

AN INVESTIGATION OF PRE-SERVICE ELEMENTARY MATHEMATICS
TEACHERS' VIEWS AND REFLECTIONS ABOUT ELEMENTARY
MATHEMATICS CLASSES BASED ON THEIR OBSERVATIONS IN
SCHOOL EXPERIENCE COURSES

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Approval of the Graduate School of Social Sciences

Prof. Dr. Sencer AYATA
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Hamide ERTEPINAR
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Assist. Prof. Dr. Mine IŞIKSAL
Supervisor

Examining Committee Members

Assoc. Prof. Dr. Safure BULUT	(METU, SSME)	_____
Assoc. Prof. Dr. Erdiñ ÇAKIROĞLU	(METU, ELE)	_____
Assist. Prof. Dr. Mine IŞIKSAL	(METU, ELE)	_____
Assist. Prof. Dr. Çiğdem HASER	(METU, ELE)	_____
Dr. Cengiz S. AŞKUN	(METU, CEIT)	_____

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Name, Last name : Smevra DOĐAN

Signature :

ABSTRACT

AN INVESTIGATION OF PRE-SERVICE ELEMENTARY MATHEMATICS TEACHERS' VIEWS AND REFLECTIONS ABOUT ELEMENTARY MATHEMATICS CLASSES BASED ON THEIR OBSERVATIONS IN SCHOOL EXPERIENCE COURSES

Dođan, Smeyra

M.S., Department of Elementary Science and Mathematics Education

Supervisor: Assist. Prof. Dr. Mine Iřıksal

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The purpose of this study was to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about elementary mathematics classes based on their observations in School Experience I and School Experience II courses. Specifically, this study investigated pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses.

The sample consisted of 19 pre-service elementary mathematics teachers from a teacher education program at Middle East Technical University (METU). Pre-service elementary mathematics teachers involved in this study made their

observations in their cooperating schools for 3 months during the spring semester of 2004-2005 academic year and the fall semester of 2007-2008 academic year. The data were collected by means of their School Experience I and School Experience II course reports.

The results indicated that although there was commonality in the views and reflections of pre-service elementary mathematics teachers' about instruction, assessment, and classroom management issues in elementary mathematics classes, there were differences in their knowledge in the way they perceive instruction, assessment, and classroom management as they progressed through their education. In other words, when School Experience I course reports were compared with School Experience II course reports, pre-service teachers perceived the mathematics instruction as more student-centered and they gave more importance to the alternative assessment strategies in their School Experience II course reports. Furthermore, they defended more positive classroom management methods in their School Experience II course reports.

Keywords: Pre-service Elementary Mathematics Teacher, Instruction, Assessment, Classroom management, School Experience I course, School Experience II course

ÖZ

İLKÖĞRETİM MATEMATİK ÖĞRETMEN ADAYLARININ OKUL DENEYİMİ DERSLERİNDEKİ GÖZLEMLERİNE DAYANILARAK İLKÖĞRETİM MATEMATİK SINIFLARI HAKKINDAKİ GÖRÜŞ VE DÜŞÜNCELERİNİN İNCELENMESİ

Dođan, Smevra

Yksek Lisans, İlkğretim Fen ve Matematik Alanları Eđitimi Blm

Tez Danıřmanı: Yrd. Doç. Dr. Mine IŐIKSAL

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Bu alıřmanın amacı, ilköđretim matematik ğretmen adaylarının okul deneyimi derslerindeki gözlemlerine dayanarak ilköđretim matematik sınıfları hakkındaki görüş ve düşncelerindeki deđiřikliđin dođasını incelemektir. zellikle, bu alıřma, ilköđretim matematik ğretmen adaylarının ilköđretim matematik sınıflarındaki đretim, deđerlendirme ve ynetim konularındaki görüş ve düşncelerini Okul Deneyimi I ve Okul Deneyimi II derslerindeki gözlemlerine dayanarak incelemiřtir.

alıřmanın rneklemini Orta Dođu Teknik niversitesi'nde (ODT) đretmen yetiřtirme programına devam eden 19 ilköđretim matematik đretmen adayı oluřturmaktadır. alıřmaya katılan ilköđretim matematik đretmen adayları, 2004-2005 akademik yılının bahar dneminde ve 2007-2008 akademik yılının gz dneminde 3 ay boyunca okullarda gözlem yapmıřlardır.

Çalışmanın verileri Okul Deneyimi I ve Okul Deneyimi II dersi raporları ile toplanmıştır.

Çalışma sonuçları, öğretmen adaylarının ilköğretim matematik sınıflarındaki öğretim, değerlendirme ve yönetim konularındaki görüş ve düşüncelerinde ortaklık olmasına rağmen, öğretim, değerlendirme ve yönetimi algılayış tarzlarında belirgin değişiklikler olduğunu göstermiştir. Diğer bir deyişle, Okul Deneyimi I dersi raporları ile Okul Deneyimi II dersi raporları karşılaştırıldığında, öğretmen adaylarının Okul Deneyimi II dersi raporlarında matematik öğretimini daha öğrenci merkezli algıladıkları ve alternatif değerlendirme yöntemlerine daha fazla önem verdikleri belirlenmiştir. Bunun yanı sıra, öğretmen adayları Okul Deneyimi II dersi raporlarında daha pozitif yönetim metotlarını savunmuşlardır.

Anahtar Kelimeler: İlköğretim Matematik Öğretmen Adayı, Öğretim, Değerlendirme, Sınıf Yönetimi, Okul Deneyimi I dersi, Okul Deneyimi II dersi.

