da. Ama moralimi bozmadım da, motivasyonumu düşürttü*.]

The role of the mentor teachers during PEMTs' teaching sessions was another most commonly mentioned evaluation type. As they performed their teaching in front of a mentor teacher, they talked about them in almost all their post-interviews. Specifically, they commented about the interferences of the mentor teachers in terms of controlling the students during their teaching sessions. They had different views regarding the way of mentor teachers' interferences during their teaching. For example, Beril reported that she was positively affected by the mentor teacher's interruptions to control problematic students in the classroom. She stated that she considered Teacher A's interference to control the classroom helpful but not annoying/disturbing in her 1st and 3rd interviews:

> Teacher A did not interfere in my lesson. She just helped students to direct their attention to me since there were problematic students in this class. She especially went to that naughty student and told him to be respectful and follow the lesson. (*post-1*)
>
> [ *Hoca derse müdahale etmedi, sadece sorunlu bir sınıf olduğu için davranışlarını, bana odaklanmaları için çocuklara yardımcı oldu. Özellikle o hareketli öğrencinin yanına gitti, bak dinle, saygılı ol şeklinde telkinlerde bulundu*.]

Another intervention by the mentor teacher was done when Selin was in her 3rd teaching session. Due to my observation notes, Teacher A asked Selin to explain the meaning and origin of the formula used for solving one of the questions during the lesson. When I asked Selin about what she thought of the intervention of the mentor teacher, she responded that:

> I actually thought about it before and went to the classroom by having been prepared. But a person might not give a proper answer immediately when he met such kind of question. This might generate problems. However, I did not have such kind of difficulty to give response to the question. Besides, Teacher A's way of asking the question was good too. She said in a whisper. Thus, I did not feel unconfortable. (*post-3*)

[*S:Kafamda zaten vardı, belki şunun için kötü olabilirdi. Ben zaten onu o şekilde hazırlanıp gittim. Ama insan bir anda söylediğinde göremeyebilir. O noktada problem yaratabilirdi. Ama benim öyle bir sıkıntım olmadığı için ben çözdüm ve söyleyiş tarzı da güzeldi, fısıldayarak söyledi. O yüzden rahatsız etmedi beni.*]

Comments about homework checking of Teacher A were stated in most of the post-interviews by Selin and Beril. Selin considered Teacher A's homework checking process normal and stated that she did not feel discomfort of that process. She considered homework checking process as necessary as it was helpful for students as a warm up activity. However, Beril expressed her annoyance of that process after a while. She stated in her 3rd post-interview that the she felt discomfort as Teacher A spent much time for it and made students distracted from the lesson:

> 15 minutes were gone with homework checking. I had only remaining 25 minutes. It takes really much time and causes students to loose their attention to the lesson. They are already distracted. Yet, there is nothing I can do about this issue.
> [*15 dakika ödev kontrolüyle gitti, geriye 25 dakikam kaldı...Ödev kontrolü gerçekten çok zaman alıyor ve bir de öğrencilerin gevşemelerine neden oluyor. Zaten gevşekler. Ama işte bu konuyla ilgili yapabileceğim bir şey yok.*]

In his 3rd and 4th post-interviews, Taner stated that he was annoyed by the mentor teachers' interventions to the flow of the lesson. He specified that he felt some anxiety because of Teacher D's unexpected questions out of his planning:

> I was not expecting any questions from him (Teacher D). It made me feel worried since I thought that I might not have been able to complete the questions that I was preparing. I feel anxious about any kind of unplanned situations. Because, there is a task which I prepared and which I had to finish I tried to complete it. (*Post-3*)

[*Bir de hocanın o aradaki sorularını hiç beklemiyordum. Beni biraz tedirgin etti. Şöyle tedirgin etti, şimdi bununla ilgilenince benim sorular yetişmeyecek mi acaba dedim... Planlı olduğu için, plan dışı her şey beni tedirgin eder. Çünkü hazırladığım, yetiştirmem gereken bir şey var, o yüzden onu yetiştireyim diye uğraştım*.]

In his 4th post-interview, Taner expressed his discomfort of the mentor teacher's interventions during his teaching session. He stated that although Teacher B gave important suggestions to students related to national exam, Taner did not like the teacher's interventions when he was teaching. He added that Teacher B had not made this kind of interventions in his prior teaching sessions. In his talk, Taner stated that

T: Teacher B had not intervening so much formerly. This time, he intervened slightly more. I think it is not good. I know it was not a malicious intervention, but still I do not like. I actually have a dominant character (smiling)… I mean, he gave meaningful suggestions by indicating the objectives of the questions. He said that students would be asked those kinds of questions measuring many gains together in one questions in SBS. He talked about important issues. However, there were conversations among some students. That was not nice. It is bad to be intervened to your personal plans. It is somehow strange… (*post-4*)

[*Hoca eskiden o kadar çok müdahale etmiyordu. Bu sefer biraz fazla müdahale etti, bence hoş değil. Hani kötü bir müdahale değil, kötü niyetli değil, ama ben hoşlanmıyorum yani. Biraz daha böyle baskın bir genetiğim var (gülüyor). Yani güzel öneriler verdi, bakın bu soruda birçok kazanım var filan dedi. SBS'de zaten böyle sorular soruyorlar, sadece bir şeyi değil, birçok kazanımı birlikte ölçüyorlar diye. Çok güzel öğrencilere şey verdi yani. Ama o arada sınıfta konuşmalar filan oldu, o öğrencinin olduğu taraflar filan*

*karmaşıktı, dinlemeyenler vardı. Ama böyle hani hoş olmuyor, çünkü bir planın birisi araya giriyor filan... Garip oluyor yani*.]

Contrary to Taner's and Selin's discomforts in terms of being intervened by the mentor teacher, Nihat had a different consideration. He considered those kinds of interventions positive specifically for the students. He stated that Teacher B needed to give some suggestions to students and make emphasis about SBS, rather than meaning that he could not manage the classroom. In the conversation between me and Nihat, he noted that:

> N: Teacher B, yes not just like the same…Formerly he did not intervene not to disturb us, although there was a problem. That is to say, he does not behave this way as if I cannot control the class. Only he makes interventions when he needs to say something to students and make an emphasis. I think it is good.
>
> R: Does it affect you in any way?
>
> N: No, it does not affect me either positively or negatively. It sounds normal to me. Of course, teaching at that class cannot be same with my class. But yet it does not have a negative effect on me, or it does not disturb me with his interventions. (*post-4*)
>
> [*N:Hoca, evet eskisi gibi… Eskiden mesela bizi rahatsız etmesin diye hiçbir şekilde müdahale etmiyordu kötü bir şey bile olsa. Yani gerektiği zaman yine böyle, şey yapmıyor mesela, sen sınıfı kontrol edemiyorsun da ben kontrol edeyim şeklinde değil de, sadece hani böyle öğrencilere ihtiyaç oluyor, SBS'yle ilgili bir şey söyleyecek ya da başka bir yeri vurgulaması gerekiyor, orada araya girişler yapıyor. Bence iyi bir şey yani. R: Bu seni etkiliyor mu herhangi bir şekilde? N: Yoo bu beni olumlu veya olumsuz bir şekilde etkilemiyor, normal geliyor. Tabii kendi sınıfımda olduğu gibi olamaz burada anlattığım ders, ama yine bana göre olumsuz bir etkisi yok yani sonuçta, karıştı diye üzülmek…]*

Nihat reported similar comments for the interferences of Teacher D in controlling the students during the course. He stated that he found Teacher D's attempts helpful to control the students since he was not the real teacher of that classroom. In his 3rd post-interview he said that

> Teacher D helped in somewhere which was positive for us. He was always following the students with his eyes. He does not allow students to make noise. If there is a student who tend to speak during the course, Teacher D observes him directly. He continuously looks at students. As we are not their regular teachers, it would be difficult to control them. He helped us in managing the classroom. (*post-3*)
>
> [*Hoca yardımcı oldu bazı yerlerde, o bizim için olumlu bir şeydi. Devamlı zaten gözüyle bile öğrencileri takip ediyor, ses çıkartırmıyor derste, ama devamlı kim ses yapıyorsa gözü onun üzerinde oluyor. Devamlı bakarak onu kontrol etmeye çalışıyor filan. Biz asıl hocaları olmadığımız çin bu şekilde sınıfı yönetmemiz daha zor olurdu... Sınıfı kontrol etmeye yardımcı oldu.*]

To summarize, all participants' reflections about their mentor teachers' role and their attempts to interfere the course during the lesson were considered positive in some conditions. In their early teaching practices, all of the participants stated that the mentor teachers' attempts to control the students were helpful during the course as they were pre-service teachers. At the same time, they underlined that the attempts of the mentor teachers were only to the controlling issues. They stated that there was no problem as long as the mentor teachers did not intervene their teaching. However, as mentioned above, some of the participants like Selin and Taner began to complain about the intervention of their mentor teacher even in controlling the students later in their teaching practices. They stated that they could manage the classroom by themselves without the interventions of the mentor teachers.

#### 4.2.24.2.2 Self satisfactory beliefs of the participants

Self-reflections were also analyzed within the motivational perspectives. All participants commented on how /to what extent they were satisfied about conducting the lesson, using the time, relationship with the students, managing the students, getting feedback from the mentor teacher, and having content knowledge about the teaching subject, mostly through a combination of these issues or in relation to each other.

Selin and Beril reflected their satisfaction about their courses. They stated that they exactly conducted the teaching session according to the lesson plan being prepared. They emphasized the organization of the courses that they could follow the order of the task identified before. In her 1st post-interview, Selin talked about the teaching process from beginning to the end step by step and seemed to be satisfied from the teaching practice:

> I think that it was a very organized lesson. Everything was given in an order, the title was presented, the definition was written, the features were identified, and the examples were shown. I did it with its order. Then, I made a recall by building the prior lesson as they were related to each other. It was good that I made a recall to the students…There was a similarity and a parity in the activity...The activity was also good.
>
> Because co triangles are similar triangles and similar triangles are co triangles? Students inferred a result by taking a note and then wrote to their notebooks. (*post-1*)
>
> *[Çok düzenli bir ders olduğunu düşünüyorum. Her şey sırasıyla verildi, başlık atıldı, tanımı yazıldı, özelliği belirtildi, örneği gösterildi. Bunu sırasıyla işledim, arkasından en başta tabi geçen dersle bağlantı kurarak, ona bir hatırlatma yaptım; çünkü ilişkili konulardı. Güzel oldu hatırlatma yapmam, öğrencilerin hatırlaması. Çünkü sonrasında çözeceğimiz sorular içerisinde de eşlik benzerlik de vardı. Etkinlikte de eşlik benzerlik vardı. Olması gerektiğini düşündüğüm için hatırlatma yaptım. Etkinlik de güzel*

*oldu. Çünkü hani eş üçgen benzer midir? Benzer üçgen eş midir? Oradan bir sonuç çıkartıp bir not olarak, o sonucu öğrenciler defterlerine yazdılar.]*

PEMTs' satisfaction with their teaching was also related to the extent they were satisfied with their content knowledge. Beril reflected that she felt comfort while teaching since she had an adequate content knowledge about the teaching subject. She noted that "I felt good while teaching, since I know that I can handle the teaching subject and I am sure of responding any questions coming from the students." [*Ders anlatırken kendimi iyi hissettim. Çünkü konuya hakim olduğumu biliyorum, gelebilecek sorulara cevap verebileceğimden eminim*]. She added that she conducted the course as a full planning. She noted that almost each student in the classroom attended the lesson as they were motivated by the mentor teacher at the beginning of the lesson.

Nihat and Selin seemed to be sure of having an effective and satisfying lesson according to the view of the mentor teacher. Selin stated that she felt confident as she was told positive comments by the mentor teacher. She said that "Teacher A told me that I did well for the course although she could not listen to me carefully as she had some works to do. It was okay for me (Smiling)". [*Teacher A işim var diye çok dersini dinleyemedim, ama ağzına sağlık dedi. Bu da yeterliydi benim için (gülüyor)*]. Similarly, Nihat asserted that he was sure about the mentor teacher's positive opinions about the lesson. He noted that "This week I am sure that Teacher B does not think that the lesson was moderate. That is, he does not think that it was an ineffective session; on the contrary I am sure that he thought that it was full and students learned". [*Bu hafta hocanın, öylesine bir ders gibi düşünmediğine eminim, yani dersin hiçbir şekilde boşa gitmediğini, tamamen dolu geçtiğini ve öğrencilerin öğrendiklerinden eminim*.]

Another concern stated by Selin was related to being considered as a regular classroom teacher by the students. Her satisfaction of being accepted as a regular teacher can be seen from her reflection stated below.

I was very comfortable, pleasant and laughed. I had a dialog with the students. They saw me as if I was their actual teacher or I felt

like that. Or at least they reflected like that. This made me feel very pleasant. I never thought anything other than the course. I completely focused on to the lesson. It was good for me, it was a good experience.

[*Çok rahattım, çok keyif aldım, güldüm. Öğrencilerle diyaloğum vardı. Onlar beni öğretmenleri gibi gördüler, bana öyle geldi, en azından bana öyle yansıttılar. Bu bana çok keyif verdi, başka hiçbir şey aklıma gelmedi, tamamen derse odaklanmıştım. Güzeldi benim için, güzel bir deneyim oldu.*]

Selin also reported her satisfaction related to getting an improvement in using the time properly. For her 3rd teaching practice, she stated that

> Previosly, I used to have time using problems; students attempted to go out of the classroom before making solution of the questions. But this time, I finished solving the questions, I could ask what we had learnt, and could say 'enjoy your meal'. Of course, I have gained an improvement in terms of it. This time, I checked the time from my watch during the lesson. I tried to be faster after solving each questions and as I said before could even say 'enjoy your meal'before the end of the lesson. (*post-3*)
>
> [… Ö*nceden zaman sıkıntısı yaşıyordum, soru bitmeden çocuklar ayağa kalkıp gitmeye çalışıyorlardı. Soru bitti, bugün ne öğrendik de diyebildim, hadi afiyet olsun deyip bitirebildim de (gülüyor). Tabii bu konuda bir ilerleme kaydettim zaman konusunda en azından… çünkü biraz da saatimi de kontrol ettim. O yüzden soruları çözerken, her sorunun bitiminde yapacağım daireleri ona göre hızlandırdım ve dediğim gibi afiyet olsun bile dedim dersi bitirmeden*.]

The participants also talked about their dissatisfaction related to the above issues by stating the reasons. Taner, for example, emphasized his dissatisfaction when he was asked how he felt himself after the teaching session:

> I do not feel good at all! (Smiling). Somehow I am not satisfied, it could be more effective. There were different reasons as I said before such as being an afternoon now, the hot weather, and noise coming from the school garden. All these distractions caused to be so. As I said, I could not feel myself well because of those defects. (*post-3*)
>
> [*Kendimi hiç iyi hissetmiyorum! (gülüyor)Nedense öyle bir his var içimde. Kendim memnun kalmadım, böyle daha etkili olabilirdi... İşte farklı nedenlerden dolayı, dediğim gibi öğleden sonra olması, havanın sıcak olması, dışarıda çalışmaların olması. İlk başta böyle aksaklıkların meydana gelmesi, bunların hepsi böyle olmasına etkendi. Dediğim gibi bunlardan dolayı tam şey hissedemedim kendimi...*]

As seen from Taner's statements he based the reasons for not being able to conduct the lesson according to his plans on some physical conditions independent from his own teaching performance.

Selin stated that she confessed her inefficacy in using the Geometry Sketchpad properly. She said that she could not explain how to use the geometry sketchpad in a clear manner. She added that she found herself unsuccessful in using the computer program.

For the 5th teaching practice, Beril stated that she did not feel very good after leaving the classroom as the teaching session was not fine. In one of her interviews, she noted that

> The course was moderate; I don't feel very well today. Meanwhile, I also think what I could do more or something different. But I can not find anything. Still, the course was not good. I feel that I shouted a lot. I can say that I was disturbed of my voice. (*post-5*)
>
> *[Orta derecede, bugün çok iyi hissetmiyorum. Ne yapabilirdim diye de düşünüyorum, ona da bir şey bulamıyorum, ama çok iyi değildi. Çok bağırdığımı hissediyorum, sesim beni rahatsız etti öyle söyleyim size.]*

### 4.2.3 Adapting /changing SRL strategies

In addition to self-satisfactions of the participants, their adapting (changing) SRL strategies regarding the teaching practices through the study (during the semester) and their reasons for making those adaptations (changes) were examined in this section. The adaptations were sometimes reported verbally as intentions for future practice and sometimes intended to be implemented in the next teaching practice. The identified adapting SRL strategies of all participants could fall into four categories: (1) adaptations in the content of the course material (e.g. worksheets, student-based activities, and /or lesson plan; (2) adaptations for personal teaching behaviors (styles/characteristics), (3) adaptations for conducting the course (flow of the lesson); and (4) adaptations for managing instructional time and classroom. In this section, I also gave some quotations from the participants in order to exemplify their adapting (changing) SRL strategies. The quotations were stated in order to understand why the participants needed to make those changes. Adaptations intended for the future teaching experiences were also reported to understand the pre-service teachers' difficulties with their practices. The adaptations for future SRL strategies mostly came from participants' post-interviews depending on their prior teaching practices.

The overall findings showed that such kind of changes of SRL strategies were both very similar and different among four participants as they taught at different grade levels and sections. In the following paragraphs, adaptations of SRL strategies of all participants were presented based on the findings of the post-interviews.

#### *4.2.3.1 Adaptations in the content of the course material*

Adaptations related to the content of the course material were mostly about difficulty level of the items (questions) in the worksheets. The PEMTs made those adaptations to adjust the difficulty of items with the students' actual achievement level. For example, Selin stated that she decided to remove one of the questions as it seemed quite difficult for the students during the lesson. Selin said that

S: Students' approaches to the subject were somehow different. They seemed not to have adequate knowledge related to the topic. Thus, I changed the first question. Because, I looked at the question and it did not seem to be a beginning question according to the level of classroom.

R: Was it difficult for their academic level?

S: Yes, it was. Thus I did not do that question. I made such kind of a change during the lesson. (*post-1*)

[*Öğrencilerin konuya yaklaşımı biraz farklı. Yeterli bilgiye sahip değillermiş gibi geldi. O yüzden, ilk soruyu değiştirdim. Çünkü orada baktım, ilk soru başlangıç sorusu gibi gelmedi sınıfın seviyesine göre. R: Zor mu geldi? S: Evet, zor geldi. Ondan o soruyu yapmadım. Öyle bir değişiklik yaptım*.]