To My Parents
Who make my life worth living

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LIST OF ABBREVIATIONS

HEC: Higher Education Council

METU: Middle East Technical University

CHAPTER 1

INTRODUCTION

Society always faces with some changes and innovations. In order to accommodate these growing and changing innovations, individuals must develop themselves. Individuals can develop themselves by means of changes and innovations in the education. (Arslan & Özpınar, 2008) Individuals can develop new interests by means of education. That is, education improves the individuals' life standards. Otherwise, individuals are limited to the knowledge that they possess; hence, they can not see the diversity and the wealth of life. Since the most basic function of education is to educate qualified individuals society needs, existing education programs must be developed parallel to the changes occurring in society and education programs should answer the current needs. Indeed, scope and validity of all the courses do not remain constant; they change continually. In order to meet the demands of the rapidly changing and developing society, development of education programs is mandatory (Yüksel, 2000). That is, in line with these changes and developments, regulations are necessary in the education programs (Özden, 2002).

Turkey is always aware of the importance of education and follows the changes in the education. For example, in 1998 the length of mandatory education was extended from 5 years to 8 years. Recent changes in the elementary education curriculum are based on the Basic Education Support Project (TEDP), which was signed between Turkey and the European Union. After implementing pilot program which was based on the constructivist approach in five content areas (Life Sciences 1-3, Social Studies 4-5, Science and Technology 4-5, Math 1-5, Turkish 1-5) in 120 elementary schools of 9 cities in 2004-2005 education year, it was put into practice throughout Turkey in 2005-2006 education year (Ministry of National Education [MoNE], 2005). The

curriculum is based on the fact that all students should be active in the mathematics teaching. Indeed, this is suggested in the 15th Ministry of National Education Congress conclusion report as instead of knowledge transfer, teaching the learning, giving the possibility for understanding, interpreting and applying the basic concepts, acquiring problem-solving abilities and behaviors and scientific thinking habits (MoNE, 1996). Moreover, in the new elementary mathematics curriculum, there were some changes in the assessment where alternative assessment strategies such as portfolio, performance homework, poster projects, peer evaluation, and self evaluation are suggested (Linn & Miller, 2005, cited in Koç, Işıksal, & Bulut, 2007). In short, some changes were done in the instruction, assessment and, classroom management part of the mathematics instruction.

By means of the new elementary mathematics curriculum, roles of the students and teachers have also changed. In the old curriculum, teacher presents the information; however, in the new curriculum, teacher is the facilitator. In other words, students think and develop their knowledge on their own. Therefore, the aim is not to give the information to the students; the aim is to teach how to think and how to develop students' own problem solving styles (Koç, Işıksal, & Bulut, 2007). "The teacher is one of the basic elements of the teaching and learning phases. He is the person who continuously interacts with the student, performs the curriculum, manages the instruction and evaluates both student and instruction. The characteristics of teachers affect mainly the characteristics of these phases" (MoNE, OYEGM, 2001, cited in Sandır, Argün, & Ubuz, 2008, p. 1). Therefore, it is necessary that teachers be previously trained in the best possible way. That is, the success of education programs mostly depends on the teacher who applies it. Hence, teaching practice courses which are taken during pre-service education is important for training these qualified teachers and for making them understand the relation between theory and practice. School Experience and Practice Teaching courses are the only courses in which pre-service teachers receive the opportunity to practice. Pre-service teachers observe in-service teachers in their cooperating schools. Since this experience provides the basis for the behaviors that should/not be taken as a model in their future teaching profession, their views and reflections in these courses are important.

Furthermore, pre-service elementary mathematics teachers observed the old elementary mathematics curriculum during School Experience I course, on the other hand, they observed the new elementary mathematics curriculum during School Experience II course. Because of the changes in the instruction, assessment, and classroom management part in the new elementary mathematics curriculum, it is important to investigate pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management.

1.1 Purpose and Context of the Study

In order to introduce the teaching profession, there are School Experience I and School Experience II courses in the education faculty. The School Experience I course is a first year course in the elementary mathematics teacher education program. The School Experience II course is a fourth year course in the elementary mathematics teacher education program. Until School Experience II course, pre-service teachers take many courses and it is expected that there is an increase in the pre-service elementary mathematics teachers' academic knowledge by means of those courses. The purpose of this study, therefore, is to investigate pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. Specifically, this study focused on the following research questions:

1. What is the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses?
2. What is the nature of changes in pre-service elementary mathematics teachers' views and reflections about assessment issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses?

3. What is the nature of changes in pre-service elementary mathematics teachers' views and reflections about classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses?

The study investigated these questions through pre-service elementary mathematics teachers' School Experience I and School Experience II courses reports. In other words, pre-service teachers wrote reports on what they observed in their cooperating schools during their school experience courses and they also reflected on these observations. More specifically, this study aims to investigate the similarities and differences of pre-service elementary mathematics teachers' views and reflections after taking School Experience I and School Experience II courses based on the instruction, assessment, and classroom management issues in elementary mathematics classes.

1.2 Significance of the Study

School Experience courses are functional and they are beneficial to familiarize the pre-service teachers with the teaching profession (Yapıcı & Yapıcı, 2004). The literature includes several studies investigating both the effect of School Experience I and School Experience II courses on pre-service elementary mathematics teachers' thoughts (Aksu & Demirtaş, 2006; Cephe, 2001; Gökçe & Demirhan, 2005; Oral & Dağlı, 1999; Özkılıç, Kartal, & Bilgin 2008; Turgut, Yılmaz, & Firuzan, 2008). These studies have showed that School Experience courses have been found to have various effects on pre-service elementary teachers' views and reflections, that is on their developments in teacher education programs. For instance, School Experience courses caused pre-service teachers to love teaching and get experienced in their field (Turgut, Yılmaz, & Firuzan, 2008) and they offered knowledge and experience together (Cephe, 2001).

Although several research studies about the effects of School Experience I and School Experience II courses separately on pre-service elementary mathematics teachers' professional growth have been conducted in Turkey, less focus is given to the changes of pre-service elementary mathematics teachers'

views and reflections from School Experience I course to School Experience II course. More specifically, no studies have investigated pre-service elementary mathematics teachers' views and reflections on instruction, assessment, and classroom management issues which are important current issues in the new elementary mathematics education curriculum. Hence, it is believed that this study contributes to the literature in this context. In addition, the findings of this study are expected to give feedback about what pre-service elementary mathematics teachers learnt from School Experience I and School Experience II courses to teacher educators. Moreover, pre-service elementary teachers encounter the teaching profession for the first time by means of School Experience I course. However, this course has been recently removed from the teacher education program (Higher Education Council [HEC], 2006). Hence, this present study is significant in order to inform policy makers whether they should restore the program or not. According to the results, this study may help teacher educators organize their pre-service education programs.

1.3 My Motivation for the Study

I graduated from Middle East Technical University (METU) in 2006 and I have been working as a mathematics teacher in Ankara for three years. During my education, I gained extensive knowledge about mathematics teaching including how to teach mathematics subjects, how to get students involved, and how to monitor students' learning. All these are skills that can be partially taught, but for the most part it must be learned through experience. During my education years at METU, there were always some questions in my mind. These questions were "how university education affected my pedagogical knowledge, whether this knowledge improved or not, and what were the most important issues in the mathematics teaching". By means of this thesis, I hope to find answers to these questions. Furthermore, I believe that this study will make contribution to my teaching profession.

This study is organized into five chapters. In chapter one, introduction and significance of this study are given. The second chapter is about literature review on importance of education, curriculum reforms in elementary education, new curriculum in Turkey, role of the teacher in the new curriculum, the importance

of teacher education, and school experience courses in teacher education. Chapter three contains a detailed description of methodology including the design of the study, information about participants of the study, teacher education program, school experience courses, data collection instrument and process. The results of pre-service elementary mathematics teachers' views and reflections are given in detail in chapter four. Chapter five includes the summary and discussion of the major findings and the recommendations for future research studies.

1.4 Definitions of Related Terms

The definitions of important terms in this study are given in the following list.

Pre-service Elementary Mathematics Teachers: Pre-service elementary mathematics teachers are students who are enrolled in the four-year undergraduate teacher education program to prepare themselves to be teachers of elementary schools. In this study, pre-service elementary mathematics teachers refer to freshman pre-service elementary mathematics teachers in 2004-2005 and senior pre-service elementary mathematics teachers in 2007-2008 at METU.

Pre-service Elementary Mathematics Teachers' Views and Reflections: It refers to the pre-service teachers' views and reflections after their observations in their cooperating schools during their involvement in school experience courses. Pre-service teachers' views and reflections were analyzed through reports that they wrote in the content of School Experience I and School Experience II courses.

Views and Reflections on Instruction: Pre-service elementary mathematics teachers' views and reflections about instruction refers to the pre-service teachers' views and reflections on teachers' use of instructional methods, teachers' usage of instructional materials, teachers' behavior and teachers' everyday routine habits that were used by their cooperating teachers during their observations in cooperating schools.

Views and Reflections on Assessment: Pre-service elementary mathematics teachers' views and reflections about assessment refers to the pre-service teachers' views and reflections on methodologies like traditional assessment strategies and alternative assessment strategies that were used by their cooperating teachers during their observations in cooperating schools.

Views and Reflections on Classroom Management: Pre-service elementary mathematics teachers' views and reflections about classroom management refers to pre-service teachers' views and reflections on methodologies like punishment, minimum intervention and positive encouragement that were used by their cooperating teachers during their observations in cooperating schools.

School Experience I Course: It is one of the courses offered by elementary mathematics teacher education program to freshman pre-service elementary mathematics teachers (METU, 2003). In this course pre-service teachers are expected to observe the mathematics lessons in their cooperating schools. This course creates opportunities for pre-service teachers to assimilate their experiences, relate them to the work being done at the university, and to discuss them with the instructor and other students taking the same course.

School Experience II Course: It is one of the courses offered by elementary mathematics teacher education program to senior pre-service elementary mathematics teachers (METU, 2003). In this course pre-service teachers are expected to acquire teaching competence and develop their teaching skills.

CHAPTER 2

LITERATURE REVIEW

In this chapter, research studies about the new curriculum in elementary mathematics education are reviewed. Teachers' views and reflections about the new elementary mathematics curriculum are also given. In addition, studies related to School Experience I and School Experience II courses both in Turkey and in abroad are summarized.

2.1 Importance of Education

That humanity improves life via education is accepted as a universal fact. Education is a basic tool for human being to attain success for individual, environmental and social aspects and to attain the peace, freedom, social justice and universal totality ideals. Furthermore, education as a social and economic booster force affects all sectors. Education creates possibility for human beings to reach their individual targets, gain vital responsibility and realize creativity potentials. For this reason, in education a continuous progress and change is necessary at individual, national and global levels (Alkan, 2001). According to Yüksel (2000), rapid increase of information and technology in this age led to a quick change in all parts of the society, and therefore, components of education. Since the most basic function of education is to educate qualified individuals society needs, existing education programs must be developed parallel to the changes occurring in the society and education programs should not fall behind the time. Indeed, the scope and validity of all the courses do not remain constant; they change continually today. In order to meet the demands of the rapidly changing and developing society, development of education programs is a must.