Taner and Nihat also talked about adjusting the difficulty level of the items in the worksheets. They underlined that their prior teaching practice at the same classroom showed them the necessity of preparing easier questions than the previous ones. They asserted that making the items easier encouraged students to deal with the course instead of making noise. Taner reported that

T: The first thing I have learnt from the current course was difficulty level of the items. If the difficulty level is high, students cannot participate to the lesson and they are obliged to make noise. In fact, the reason of the noise in the prior session was this..

R: Students cannot solve questions as they are quite difficult, can they?

T: As they cannot do the questions, they begin to talk each other, because they have nothing to deal with. However, at least they deal with the questions when the difficulty level of the questions is appropriate for them, they don't begin to talk with the friend sitting near to them. At least, I will pay attention to this issue. (*post-1*)

[*T: Valla ilk olarak bu dersten öğrendiğim şey: soruların güçlük seviyesi. Soru seviyesi zor oluyor, öğrenciler katılamıyor derse,*

*öğrenciler gürültü yapmak zorunda kalıyorlar. Aslında gürültünün sebebi oymuş yani.*

*R: Sorular zor olduğu için yapamıyorlar...*

*T: Yapamadıkları için de konuşmaya başlıyorlar kendi aralarında, çünkü uğraşacakları bir şey yok. Ama sorular onların seviyesinde olduğu zaman en azından uğraşıyorlar, onunla ilgileniyorlar, yanındaki arkadaşıyla konuşmaya başlamıyorlar. En azından buna dikkat edeceğim*.]

The PEMTs talked about their decisions to prepare more organized course materials- worksheets or student-based activities- for the next time. They reported that they decided to think the activity planning process in depth for the coming teaching sessions. Nihat stated that he would prepare the content of the lesson 'rich' in order not to meet problems faced in the previous lesson. Taner noted that he decided to write the definition of the topics to be taught to the final slide of the smart board. Further, he took a decision that he would prepare extentions (more questions) for the next teaching session. He also noted something about the design of the worksheet:

> For the following session, I would put a definition to the smart board. Secondly, I did not much like the activity sheet, the page numbers and the title were not written. I did not say which page is the first, which page is the second. Then, it should always be thought of preparing extentions. It should not have such kind of cases like we have had in the current teaching session. At the end of the course, formulas, major definitions could be shown on the smart board. After that they could be written to the notebooks as a written recall. It would be better that way, I would do like that for the next session. (*post-2)*
>
> [*Bir sonraki sefer için, o aktivite kağıdını koymuştuk ya akıllı tahtaya, ondan önce bir tanım güzelce yazıp koyardım. İkincisi aktivite kağıdını çok beğenmedim, soru numaraları yazmıyordu. Başında aktivite kağıdı diye bir şey yazmıyordu, sayfa numaraları*

*yoktu, hangisi 1. hangisi 2. sayfa onu söyleyemedim. Sonra extension'ı her zaman düşünmek lazım. Böyle anlarda az önce yaşadığımız anlarda (gülüyor), extensionsız kalmamak lazım. En sonunda genel formüller, gerekli tanımlar filan tahtada gösterilebilir. Ondan sonra deftere yazılır bir tekrar edilmiş olur. Öyle güzel olurdu. Bir dahakine öyle yapardım*.]

Taner stated that the difficulties he met in his last teaching session provided him to gain an experience to prepare a detailed plan by taking personal notes besides the course material.

> This time I took some notes for my personal use with more organized and planned by experiencing the difficulties in terms of the inadequate content of the course material we had last teaching session for the subject 'Slope'. This note is personal. It includes what I will mention at first and do. Actually, I organized the worksheet according to those notes. A more organized worksheet and notes for how I conduct the lesson.
>
> [*Geçen hafta yaşadığımız eğim konusundaki zorluklardan, materyallerin eksik gelmesinden tecrübe ederek, bu sefer biraz daha planlı ve programlı, aklımızdan çok kendim için bir kağıda yazdım. Yani bu kişisel bir şey, işte ilk önce şuna değineceğim, şunu yapacağım diye küçük bir kağıt çıkarmıştım kendime, öyle yaptım. Zaten aynı zamanda çalışma kağıdını da ona göre düzenledim, daha düzenli bir çalışma kağıdı ve nasıl gideceğimi hatırlatacak düzende bir kağıt*].

The participants mostly stated about preparing an answer key in order to check the students' responses quickly and respond them whether their answers were correct or not. They thought that they would not loose time in giving feedback to students by using an answer key. Selin noted that

> I solved the questions beforehand. I had already had the solutions of the questions in my mind. Yesterday, I solved the questions while preparing them; but I had not written them on a paper. When

> I woke up in the morning I thought that it was not good as I might have had mistakes, maybe there were incorrect results. Thus, I prepared an answer key for each question in order not to lead students to the wrong place and to gain time. (*post-3*)
>
> [*Soruları çözdüm önceden... kafamda da vardı zaten sorunun çözümleri. Dün bu soruları hazırlarken, planı hazırlarken çözdüm soruları, ama yazmamıştım. Sabah kalkınca dedim böyle olmaz, belki dün gecenin bir yarısı yaptım, belki de yanlış yapmışımdır. Çocukları yanlış yönlendirmeyeyim ve zamandan kazanmak için cevap anahtarı hazırladım her soru için*.]

#### *4.2.3.2 Adaptations of the teaching behaviors*

Adaptations related to the teaching behaviors were mostly based on the PEMTs' voice tone, pronounciation, and/or their body language used during the lesson. Selin stated that she paid special attention to her pronounciation while teaching as she had been criticized by her friends from a prior teaching practice at the faculty. She also talked about reflecting her personal feelings or moods to the students during the course. Selin stated that she was aware of the importance of not reflecting the personal feelings to students:

> A teacher is a human being and he/she can go into the classroom with any kind of feelings; however, I learnt the importance of not to reflect his/ her feeling to the course. But, going to the classroom just after having a bad event and being inexperienced in these issues… it is normal to have felt like that. (*post-3*)
>
> [*...gerçekten insan olarak, bir öğretmen de insan ve her şekilde her duyguyla derse girebilir, ama bunu dersine yansıtmamasının ne kadar önemli olduğunu bu derste gördüm. Ama böyle bir sıkıntıdan sonra hemen derse girince böyle bir yaşayınca, ki tecrübesiz de olunca (gülüyor), böyle doğal olarak*.]

Selin reported that she decided not to wear black suit if she would use chalkboard for her future teaching practices. She reasoned her decision to her wearing black suit which painted with white chalk. She noted that it might have led students to make jokes about her clothing. Beril, on the other hand, said that she became aware of not to be seemed soft to students anymore. She decided to seem serious for her next teaching sessions. Nihat and Taner also stated that they should have given attention to speak loudly and walk around the classroom to be closer to students during the course. They noted that they took the decision depending on their previous teaching session in which they standed in front of the board and did not move anywhere. Nihat said that he could achive to speak more loudly at that time: "I needed to speak more loudly that I specifically gave attention to it previously. I think I could achieve to manage the class and speak louder this time."*[Daha yüksek sesle konuşmam gerekiyordu, daha önce ona dikkat etmiştim. Bu sefer biraz daha onu gerçekleştirdiğimi düşünüyorum, yani sınıfa hakim olmayı, daha yüksek sesle konuşmayı.*]

Taner stated that he would give special attention to go to the classroom at least fifteen minutes before the course begins in order to regulate their classroom conditions. He also stated that he did not want to meet similar problems he faced in the prior teaching practice. He said that

> First of all, if I taught the same subject, I would come to the classroom 15 minutes before. I would start the smart board. I would prepare an answer key for the solutions of the questions. Specifically, if there were big numbers as a result of those questions, I would remove them from the worksheet. (*post-3*)
> [*İlk önce, bu dersi bir daha anlatacak olsam 15 dk öncesinden sınıfa gelirim. Akıllı tahtayı açarım. Soruların cevapları için bir cevap anahtarı çıkartırım kendime. Özellikle bu sorularda büyük sayılar çıkıyorsa o soruları out yaparım*.]

#### *4.2.3.3 Adaptations related to conducting the lesson*

The participants also reflected about the necessity of making adaptations about conducting the lesson. Their adaptations were usually based on giving more information than planned when they realized the students' lack of knowledge of the topic. Selin noted that she decided to make some practices about the previous topic during the lesson. This strategy was employed depending on the students' existing content knowledge.

Another type of adaptation was related to way of responding to the students. Nihat stated that he decided not to give direct answer to students while they were struggling with the questions to keep their attention to the lesson. Beril stated that she changed her strategy related to the way of students' presenting their solution process:

> For the next session I would say to the students that they first should make the solution in their notebooks and then be allowed to come to the board if they found the answer. That is, I would follow an inverse progress with the current practice. Because I noticed that every student brings their answers to me by copying from their friends. (*post-4*)
>
> [*Bir sonraki ders için, birisini tahtaya kaldırdığımda herkes önce bir defterine çözsün, kim buldu hadi birisi tahtaya gelsin derdim. Yani tersten gelen bir süreç işlerdim. Çünkü baktım ki hepsi direk sonucu getiriyor başkalarından geçirerek.*]

The adaptations were usually attempted to make in order not to meet difficulties and/or problems that appeared in the prior teaching practices. In other words, they were made for intended outcomes. However, Beril changed the way of conducting her lesson for another kind of reason. She reported that she decided just to continue her lesson like the mentor teacher instead of doing a student-based activity. Because, she thought that doing an activity in the course did not work for taking students' attention to the task depending on her previous observations and experiences.

#### *4.2.3.4 Adaptations related to managing the instructional time and classroom*

The overall findings showed that most of the adaptations were made by the PEMTs due to their managing concerns. The participants needed to change and adapt some of their strategies not to meet difficulties related to time or classroom management. They reported that they had a progress in controlling the time properly. For example, Nihat and Selin reported that they could use the time properly by watching their clock during the lesson and adjusting the time due to the flow of the lesson. They also stated that they paid special attention to go faster while solving the questions. In his conversation, Nihat said that he overcame his major challenges by controlling the time properly:

> This time I could manage the time. We let things slide in our previous practices. We used to say the bell rang and the lesson finished. But this was not case for this time. I watched the time whether I go fast or low. I asked questions depending on the time. I either delayed or passed quickly.
>
> [*Bu sefer zamanı kontrol ettim yani. Diğerlerinde öyle olmuyordu, akışına bırakıyorduk, aaa zil çaldı, bitti diyorduk. Şimdi öyle olmadı, bu sefer saati kontrol ettim, hızlı mı gidiyorum, yavaş mı gidiyorum filan işte ona göre soru sordum, oyaladım veya hızlı geçtim*.]

Finishing all the tasks in the given course hour(s) was another concern of the participants. They began to complete the course material in the given course hour. Beril and Nihat stated that they developed a strategy for completing the tasks. They stated that they gave unsolved (remaining) questions as homework in order to use the time properly. Beril noted that

> Even you have noticed that students really had difficulties while drawing D, L, Z and the combination of them. 80% of the students drew, while 20% of them could not draw. I thought myself that there was a curriculum that I had to complete. Then, I said to the students who could not draw the codes to try drawing by looking

> their friends or try it at home as the textbook already involve those codes in it. Also, they had the isometric papers. (*post-2*)
>
> [*Hatta fark etmişsinizdir öğrenciler çok zorlandı bu D, L, Z'yi, bir de bunların birleşimi DL'yi çizerken. %80'i çizdi, %20'si çizemedi. Ben de dedim yetiştirmem gereken bir program var çizen arkadaşlarından alıp kendin deneyerek yapmaya çalış. Evde kendin de uğraş, kitapta zaten şekli var, izometrik kağıdın da var*.]

The adaptations related to conducting the lesson was also aimed to prevent possible problems of managing the classroom. Taner reported that he needed to change the way of delivering the papers of the worksheets to avoid a distraction in the class based on the negative outcomes occurred in his prior teaching practice. He stated that he delivered all the pages of the worksheets at the same time which then caused a trouble in controlling the students. His decision related to delivering the worksheets to students was that

> Formerly we used to deliver all the pages at the same time. Later there had been a complexity. There would be again a complexity even the page numbers were written on it, because there were a lot of papers on their tables. They saw an item and did it if it was easy to do. For this reason, I said that I would deliver each pages one by one although there would be time loss. I took that risk. On behalf of distracting students' attention, I risked the time loss. (*post-5*)
>
> [*Valla önceden hepsini aynı anda dağıtıyorduk, sonra karmaşa oluyordu. Sayfa numaraları yazıyor, ama şimdi yine bir karmaşa olacaktı sayfa numaraları yazmasına rağmen. Çünkü masanın üstünde bir sürü kâğıt var. Onu yazıyorlar, burada bir işlem görüyor onu yapıyor. Yani şuna bakacak kolay gelecek, yapayım diyecek… o yüzden en iyisi dedim teker teker dağıtmak, biraz zaman kaybı, ama olsun onu göze aldım. Dikkatin dağılmasının yerine, en azıdan dedim biraz zaman kaybı olsun.*]

As their teaching practices continued, the PEMTs mentioned about the importance of taking students' attention to the lesson before setting any goals for

the teaching topic. For example, Beril stated that she decided to conduct the lesson by focusing on controlling the students:

> As far as my prior experience at 7/A, I do not believe that it is impossible to reach any of the goals without making students focus on to the course. The curriculum, the lesson plan is untrue. What if I teach a+b is equal to c, when they (students) even do not have notebooks. The thing that I do not understand is that Teacher A knows it and always ignores it. (*post-2*)
>
> [*7/A'dan yaşadığım kadarıyla kesinlikle öğrencileri kendime odaklandıramadıktan sonra hiçbir amaca ulaşabileceğime inanmıyorum, ne program, her şey yalan. Ben orada a+b'nin c'ye eşit olduğunu göstersem ne göstermesem ne, ki zaten defterleri yok. Defteri olmayan öğrenci de vardı. Benim anlamadığım şey bunu hep görüyor hoca ve her zaman geçiştiriyor.*]

The participants talked about gaining experience in terms of controlling the students and/or deciding what to do for problematic situations comparing to their past teaching practices. They reflected that their attempts to make adaptations for the undesirable cases were successful as the teaching experiences continued. Nihat, for instance, stated that

> While teaching, I do not feel very excited like before anymore. Yet, there are somethings that I would like to change, such as managing the classroom better or speaking loudly. Yet, I used to make something become routine comparing to the past. In other way, I did not know what I should do for the similar cases. One begins to change as well as doing teaching practices and repeat it. (*post-3*)
>
> *[Ders anlatırken artık eskisi gibi böyle elim ayağıma dolaşmıyor, heyecanlanmıyorum çok fazla. Yine değiştirmek istediğim şeyler olabilir, mesela biraz daha sınıfı iyi yöneteyim gibi, biraz daha gür sesle konuşayım gibi. Yine de eskiye göre biraz daha rutinleşti, birisi ses yaptığı zaman en azından onun tarafına gideyim, bir şeyler söyleyeyim gibi şeyler oluyor. Öbür türlü gitmem mi lazım*

*acaba, ne yapmam lazım hiçbir şey bilmiyordum. İnsan deneyim kazandıkça, tekrar ettikçe değişiyor, kolaylaşıyor.*]

Nihat's adapting and changing SRL strategies were very similar to Taner in some cases. However, besides having similarities, they had different kind of strategies that were adopted and changed. Nihat usually taught after Taner's session through the study. For this reason, he stated that he had some advantages in terms of having seen the classroom environment to make some adjustments before his actual teaching session. When I asked Nihat whether there were any changes he planned to do after observing Taner's teaching session. He said that

> N: First of all, I solved the questions. Even though we prepared the questions, one can forget something at that time. However, Taner did solve all the questions. Beacuse of that, normally I would not pay attention to the units of the answers. Since Taner made an emphasis there, I tried to pay attention to the units. It is really good to see how the course was going. It is really useful.
>
> [*N: Bir kere soruları çözmüş oldum. Ne kadar soruları kendimiz hazırlasak da orada o anlık bir soru işareti geliyor, bir şeyi insan unutuyor. Ama Taner hepsini çözmüş oldu, dolayısıyla normalde ben birimlere dikkat etmezdim diyelim, orada Taner özellikle vurgu yaptığı için bir sonraki derste ben de birimlere dikkat etmeye özen gösterdim. Bir kere denenmiş halini görmek çok daha iyi tabii ki. Faydalı oluyor*.]

A similar case was also seen in Nihat's 2nd teaching practice. Nihat stated that he realized the class hour was too much for the course material they prepared while observing Taner's teaching. He noted that

> The course did not go as I planned beforehand, because I realized that much time would remain in the given class hour while Taner was teaching. For this reason, I tried to extend the course as much as possible. I conducted the lesson slowly than I planned, I tried to

> go slowly. I asked extra questions to students. But, this time there was a problem in terms of using the time. (*post-2*)
>
> [*Ders aslında dersin öncesinde planladığım gibi gitmedi, çünkü Taner anlatırken baktım ki fazla vakit kalacak. Onun için olabildiğince dersi uzatmaya çalıştım. Dersi planladığımdan daha yavaş işledim, yavaş gitmeye çalıştım. Ekstra sorular sordum öğrencilere. Bir de benim dersim Taner'a göre ikiye bölündüğü için aralarda kayıplar oldu vakit olarak 5 dk geç başlama filan. O şekilde de kaymalar olunca vakit biraz da vakit kullanımı problem oldu*.]

Nihat said that he prevented some unexpected outcomes by observing Taner's teaching session before his own teaching. He reported that

> For the second question, for example, as Taner had a problem with that question, I looked at the question again and immediately calculated the result which was 34. I had made the calculation before my session. Thus, his teaching before me usually prevents many negative things to occur. (*post-3*)
>
> *[2. soru mesela, ilk derste Taner sorun yaşayınca, sorulara tekrar bir baktım, acaba işlem olarak bir sorun var mı diye, bunu hemen hesapladım, baktım ne çıkıyor diye, 34 çıkıyormuş cevabı...yani derse girmeden önce onu hesapladım. Onun için derse Taner'ın önden girip şey yapması, bir dolu olumsuz şeyin olmasını engelliyor genelde.]*

Nihat added that observing the peer's teaching session provided some opportunities for him to see the problems in terms of organizing the equipments of the electronic tools in the classroom. As well as adapting the physical conditions, Nihat stated that observing Taner allowed him to have an idea about the students who listen and do not listen to the lesson. He added that he overcame the difficulties with those observations. Upon his statements, I asked Nihat that

whether he was affected by Taner's teaching session regarding his teaching behaviors as well as having an idea of the problems observed. He responded that

> The teaching subject was different with Taner; thus I was not influenced of his lecturing. For example, things like you mentioned in previous teaching sessions, were happening. Since the course materials were same I used to think that I would not solve that question in the same way or I would stress another point, and etc. however, nothing like these happened at the current course. (*post-3*)
>
> [*Taner'la konular farklıydı, o yüzden konu anlatımı yönünden etkilenmedim. Mesela diğer daha önceki derslerde söylediğiniz gibi şeyler oluyordu... aynı sorular olduğu için çözüyordu, ben çözsem onu, o noktayı vurgulamazdım, başka yeri vurgulardım gibi.Ama bu derste öyle bir şey olmadı.*]

The overall findings showed that the PEMTs' adapting and changing SRL strategies mostly came from the difficulties they experienced during the lesson. Based on those difficulties, they decided to change their SRL strategies or make some adaptations either during or after the lesson. The kinds of adjusting strategies were in some way very similar among four participants; although they taught at different sections and grade levels. These changes were mostly related to managing the time and the classroom, taking students' attention to the lesson, designing the course material in detail, preparing extensions in case of having extra time, solving the questions before the class, trying to complete the content of the lesson, and the difficulty level of the task. A summary of findings is presented in the below table based on the combined and adapted framework of the present study to provide an overall view to the readers.