Since individuals are faced with planned-programmed instruction activities in elementary education, they gain new behaviors (Gökçe, 1999). The

first level of education foundations that students meet are elementary foundations. Here students get ready for one upper level of education foundation. That is, elementary education is a step for other levels of instruction (Orbeyi & Güven, 2008). The prerequisite level of this upper education foundation demonstrates a suitable change according to the age. Therefore, in line with these changes and developments, regulations are necessary in the education programs (Özden, 2002). Programs contain the aims that will be achieved, the content that will be arranged according to certain principles, methods that will be applied, supporting materials and tools, and evaluation standards that show how much it could reach the aim (Gözütok, 2003). New elementary mathematics programs had been first implemented in pilot schools and after making the required changes they were implemented in all schools. Along with the developments in science and technology, arrangements are made when necessary (Gürkan, 2004).

As a result, elementary education level is the most important level. Hence, from time to time necessary arrangements are being made in the elementary education program of Turkey. In the next section, curriculum reform that has taken place in the elementary education program will be examined.

2.2 Curriculum Reform in Elementary Education

Although so many elementary education programs have been developed and applied since the foundation of the Republic, these programs have failed to produce qualified members of society, especially in the last 40 years (Şahin, 2007). The National Education Development Project (MGEP), which was started between Turkey and the World Bank in 1990, has the most important role in the change of education programs. By means of this project, the increase in the quality of elementary and secondary education, the increase in the quality of the teacher education and the development of administration strategies and abilities were aimed (MoNE, 1999). Recent changes in the elementary education curriculum are based on the Basic Education Support Project (TEDP) agreement of which was signed between Turkey and the European Union. After implementing this program which was based on the constructivist approach (Life Science 1-3, Social Science 4-5, Science and Technology 4-5, Math 1-5, Turkish 1-5) in 120 elementary schools of 9 pilot cities in 2004-2005 education year, it

was applied throughout Turkey in 2005-2006 education year (MoNE, 2005). The main objectives of the applied curriculum reform are (MoNE, 2005):

- to reduce the amount of content and number of concepts
- to make the lessons more enjoyable, more related to daily life
- to arrange the units through constructivist approach instead of behaviorist approach
- to move from a teacher-centered model to a student-centered model by means of activities
- to monitor student progress through alternative assessment techniques
- to make the students construct the knowledge on their own

Instead of understanding knowledge, knowledge transfer was more important in the old programs which accepted the teachers as the only authority in the class and put them in the center of instruction activities. Therefore, students were not given any opportunities to thinking process. However, in contrast to the old program, students were given experience of diverse intelligences and abilities in the new program (Koç, Işıksal & Bulut, 2007). Also, through curriculum change, schools became not places where knowledge is transferred to students; instead, schools became places where students are taught how to reach knowledge. Indeed, this is suggested in the 15th Ministry of Education Congress conclusion report as instead of knowledge transfer teaching, the learning process has to provide the possibility for understanding, interpreting and applying the basic concepts, acquire problem solving abilities and behaviors and scientific thinking habits (MoNE, 1996). Furthermore, Linn and Miller (2005, cited in Koç, Işıksal & Bulut, 2007) mention that the new program emphasize the alternative assessment strategies, such as observation checklists, portfolio and other performance-based assessments. In Table 2.1, the comparison of the old and new curriculum is given (Koç, Işıksal & Bulut, 2007, p. 7).

Table 2.1: A comparison of the old versus the new curriculum

Old Curriculum	New Curriculum
Information does not change.	Information changes
Education is for knowing	Education is for understanding
Teacher as the information provider	Teacher as the facilitator
Teacher as the only decision maker	Teacher and students make decisions
One-way communication	Two-way communication
Product-based	Process-based
School for individual's learning	School for everyone's learning
Parents do not know about education	Parent involvement is essential
Competency-based learning	Community-based learning
Norm-referenced assessment	Criterion-based assessment
Teacher knows the answers	There is more than one solution and the teacher may not know all the answers

(Source: Koç, Işıksal, & Bulut, 2007)

The table shows that in the old curriculum, the teacher presents the information; however, in the new curriculum, the teacher is a facilitator. That is, students think and develop their knowledge themselves. Although the information does not change in the old curriculum, it changes in the new one. Therefore, the aim is not to give the information to the students; the aim is to teach how to think and how to develop their own problem solving styles. There is an interaction between student and teacher and between student and student in the new curriculum. In addition, in the old curriculum the product is important; however, the process is important in the new one. There may be more than one answer for the questions; that is, not only the solutions are important but also the problem solving processes are important in the new curriculum. The topic of the next section will be instruction, assessment, and classroom management issues which were mentioned explicitly in the curriculum change.

2.3 Important Issues in New Elementary Curriculum

Fundamental regulations and changes in the Turkish education system have been made to raise individuals with the desired features and qualities. In this

context, changes based on the constructivist theory (student-centered teaching taking into account individual differences, etc.) were made. Therefore, from teacher-centered and a traditional education, which views the student just a "recording device" a switch was made to the student-centered approach, in which the learning environment is prepared according to the students' needs and interests, and teachers are seen as a guide. In addition, it is aimed that students develop their critical thinking, communication, problem solving, research, decision-making, entrepreneurship, and information technology skills (Gömleksiz, 2005; Kıroğlu, 2006; Yaşar, Gültekin, Türkan, Yıldız, & Girmen, 2005, cited in Arslan & Özpınar, 2008).

In the new program, changes were also made in the measurement and evaluation part. Instead of product evaluation, process evaluation, which determines the lack of students and gives feedback, is emphasized in the new program (MoNE, 2006). The quality of education is related to the quality of teachers rather than how good a program is prepared. That is, realization of the new curriculum's innovations requires teachers to change their roles in instruction, assessment, and classroom management part. Therefore, in the next section firstly, research studies related to the important issues in the curriculum, that on instruction, assessment, and classroom management, will be examined.

Instruction: Since the new elementary mathematics program is based on the constructivist approach, there were some changes in the teachers' roles in instruction process. For example, teachers guide their students, create necessary environments for students to make their own meaning, accept students' differences, orient students to learning by means of creating an environment emphasizing open, free and individual responsibility and not to expect only one correct answer, and not to stick to the strict criteria and standards. Students learn with less direction from the teacher, express their own thoughts, and organize their knowledge (Airasian & Walsh, 1997). In the same way, Windschitl (2002) stated the basic features of teachers' and students' activities in a constructivist class. Teachers help their students to make their own meaning. Since teachers provide a number of resources, students are given enough opportunities in the

learning environments. Teachers assess their students' learning in different environments and give feedback.

Oral (2000) determined pre-service teachers' perceptions about the instruction behavior of teachers. According to the findings of the study, some of the behaviors that teachers exhibit occasionally are telling the objective of the course to the students, communicating with all students in the class, using audio-visual tools effectively and keeping students' interest alive. Some of the behaviors that teachers exhibit quite often are drawing students' attention to the subject matter, considering students' level, using time efficiently, ensuring students' active participation, keeping students under control by means of eye-contact, supporting the lesson by nonverbal behaviors, expressing the importance of the subject before the end of the course. However, the only behavior that teachers always show is presenting the subject matter in a clear and understandable way.

Besides supporting the data of Oral's (2000) study, Şahin (2004) gives information about why the ideal classroom environment could not be provided. Şahin evaluated the activities that were done during the learning-teaching process in mathematics courses of primary schools' second stage in terms of teacher and student. Fifty elementary mathematics teachers and 200 students in city center constituted the sample of the study. Data were collected by a questionnaire developed by the researcher. According to research results, it was found that the teachers often give assignments, but instead of giving them from different sources they use only textbooks. Teachers indicated that there were factors that prevent to use activities frequently, students from different cultures, students with special needs, having crowded classes and threats to the students' security were some of them. When the use of information collected from students by teachers is investigated, it is observed that this information was mostly used for planning future activities. It was also used in a descending order such that giving reports to the families, giving feedback to the students, and identifying the students' learning problems. When students' perceptions of activities done in mathematics lessons were examined, it was seen that although saying how to solve the problem, asking them to write down those on the board, giving homework

happened quite often, whereas allowing them to work on projects, discussing homework, using overhead projector happened occasionally.

In the same way, Temizöz and Koca's (2009) study which was performed with mathematics teachers shows the maintenance in the use of traditional methods. By using random stratified sampling method, 25 elementary mathematics teachers were selected from 14 primary schools chosen among the primary schools in central district of Ankara. In order to collect data, semi-structured interviews were conducted with the elementary school mathematics teachers. In addition one-hour observation and two lesson plans were used. The results revealed that the question-answer technique was the most commonly used technique, and this was confirmed with the observation reports and lesson plans. The analysis of the results showed that the majority of participant teachers used traditional methods in their instruction.

As understood from the above studies, although new elementary mathematics program defends new teaching methods, the teachers continue to use traditional methods. That is, the importance of instruction part might be understood from this. In the following part, studies related to assessment part will be given.

Assessment: Measurement and evaluation take place among the problems of programs based on constructivist approach (Harwell, 2000). Indeed, according to a research that was done by Gözütok, Akgün and Karacaoğlu (2005, cited in Bümen, 2005) it appeared that the assessment and evaluation part is the most defective part where teachers feel less confident. As it was mentioned before, in the new program that is currently in use, there has been a shift from product evaluation to process evaluation. Although measurement and evaluation tool types such as student work folders, concept maps, observation, conversation, performance evaluation, peer evaluation, self evaluation, and project evaluation were introduced to teachers, no information about how, when and how often they are used has been given to teachers. Therefore, teachers are less competent in this subject.

Orbeyi and Güven (2008) examined the teachers' perceptions about the Elementary School Mathematics Course (1-5 grades) Teaching Program's

evaluation part and their findings were in line with the results of the studies. The sample of this descriptive research consisted of 427 classroom teachers who were randomly chosen from the primary schools in Çanakkale, Edirne and Eskişehir which were also randomly chosen. In order to determine the classroom teachers' perceptions about Elementary Mathematics Education Program a 48-item scale was prepared by the researchers, but 7 items identifying teachers' personal information and 11 items related with evaluation part were used. According to the results of the research, the rank of evaluation tool types that were used by classroom teachers in the evaluation component of new mathematics course education programs in a descending order was student product file (portfolio), optional tests (multiple choice, true-false, etc.), written exam, oral presentation, oral exam, observation form, self-assessment form, project evaluation form, interview, group evaluation form and course attitude scale respectively. According to this order, teachers use portfolio that is preferred in the new program often enough. On the other hand, it was seen teachers continue to use written exams that are not preferred in the new program. Regarding the relation between taking in-service training about new program and evaluation part of the program, teachers who took in-service training expressed more positive views than teachers who did not, and this led to the significant differences.