*Table 4.2 Summary of PEMTs' Self-Regulated Learning Strategies*

| **Phases / *Areas*** | **Forethought** | | **Self-Reflection** | |
|---|---|---|---|---|
| ***Cognition*** | **Planning Lesson**<br>- Searching for Related Sources<br>- Arranging/Organizing the Related Resources to form the course material<br>- Taking personal notes<br>- Preparing the course material<br>- Reviewing the course material before the teaching<br>- Asking for help/ suggestion /feedback<br>- Mental preparation of the planning process<br>- Setting goal(s) | **Perception of Context** | **Self-evaluation**<br>Reasons attributed to outcomes | **Evaluation of Context** |
| ***Motivation*** | ***Self-Motivation Beliefs***<br>Self-efficacy<br>Perception of task<br>Intrinsic Interest | **Perception of Context** | ***Self-satisfaction***<br>Adaptive and Changing Strategies<br>- Adaptations in the content of the course material<br>- Adaptations of the teaching behaviors<br>- Adaptations related to conducting the lesson<br>- Adaptations related to managing the instructional time and classroom | **Evaluation of Context** |

Table 4.2 summarizes the self-regulated learning strategies of PEMTs within the context of their teaching practices. As seen from the table, there are several strategies in planning the lesson phase as a first step

# CHAPTER 5

## CONCLUSION and DISCUSSION

The current study mainly investigated four pre-service elementary mathematics teachers' (PEMTs') self-regulated learning (SRL) strategies within the context of their teaching practices at collaborating schools. As well as investigating their SRL strategies, the changes and adaptations of those strategies through the teaching practices were also explored. From this point, the findings of the current study were summarized and discussed based on the current SRL model of the study. The findings were also presented together with implications and recommendations for future research.

I reported the findings in three phases. In the first phase, pre-interviews' findings reflecting the forethought phase of the current SRL model are given. The second phase covers the post-interviews' findings representing the self-reflection part of the study. Finally, in the third phase, changing and adapting SRL strategies considering the post-interviews' findings are reported.

The self-regulated learning experiences of all pre-service teachers were identified by utilizing the combined and adapted SRL Model of the present study by focusing on forethought and self-reflection phases (See Table 2.3). For all participants, the SRL strategies within the context of their teaching practices were examined among their eight class-hours teaching experiences at collaborating schools. It was seen that all the participants in the study regulated their learning at any time in the process before and after each teaching practice. Although each had a different way of regulating their learning for their teaching practices, data analysis demonstrated that certain patterns in their regulation behaviors could be identified. As has been reported in the previous section, all the PEMTs went through a planning process, which corresponded to the forethought phase and a

self-evaluation process referring to the self-reflection phase of SRL framework of the current study. The participants returned to the forethought phase in the next teaching task right after the self-reflection phase of the completed teaching session. This cycle continued for each teaching practice similar to Zimmerman's (1998) SRL model. During the forethought phase, the PEMTs used various strategies to prepare their lessons. The strategies used for planning the course included; searching for related sources, arranging and organizing them to form the course material, taking personal notes, preparing the course material and reviewing it before the teaching session, asking for help from mentor teachers, instructors, and/ or their peers, mental preparation of the planning process, and finally setting goal(s). Through the cycle of SRL, the PEMTs regulated not only their learning for teaching, but also their resources, time, and motivations to achieve their goals.

## 5.1 Discussion of the Findings Based on the Combined and Adapted SRL Framework of the Study

### 5.1.1 Discussion of Findings Regarding the Forethought Phase

Existing literature about the self-regulation has reported several research-based strategies for SRL including the ones presented in the Table 4.2. Those strategies fall into different domains such as, cognitive, meta-cognitive, and motivational self-regulation strategies (see, e.g., Weinstein & Mayer, 1986; Garcia & Pintrich, 1994). In line with the literature, the existing data about the participants' preparation for the lessons were analyzed in two major areas: cognitive area and motivational area. Each SRL strategies presented in the Table 4.2 was discussed in the following sections.

As a major strategy, all the participants used teachers' guide book as a primary source while searching for the related sources to identify and follow the order of topics of the main teaching subject as stated in the curriculum. The teachers' guide book is a source that was offered by the Ministry of National Education (MONE) to be used by all the teachers. This book serves as a guide for

teachers in teaching methods, sample activities and practices, and evaluations. Thus, it was a primary source while preparing a lesson for all the PEMTs. However, two of the participants stated that they did not need to use the teachers' guide book when they would conduct drill and practice in their courses. This might be due to the fact that they were required to prepare questions for the lesson by the mentor teachers. Therefore, they did not need to search for the objectives and/or in-class activities as they did not prepare a lesson plan and the question banks covering many questions were sufficient for drill and practice.

Internet could be considered as a major source for all of the participants in the study. Knowing English broadened their alternatives for searching sites that they could use in planning their courses. Based on my observations, it can be said that web-based sources were mostly used to find lesson plans and/or student-based activities to shorten the duration of preparation. For the participants (Taner and Nihat) who rarely used the internet, it can be stated that they usually made drill and practice and prepared the items with using question banks.

Organizing the available resources for the purpose of preparing the course material was another strategy that the PEMTs used. This strategy was considered an important step for planning the lesson and it was based on the previous strategy, searching for related sources. They arranged the resources gathered from different sources to form and design a well-organized course material such as worksheets or activity sheets. The participants noted that the course material should be organized and formed to cover the objectives identified or told by the mentor teachers. They reported that this process took considerable time since it was one of the major parts of the planning process. Another concern was to prepare the course material aiming to take students' attention. This was probably related to their concern about performing effective classroom management. With this strategy, the PEMTs seemed to be more confident in what they would do during the lesson and gain experience what they would do better for the next time. Knowing their next move during the lesson would also help them in managing the class, time, and the content simultaneously. As their teaching practices continued,

the participants seemed to be more capable of organizing the resources depending on the grade levels and students' achievement levels.

The participants sometimes took personal notes and/or prepared a formal (written) lesson plan for the lessons they conducted while preparing the course material, although they were not required to prepare such notes or plans in the context of the current research. On the contrary, I made them feel free to decide for what they would like to prepare. Actually, most of the participants seemed that they considered lesson plans as unnecessary formality for the teaching task. Only one of the participants (Selin) insisted on preparing a formal lesson plan. However, it was interesting to observe that the participants who considered lesson plans as formality changed their opinion later in the study. These participants did not clearly state that having a lesson plan was necessary, rather they underlined the importance of having a written note -whether it was a lesson plan or not- covering the important issues that should not be forgotten during the lesson. This strategy of regulating their learning for teaching might be the consequence of their initial teaching experiences in the study.

All of the participants asked for suggestions from their mentor teachers, peers, and/or university instructors throughout the study. They usually asked for comments from their mentor teachers about the course material they prepared. If the mentor teachers gave positive feedback specifically for the content of the course material, they conducted the lesson more confidently. Indeed, my observations showed that feedback acquired from mentor teachers was considered important information for both the self-reflection and forethought phases. In our informal conversations, the PEMTs usually talked about the teaching experiences of their mentor teachers and considered them as experts in teaching or in managing the students. In almost every case, they reflected their appreciation of the mentor teachers in terms of their teaching styles. For this reason, the feedback coming from the mentor teachers might be valuable for the participants especially when it was positive. However, it should be stressed that availability of feedback from the mentor teachers mostly depended on mentors' attitude. Based on my

observation, it can be said that the PEMTs asked for feedback as long as the mentor teacher seemed interested in providing it. This finding seemed to be consistent with what Newman (1994) stated about the social aspect of help seeking behavior:

> Help seeking is different from most other strategies of self-regulated learning because it is a social strategy, involving individuals other than the learner. Because help seeking is not an isolative activity, motivational, and affective factors strongly come into play in constructing the stage for, and influencing in an ongoing way, the help-seeking process (p.288).

Participants who gave up asking for suggestions or feedback from their mentor teacher stated that the teacher did not seem willing to respond them. Interestingly, this attitude of the mentor teacher was considered somehow positively by the participants. They asserted that the mentor teacher relied on their preparation for the lesson.

Some of the participants asked for lesson plans or in-class activities from their classmates in the teacher education program for a few times. It was obvious that they used the teaching materials gathered from their peers in order to shorten the preparation process by putting less effort. As the participants had many works to do for the courses and examinations in the faculty at that time, they did not want to spend much time on preparing the lesson. However, asking for plans and/or activities from the peers was not sustained by the participants through the study. This strategy utilized only when the teaching topic was taught before by a peer in the faculty or in the same collaborating school.

Consistent with the arguments of Pintrich (2005), the existing data revealed that the participants' SRL strategies were depended on their perceptions and evaluation of the context. Loughran (2006) discussed similar concerns and stated that context issues should be considered while talking about one's ability to self-regulate. Similar to what Loughran illustrated, SRL strategies identified in the

present study seemed to be related with the teaching practice context including students' behaviors and prior knowledge, physical conditions, and role of the mentor teacher and peers. Participants' perception and evaluation of the context seemed to influence forethought and self-reflection phases to a great extent.

One of the important contexts in the current study was the content area PEMTs taught. Schunk (2005) pointed out that the process of self-regulated learning might differ depending on the content area. In this study, it was seen that the process of identifying the SRL strategies was depended on the mathematical topic to be taught. Specifically, the findings showed that the PEMTs' conceptions of the objectives of the course and the mathematical topic had implicit but noteworthy link to their strategy use in terms of the motivational beliefs. Specifically, I observed and it was stated by the participants that they had the lesson planning process more willingly if they had intrinsic interests in the subject. Participants had certain subject preferences in teaching mathematics. Some of them specified that they would like to teach the topics which could be visualized and taught by using the computer. Therefore, pre-service teachers' SRL strategies seemed to be adjusted to different mathematics topics.

The findings of the present study supported Schunk's (2001) argument addressing that goals were stated in different phases of self-regulated learning process. The participants in this study set goals and decided for the strategies to achieve those goals. In the self-reflection phase, they evaluated their own performances by comparing their present performance with their goal(s) and adjusted the strategies depending on the identified goals. As Butler (1998a) noted, pre-service teachers' self-regulation of learning or teaching mostly depends on their interpretation of goals. He argued that when pre-service teachers have clear understanding of purposes, they can be more effective in developing strategies for accomplishing goals.

Locke and Latham (1990) pointed out that people can achieve more than one goal at a time since they had cognitive and physical capabilities to do so.

Consistent with what Locke and Latham (1990) argued, the findings of the current study showed that the PEMTs had multiple goals identified simultaneously for their teaching practices based on the issues such as students' learning outcomes, classroom and time management, and instructional procedures. While those goals might differ through the PEMTs, the classroom management was a common concern for all participants. This finding is consistent with several studies reporting that the identified goals of pre-service teachers typically focused on classroom management (Battersby &Gordon, 2007; Randi, 2004; Smith, 1997). These studies argued that the issue was a major concern of pre-service teachers in their early teaching experiences. In the current study, it was seen that classroom management issue continued to be a concern for all participants through each of their teaching practices whether explicitly or implicitly stated in their interviews. PEMTs' goals in their early teaching practices were based on students' learning and effectiveness of the course. However, later in their teaching practices, they seemed not much concerned about how to make mathematics interesting or how to conduct an effective lesson. Interview data explicitly indicated that the most important issue that the participants worried was how they would be able to control the students during the lesson. As many other researchers have indicated (Fuller & Bown, 1975; Mewborn, 1999), the present data showed that the PEMTs focused first on to survival concerns such as classroom management apart from mathematics and teaching mathematics; then they attended to matters of students' learning of mathematics and adapting the instruction according to the individual needs of those students as their teaching practices continued. Differing from the related literature, PEMTs' survival concerns have become as major concerns over the time as they got more experience in teaching and having difficulties in classroom control. That is, their first focus was on effectiveness of the instruction which then moved on to the survival concerns as the time passes.

As mentioned, another influential concern was PEMTs' knowledge of the context, and mostly of students. The extent to which pre-service teachers know about students was influential in their instructional decisions and strategy use. For

instance, all participants adapted the complexity of the course material they designed according to the students' existing knowledge levels as they perceived it. They thought that if the course material was not appropriate for the students' academic levels, it affected the students' attention to the course which directly had an effect on controlling the students and the time. Further, while making judgments about their readiness for the class, they considered what they already knew about the class they would teach. Depending on the information they got from their prior observations and/or previous teaching experiences, they felt comfortable or uncomfortable specifically regarding the management issues. If the class seemed to be difficult to control, they expected to have difficulty in managing the class which directly affected their self-efficacy beliefs. In case of not having any information about the class, they felt hesitant as there might be unexpected events during the lesson, especially regarding the classroom management problems. Actually, such concerns about the managing issues were not unusual; rather they were ongoing probably for most pre-service teachers, even those for beginning and in-service teachers. (Battersby & Gordon, 2007; Haser, 2010; and Veenman, 1984).

The overall findings were consistent with the literature on persons' selection of goals (Bandura, 1997) and suggested that, in general, the PEMTs' goal(s) setting and commitment to using SRL strategies to achieve their goals were influenced by their motivational beliefs. One of the motivational beliefs was self-efficacy, in other words, to what extent learners believe about their abilities for attaining specific tasks (Bandura, 1986; 1997). In the current study, most of the participants stated that they preferred to teach the mathematics subjects for which they felt efficacious similar to what Bandura (1997) asserted. More specifically, PEMTs mentioned about the difficulty to teach some topics like 'division' to younger children such as fifth graders. This perception might be due to the fact that they were generally focused on the mathematics curriculum for the sixth, seventh, and eight grade levels of students in their faculty courses.

The findings indicated that there was a strong link between pre-service teachers' judgments of their effectiveness in reaching their goals and their confidence in their knowledge of the topic (perceived self-efficacy), and their decisions and strategy uses. For instance, when PEMTs foresaw a possible problematic issue in their teaching tasks, they decided to study further for preparation if they did not feel confident or just dealt with it during the practice when they had a sound confidence in themselves. A possible reason to this finding might be due to sense of self-efficacy depended heavily on their previous experiences in teaching and in private tutoring.

### 5.1.2 Discussion of Findings Regarding Self-Reflection Phase

Self-reflection phase is considered as a critical component of self-regulation with strong supports in many researches (Schunk & Zimmerman, 1994). PEMTs were asked to reflect about their teaching performances after each teaching session. They talked about their intentions at the beginning of the process and began to think of the experienced teaching session. Further, they took decisions about how their initial intentions needed to be changed for the upcoming teaching tasks. At most point during this phase, the participants stated whether the reported goal(s) or task had been accomplished at the end of the teaching sessions or not. Then they repeated the same cycle of forethought, teaching performance, and self-reflection phases.

In this phase, the PEMTs evaluated themselves in terms of their teaching practices, whether being satisfied of their performances, and what they would have done differently for the next session. Participants reflected on whether they could effectively manage the classroom and the instructional time during the course. Time use was viewed as an important "performance outcome" (Zimmerman, Greenberg, & Weinstein, 1994, p.181) by the pre-service teachers that they use to self-regulate their current and future learning. Reasons of why they were (not) able to control the classroom and the time as they had planned were revealed in the self-reflection phase. If they noted that they were not able to conduct the lesson as they planned, they usually based their reasons to students'

lack of knowledge related to subject or their lack of interests to the course. They usually tended to attribute the negative outcomes to the factors related to students rather than themselves. Only few of them attributed those negative outcomes to their teaching practice. The possible reason for attributing negative outcomes to student-related factors might be due to their self-efficacy developed through their previous teaching practices of tasks.

As noted above, the PEMTs also talked about the necessities to make some adjustments or changes for the following teaching session. It was seen that, the PEMTs' decisions for adjusting their SRL strategies were based solely on their past experiences. If they had experienced a difficulty or a problem in a specific case, they thought that they needed to make some adjustments or changes. These kind of changes usually occurred as the participants became familiar with their teaching practice in the classroom, their students, and the teaching task, which were also related to the context issue. Recognizable changes and adaptations were done specifically for the goals including managing the classroom and the instructional time through the teaching practices.

In some cases, the PEMTs wanted to conduct a lesson that was similar to their mentor teachers' lesson, in terms of the overall instructional approaches or classroom management techniques. Based on their prior observations of teaching sessions of the mentor teachers and their individual teaching experiences, the participants started to believe that instructional techniques that were unfamiliar for children could lead to difficulties in controlling the class. Thus, they needed to adapt their strategies in order not to face possible problems in their next teaching sessions. This finding revealed that the strategies of the participants might vary depending on the context they experienced before.

### 5.2 Contributions of the Study to the Participants

Participants' awareness of their own regulations for teaching increased through eight class-hour teaching practices. They were provided the opportunity to think aloud the processes before and after each teaching practice in the

interviews. This might have also led them to make some adjustments regarding their future SRL strategies for the next teaching session. As Loughran (2006) states "consciously questioning one's own learning, building, extending, and developing ideas is one valuable way of engaging learners in their own learning and of making the purpose of teaching and learning clear" (p.93-94). In line with the statement, the pre-service teachers were encouraged to ask themselves what their purpose was, how they would reach their purpose, and then evaluate themselves for whether they could achieve their purpose after the teaching session. These kinds of questions probably made them develop their self-regulation strategies through the learning and teaching practice they experienced.

In the final post-interview, the participants stated that participating to the study and having 8-class hours teaching practices had influences on their learning about teaching practices. As found in Van Eekelen, Boshuizen, and Vermunt's (2005) study, the pre-service teachers reported that they became more conscious of their learning than they would normally be. This might be due to the nature of qualitative studies affecting the investigated phenomenon perceived by the participants.