Gelbal and Kelecioğlu (2007), in their study, give information about why these traditional methods are still used. Two hundred forty two teachers who work in different districts of Ankara constituted the research sample. Data of the study were collected by means of a 5 section questionnaire developed by the researchers. According to the results, since teachers saw themselves more adequate in traditional methods, generally they preferred them in order to recognize their students and to determine their success level. The most deficient method was student's evaluation. Teachers ranked the assessment methods in a descending order the traditional, face to face, the new, self evaluation, respectively. It was emphasized that teachers must use different assessment methods in order to get to know their students better and for this purpose teachers should be informed about these assessment methods.

In another study, Çakan (2004) examined what elementary school and secondary school teachers' assessment and evaluation practices were, how

sufficient they find themselves in this area and whether a difference exists between them or not. Two hundred sixty elementary and 244 secondary school teachers who attended Seminar of Measurement and Evaluation in Education held in Bolu during the summer semester of 2003-2004 academic year comprised the sample of the study. Research data were collected by a 24-item scale in 5 level of likert type scale. Similar to the results of Gelbal and Keleceioğlu's study, the vast majority of the teachers in both levels saw themselves insufficient in the assessment and the evaluation methods. When this was examined according to the level of the education, elementary teachers saw themselves more adequate. Examining the question levels used in the assessment and the evaluation methods, there was no significant difference between them. When the question types were examined, there was a significant difference. Although the elementary school teachers used multiple-choice items, short answer, written exams, blank filling, true-false and matching in a descending order, the secondary school teachers used written exams, multiple choice items, short answer, blank filling, true-false and matching.

As understood from the above studies, since teachers did not take an in-service training about the new assessment-evaluation methods, they continue to use traditional assessment methods instead of the methods preferred in the new program. In fact, this situation coincides with the findings of Orbeyi and Güven's (2008) study such that teachers who take an in-service training are more successful than teachers who do not. Studies related to classroom management part will be given below.

Classroom Management: According to constructivist approach, the planning and application of tuition process has been criticized because it is time consuming and accurate implementation of these applications is hard (Talbert & Mc Laughlin, 1993, cited in Hazır-Bıkmaz, 2006).

Atıcı (2001) conducted a study about classroom management strategies of teachers with high and low level of competence. The purpose of the study was to show whether there was a difference between the classroom management behaviors of teachers with a high level of competence and a low level of competence. Some important results obtained from the study whose sample was

chosen from Turkey and England were as follows: Although teachers with low competence tended to use negative methods such as criticizing, scolding, yelling, and punishment, it was seen that teachers with high competence used these methods less. It was observed that teachers with high competence used positive methods such as subsidies, warning, questioning, looking at, and talking to students. According to the findings of the study, teachers with high competence can prevent behavioral problems and can create an atmosphere in which students concentrate on their academic work.

Atıcı (2002) examined Turkish and English teachers' methods that were used in order to prevent the unwanted behaviors in another study. According to the obtained findings, "praise" "encouragement", and "student-talk" were the most commonly used methods by Turkish and English teachers. It was observed that encouragement and praise in both groups were used for academic effort and performance. "Scolding students" method was the least used method in both groups. Another important finding was that British teachers applied more "punishment" than Turkish teachers did. It was determined that although British teachers used "changing students' seats", "giving directions", and "telling students what to do" more than Turkish teachers did, Turkish teachers used "praise", "encourage", and "student talk" more than British teachers did.

Similar to previous study, Türnüklü and Yıldız (2002) intended to identify classroom management strategies that are used by elementary school teachers in order to cope with students' unwanted behaviors. Their findings can be summarized as follows: It was identified that teachers did not frequently use behavior management strategies including penalty against students' unwanted behavior; instead, they coped with the most unwanted students' behavior by having eye contact, talking with students about the behavior, reminding the class' rules, calling the student with name, and encouraging the student.

Apart from behavior management strategies of teachers, Sağlam, Adıgüzel and Güngör (2008) determined the students' unwanted behaviors. Of all unwanted behaviors, the most common ones were talking freely without raising hands, not doing the given homework or not paying enough attention to it, and not listening to his/her friends while they were talking and interrupting them. The most common approaches which teachers used in the classroom in order to deal

with unwanted students behaviors were “making a general description”, “warning the student in an appropriate way”, “showing the students who behave positively as models”, and “talking to student after the class”.

The causes of these unwanted behaviors was examined by Memişoğlu (2005), who determined the primary teachers’ behaviors that caused unwanted behaviors in the classroom environment. Threatening the students with marks, discriminating students, shouting at students, not being a good role model, paying attention to same students, having inadequate knowledge of subject matter, and trying to impose personal views were the most common causes of unwanted behaviors. In this context, it was stated that an important part of the teacher behavior causing unwanted behavior in classroom was based on the insufficiency in human relations. It was recommended that importance should be given to this dimension and attributes of student-centered teaching must be acquired by teachers.

In another study, İra (2004) mentioned that in the effective classroom management, showing an effort to prevent unwanted behaviors, and making students sit quietly was not a desired behavior. For the effective classroom management, defining classroom rules with the students, focusing on the reasons of events instead of their results, taking students’ physical, mental, emotional, social, sexual, moral, and other developmental features into account, expecting appropriate behaviors, giving importance to the developmental features, and applying student centered instruction were needed. It needs to be emphasized that active learning can only take place with an effective classroom management.

When classroom management studies in general were considered, it was seen that an effective classroom management was not making students sit quietly. In addition to studies that examine teachers’ classroom management strategies, there are studies examining teachers’ behaviors that lead to unwanted behaviors. Shouting, rebuking, and punishment which are used frequently by teachers who have low level of competence cause unwanted behaviors (Atıcı, 2001, 2002; Memişoğlu, 2005). However, teachers who have high level of competence use different methods such as eye contact, calling students with their names, and rewarding (Türnüklü & Yıldız, 2002; Sağlam & Adıgüzel, 2008). As understood from above studies, instruction, assessment, and classroom management issues

are important for effective teaching. Since the teachers have the most important role in these parts, the next section will emphasize the teachers' roles in the elementary education.