According to my own observations and perceptions obtained from all the interviews, the PEMTs began to learn from their own experiences throughout the study. With this research, it is more probable that they would continue to reflect upon their experiences when they would work as teachers after they graduated from the university. In their final post-interviews and end of semester reflections all participants said that the more the reflections they made in post-interviews, the more useful it was for future planning. They also stressed on the development of their personal competence as a teacher and gave some suggestions for ELE 420 Practice Teaching course in their end of semester reflection papers. Selin's reflection about her inadequate points about her teaching showed that the participants became aware of their own learning for teaching and needed to be provided suggestions and/or trainings for the reported concerns:

> While I was teaching in college, I have tried to develop my teaching since I know that I still have inadequate point in my teaching. For example, although I am good at classroom management, I cannot manage the course time effectively. However, during the teaching practice I have learned controlling the time. Moreover, I generally spend so much time to prepare lesson plan, because I thought that we didn't study on preparing lesson plan in the courses that we took before. In this reason, the course ELE 420 can include some lecture hours which are focused on preparing lesson plan effectively.

The study provided pre-service teachers with an increased awareness of their own actions and development by reflecting each process they had for the teaching practices through the study. Reflecting about their teaching practices made them see their progress, situations they came across, and how they dealt and managed with them. In other words, they learnt about their own teaching, about students' behavior, and about classroom management remarkably. Nihat reported in his end of semester reflection paper that

> I think the most important innovation related to myself is classroom management. Before these teaching experiments I just stand in front of the class; but now I am talking loudly (at least I am trying). I also go near to students who disturb class. I walk around the class… I am also experienced about using smart board and preparing materials with it.

The most common reflection the participants reported at the end of the semester was gaining experiences and having opportunity to talk about them. However, it was underlined that they did not gain many experiences related to their mathematical knowledge. But they had an opportunity to skim the teaching subjects stated in the curriculum.

Setting a goal and being aware of what they should do provided the participants to focus on the teaching practice and think for how to apply appropriate strategies to reach their goals. By this, they were provided a context in

which they compared their existing performance with the goal set before the teaching session. It should be noted that the PEMTs were not provided an explicit instruction on self-regulated learning strategies through the study. Therefore, it might be speculated that if they had received such an instruction, they would most probably express an improvement in their SRL strategies.

### 5.3 Implications

The results of the study might make contributions to teacher educators in developing considerations for self-regulated learning theory as a perspective in pre-service teacher education. Since the study was conducted with pre-service mathematics teachers, the findings will inform mathematics educators by explaining how pre-service teachers' use self-regulation strategies while learning to teach mathematics. Understanding the nature of these strategies will help teacher educators to make improvements in programs to better facilitate the learning process of pre-service teachers.

University supervisors and/or instructors have an important role in bridging theory and practice. They could profitably assist pre-service teachers in reflecting and evaluating their own teaching practices in related courses. Further, university instructors might point out opportunities for SRL with an explicit instruction and formal courses. Pre-service teachers might be given assignments requiring self-reflections to lead them review their teaching performances. Thus, pre-service teachers would have experience in reflecting their teaching performances, and could then move on to making this a routine for their teaching experience.

The findings of the study might lead an implication for the students studying in teacher education programs. Teacher education students, as future teachers, ideally could be able to use strategies for resource and time management, regulating the learning environment, seeking for help or suggestions when needed, identifiying goals, and reflecting on their learning. With these strategies, they would be self-regulated learners as well as teachers who would

provide their students to become effective and self-regulated learners. If future teachers would be models for their students by indicating the steps taken in planning, reviewiving the learning task, identifiying goals, seeking help, and reflecting on what has been done through the process, the students can assimilate those strategies by observing their teacher and/or peers (Schunk & Zimmerman, 1998).

To provide teacher education students to be self-regulated, the courses should make an emphasis on how to regulate their own learning to learn and to teach. The findings of the study also have implication for my future practice as a mathematics teacher education. The Practice Teaching courses aiming to provide pre-service teachers to observe and perform in the actual classroom environment might be designed based on the concerns of self-regulated learning. For the first semester, for instance, students could be taught self-regulation and its components covering the issues such as how to be more self-regulatory learners. Then, for the second semester, the students could be required to prepare SRL based instructional practices and/or activities to be used in their practice teaching schools.

An important implication is that it is not possible to judge individuals' capacity to self-regulate without consideration of context including class level and sections, teaching subject, and/ or role of mentor teachers. In this manner, mentor teachers might be trained to learn the importance and necessity of self-regulated learning for their students and pre-service teachers as well. This might provide mentor teachers to become more willing to be a guide for pre-service teachers and to help them in terms of giving more opportunities to experience teaching practices.

### 5.4 Recommendations for Future Research

In an attempt to investigate the SRL strategies of PEMTs, this study focused on interviews with four pre-service teachers to examine their preparation process for the teaching practices at collaborating schools. The results of the study

were limited to the findings that were gathered from four participants through their eight class hour teaching experiences. For further research, it is necessary to reveal the existence of the different SRL dimensions with more number of participants. Besides that, much more opportunity to have teaching practices at different instructional contexts must be given to pre-service teachers to better examine their SRL strategies.

In this study, the PEMTs' SRL strategies for their teaching practices were identified based upon pre-interviews and post-interviews. In those interviews, there were no training for their reported statements and reflections. However, as it was mentioned in Frykholm's (1998) study, pre-service teachers tended to take their university supervisors' feedback seriously since they believed that their university supervisors knew their classroom environments and provided more feedback related to their teaching practices. Thus, for future studies, the participants could be given feedback and discussed about their teaching practices to provide opportunities to be a more self-regulated learner and a teacher. Besides making interviews, the participants could be asked to write reflection paper for each of their teaching practice to review the process before and after the course once again.

Enhancing pre-service teachers' self-regulation strategies should be a part of the teaching and learning agenda in teacher education, specifically regarding their teaching practices at collaborating schools. First of all, the period of practice teaching of pre-service teachers must be lengthen by giving them opportunity to teach several mathematics concepts through the semester at different classes, instead of teaching only two lessons in one semester. With those practices, they would have many advantages such as realizing students' prerequisites and prior knowledge, being familiar to teaching subjects, being aware of possible classroom management problems, and taking precautions for the next teaching session. Additionally, more opportunities should be given to pre-service teachers to make microteaching activities in which they would experience the implementation of

several student-centered approaches throughout the method or pedagogical content courses.

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# APPENDICES

## APPENDIX A

**Syllabus of ELE 420 Practice Teaching in Elementary Education**

**Spring, 2009**

**Instructors:**

Oğuzhan Doğan, Yasemin Esen, Gönül Kurt

**E-mail**: doguzhan@metu.edu.tr, yesen@metu.edu.tr, gonul@metu.edu.tr

**Office Hours**: By Appointment

**Course Description**

Field experience and teaching practice including class observation, adaptation to classroom condition, planning and preparation for teaching.

**Course Objectives**

Practice teaching is a means of providing opportunities for student teachers, under typical conditions in selected cooperating schools, to obtain experience in observing and participating actively in all the diverse educational activities in the school.

At the end of the course students should be able to:

- Demonstrate knowledge regarding different techniques of teaching mathematics.

- Develop and implement mathematics lessons for the elementary school students and be familiar with classroom management techniques.

- Select and use appropriate instructional strategies and equipment.

- Design and implement activities which promote the development of concepts and problem solving skills in mathematics, as well as promote positive attitude toward mathematics.

- Understand how elementary school students learn mathematics.

- Be aware of specific mathematics topics taught in each of the grades 6-8 and know where to gather resources to aid in the teaching of those topics.

- Be familiar with how to assess progress of elementary school students who are learning mathematics and be able to adjust instruction for students with special needs.

- Use different technological tools to develop elementary school students' understanding of mathematics concepts.

**Online Components**

Online components of this course can be accessed from the following address:

https://online.metu.edu.tr/

Log in using your METU Id and passwords. Please do not forget to update your profiles (esp. your e-mail addresses).

You will submit electronic form of your written assignments to https://online.metu.edu.tr/

**Academic Ethics:**

All assignments you hand in should be the result of your effort only. Academic dishonesty, including any form of **cheating** and **plagiarism** will not be tolerated and will result in failure of the course and/or formal disciplinary proceedings usually resulting in **suspension** or **dismissal**. Cheating includes but is not limited to such acts as; offering or receiving unpermitted assistance in the exams, using any type of unauthorized written material during the exams, handing in any part or all of someone else's work as your own, copying from the Internet. Plagiarism is a

specific form of cheating. It means using someone else's work without giving credit. Plagiarism is a literary theft. Therefore, you have to acknowledge the sources you use in your assignments.

**Required Texts:**

1. "Making Sense: teaching and learning mathematics with understanding" by Thomas P. Carpenter, James Hiebert, Elizabeth Fennema, and Karen C. Fuson. Heinemann, Portsmouth, NH, 1997.

2. "Case Study for Teacher Problem Solving" by Rita Silverman, William Welty , Sally Lyon, 2007.

**Course Requirements**

***Expectation paper (in-class assignment):*** Write about your expectations from practice teaching course as a student and as a prospective mathematics teacher. What do you hope and expect to learn in this course (esp. about mathematics, teaching/learning of mathematics, students, and teaching in general)?

Write about what you expect to **learn** from;

- your experiences in school
- university course meetings,
- from the instructor(s),
- from collaborating teacher(s) in school

***End of Semester Reflection paper:*** Parallel to *expectation paper*, you will reflect upon your experiences based on your expectations stated at the beginning of the semester. To what extend your experiences satisfied your expectations at the end of the semester?

***Attendance:*** Full attendance is expected to all required classroom visits in schools. The purpose for field experience is to give you an opportunity to observe

and reflect upon teaching. Successful completion of ELE 420 includes completing a minimum of 6 hours of classroom observation/participation per week. Active energetic participation in course meetings is required. If you miss more than 6 class hours of all lessons, your total grade will be no more than CC.

***Teaching in School:*** You are required to plan, implement and reflect on at least 3 lessons in school. One of these lessons will be observed and assessed by your instructor, and the others will be assessed by the collaborating teacher. For each lesson, you are expected to prepare *lesson plans* and write a *self-critique* about your teaching.

***Teaching:*** Your school teaching will be observed by your instructor and it will be scored based on a rubric that will be shared with you in the class.

***Lesson Plans:*** You will prepare lesson plans for 3 different teaching practices you will conduct. A lesson plan format will be introduced to you during semester.

***Self Reflection Paper:*** For each of the lesson you conduct, you will write a self-critique that will describe your opinions about your teaching performance. Self critique should be attached to your lesson plans.

***Case-based discussions:*** You will be given some cases about in-service teachers' experiences. You are expected to participate in all class discussions about these cases. During your lesson observations in the practice schools, you will witness many cases in the classroom that will be worth discussing in the classroom. These cases from your observations will also be covered in your discussion.

***Class hour activities***: Each student will plan and implement a micro teaching in a workshop format. You are expected to submit your teaching plans prior to your presentations in class.

***Readings***: You will read at least three academic articles related to mathematics education during the semester. Related with these articles, you are supposed to send two discussion questions through metu-online 2 days before coming to the class.

***Learning Center Activity***: You are expected to prepare and implement a learning center in your practice school. This learning center will include 4-5 activities about specific curricular subjects. After implementing your learning center, you are expected to submit your materials and your experiences written as a report format.

**Grading**

| ***Activity*** | ***Percent*** |
|---|---|
| Expectation Paper | 5 |
| Reflection Paper | 10 |
| School teaching 1 (Observed by instructor) + Lesson plan+ Self Critique | 20 |
| School teaching 2 (Observed by teacher)<br>+ Lesson plan + Self Critique | 10 |
| School teaching 3 (Observed by teacher) + Lesson plan + Self Critique | 10 |
| Micro teaching +Lesson plan | 10 |
| Learning center | 15 |
| Discussion Participation | 10 |
| Discussion questions about articles | 5 |
| Attendance | 5 |
| ***Total*** | ***100*** |

**Tentative Schedule**

| Weeks | |
|---|---|
| First Meeting-<br>19.02.2009 | Course overview, expectations from field experience, article assignment |
| 1 | Article Discussion, writing expectation papers |

| | |
|---|---|
| 23-27 Feb. | |
| 2<br>02-06 March | Micro Teachings |
| 3<br>09-13 March | Micro Teachings |
| 4<br>16-20 March | Micro Teachings |
| 5<br>23-27 March | Micro Teachings, Article Discussion |
| 6<br>30 March-03 April | Micro Teachings, Case Discussions |
| 7<br>06-10 April | Micro Teachings, Case Discussions |
| 8<br>13-17 April | Micro Teachings, Article Discussion |
| 9<br>20-24 April | Field trip (Feza Gürsey Bilim Merkezi) |
| 10<br>27 Apr-01 May | Implementation and Discussion of Learning Center |
| 11<br>04-08 May | Case Discussions |
| 12<br>11-15 May | Seminar with a Guest Teacher |
| 13 | Case Discussions, Deadline for Learning center |

| | |
|---|---|
| 18-22 May | submission |
| 14<br>25-29 May | Wrap up, Deadline for Self-critiques |

* Expected three teaching experiences will be observed between March 9 –May 11, 2009. You are supposed to arrange teachers and instructors in this period.

## APPENDIX B

## ÖĞRETMEN ADAYLARI İÇİN GÖRÜŞME PROTOKOLÜ

Merhaba,

Ben Gönül Kurt. Orta Doğu Teknik Üniversitesi Eğitim Fakültesi İlköğretim Bölümü doktora öğrencisi ve araştırma görevlisiyim. İlköğretim Matematik Öğretmenliği son sınıf öğrencilerinin -Matematik öğretmen adaylarının- öz-düzenleyici öğrenme stratejilerini araştıran bir çalışma yürütüyorum. Bu çalışma kapsamında sizinle bir dizi görüşmeler yapmak istiyorum. Görüşmeye katılıp katılmamak tamamen sizin isteğinize bırakılmıştır. Görüşmeye katılmak istediğiniz takdirde, herhangi bir zamanda görüşmeyi sonlandırabilirsiniz.

Size soracağım soruların dersleriniz ve notlarınızla herhangi bir ilgisi yoktur. Vereceğiniz cevaplar hiçbir öğretim üyesi veya görevlisiyle paylaşılmayacak; aksine sadece benim tarafımdan bilinecektir. Çalışma sonuçlarının herhangi bir şekilde yayınlaması durumunda isminiz kesinlikle belirtilmeyecektir. Ancak, sizinle ilgili birtakım bilgiler (yaş, cinsiyet, genel not ortalaması v.b.) isminizin verilmemesi koşuluyla kullanılabilir.

Aşağıda, ilk bölümde altı, ikinci bölümde dokuz olmak üzere 15 tane soru bulunmaktadır. Bu soruların hiçbir şekilde doğru cevapları yoktur. Burada önemli olan sadece sizin öz-düzenleyici öğrenmeyle ilgili fikir ve görüşlerinizdir. Bu sebeple, kendinizi rahat hissetmenizi rica ederim.

Görüşmelerimizde, uygun gördüğünüz taktirde, görüş ve yorumlarınızı dikkatle takip edebilmek için ses kayıt cihazı kullanmak istiyorum. Eğer ses kayıt cihazının kullanılmasını istemiyorsanız, lütfen bunu belirtmekte çekinmeyiniz. Ayrıca görüşme esnasında istediğiniz bölümlerin kayıt dışı bırakılması sizin isteğinize bağlıdır. Daha önceden de belirttiğim gibi görüşmemiz 30-45 dakika sürebilir.

Başlamadan önce sormak istediğiniz herhangi bir şey var mı? Şimdi başlayabilir miyiz? Eğer ara vermek isterseniz lütfen belirtiniz. Teşekkürler.

## GÖRÜŞME SORULARI-I

### Ders Anlatımı Öncesi

- Hangi okulda ders anlatacaksın? Daha önce bu okulda gözlem yaptın mı/ ders anlattın mı?
- Hangi sınıflarda ders anlatacaksın?
- Ders anlatacağın sınıf hakkında ne düşünüyorsun?
- Kaçıncı sınıfta ders anlatacaksın*?*
- Hangi konuyu anlatacaksın? Bu konu hakkındaki düşüncelerin nelerdir?
- Bu konuya kim, nasıl karar verdi?
- Bu durum seni nasıl etkiledi?
- Anlatacağın bu dersle ilgili ne tür hazırlıklar yaptın? Bu hazırlanma sürecinde,
- Kendine bir plan yaptın mı?
    - Ne tür bir plan yaptın?
    - Yazılı ders planının dışında bir plan yaptın mı? Açıklar mısın?
- Yazılı ders planında hangi noktaları belirttin?
- Yazılı ders planında belirtmediğin noktalar var mı? Nelerdir?
    - Bunları nasıl düzenledin?

- Hangi kaynaklardan yararlandın?
- Bu dersle ilgili kendine hedef(ler) belirledin mi? Nelerdir?
- Zamanı nasıl kullanacağın konusunda düşündün mü? Açıklar mısın?
- Arkadaşlarından veya hocalarından yardım/destek aldın mı?
    - Ne gibi sorular sordun?
    - Onların yorumlarını değerlendirdin mi? Ne şekilde değerlendirdin?

- Anlatacağın derste olumlu neler olmasını bekliyorsun? Açıklar mısın?
- Bu derste olumsuz neler olmasını bekliyorsun? Açıklar mısın?
- Bu derste sence beklenmedik durumlar olabilir mi? Neler?
- Beklenmedik bu tür durumların üstesinden gelebilmek için neler yaparsın?
- Anlatacağın dersle ilgili tekrar/prova yaptın mı?
    - Neden yaptın? (Evet ise)
    - Nasıl yaptın?
- Kendini ders anlatmak için hazır hissediyor musun? Neden?

## GÖRÜŞME SORULARI - II

***(Ders Anlatımı Sonrası)***

1. Anlattığın dersle ilgili neler düşünüyorsun?
2. Dersi planladığın şekilde yürütebildin mi?

- Nasıl?
- Bunu neye bağlıyorsun?

3. Zamanı doğru kullandığını düşünüyor musun? (Silebiliriz? Yukarıda kendileri zaten buna değiniyorlar.)
4. Hedeflerine ders sonunda ulaşabildin mi?

a. Nasıl? Açıklar mısın?

5. Beklenmedik durumlarla karşılaştın mı? Neler yaptın?
6. Sence dersle ilgili en olumlu/olumsuz durum neydi?
7. Bir sonraki ders anlatımında nelere dikkat etmeyi planlıyorsun?
8. Ders anlatırken kendini nasıl hissettin?

a. Şu anda (ders anlattıktan sonra) kendini nasıl hissediyorsun?

9. Bir öğretmen adayı olarak, ders anlatma deneyiminin etkili olup olmadığı hakkında ne düşünüyorsun?
10. İlk görüşmemizden şu ana kadar herhangi bir değişiklik yaptın mı?

a. Neler yaptın?

b. Neden?

## APPENDIX C

## GENEL GÖRÜŞME SORULARI

***Demografik Bilgiler:***

- Doğum tarihi
- Mezun olduğu lise türü
- Akademik Ortalama
- İkamet edilen yer? Ev/Yurt/Aile?
- Şu ana kadar aldığın eğitim dersleri?
  - Seçmeli vb. eğitim dersleri var mı?
- Özel ders veriyor musun/verdin mi?
  - Bu deneyiminden söz eder misin?
  - Nasıl hazırlık yapıyorsun?
  - Dersinin etkililiği konusunda ne düşünüyorsun?
  - Özel ders vermenin öğretim deneyimi kazandırması konusunda ne düşünüyorsun?
- Dersanede çalıştın mı/çalışıyor musun?
  - Bu deneyiminden söz eder misin?
  - Nasıl hazırlık yapıyorsun?
  - Dersinin etkililiği konusunda ne düşünüyorsun?
  - Dershanede çalışmanın öğretim deneyimi kazandırması konusunda ne düşünüyorsun?

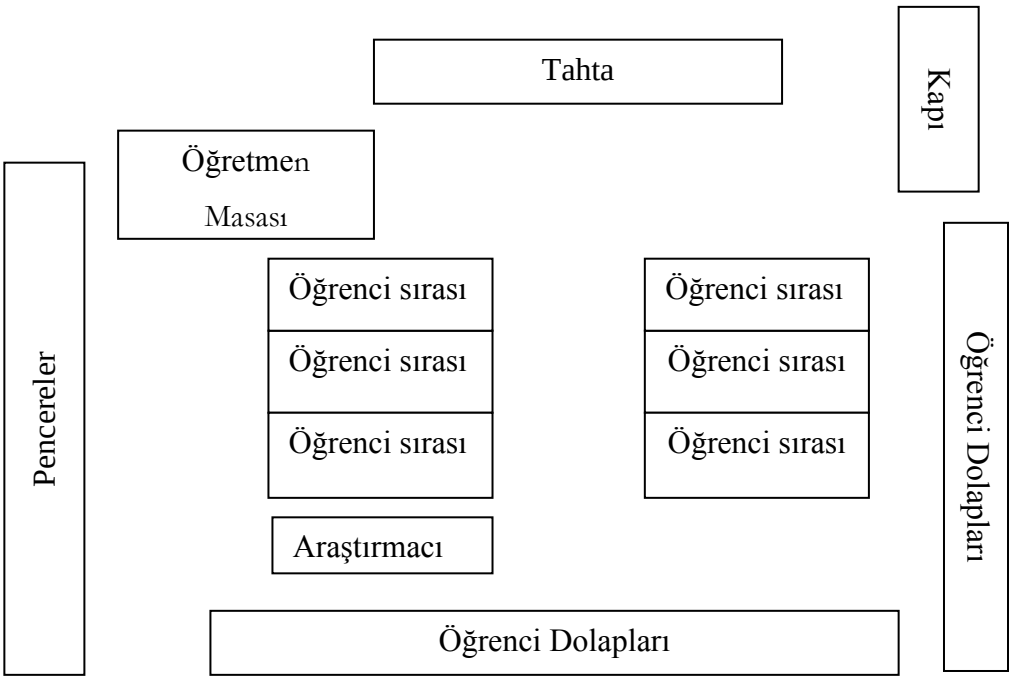
- Önceki okul deneyimi dersi kapsamında hangi okullara gittin (1. Sınıfta ve 4. Sınıftaki dersler)?
- Gözlemlerinden bir öğretmen adayı olarak neler öğrendin?
- Geçen dönemki okul deneyimi dersinde ders anlatma şansın oldu mu?
  - Bu deneyiminden söz eder misin?
  - Nasıl hazırlık yaptın?
  - Aldığın dönütler nasıldı?
  - Sen, ders(ler)in hakkında ne düşünüyorsun?
  - Öğretim deneyimi kazandırması konusunda ne düşünüyorsun?
- Okulda gözlemlediğin öğretmenler derse nasıl hazırlanıyordu?
  - Hazırlıkları hakkında ne düşünüyorsun? (Örneklendirerek açıklayabilir misin?)
- Sence bir öğretmen ideal olarak derse nasıl hazırlanmalıdır?
  - Sen, bunların ne kadarını yapabileceğini düşünüyorsun?
- Bölümde aldığın derslerde ders anlattın mı (micro teaching)?
- Öğretmenlik mesleğine yönelik düşüncelerin nedir?
- Mezun olduktan sonraki mesleğinle ilgili hedef (ler)in nelerdir?
- Bu dönemki stajla ilgili düşüncelerin/beklentilerin nelerdir? Neler kazanacağını düşünüyorsun?

**APPENDIX D**

**Gözlem Notları-Örnek**

**GözlemNotları-5 (Observation Notes)**

**Selin**




Tarih: 27.05.2009

Sınıf: 6/A

Sınıf mevcudu: 15

Saat: 10:35 (3. ders saati)

Süre: 1 ders (40 dk)

(Selin bu sınıfta daha önce I. dönem ders anlatmış, II. dönem ilk kez anlatıyor. Sınıf sakin ve ilgili.)

| | |
|---|---|
| **10:35:** Hoca ödevleri kontrol etmeye başladı. Hoca ödevleri kontrol ederken Selin tahtaya konu başlığını- Karenin, Dik üçgenin ve Dikdörtgenin Alanı- yazdı ve " Bu arada biz derse başlayalım ödevler kontrol edilirken" dedi.<br><br>Hoca, Selin'i onaylayarak "evet başlayalım, zamanımız boşa gitmesin" dedi.<br><br>S, dörtgenlerin alan formüllerini tahtaya yazdı. Bu esnada H, ödev kontrolünü bitirdi.<br><br>Sınıf oldukça sessiz ve ilgiyle izliyorlar Selin'i.<br><br>S, bir hikaye anlattı: Ali Amca bir lunapark kurmak istiyor. 2 tane araziden birini seçmek istiyor, ama büyük olanı tercih etmek istiyor.... şeklinde. S, anlattığı hikayeden sonra, öğrencilere bir etkinlik kağıdı dağıttı ve öğrencilere öncelikle 2'li gruplar oluşturmalarını söyledi.<br><br>***Görüşmede sor***: H, ödevleri kontrol ederken sen derse başladın. Buna nasıl karar verdin?<br><br>**10:45:** S, grupları teker teker dolaşıyor. Gruplar etkinlikle uğraşıyorlar.<br><br>***Görüşmede sor:*** Gruptaki öğrencilerden birinin yerini değiştirdin, neden?<br><br>S, etkinlik kağıdındaki arazilerin ölçümlerini tahtaya yazdı ve öğrencilere sorarak hesaplamaları yaptı.<br><br>***Görüşmede sor:*** İki arazinin miktarları arasında yarım metre karelik bir fark çıktı. Bunu sen önceden hesaplamış mıydın?<br><br>S, öğrencilere defterlerini açmalarını ve soru başlığını yazmalarını | ***NOTLAR*** |

| | |
|---|---|
| istedi. S, soruyu okuyarak öğrencilerin defterlerine yazdırdı.<br><br>**10:55:** S, öğrencilerin defterine bakıyor. Sorunun çözümü için 3-4 dk bekledi. Bir öğrenci tahtaya geldi ve soruyu çözdü.<br><br>S, 2. Soruyu tahtaya çizdi.<br><br>**11:05:** S, 2. Soruyu tahtada çözüyor.<br><br>***Görüşmede sor***:<br><br>Öğrencilerin derse olan ilgileri nasıldı sence?<br>Öğrencilere sorduğun her soruyu kendin daha önceden çözdün mü?<br>T, 3. Soruya geçti, şekli tahtaya çizdi.<br><br>**11:10:** Zil çaldı ve ders bitti. | |

## CURRICULUM VITAE

### PERSONAL INFORMATION

Surname, Name: Kurt, Gönül

Nationality: Turkish (TC)

Date and Place of Birth: 5 August 1979, Ankara

Marital Status: Single

Phone: +90 312 240 32 62

E-mail: gonulkurt@gmail.com

### EDUCATION

| Degree | Institution | Year of Graduation |
|---|---|---|
| MS | METU Secondary Science and Mathematics Education | 2006 |
| BS | Hacettepe University Elementary Education | 2002 |
| High School | Aydınlıkevler Lisesi, Ankara | 1997 |

## WORK EXPERIENCE

| Year | Place | Enrollment |
|---|---|---|
| 2005-2010 | METU | Research Assistant |
| 2003-2004 | Ministry of National Education | Mathematics Teacher |

## FOREIGN LANGUAGES

Advanced English

## PUBLICATIONS

1. Kurt, G. & Çakıroğlu, E., (2009). Middle grade students' performances in translating among representations of fractions: A Turkish perspective. *Learning and Individual Differences*, *19*(4), 404-410

2. Işıksal, M., Kurt, G**,** Doğan, O., & Çakıroğlu, E. (2007). Ilköğretim matematik öğretmen adaylarının epistemolojik kavramlamaları: üniversite ve sınıf düzeyinin etkisi.*[Online]: http://ilkogretim-online.org.tr, 6*(2), 313-321.

**ULUSLARARASI KONFERANSLAR**

1. Kurt, G. & Çakıroğlu, E. (2010). *Pre-service mathematics teachers' self-regulated learning strategies for the teaching of mathematics in practice schools.* Paper presented at American Educational Research Association (AERA). Denver, CO. April 30 – May 4.

2. Kurt, G. (2009). *A study on elementary students' ıdeas about environment.* European Conference on Educational *Research* (ECER). Vienna, Austria, September 28- 30.

3. Kurt, G. & Çakıroğlu, E. (2009). *An investigation of what type of self-regulated learning strategies pre-service elementary mathematics teachers use for their teaching practices*. European Conference on Educational Research (ECER). Vienna, Austria, September 28- 30

4. Kurt, G. & Çakıroğlu, E. (2008). *An analysis of Turkish students' most frequent response types in translating among various representations of fractions*. European Conference on Educational Research (ECER). Gothenburg, Sweden, September 10- 12.

5. Kurt, G. & Çakıroğlu, E. (2007). *Middle grade students' abilities in translating among representations of fractions.* Paper presented at American Educational Research Association (AERA). Chicago, Illinois, April 9-13, 2007.

6. Kurt, G., Işıksal, M., Doğan, O., & Cakiroglu, E. (2006). *Assessing pre-service teachers epistemological conceptions of mathematics*. Poster presented at 3rd International Conference on the Teaching of Mathematics at the Undergraduate Level, Istanbul, Turkey, June 30- July 5.

**ULUSAL KONFERANSLAR**

1. Kurt, G. (2008). *İlköğretim matematik öğretmen adaylarının öz-düzenleme stratejilerinin incelenmesi.* VIII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi, Bolu.

2. Doğan, O., Işıksal, M., Kurt, G., & Çakıroğlu, E. (2006). *Öğretmen adaylarının matematiğe yönelik epistemolojik kavramlamaları*. VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi, Ankara.

3. Çakıroğlu,E., Beşer, Ş., Kurt,G., & Erbaş, A.K. (2006). *İstatistik eğitiminde veriye dayali tahmin: Basketbol heyecanı.* VII. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi, Ankara.

## TURKISH SUMMARY

# İLKÖĞRETİM MATEMATİK ÖĞRETMEN ADAYLARININ ÖĞRETİM DENEYİMLERİ KAPSAMINDA ÖZ-DÜZENLEYİCİ ÖĞRENME STRATEJİLERİ

### 1.1 Öz-Düzenleyici Öğrenme Nedir?

Akademik başarıyı etkileyen en önemli etmenlerden biri olduğu düşünülen öz-düzenleme kavramının birçok araştırmacı ve teorisyen tarafından tanımı yapılmış ve her bir araştırmacıya özgü görüş ve yorumlar ortaya çıkmıştır. Alan yazınında en çok yer alan tanımlardan biri Pintrich (2005) tarafından yapılmıştır. Pintrich (2005) öz-düzenlemeyi "öğrencilerin kendi öğrenme hedeflerini belirledikleri, bilişlerini, motivasyonlarını ve davranışlarını düzenlemeye çalıştıkları, hedefleri ve çevrelerindeki bağlamsal özellikler tarafından yönlendirilip sınırlandırıldıkları, aktif ve yapıcı bir süreç" (s.453) olarak tanımlamıştır. Diğer taraftan, Zimmerman (2002) öz-düzenlemeyi süreç kavramı açısından tanımlamış ve bunun zihinsel ya da akademik bir performans becerisi olmadığını, aksine öğrencinin zihinsel becerilerinin akademik yeterliliklere dönüştüren öz-yönlendirici bir süreç olduğunu vurgulamıştır. Bu tanımlar, etkili bir öz-düzenleme süreci için, öğrencilerin kendi öğrenme ortamlarını kendi belirledikleri öğrenme hedeflerine göre oluşturmaları gerektiğini ifade etmektedir.

Öz-düzenleme süreçlerinden geçen bir öğrenen, kendi öğrenmesinin sorumluluğunu taşıyan ve kendi öğrenmesiyle ilgili kararlar alan ve uygulayan bireydir. Öğrenen, neyi öğreneceğini, zamanını nasıl kullanacağını, bu süreçte hangi yöntemleri izleyeceğini, yardıma ihtiyaç duyup duymadığını kendisi belirler (Heikkila ve Lonka, 2006). Bu tür öğrencilerin birçok bilişsel ve bilişüstü stratejileri kullandıkları düşünülmektedir. Ayrıca bu öğrenciler, belirledikleri hedeflere göre hem stratejilerini hem davranışlarını gözlemleyebilir ve ihtiyaç duyduğu taktirde kullandığı yöntemleri genişletebilir veya uyarlayabilirler (Butler

ve Winne, 1995). Bu tür uygulamalar, kullandıkları teknikleri geliştirirken, motivasyonlarını ve öz-memnuniyetlerini de artırmalarına olanak verir (Boekaerts, 1999).

Zimmerman (2002), öz-düzenleme yapan bir bireyin sadece akademik çalışmalarda başarılı olmadığını, aynı zamanda kendi geleceğine de olumlu bir perspektifle baktığını belirtmektedir. Diğer bir deyişle, eğitimin temel işlevlerinden biri olan öz-düzenleme, hayat boyu öğrenmeyi de içine alan önemli bir kavram haline gelmiştir. Bu bakımdan, alandaki birçok uzman ve araştırmacı, öğrencilere öz-düzenleme becerilerini öğretmenin önemini vurgulamıştır. Ayrıca, bu becerilerin, okuldan sonraki hayatında da kendi öğrenmelerini sağlayan bireyler için hayati önem taşıdığı belirtilmiştir (Boekaerts, 1997; Zimmerman, 2002).

Öz-düzenleyici öğrenme, alana ve konuya göre değişebilen bir etkinlik olarak kabul edildiğinden (Pintrich, 2005), öğrenciler farklı bağlamlarda farklı öz-düzenleme stratejilerini kullanabilirler. Öz-düzenleyici bilgi matematik alanında öğrencilerin matematiksel fikirlerle aktif ve yapıcı bir ortamda etkileşim içinde bulundukları bir olgu olarak düşünülmektedir (Darr ve Fisher, 2004). Örnek olarak problem çözme, öz-düzenleme etkinliklerinin sıklıkla uygulanabildiği bir süreç olarak değerlendirilmektedir. Darr ve Fisher (2004) iyi problem çözen bireylerin analiz etme, planlama, keşfetme ve yansıtma gibi yaklaşımları kullanarak problem durumunu anlamlı bir şekilde yorumlayabildiklerini ve çözüme ulaşabildiklerini belirtmiştir. Diğer taraftan, öz-düzenleme etkinliklerini az kullanan veya kullanmayan öğrencilerin genellikle formülleri ezberleyerek veya belli kuralları akılda tutarak problem çözdükleri görülmüştür.

## 1.2 Araştırma Sorularının Belirlenmesi

Öğretmen adaylarının öğretim deneyimleri kapsamındaki öz-düzenleyici öğrenme (ÖDÖ) stratejilerinin incelenmesine yönelik bulgu ve görüşler bu çalışmayı yürütmeyi gerektirmiştir. Bu anlamda, ilköğretim matematik öğretmen (İMÖ) adaylarının öğretim deneyimlerine hazırlık süreçlerinden başlayarak ders sonrası

değerlendirmelerine kadar geçen süreçte ortaya çıkan öz-düzenleyici öğrenme stratejileri araştırılmıştır.

### 1.3. Araştırma Soruları

Bu çalışmada genel olarak aşağıda belirtilen araştırma sorularına cevap aramayı hedeflemektedir.

1. İMÖ adaylarının öğretim deneyimleri kapsamındaki öz-düzenleyici öğrenme stratejileri nelerdir?
2. İMÖ'lerin öğretim deneyimleri boyunca öz-düzenleyici öğrenme stratejilerinde ne tür değişiklikler olmuştur?
3. İMÖ'lerin öz-düzenleyici öğrenme stratejilerindeki değişikliklerin sebepleri nelerdir?

### 1.4. Çalışmanın Önemi

Öğretmen adayları, geleceğin öğretmenleri olarak, öğretim mesleğine yönelik yoğun bir öğrenme süreci içindedirler. Uygulama okullarında öğretim deneyimi yaşadıklarında onlar artık öğrenci sıralarında değillerdir. Tersine onlar artık sıranın karşı tarafında yer alırlar. Bu öğrenme süreci, öğretmen adaylarının kendileri tarafından yönetilen ve düzenlenen bir süreç olarak tanımlanabilir. Bu bakımdan öz-düzenleyici öğrenme, öğretimin düzenlenmesinde hem teori hem de uygulamanın önemli bir amacı olarak yer almaktadır.

Öz-düzenlemeyle ilgili birçok çalışma ilköğretim ve ortaöğretim seviyelerindeki öğrencilerin akademik anlamdaki öğrenmelerine yönelik öz-düzenlemelerine odaklanmıştır. Bu çalışmalarda öğretim deneyimlerinin tasarlanması ve bu deneyimlerin etkililiğinin araştırılması temel alınmıştır. Fakat öğretmen adaylarının öğretmeye yönelik öğrenmelerini anlamak öğretmen eğitimi alanında odukça önemlidir. Ayrıca, öz-düzenleyici öğrenme hakkında detaylı öğrenme etkili ve güçlü öğretmen eğitimi programlarını desteklemekte de önemli yere sahiptir. Hizmet öncesi ve hizmet içi öğretmenleri ele alan çalışmalarda onların öz-düzenleyici öğrenme davranışları yerine, öğrencilerinin öz-düzenleyici öğrenmelerinin nasıl desteklenebileceği incelenmiştir. Ancak, bu çalışmada

öğretmen adaylarının öğretim deneyimlerine yönelik hazırlanma süreçleri temel alınmıştır. Bu çalışmadaki en önemli nokta öğretmen adaylarının öğrenen ve öğreten olarak iki farklı rollerinin aynı anda yer almasıdır. Bu iki farklı rol onların öğrenme ve öğretmelerinde farklı düzenleme stratejilerinin kullanılmasına yol açmıştır. Öğretmen adaylarının öz-düzenleme becerilerinin araştırılması ve belirlenmesi onların öğretim deneyimlerinin etkililiğini artırmada dikkate değer katkılar sağlayacaktır.