2.4 Role of the Teacher in the New Curriculum

Our children, who we will commend our future, must be brought up from every aspect from now on. This is only possible by means of high education standards of our children and young. Educational programs have several goals for students. Many factors contribute to achieving these goals. However, the changes in classroom practices demanded by the reform visions ultimately rely on teachers (Fullan & Miles, 1992). Therefore, it is necessary that teachers must give priority to bringing up themselves in the best way. That is, the success of education program depends on the teacher who applies it. Becoming aware of this, teacher education has started to receive enough attention. If students need their education served up differently in order to meet new assessments and standards, teachers, in the first place, need something new (Cohen & Ball, 1990). That is one of the main reasons of failure of these reforms, the negligence of education of teachers who will implement the program. In addition, it is quite difficult to pass from teacher-centered education to student-centered education without giving necessary education to teachers (Hazır-Bıkmaz, 2006). In the same way, Babadoğan and Olkun (2006) stated that the teachers must get education for change; however, since the required education is not given to them, this change is not easy.

Since the changes in the curriculum of the elementary education need the changes in the mathematics education, the role of teachers in the mathematics education also changes. Bulut (2004) points out that:

“In the new education program, students are aimed to be individuals taking responsibility for their own learning, searching, being active physically and mentally when learning mathematics, thinking, questioning, describing their own feelings and thoughts, forming their own questions and solving them, using technology, enjoying mathematics and trusting themselves in mathematics, having the ability to participate in group works and having self-management skills. On the other hand, teachers will be individuals who take responsibility for enabling students' learning, make them think, make them ask questions, criticize and discuss and individuals who canalize, guide and listen to them, produce activities, and evaluate students in different aspects with various measurement devices”.

Since the new program is student-centered, students are directed to think by means of students' participation (Ersoy, 2002). In the report of 15th Ministry of National Education Congress meeting in 1995, it is stated that instead of classical tuition methods, teaching techniques and methods that teach the learning, get student at the centre, and make students active must be used (MoNE, 1995). Similarly, an elementary mathematics program is based on the policy of every child can learn mathematics (MoNE, 2005).

In order to apply these new programs, teachers must have program's requirements (Gödek, 2004). "Institutions can not be developed unless the people in the institutions develop" (Fullan & Stiegelbauer, 1991, p. 349). In the same way, Hopkins, Ainscow and West said that "since the change efforts are not well understood by the teachers, centrist change models result in failure" (Hopkins, Ainscow & West, 1994, p. 17). The reason why importance must be given to education of teacher who will implement the program will be in the next section.

2.5 The Importance of Teacher Education

In order to improve quality in education, teachers and education faculties where they were educated have big roles. For this purpose, links between education faculties and schools must be correlated; faculty courses must be associated with the schools' program. Content of faculty courses must be organized according to the perceptions of pre-service teachers and content of schools' programs (Gödek, 2004). These are important because professional development has a tremendous impact on teachers, therefore, on their students. Borko and Putnam's study (1995, cited in Villegas-Reimers, 2003, p. 22) showed that "powerful evidence that experienced teachers' pedagogical content knowledge and pedagogical content beliefs can be affected by professional-development programmes and that such changes are associated with changes in their classroom instruction and student achievement". Calderhead (1996, cited in Mansour, 2009, p. 2) also points out the relationship between beliefs and experience and states that teachers' past experiences influence the way they think about their work.

It is obvious that, there is a need for qualified teachers in order to increase efficiency of education. Thus, pre-service education is important for bringing

qualified teachers up. Knowledge, ability and behaviors that need to be given to pre-service teachers are gained by pedagogical courses and activities. Theory of teaching is based on teaching field courses. However, this theoretical knowledge must be combined with practice activities (Küçükahmet, Külahoğlu, Çalık, Topses, Öksüzoğlu, & Korkmaz, 2004). Therefore, School Experience Course that gives opportunities of making observations about their future jobs and Teaching Practice Course that gives opportunities of applying their observations in real classroom environment to pre-service teachers are the most important elements of teacher education programs (Hoşgörür, Kuşdemir, & Katrancı, 2006).

2.6 School Experience Courses in Teacher Education Programs

Teaching practice process having an important place in teacher education has a basic role in order to make pre-service teachers understand the relation between theory and practice. Pre-service teachers' developing themselves in teaching aspects, gaining abilities of applying theoretical knowledge in education environment and having a positive attitude related with teaching profession are developed in this process. This process aims at pre-service teachers' recognizing and developing themselves and making pre-service teachers to get ready for their educational duties in institutions (Alkan, 1991; Gürşimşek & et al., 2000 cited in Alakuş, Oral, & Mercin, 2005).

There are several studies related to the pre-service teachers' perceptions about School Experience I in the literature. Turgut, Yılmaz and Firuzan (2008) examined pre-service elementary mathematics teachers' perceptions about School Experience practices and realized cooperating teachers' thoughts about new approaches and new configurations. The sample of this descriptive study was 107 pre-service teachers (66 Female, 41 Male). Likert type questionnaire with 30 items was developed by the researchers by means of School Experience practice reports written by pre-service teachers. This study showed that School Experience courses were necessary for their education, caused pre-service teachers to love teaching and gained some experiences in their field.