### 1.5 Önemli Terimlerin Tanımları

Aşağıda yer alan tanımlar okuyucuya daha açık bir anlatım sağlamak amacıyla açıklanmıştır.

Öz-düzenleme ve Öz-düzenleyici Öğrenme: Öz-düzenleme ve öz-düzenleyici öğrenme bu çalışma boyunca birbirlerinin yerine kullanılmakta ve öğretmen adaylarının öğretmeye yönelik öğrenmelerini düzenlemeleri olarak tanımlanmaktadır.

Öz-düzenleyici Öğrenme Stratejileri: Öz-düzenleyici öğrenme stratejileri, öğretmen adaylarının uygulama okullarındaki öğretim deneyimleri kapsamındaki davranışları olarak tanımlanmıştır.

İlköğretim Matematik Öğretmen Adayları: İlköğretim Matematik Öğretmenliği bölümünde okuyan son sınıf öğrencileridir.

Uygulama Okulları: Uygulama okulları, Eğitim Fakülteleri ve Milli Eğitim Bakanlığı arasındaki resmi protokol uyarınca belirlenen ve öğretmen adaylarının öğretimlerine olanak sağlayan okullardır.

Uygulama Öğretmeni: Öğretim deneyimi dersi kapsamında öğretmen adaylarına öğretme deneyimlerine yönelik rehberlik eden öğretmenlerdir.

ELE 420 Öğretmenlik Uygulaması Dersi: Bu ders kapsamında öğretmen adaylarına uygulama okullarında haftalık 4 saat süren bir gözlem ve öğretim deneyimi uygulamaları öngörülmüştür. Öğretim deneyimi dönem boyunca 1 veya

2 ders saati olarak belirlenmiştir. Bu derslerin öğretim elemenları tarafından izlenmesi ve değerlendirilmesi gerekmektedir.

Öğretim Bağlamı: Öğretim bağlamı öğretilen konu, öğrencilerin sınıf seviyeleri, öğrencilerle ilişkiler, öğrenci davranışları, uygulama öğretmenin rolü ve tutumlarını içermektedir.

## 2. ÇALIŞMANIN KURAMSAL YAPISI

Son yirmi yılda birçok öz-düzenleyici öğrenme modeli tanımlanmıştır (Zimmerman, 2001). Her model öz-düzenleyici öğrenme için alternatif bakış açıları önermektedir. Bu çalışmada başlıca iki temel model olan Zimmerman (1998) ve Pintrich'in (2005) öz-düzenleyici öğrenme modelleri birleştirilip uyarlanarak oluşturulan kuramsal çerçeve kullanılmıştır. Bu iki model kuramsal alt yapılarının benzerliği sebebiyle bir araya getirilmiş ve çalışmanın alt yapısına uygun olarak uyarlanmıştır. Her iki modelde öğrenen kendi öğrenme sürecinde aktif ve yapılandırmacı bir role sahiptir. Bu iki model önceden düşünme ve öz-yansıtma evreleriyle brlikte bilişsel ve güdüsel alanları içermektedir. Ayrıca tüm evre ve alanlarda bağlam algılaması ve değerlendirmesi de yer almaktadır. Aşağıda verilen tabloda çalışmanın kuramını belirten çerçeve görülmektedir.

*Tablo 1. Birleştirilmiş ve Uyarlanmış Öz-Düzenleyici Öğrenme Yapısı*

| **Evreler / *Alanlar*** | **Önceden Düşünme** | | **Öz-Yansıtma** | |
|---|---|---|---|---|
| ***Bilişsel*** | ***İş Analizi*** Hedef belirleme Stratejik planlama | **Bağlamın algılanması** | Öz-değerlendirme Sonuçları sebeplere atfetme | **Bağlamın değerlendirilmesi** |
| ***Güdüsel*** | ***Öz-güdüsel inançlar*** Öz-yeterlik Görev algılamaları İçsel ilgiler | | Öz-doyum Uyarlama | |

İMÖ adaylarının ders anlatımı öncesi görüşmeleri önceden düşünme evresini, ders anlatımı sonrası görüşmeler de öz-yansıtma evresini yansıtmaktadır. Zimmerman'ın (2005) öz-düzenleyici öğrenme modeli çalışma verilerini en temel şekliyle yansıtması sebebiyle kullanılmıştır. Ayrıca Zimmerman'ın modelinde öz-düzenlemeyi döngüsel bir süreç olarak ele alması çalışmanın ders anlatımı öncesi, ders anlatma ve ders anlatma sonrası evrelerini açıkça yansıtmaktadır. Bu da modelin temel alınmasının sebeplerinden biridir. Zimmerman'ın modelinin yanı sıra, Pintrich'in (2005) öz-düzenleyici öğrenme modelinde yer verdiği çalışma ortamı, sınıf kültürü, öğrenci davranışları, anlatılacak konu gibi bağlamların da ele alınması gereği görülmüştür. Tablo 1'de görüldüğü gibi 'bağlam' kuramsal çerçevenin tümünde yer alan önemli kavramlardandır. Sonuç olarak, İMÖ adaylarının öz-düzenleyici öğrenme stratejileri bilişsel ve güdüsel alanlarda,

önceden düşünme ve öz-yansıtma evrelerinde, ilgili bağlamı göz önünde bulundurarak belirlenecektir.

## 3. YÖNTEM

### *3.1 Çalışma Deseni*

Bu çalışmada öz-düzenleyici öğrenme kavramı nitel araştırma yöntemleri kullanılarak incelenecektir. Bu yöntemlerle, İMÖ adaylarının öğretim deneyimleri kapsamında uyguladıkları öz-düzenleyici öğrenme stratejilerinin doğal ortamlarında, herhangi bir müdahale olmaksızın araştırılması hedeflenmiştir. Çalışma deseni olgu-bilim araştırma deseni özellikleriyle bağdaşmaktadır. Bu araştırmada İMÖ adaylarının uygulama okullarındaki öğretim deneyimlerini nasıl yorumladıkları ve o deneyimlere ne tür anlamlar yükledikleri üzerine yoğunlaşılmıştır.

### *3.2 Çalışma Grubu*

Çalışma grubu, bir devlet üniversitesinin Eğitim Fakültesi İlköğretim Matematik Öğretmenliği (İMÖ) bölümü son sınıfında okuyan 4 tane son sınıf öğrencisinden oluşmaktadır. Katılımcıların tamamı 2008-2009 Bahar dönemi sonu itibariyle mezun olacak durumdaki öğrencilerdi. Bu öğrenciler dönem boyunca sahip oldukları serbest zamanları ve uygulama okullarındaki rehber öğretmenlerinin izinleri dikkate alınarak belirlenmiştir. Dolayısıyla katılımcıların belirlenmesi iki koşula dayandırılmıştır. Birincisi, rehber öğretmenlerin İMÖ adaylarının tek başına yürütebileceği 8 saat ders anlatmalarına izin vermeleri; ikincisi ise katılımcıların belirtilen ders saatlerinde uygulama okullarında bulunmalarıdır. Çalışma yürütüldüğünde İMÖ adayları uygulama okullarında haftada 4 saat bulunmakla yükümlüydüler. Katılımcıların öğretim deneyimi yaptıkları uygulama okulları Ankara ilinde bulunan iki farklı özel ilköğretim okuludur.

### *3.2.1 Öğretmen Adaylarının Önceki Öğretim Deneyimleri*

Tüm katılımcılar Anadolu Öğretmen Liselerinden mezun olmuşlardır. Her birinin farklı seviyelerdeki öğrencilerle özel ders deneyimleri olduğu belirtilmiştir. Katılımcılardan ikisinin dersane öğretmenliği deneyimleri vardır. Bir başka katılımcının ise gönüllü öğretmenlik deneyimi bulunmaktadır. Aşağıdaki tabloda çalışmadaki katılımcıların önceki öğretim deneyimleri görülmektedir. Katılımcıların isimleri değiştirilerek verilmiştir. Uygulama okulları Okul A ve Okul B olarak adlandırılmıştır.

***Tablo 2. Katılımcıların Öğretim Deneyimleri***

| İsim | Önceki öğretim deneyimleri | Uygulama Okulu ve Sınıfları |
|---|---|---|
| Selin | Özel ders, uygulama okulunda geçen dönem öğretim deneyimi, gönüllü öğretmenlik | Özel İlköğretim Okulu (Okul A)<br>6, 7, ve 8. Sınıflar |
| Beril | Özel ders, uygulama okulunda geçen dönem öğretim deneyimi, | Özel İlköğretim Okulu (Okul A)<br>6, 7, ve 8. Sınıflar |
| Taner | Özel ders, Dersane | Özel İlköğretim Okulu (Okul B)<br>5, 6, ve 8. Sınıflar |
| Nihat | Özel ders, Dersane | Özel İlköğretim Okulu (Okul B)<br>5, 6, ve 8. Sınıflar |

Tablo 2'de görüldüğü gibi Selin ve Beril Okul A'da, Taner ve Nihat ise Okul B'de öğretim deneyimlerini gerçekleştirmişlerdir.

Bu çalışmada nitel araştırma yöntemlerinden, görüşme, gözlem yapma ve bunlara destek amacıyla da İMÖ'lerin ELE 420 dersi kapsamında yazdıkları dönem sonu yansıtma raporlarının içerik analizleri yapılmıştır. Çalışmaya katılan öğrenciler

çalışmanın amacı ve veri toplama süreçleri hakkında bilgi verildikten sonra gönüllük esasına göre seçilmişlerdir. Gönüllü öğrencilerin belirlenmesinde uygulama okullarındaki rehber öğretmenlerin görüşleri de rol oynamıştır. Çalışma kapsamında öğretmen adaylarından 8 saat ders anlatmaları isteneceği rehber öğretmenlere bildirilmiş ve kendilerinin izinleri alınmıştır. Katılımcıların staj okullarındaki öğretim deneyimlerine hazırlanma süreçlerinde kullandıkları ÖDÖ stratejileri ve bu stratejilerin çalışma süresinceki değişimleri araştırılmıştır.

### *3.3 Veri Toplama Süreçleri*

Öz-düzenlemeyle ilgili yapılan araştırmaların çoğu betimsel veri toplama yöntemleriyle yürütülmektedir. Öz-düzenleme stratejilerini ve alt boyutlarını içeren, o çalışmaya katılan öğrencilerin belirtilen düşüncelere katılıp katılmadıklarını gösteren ölçekler kullanılmıştır. Ölçme aracı olarak sadece bu tür hazır ölçeklerin kullanılması, öz-düzenleme gibi duyuşsal bir boyut hakkında yeterli bilgi kaynağı olamamaktadır. Bu sebeple, seçilen öğretmen adaylarıyla bire-bir görüşmeler yapılmıştır. Aday öğretmen ve araştırmacı tarafından belirlenen zamanlarda bire-bir olarak yapılan bu görüşmelerde yarı yapılandırılmış görüşme teknikleri kullanılmıştır. Bu görüşmelerin yanı sıra, öğretmen adaylarının görüşme sorularına verdikleri cevapların güvenilirliğini artırmak amacıyla, öğretmen adaylarının staj okullarındaki öğretim deneyimleri düzenli olarak gözlemlenmiştir. Ek olarak, "Öğretmenlik Uygulanması" dersinde hazırladıkları öz-değerlendirme raporlarının incelenmesi de veri toplama işlemlerine dahil edilmiştir. Farklı veri toplama yöntemleriyle elde edilen bulgular, İMÖ adaylarının uygulama okullarındaki öğretim deneyimleri kapsamındaki öz-düzenleyici öğrenme stratejilerinin belirlenmesinde rol oynamıştır.

Katılımcılar 8 ders saati süren öğretim uygulamalarını 3 ay boyunca farklı zamanlarda farklı sınıf ve şubelerde tamamlamışlardır. Aşağıdaki tabloda İMÖ adaylarının kaçar saatlik derslerle 8 ders saatini tamamladıklarını ve hangi sınıflarda ders anlattıklarını göstermektedir.

***Tablo 3. Her Katılımcıya ait Ders Anlatma Süreleri, Sınıf ve Şubeler***

| Katılımcılar | Anlatılan ders saati sayısı | Sınıf ve şubeler |
|---|---|---|
| Selin | 2, 1, 1, 1, 1, 2 ders saati | 8/B, 8/B, 7/A, 8/A, 6/A, 6/A |
| Beril | 1, 2, 1, 1, 2, 1 ders saati | 7/A, 8/A, 8/A, 7/B, 7/A, 6/B |
| Taner | 2, 2, 1, 1, 2 ders saati | 8/B, 8/B, 6/B, 8/A-B-C (biraraya getirilmiş*), 5/B |
| Nihat | 2, 2, 1, 1, 2 ders saati | 8/A, 8/A, 6/B, 8/A-B-C (biraraya getirilmiş *), 5/A |

*: Şubelerdeki öğrenci sayısının azlığı sebebiyle üç şube bir araya getirilmiş.

Tablo 3'te görüldüğü gibi, Selin ve Beril 8 saatlik ders anlatma uygulamalarını 6 seferde, Taner ve Nihat ise 5 seferde tamamlamışlardır. Her bir İMÖ adayı, farklı sınıf ve şubelerde ders anlatma deneyimleri yaşamışlardır.

### *3.4 Veri Toplama Araçları*

İMÖ adaylarının öz-düzenleyici öğrenme stratejilerini ortaya çıkarmak amacıyla bire-bir görüşmeler, gözlemler ve öz-yansıtma raporlarından elde edilen veriler incelenmiştir.

#### *3.4.1 Görüşmeler*

Çalışmadaki temel veri toplama aracı bire-bir görüşmelerden oluşmaktadır. Çalışmanın kuramsal yapısı göz önünde bulundurularak, İMÖ adaylarıyla ders anlatma deneyimleri öncesinde ve sonrasında olmak üzere ön görüşmeler ve son görüşmeler yapılmıştır. Bu görüşmelerin amacı katılımcıların öğretme deneyimlerine yönelik öğrenme süreçleri hakkındaki düşüncelerini ortaya çıkarmaktır. Ön görüşmelerde katılımcıların ders anlatma hazırlıkları ele alınırken, son görüşmelerde katılımcıların anlattıkları dersle ilgili değerlendirme ve düşüncelerine yer verilmiştir. Aşağıda genel görüşmeler, ön görüşmeler ve son görüşmeler detaylı olarak anlatılmıştır.

#### *3.4.1.1 Genel Görüşmeler*

Genel görüşmeler, katılımcılar belirlendikten hemen sonra yapılmıştır. Görüşme soruları yapılandırılmış soruları içermektedir. Yapılandırılmış görüşme sorularının yanı-sıra birtakım ek sorular da katılımcıların verdikleri yanıtlar üzerine sorulmuştur. Bu görüşmelerin amacı, katılımcılar hakkında detaylı kişisel bilgilere ulaşmak ve varsa önceki öğretim deneyimleri hakkında bilgi edinmektir. Genel görüşme sorularından bazıları aşağıdaki tabloda gösterilmiştir.

*Tablo 4. Genel Görüşme Soruları*

***Demografik Bilgiler:***

- Doğum tarihi
- Mezun olduğu lise türü
- Akademik Ortalama
- İkamet edilen yer? Ev/Yurt/Aile?
- Şu ana kadar aldığın eğitim dersleri?
- Seçmeli vb. eğitim dersleri var mı?

***Öğretmenlik Deneyimleri***:

- Özel ders veriyor musun/verdin mi?
- Bu deneyiminden söz eder misin?
- Nasıl hazırlık yapıyorsun?
- Dersinin etkililiği konusunda ne düşünüyorsun?
- Özel ders vermenin öğretim deneyimi kazandırması konusunda ne düşünüyorsun?
- Dersanede çalıştın mı/çalışıyor musun?
- Bu deneyiminden söz eder misin?
- Nasıl hazırlık yapıyorsun?
- Dersinin etkililiği konusunda ne düşünüyorsun?
- Dershanede çalışmanın öğretim deneyimi kazandırması konusunda ne düşünüyorsun?
- Önceki okul deneyimi dersi kapsamında hangi okullara gittin (1. yıl ve 4. yıldaki dersler)?
- Gözlemlerinden bir öğretmen adayı olarak neler öğrendin?
- Geçen dönemki okul deneyimi dersinde ders anlatma şansın oldu mu?
- Bu deneyiminden söz eder misin?
- Nasıl hazırlık yaptın?
- Aldığın dönütler nasıldı?

#### *3.4.1.2 Ön-görüşmeler*

Yarı-yapılandırılmış ön-görüşmelerde İMÖ adaylarının anlatacakları derse hazırlanma süreçleri hakkında sorular yöneltilmiştir. Ön-görüşmeler 14 adet açık uçlu sorudan oluşmuştur. Ön-görüşmeler İMÖ adaylarının ders anlatımlarından bir veya iki gün önce araştırmacının ofisinde veya uygulama okulunda uygun görülen bir yerde yapılmıştır. Ön-görüşmeler İMÖ adaylarının anlatacakları derse yönelik hazırlık süreçlerini tamamladıkları zaman gerçekleştirilmiştir. Ön-görüşme soruları Tablo 5'te gösterilmiştir.

***Tablo 5. Ön-Görüşme Soruları***

- Hangi okulda ders anlatacaksın? Daha önce bu okulda gözlem yaptın mı veya ders anlattın mı?
- Hangi sınıflarda ders anlatacaksın?
- Ders anlatacağın sınıf hakkında ne düşünüyorsun?
- Kaçıncı sınıfta ders anlatacaksın*?*
- Hangi konuyu anlatacaksın? Bu konu hakkındaki düşüncelerin nelerdir?
- Bu konuya kim, nasıl karar verdi?
- Bu durum seni nasıl etkiledi?
- Anlatacağın bu dersle ilgili ne tür hazırlıklar yaptın? Bu hazırlanma sürecinde,
    - Kendine bir plan yaptın mı?
        - Ne tür bir plan yaptın?
        - Yazılı ders planının dışında bir plan yaptın mı? Açıklar mısın?
    - Yazılı ders planında hangi noktaları belirttin?
    - Yazılı ders planında belirtmediğin noktalar var mı? Nelerdir?
        - Bunları nasıl düzenledin?
    - Hangi kaynaklardan yararlandın?
    - Bu dersle ilgili kendine hedef(ler) belirledin mi? Nelerdir?
    - Zamanı nasıl kullanacağın konusunda düşündün mü? Açıklar mısın?
    - Arkadaşlarından veya hocalarından yardım/destek aldın mı?
- Anlatacağın derste olumlu neler olmasını bekliyorsun? Açıklar mısın?
- Bu derste olumsuz neler olmasını bekliyorsun? Açıklar mısın?
- Bu derste sence beklenmedik durumlar olabilir mi? Neler?
- Beklenmedik bu tür durumların üstesinden gelebilmek için neler yaparsın?
- Anlatacağın dersle ilgili tekrar/prova yaptın mı?

#### *3.4.1.3 Son-görüşmeler*

Son görüşmeler, katılımcıların öğretim uygulamalarına yönelik yansıtıcı düşüncelerini ortaya çıkarmak üzere yapılmıştır. İMÖ adaylarına, dersi

planladıkları gibi yürütüp yürütemedikleri hakkında sorular sorulmuştur. Yöneltilen sorularda, İMÖ adaylarının ön-görüşmelerde belirttiği düşünceleri dikkate alarak yanıtlamaları istenmiştir. Son-görüşmeler yarı-yapılandırmış görüşme soruları içermektedir. Bu sorularda İMÖ adaylarının ders anlatımları sırasında alınan gözlem notlarından yola çıkılarak sorulan sorular da yer almaktadır. Öğretim deneyimlerine yönelik sorulan sorularda İMÖ adayının ders anlatma performansıyla ilgili düşünmeleri sağlanmıştır. Tablo 6'da son-görüşme soruları gösterilmektedir.

***Tablo 6. Son-Görüşme Soruları***

- Anlattığın dersle ilgili neler düşünüyorsun?
- Dersi planladığın şekilde yürütebildin mi?
    - Nasıl?
    - Bunu neye bağlıyorsun?
- Zamanı doğru kullandığını düşünüyor musun? (Silebiliriz? Yukarıda kendileri zaten buna değiniyorlar.)
- Hedeflerine ders sonunda ulaşabildin mi?
    - Nasıl? Açıklar mısın?
- Beklenmedik durumlarla karşılaştın mı? Neler yaptın?
- Sence dersle ilgili en olumlu/olumsuz durum neydi?
- Bir sonraki ders anlatımında nelere dikkat etmeyi planlıyorsun?
- Ders anlatırken kendini nasıl hissettin?
    - Şu anda (ders anlattıktan sonra) kendini nasıl hissediyorsun?
- Bir öğretmen adayı olarak, ders anlatma deneyiminin etkili olup olmadığı hakkında ne düşünüyorsun?
- İlk görüşmemizden şu ana kadar herhangi bir değişiklik yaptın mı?
    - Neler yaptın?
    - Neden?

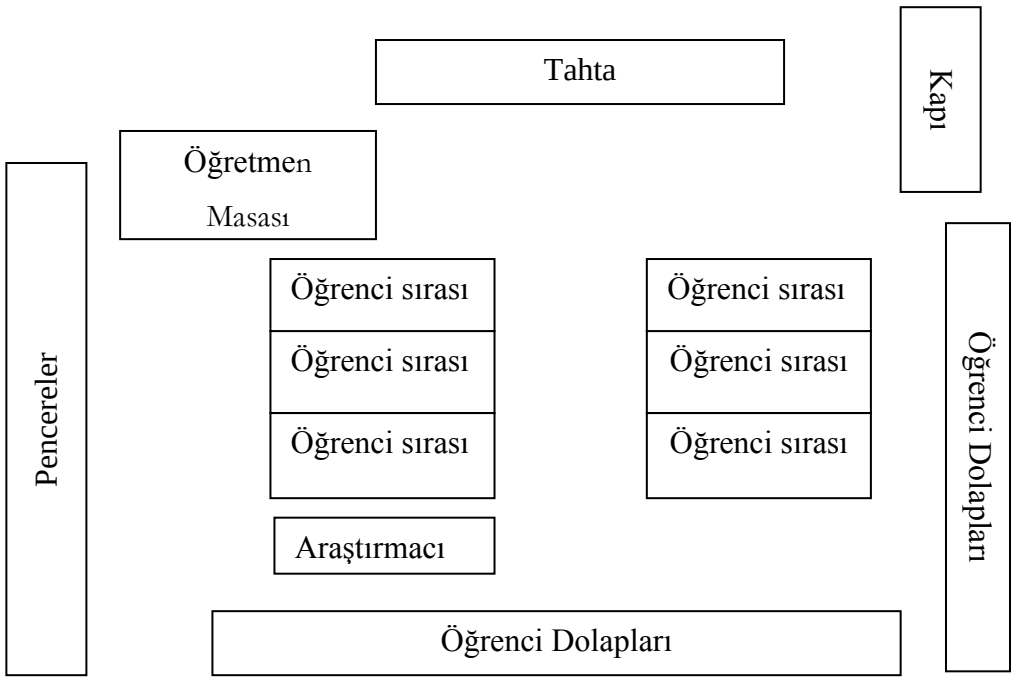
### *3.4.1.4 Gözlemler*

Görüşmelere ek olarak, katılımcıların uygulama okullarındaki ders anlatımları gözlenmiştir. Gözlem yapmanın en temel sebebi, görüşmelerden elde edilen bulguları desteklemektir. Bunun yanı sıra son-görüşmelerde katılımcıya ders anlatma sürecini hatırlatarak soruları yanıtlamalarına olanak sağlamak da hedeflenmiştir. Gözlem yapmanın bir başka nedeni de sınıfın fizikel özellikleri, İMÖ adayının tutum ve davranışları, rehber öğretmenin rolü gibi konularda bilgi edinmektir. Örnek bir gözlem notunun bir kısmı aşağıda Şekil 1'de verilmiştir.

***Şekil 1. Gözlem Notları-Örnek***

**Gözlem Notları-5**

**Selin**




Tarih: 27.05.2009

Sınıf: 6/A

Sınıf mevcudu: 15

Saat: 10:35 (3. ders saati)

Süre: 1 ders (40 dk)

(Selin bu sınıfta daha önce I. dönem ders anlatmış, II. dönem ilk kez anlatıyor. Sınıf sessiz.)

**10:35:** Hoca ödevleri kontrol etmeye başladı. Hoca ödevleri kontrol ederken Selin tahtaya konu başlığını- Karenin, Dik üçgenin ve Dikdörtgenin Alanı- yazdı ve "Bu arada biz derse başlayalım ödevler kontrol edilirken" dedi.

Hoca, Selin'i onaylayarak "evet başlayalım, zamanımız boşa gitmesin" dedi.

Selin, dörtgenlerin alan formüllerini tahtaya yazdı. Bu esnada Hoca, ödev kontrolünü bitirdi.

Yukarıdaki tabloda görüldüğü gibi, gözlem notları sınıfın fiziksel durumunu belirten bir kroki çizimiyle birlikte, öğrenci sayısı, anlatılan konu ve ders süresi gibi bilgileri de içermektedir. Gözlem notlarında İMÖ adayının dersi nasıl yürüttüğüyle ilgili bilgiler de yer almaktadır.

#### *3.4.1.5 Dönem Sonu Yansıtma Raporları*

İMÖ adayları 420 Öğretim Uygulaması dersi kapsamında uygulama okullarındaki deneyim ve gözlemlerini belirten bir yansıtma raporu yazmaları istenmiştir. Yazılan raporlar çalışmanın veri toplama araçlarına dahil edilmiştir.

### 3.5 Araştırmacının Rolü

Çalışmanın katılımcıları İMÖ bölümü son sınıf öğrencilerinden oluşmaktadır. Araştırmacı da aynı bölümde araştırma görevlisi olarak çalışmakta olup katılımcıların birinci, üçüncü ve dördüncü sınıflarda aldıkları bazı derslerde

ders asistanı olarak görev almıştır. Dolayısıyla katılımcılarla araştırmacılar arasında önceki deneyimlerine dayalı bir iletişimleri bulunmaktadır. Bu iletişim katılımcıların ön-görüşme ve son-görüşmelerde daha istekli ve detaylı bilgi vermelerini sağlamış olabilir. Görüşmelerde, katılımcılara yöneltilen soruların hiçbir şekilde doğru yanıtlarının olmadığı vurgulanmıştır. Ancak, bazı durumlarda katılımcılar araştırmacıya verdikleri yanıtlara onay beklemişlerdir. Ancak, araştırmacı sadece katılımcıların öğretim deneyimlerine yönelik kendi öğrenmeleriyle ilgilendiğini, onları hiçbir şekilde yargılamak veya yönlendirmek gibi bir amacının olmadığını belirtmiştir. Katılımcıların görüşmelerde rahat hissetmelerini sağlamak amacıyla, öğretim uygulamalarının tarihlerini kendilerinin ve uygulama okullarındaki rehber öğretmelerin uygun zamanlarını dikkate alarak belirlemeleri istenmiştir. Böylece ders anlatım tarihleri katılımcılar tarafından araştırmacıya iletilmiştir.

Nitel araştırmalarda, araştırmacıyla katılımcılar arasındaki iletişimin çalışmanın önemli bir boyutu olması bakımından, araştırmacının rolünün açıkça ifade edilmesi gerekmektedir. Katılımcılardan ikisi, Taner ve Nihat, araştırmacının yürüttüğü Öğretim Uygulaması şubesine kayıtlı durumdaydılar. Fakat araştırmacı hiçbir şekilde çalışmanın içeriği ve öz-düzenleyici öğrenme hakkında bilgiler vermemiştir. Bu sebeple, tüm katılımcılar çalışmada aynı koşullarda yer almış, öz-düzenleyici öğrenme kavramı hakkında kuramsal veya tanımsal hiçbir bilgi aktarılmamıştır.

Araştırmacıyla katılımcılar arasında herhangi bir değerlendirme sürecinin yer almaması için, 420 Öğretim Uygulaması dersi kapsamında İMÖ adaylarından beklenen uygulama okullarındaki 1 saatlik ders anlatma deneyimlerini gözlemek ve değerlendirmek üzere dersi veren diğer şubelerdeki öğretim elemanlarından çalışmaya katılan öğretmen adaylarını (Taner ve Nihat) değerlendirilmeleri istenmiştir. Böylece araştırmacı, kendi şubesinde yer alan iki katılımcıyı herhangi bir şekilde değerlendirmemiştir.

### *3.6 Pilot Çalışma*

Pilot çalışma, görüşme protokolünün son halini belirlemek üzere Okul A'da yürütülmüştür. 2008-2009 Sonbahar döneminde açılan 435 Okul Deneyimi dersi kapsamında Öğretmen A'nın isteği üzerine aynı okulda öğretim uygulaması yapmak üzere 5 tane İMÖ adayının 1 saat ders anlatmaları istenmiştir. İMÖ adaylarıyla ders anlatma öncesi görüşmeler yapılmış ve anlattıkları derslerde gözlemler yapılmıştır. Ancak, son görüşmeler pilot çalışma kapsamında yapılmamıştır. Görüşme ve gözlemlerden elde edilen bulgular ışığında ön-görüşme ve son-görüşmelerdeki sorular belirlenmiş ve birtakım eklemeler yapılmıştır. Ayrıca pilot çalışmayla birlikte katılımcıların öğretim uygulamalarındaki öz-düzenleyici öğrenme stratejilerinin belirlenmesinin mümkün olmadığı görülmüştür. Çünkü İMÖ adayı dersini anlatırken bir öğrenen değil öğreten olarak algılanmaktadır. Bu sebepledir ki İMÖ adaylarının öğretimleri esnasında kendilerini izlemede kullandıkları öz-düzenleyici öğrenme stratejilerinin tespiti mümkün olmamıştır.

### *3.7 Veri Analizi*

Verilerin analizi için görüşmeler harfiyen yazıya dökülmüştür. Daha sonra, yazılı haldeki metinler genel bir anlam oluşturmak üzere birkaç kez okunmuştur. Metinler okunduktan ve veriler düzenlendikten sonra, araştırma sorusu kapsamında metinlerden anlamlı kısım ve cümleler belirlenmiş ve kodlar oluşturulmuştur. Yazılı metinlere ek olarak araştırmacı kısa notlardan oluşan ve anahtar kavramları ele alan yansıtıcı notlar da almıştır. Kodların anlamlı bir şekilde düzenlenmesi ve indirgenmesiyle kategoriler oluşturulmuştur. Kategoriler çalışmanın araştırma sorusunu oluşturan öz-düzenleyici öğrenme stratejilerini yansıtmaktadır.

Orijinal veri Türkçe toplanmış ve harfiyen yazıya dökülmüştür. Araştırmacının aldığı notlar da Türkçe olarak yazılmıştır. Ancak, kodlar, çalışmanın kuramsal yapısının İngilizce olması sebebiyle İngilizce olarak

belirlenmiş ve yazılmıştır. Dolayısıyla kodlardan elde edilen kategoriler de İngilizce olarak rapor edilmiştir.

Veri analizi yapılırken, oluşturulan kodlar ve kategoriler Orta Doğu Teknik Üniversitesi İlköğretim Bölümü'nde görev yapan ve nitel çalışma deneyimi bulunan bir öğretim üyesi tarafından gözden geçirilmiştir. Öğretim üyesinin incelemesi sonrasında ortaya çıkan kodlarda % 90 uzlaşma sağlanmıştır.

### *3.8 Çalışmanın Geçerlilik ve Güvenirliği*

Nitel çalışmaların geçerliliği ve güvenirliğini sağlamak amacıyla 4 farklı strateji kullanılmaktadır (Guba ve Lincoln, 1985). Bu stratejiler: inandırıcılık, aktarılabilirlik, tutarlık ve teyit edilebilirlik olarak adlandırılmıştır. Merriam (2009) çalışmanın inandırıcılığını arttırmak için veri toplama araçlarının çeşitlendirilmesinden bahsetmiştir. Farklı veri toplama araçlarından elde edilen bilgilerle çalışmanın sonuçları hakkında daha kapsamlı bulgulara ulaşmaya çalışılmıştır. Bu sebeple, çalışmada genel görüşmeler, ön-görüşmeler, son-görüşmeler yapılmış ve bunlara ek olarak gözlemlerle birlikte İMÖ adaylarının dönem sonu yansıtma raporları incelenmiştir. İnandırıcılığı arttırmak için bir diğer yöntem, uzman incelemesi olarak belirtilmiştir. Çalışmanın araştırma konusu hakkında gerekli bilgiye sahip olan tez danışmanı ve yardımcı tez danışmanı olmak üzere iki kişiden ham veri, verilerin kodlanması ve oluşturulan kategoriler hakkında görüş ve önerileri alınmıştır. Araştırmacı, edinilen geri bildirimler doğrultusunda, oluşturulan kodlar ve kategorileri gözden geçirmiştir.

Nitel çalışmalarda aktarılabilirlik, bulguların benzer ortamdaki sonuçlara uyarlanabilmesini, bir başka deyişle, genellenebilmesini ifade etmektedir. Bu çalışmada genelleme amacı olmamasına rağmen, katılımcılar, araştırma süreci, veri toplama araçları gibi konularda detaylı bilgilerin verilmesi sebebiyle belli bir seviyede genellemeden bahsetmek mümkün olmaktadır. Bu nedenle, okuyucular İMÖ adaylarıyla yapılan benzer bağlamdaki bir çalışmada bu çalışmanın bulgularını kendi sonuçlarına aktarabilir ve çalışmalarına daha deneyimli ve bilinçli yaklaşabilirler.

Tutarlık kavramı, nicel araştırmalardaki güvenirlik kavramıyla örtüşmektedir (Miles ve Huberman, 1994). Tutarlığın sağlanması için bulguların çapraz kontrollerle rapor edilmesi gerekmektedir. Bu çalışmada, İlköğretim bölümünde araştırma görevlisi olarak çalışan, araştırmacı dışında bir kişinin, verileri yeniden kodlaması istenmiştir. İkinci veri kodlayıcı kişinin daha önceden nitel araştırma deneyimi olmasına dikkat edilmiştir. Bu kişiye araştırmacı tarafından çalışmanın amacı ve verileri analize etmede yararlanılan kuramsal yapıdan söz edilmiştir. Ayrıca kodlama aşamasında, araştırmacının belirlediği kodları içeren kategoriler hakkında da birtakım bilgiler paylaşılmıştır.

Teyit edilebilirlik kavramı, araştırmacının öznel yargılarından uzak olmasıyla ilgilidir (Yıldırım ve Şimşek, 2008). Bu çalışmada da araştırmacı, ulaşılan bulguları eldeki verilerle sürekli olarak teyit etmiş ve akılcı açıklamalarla okuyucuya aktarmıştır. Ayrıca araştırmacı, çalışmadaki rolünü açıkça ortaya koymuş ve objektifliği üzerine vurgulamalar yapmıştır.

## 4. BULGULAR

Bu çalışmanın üç temel hedefi vardır. Birincisi, İMÖ adaylarının öğretim deneyimi kapsamındaki öz-düzenleyici öğrenme stratejilerini belirlemek; ikincisi İMÖ adaylarının öğretim deneyimleri boyunca stratejilerindeki değişim ve uyarlamaları ortaya çıkarmak; son olarak da değişim ve uyarlamaların nedenlerini araştırmaktır. Çalışmanın bulguları ön-görüşme sonuçları ve son-görüşme sonuçları olarak iki kategoride sunulmuştur. Gözlem sonuçları ve dönem sonu yansıtma raporlarından elde edilen bulgular da görüşme sonuçlarıyla birlikte sunulmuştur.

### 4.1 Ön-Görüşme (Ders Anlatımı Öncesi) Bulguları

Çalışmanın öz-düzenleyici öğrenmeyle ilgili kuramsal çerçevesi önceden düşünme evresiyle başlamaktadır. Bu evre, İMÖ adaylarının ders planlama süreçlerini içermektedir. Çalışmanın bulguları, İMÖ adaylarının birbirini izleyen bir düşünme evresinden geçtiklerini göstermektedir. Bu evrede katılımcılar

tarafından kullanılan öz-düzenleyici öğrenme stratejileri aşağıdaki tabloda belirtilmiştir:

***Tablo 8. Ders Hazırlama Sürecinde kullanılan Öz-düzenleyici Öğrenme Stratejileri***

| |
|---|
| - Kaynak araştırması yapma<br>- Kaynakları hazırlama ve düzenlenme<br>- Öğretim üyelerinden, öğretmen adaylarından ve /veya rehber öğretmenlerden yardım, görüş veya öneri alma<br>- Zihinsel plan yapma<br>- Hedef belirleme |

Tablo 8'de belirtilen stratejiler bilişsel stratejiler olarak dikkate alınmaktadır. Bilişsel stratejilerin yanında, öz-yeterlik, görev algıları ve içsel ilgiler gibi güdüsel inançlar da çalışmanın bulguları arasındadır. Aşağıda bilişsel ve güdüsel öz-düzenleyici öğrenme stratejileri detaylı olarak anlatılmıştır.

### 4.1.1 Bilişsel Öz-düzenleyici Öğrenme Stratejileri

#### 4.1.1.1 Kaynak Araştırması

Çalışmanın bulguları, İMÖ adaylarının ders hazırlıklarına, kullanacakları ders materyalini hazırlamakla başladıklarını göstermiştir. Ders materyalleri genellikle çalışma yaprakları, öğrenci merkezli etkinlikler, elektronik ortamda hazırlanmış slayt ve akıllı tahta dosyaları gibi katılımcının ders esnasında kullanacağı veya öğrencilerin kullanımı için hazırladığı referanslardır. Bu tür materyallerin hazırlanması için ilgili kaynaklardan araştırma yaptıkları görülmüştür. Yararlanılan kaynaklar genellikle Milli Eğitim Bakanlığı'nın hazırladığı öğretmen kılavuz kitabı, internet, soru bankaları ve öğrenci çalışma kitapları olarak belirtilmiştir. Öğretmen kılavuz kitabının, anlatılacak matematik konusunun ilköğretim matematik programındaki yerini belirlemek ve konu içeriğinin sıralamasını yapmak üzere kullanıldığı belirtilmiştir.

#### 4.1.1.2 Kaynakları Hazırlama ve Düzenlenme

Bu süreçte, İMÖ adaylarının anlatacakları derse hazırlanırken farklı kaynaklardan elde ettikleri bilgileri hazırlama ve düzenleme stratejilerinden bahsedilmektedir. Toparlanan bilgilerin derste kullanılacak öğretim materyalin içeriğini hazırlamada kullanıldığı belirtilmiştir. Katılımcıların tamamı, kaynak araştırması sonucu elde edilen bilgilerin düzenlenmesinin önemli bir iş olduğunu belirtmişlerdir. Bilgilerin hazırlanması ve düzenlenmesinde öğrencilerin ilgi ve tutumlarının da dikkate alınması gerektiğini vurgulamışlardır. Katılımcılardan Beril "*Kaynaklardan bulunanların şekillenmesi biraz zaman alıyor, 1-2 saat kafamda yorumluyorum, sonra dökmesi kolay. Yarım saate döküyorum, ama yorumlama süreci daha uzun*.." (ön-görüşme-1). Bilgilerin düzenlenmesiyle ilgili yaşadığı süreci Taner şu şekilde yansıtmıştır:

> Aslında ilk önce, Ölçüler konusuna nereden başlayacağıma karar veremedim. Çünkü hoca sadece Ölçüleri anlatacaksınız dedi, başka da bir şey söylemedi. Elimde bir sürü kaynak vardı, onlardan nasıl toparlama yapacağımı uzun uzun düşündüm, hatta bütün hafta sonu onu düşündüm. Sonra ilk etapta Sıvı Ölçüleriyle başlamaya karar verdim. İlk önce konu bazında küçük bir hatırlatma, sonra da değerlendirme amacıyla bir çalışma yaprağı hazırlamaya karar verdim…

#### 4.1.1.3 Kişisel Notlar Alma

İMÖ adayları ders anlatımları sırasında kullanmak üzere kendilerine yazılı birtakım notlar aldıklarını belirtmişlerdir. Alınan bu notlarda, derste unutulmaması ve vurgulanması gereken belirli noktalardan ve yönergelerden bahsedilmektedir. Selin kendi notlarının içeriğinden bahsederken, aldığı notların dersi yürütmede daha önemli bir role sahip olduğunu vurgulamaktadır. Selin, 2. ön-görüşmesinde:

> Baştan itibaren çocuklara hangi soruları soracağım, şunları söyleyeceğim diye bir kağıda not aldım. Ders planını da işte, dersin

girişi... Ya aslında formalite icabı hazırladım planı. Ders, dersin girişi, dersin işlenişi filan. Sorular yer alıyor ders planında, ama kendim ders planıyla ilgili asıl önemli olan notları ayrı bir yere aldım.

#### 4.1.1.4 Öğretim Materyali Hazırlama

İMÖ adayları öğretim materyalini hazırlarken yazılı not almanın dışında yazılı ders planı hazırladıklarını da belirtmişlerdir. Örneğin Selin, içeriği ne şekilde olursa olsun ders planı hazırlamanın önemini vurgulamıştır:

> Ben ders planı olmadan asla ders anlatmam. Genellikle fakültedeki derslerden öğrendiklerime göre ders planı hazırlıyorum. Ders planını konu, ders süresi, kazanımlar, dersin işlenişi, değerlendirme bölümü gibi bölümleri içerecek şekilde hazırlamaya gayret ediyorum. İster formal olsun ister olmasın, bir öğretmenin mutlaka dersi için bir ders planı olması gerektiğine inanıyorum.

Diğer taraftan Taner ve Nihat ders anlatımları için kesinlikle plan hazırlamaya ihtiyacı olmadıklarını, akıllı tahtadaki dokümanları ders planı olarak kullandıklarını ifade etmişlerdir. Nihat, 1. ön-görüşmesinde:

> Akıllı tahta kullandığımız için, soruları içeren elektronik bir dosya hazırladık ders planı olarak kullanabileceğimiz. O bize izlememiz gerek adımları gösterecek. Ama işte bizim hep bildiğimiz kazanımlar, ders süresi gibi şeyleri içermiyor.

Nihat aynı görüşmenin devamında ders planı hazırlamayla ilgili düşüncelerini net bir şekilde ortaya koymuştur:

> …ya ben hatta akıllı tahta olmasaydı bile yine de ders planı hazırlamazdım. Düşünürüm kafamdan, sonra da etkinlik, sunum ya da işte her türlü materyal neyse onu hazırlarım. Sonra, unuttuğum bir nokta var mı diye bir gözden geçiririm. Eğer unuttuğum

noktalar olduğunu fark edersem öyle notlar alırım, genelde böyle küçük bir kâğıda.

#### 4.1.1.5 Hazırlanan materyali gözden geçirme

Bu süreçte İMÖ adayları hazırladıkları öğretim materyallerini gözden geçirdiklerini belirtmişlerdir. Gözden geçirme süreci belirlenen adımları düşünmeyi veya izlenecek adımları prova etmeyi içermektedir. Öğretim materyalinin gözden geçirilmesi genellikle çalışma yaprağında hazırlanan soruların çözümlerini yapmak olarak ifade edilmiştir.

#### 4.1.1.6 Görüş ve dönüt almak için yardım isteme

Tüm katılımcılar, farklı zamanlarda üniversitedeki öğretim görevlilerinden, arkadaşlarından ve /veya uygulama okullarındaki rehber öğretmenlerden görüş, öneri ve dönüt aldıklarını belirtmişlerdir. İMÖ adaylarının yardım istekleri, genellikle ders anlatacakları sınıf ortamı, öğrencilerin konuyla ilgili ön-bilgileri, tutum ve davranışları hakkındaki görüşlerini içermektedir. Bunun yanı sıra öğretim materyalinin içeriğinin uygunluğunu rehber öğretmene danışmaları katılımcıların çoğunluğunda sıklıkla görülen bir strateji olarak karşımıza çıkmaktadır.

#### 4.1.1.7 Zihinsel planlama

Tüm katılımcılarda zihinsel bir planlama yapma eğilimi gözlemlenmiştir. Derste izleyecekleri basamakları zihinlerinden geçirmelerinin tipik bir strateji olduğunu ifade etmişlerdir. Örneğin Nihat, 2. ön-görüşmesinde şunları dile getirmiştir:

> Hazırlanma süreci olarak, ben genelde bir derse hazırlanırken en çok kafamda bir şeyler düşünerek hazırlanırım. Yani açıp kitapları karıştırmak yerine, o konuyla ilgili ne yaparım diye düşünürüm. Ondan sonra zaten kafamda bir şeyler oluşturduktan sonra, gerisi çok kolay olur.

#### 4.1.1.8 Hedef(ler) belirleme

İMÖ adaylarının bu süreçte en çok öğrencilerin öğrenmeleri, sınıf ve zaman yönetimi ve dersin işlenişi konularında hedefler belirledikleri ortaya çıkmıştır.

### 4.1.2 Güdüsel Öz-düzenleyici Öğrenme Stratejileri

Önceki bölümlerde de belirtildiği gibi, çalışmanın kuramsal yapısında bilişsel stratejilere ek olarak güdüsel stratejiler de öz-düzenleyici öğrenme süreçlerinde yer almaktadır. Öz-yeterlik, görev /değer algılaması ve içsel ilgi gibi güdüsel inançların, İMÖ adaylarının öğretim uygulamalarına hazırlanma ve karar alma süreçlerinde etkili olduğu belirtilmektedir.

İMÖ adaylarının öz-yeterlik inançları genellikle anlatılacak matematiksel konunun içerik bilgisine hakim olup olmama durumlarıyla ilişkilendirilmiştir. Matematiksel içerik bilgisinin yanı sıra, İMÖ adaylarının önceki öğretim deneyimlerinin olup olmaması da öz-yeterlik algısını yansıtan düşünceler olarak ortaya çıkmıştır. Sınıf yönetimi, bilgisayar kullanımı, öğrenci merkezli etkinlikler hazırlama gibi konular da öz-yeterlik algısını ifade etmiştir.

Sınıf yönetimi ve sınıf kültürünü önceden tanımakla ilgili Nihat'ın 4. ön-görüşmesinden alınan ifadesi anlatacağı derste öğrencilerin kontrolüyle ilgili yaşayacağını düşündüğü olası problemlerini aktarmaktadır.

> Sınıf yönetimi konusunda… Girdiğim sınıf, yalnız girdiğim sınıf sorun olacak bu sefer. Normalde önceden girdiğim sınıfı tanıdığım için, hep de aynı sınıfa giriyordum. O yüzden sınıf yönetiminde bir problem yaşamıyordum, yani rahatlıkla sınıfa hakim olabiliyordum. Bu sefer o tip problemler olabilir, sınıfın karma olmasından dolayı. Farklı şubelerden daha önce görmediğim öğrenciler olacak orada. O konuda tedirginlik var yani.

İMÖ adaylarının görev algılamalarıyla ilgili inançları, genellikle anlatacakları matematiksel konuya yönelik düşüncelerini yansıtmaktadır. Örneğin, katılımcılara hangi konuyu anlatacakları sorulduğunda, konuya yönelik bireysel

düşünce ve yorumlarını aktardıkları görülmüştür. Konuya yönelik yorumları öğrenci bakış açısıyla da belirtilmiştir. Anlatılacak matematiksel konu zevkli, sıkıcı, zor, ve ezberlemeye yönlendiren gibi birtakım etiketlemelerle ifade edilmiştir. Taner, 5. ön-görüşmesinde: *"Bölme işlemi, aslında sıfırdan anlatılıyorsa güzel bir konu, ama bizim anlatacağımız bölüm işin sıkıcı bölümü sanki, hem öğrenciler için hem bizim için. Çünkü tahmin etmek insanların çok hoşuna giden bir şey değildir, benim de başta olmak üzere."*

İMÖ adaylarının içsel ilgileri, özellikle anlatmak istedikleri matematiksel konular belirtilerek ifade edilmiştir. İçsel ilgileri olan bazı konu veya öğretim tekniklerini anlattıkları veya uyguladıkları taktirde, daha yüksek bir performans sergileyebileceklerini belirtmişlerdir.

## 4.2 Son-Görüşme (Ders Anlatımı Sonrası) Bulguları

İMÖ adayları, öğretim uygulamalarıyla ilgili performanslarını farklı bakış açılarıyla değerlendirmişlerdir. Değerlendirmelerinin yanı sıra, öğretimlerine yönelik öz-yansıtıcı ifadelerde bulunmuş ve nedenleri ifade etmişlerdir. Ayrıca olumlu veya olumsuz olarak ifade edilen durumların nedenlerini de farklı temeller dayandırmışlardır.

### 4.2.1 Öz-Yansıtma Evresindeki Bilişsel Öz-Düzenleyici Öğrenme Stratejileri

İMÖ adayları, öz-yansıtıcı ifadelerinde ön-görüşmelerde belirledikleri hedeflerine ulaşıp ulaşamadıkları konusunda değerlendirmeler yapmışlardır. Bu değerlendirmelerde, dersi planladıkları gibi işlemeleri, ders süresini etkili ve yerinde kullanmaları, sınıfı istedikleri şekilde kontrol edebilmeleri gibi konulara değinmişlerdir. Değerlendirme sonuçlarını sebepleriyle birlikte ifade etmişler ve sonuçları birtakım sebeplere atfetmişlerdir. Örneğin Taner, 2. son-görüşmesinde dersle ilgili hedefine ulaştığını belirtmiş ve bunu destekleyen sonuçlarından bahsetmiştir.

> Bence bu ders çok etkili oldu... Çünkü çocuklar zaten az çok biliyorlardı… Ama bir kez daha gözden geçirmeleri gerekiyordu.

> Biz onların Koordinat Sistemiyle ilgili bilgilerini sağlamlaştırmış olduk. O yüzden hedefime ulaştım diyebilirim, bütün sorular çözüldüğü ve anlaşıldığı için. Zaten bir ders saatinde 5-6 soru çözmeyi hedeflemiştim ve zaten 5 soru çözdüm.

Öğretim uygulamalarına yönelik olumsuz ve beklenmeyen durumlar da katılımcıların ifadelerinde yer almıştır. Bu durumların sebepleri olarak, öğrencilerin matematiksel konuya yönelik bilgilerinin yetersizliği, derse yönelik isteksizlikleri, ders süresinin yeterli olmaması gibi durumlara atfedilmiştir. Selin 5. son-görüşmesinde dersini planladığı gibi yürütemediğini ve nedenlerini belirtmiştir:

> Arazi ve alan ölçüleri konusuna değinmeyi planlamıştım. En azından bir giriş yaparım, soruyu çözemesem de giriş yaparım diye kendimi şartlandırmıştım. Ama zaman yetmedi maalesef, o yüzden yapamadım. Onun dışındaki yerlerde ama planladığım dışında hiçbir şey olmadı... Ama etkinliğin daha az bir zaman içerisinde biteceğini düşünmüştüm. Ama çocuklar biraz fazla uğraştılar hesaplamak için. Yamuk vardı mesela onu hemen dikdörtgen ve üçgen diye ayırabileceklerini düşündüm ben. Hemen hemen hepsi de hocam yamuğun alanını bilmiyoruz dediler. Hepsiyle tek tek ilgilenip, evet buradan bir çizgi çizerseniz üçgenle dikdörtgen şeklinde göreceksiniz diye açıklama yapmak zorunda kaldım

### 4.2.2 Güdüsel İnançlar

İMÖ adaylarının öz-yansıtıcı düşünceleri güdüsel inançlar çerçevesinde de ele alınmıştır. Bu anlamda, dersin işlenişi, zaman kullanımı, öğrencilerle ilişkiler, öğrencileri kontrol etme, rehber öğretmenden alınan dönütler, matematiksel konu alanı bilgisine sahip olma gibi konularda kanaatlerini ifade etmişlerdir. Ayrıca, olumlu veya olumsuz kanaatlerinin nedenleri de belirtilmiştir. Selin 1.son-görüşmesinde dersiyle ilgili kanaatlerini aşağıdaki ifadelerle yansıtmıştır:

Çok düzenli bir ders olduğunu düşünüyorum. Her şey sırasıyla verildi, başlık atıldı, tanımı yazıldı, özelliği belirtildi, örneği gösterildi. Bunu sırasıyla işledim, arkasından en başta tabi geçen dersle bağlantı kurarak, ona bir hatırlatma yaptım; çünkü ilişkili konulardı. Güzel oldu hatırlatma yapmam, öğrencilerin hatırlaması. Çünkü sonrasında çözeceğimiz sorular içerisinde de eşlik benzerlik de vardı. Etkinlikte de eşlik benzerlik vardı. Olması gerektiğini düşündüğüm için hatırlatma yaptım. Etkinlik de güzel oldu. Çünkü hani eş üçgen benzer midir? Benzer üçgen eş midir? Oradan bir sonuç çıkartıp bir not olarak, o sonucu öğrenciler defterlerine yazdılar.

### 4.2.3 Uyarlanan / Değişen Öz-Düzenleyici Öğrenme Stratejileri

İMÖ adaylarının anlattıkları derse yönelik olumlu ve olumsuz kanaatleri onların bir sonraki öğretim deneyimlerinde birtakım değişiklikler ve uyarlamalar yapmalarını gerektirmiştir. Bu değişimler ve sebepleri de ayrıca ifade edilmiştir. Çalışmada, katılımcılar tarafından ortaya konulan değişim ve uyarlamalar

- öğretim materyalinin içeriği,
- öğretim davranışları,
- dersin işlenişi,
- sınıfı ve ders süresini kontrol etme gibi alanlarda ifade edilmiştir.

Sonuç olarak, bu çalışmaya katılan İMÖ adaylarının öğretim deneyimleri kapsamında kullandıkları öz-düzenleyici öğrenme stratejileri çalışmanın kuramsal yapısı temel alınarak, ön-görüşme ve son-görüşme sonuçlarına göre aşağıdaki tabloda özetlenmiştir.

*Tablo 9. İMÖ Adaylarının Öz-Düzenleyici Öğrenme Stratejileri*

| Evre /Alanlar | Önceden Düşünme | Bağlamın Algılanması | Öz-Yansıtma | Bağlamın Değerlendirilmesi |
|---|---|---|---|---|
| ***Bilişsel*** | **Dersi Planlama**<br>- Kaynak araştırma<br>- Kaynakları hazırlama ve düzenleme<br>- Kişisel notlar alma<br>- Ders materyalini hazırlama<br>- Hazırlanan materyali gözden geçirme<br>- Görüş ve dönüt almak için yardım isteme<br>- Zihinsel planlama<br>- Hedef(ler) belirleme | | **Öz-değerlendirme**<br>Sonuçları nedenlere atfetme | |
| ***Güdüsel*** | **Güdüsel İnançlar**<br>- Öz-yeterlik<br>- Görev algılama<br>- İçsel İlgi | | **Öz-Doyum**<br>Stratejileri uyarlama / değiştirme<br>- Ders materyalinin içeriği<br>- Öğretim davranışları<br>- Dersin işlenişi<br>- Zaman kullanımı<br>- Sınıf yönetimi | |