The professional experience gained by School Experience I course was also observed in the study of Oral and Dağlı (1999). They examined 191 pre-service teachers' perceptions in two dimensions which were field competence and

possibilities of cooperating schools. Also, the degree of pre-service teachers' perceptions was determined at each dimension. According to the results, pre-service teachers' perceptions were high for field competence and were average for cooperating schools' possibilities. The researchers made some suggestions in order to increase this degree of these possibilities. These were that school administration should coordinate the materials and human resources and cooperate with Faculty of Education if necessary. Similar to Oral and Dağlı (1999), Cephe (2001) made the evaluation of School Experience I Course whose aim is to provide pre-service teachers with knowledge and experience about teaching and school life. For this evaluation, three part questionnaire was administered to first year pre-service teachers of the English Language Teaching at Gazi University. The questionnaire was applied to 135 freshman pre-service teachers in 1998-1999 and 1999-2000 academic years. In the first part, the name of the cooperating school and the level of the class that were observed were asked. The second part composed of 18 questions in order to determine how much the aims of the School Experience course were understood by pre-service teachers. The third part aimed at determining how much the 13 activities included in School Experience course contributed to pre-service teachers' perception of teaching profession. According to research findings, pre-service teachers consider School Experience I course helpful in terms of administration, class environment and teaching profession. They mentioned that School Experience course offers knowledge and experience together. However, pre-service teachers also mentioned that they were unable to communicate effectively with their cooperating teachers and administrations.

Yapıcı and Yapıcı (2004) investigated the situation and problems of School Experience I course by means of pre-service teachers' perceptions. Forty-nine pre-service teachers who were enrolled in School Experience I course in the spring semester of 2001-2002 academic year in the Primary School Teaching Program of Uşak Education Faculty constituted the sample of the study. This study was a descriptive study in which activity and analysis reports written by pre-service teachers and seminar studies held on cooperating schools were investigated. When the research results were considered, although there were some deficiencies in the activities of School Experience I course, it was found

functional and helpful. Pre-service teachers mentioned that School Experience course was functional in introducing teaching profession. However, the cooperation of faculty and school was inadequate and there were some contradictions between the content of the courses being taught in the universities and applications in schools. Whereas pre-service teachers found some of the activities of School Experience functional which were “One Day of Teacher in School, One Day of Student in School, Classroom Management, Evaluation of School Experience Activities”, they regarded other activities such as “School Administrator and Rules, Observation of Minor Courses, Teaching Methods of Minor Courses” as useless. In another study, Kudu, Özbek and Bindak (2006) explored perceptions of 226 pre-service teachers of Siirt Faculty of Education at Dicle University in the 2001-2002 academic year. The data was collected by means of 3 part instrument developed by the researchers. In the first part, there were 3 questions in order to learn pre-service teachers’ personal information. Pre-service teachers indicated their opinions related with the School Experience I by means of 4 point likert type questionnaire in the second part. In the third part, there were statements related with difficulties that were encountered by pre-service teachers during School Experience I course. Similar to Yapıcı and Yapıcı (2004) study results, most of the pre-service teachers considered School Experience I as functional. It was found that School Experience I course was beneficial for recognizing teaching profession. However, pre-service teachers realized that teaching profession was more difficult than they taught. Hence, they indicated the theoretical knowledge that they were taught in faculty was insufficient and practice duration was short. To see in what kind of subjects is helpful and in what level School Experience I course is functional for pre-service teachers, Sarıtaş (2007) examined perceptions of 80 pre-service teachers and 35 cooperating teachers. Data was collected by means of two part questionnaire developed by the researcher. In the first part, there was personal information about cooperating teachers and pre-service teachers. In the second part, there were 32 closed-type questions related to activities held on School Experience I course. When the data was analyzed, similar results to Yapıcı and Yapıcı (2004) and Kudu, Özbek and Bindak (2006) study results were gained. Both groups considered School Experience I as beneficial. Interestingly, it was found that

cooperating teachers found School Experience I practices more beneficial than pre-service teachers did. All the points that were covered in School Experience I practices were found beneficial by pre-service teachers. This result shows that School Experience I is necessary and fruitful.

In order to make School Experience I more beneficial, Oğuz (2004) explored thoughts of 30 first-year pre-service primary school teachers enrolled in the Department of Primary Education, the Faculty of Education of Dumlupınar University in the 2003-2004 academic year and came up with suggestions to make the course more effective. He used case study as a qualitative research method. During the data analysis, answers given by pre-service teachers to each question were coded according to research aims. Taking the similarities and differences of codes into account, categories were formed and perception of each pre-service teacher was written under these categories. Sentences were used as analysis unit. According to the results, although School Experience I course had a positive effect on the pre-service teachers' perceptions regarding teaching profession, it was seen that naughtiness of students and deficiencies of schools had negative effects. Most of the pre-service teachers claimed that School Experience I course must exist in education faculties since they could recognize the importance of teaching profession and comprehend its seriousness, to be a more motivated teacher and learn more about students and get rid of prejudices.

Studies of School Experience I course showed that this course make pre-service teachers gain positive experiences in general, however, they also gain negative experiences. School Experience I course is beneficial to recognize the teaching profession. In fact, these experiences can be increased by means of the increase in the communication of schools and faculties. Negative experiences related with schools and students that are encountered during School Experience I course was enabled them to understand the seriousness of the teaching profession.

In addition to School Experience I course, there are various research studies related to pre-service teachers' perceptions about School Experience II course in the literature. Aksu and Demirtaş (2006) examined pre-service teachers' perceptions of School Experience II with respect to cooperating schools, cooperating school administrators, cooperating teachers, faculty members and

their aspects. The sample of the study was senior pre-service teachers of İnönü University Education Faculty in the 2004-2005 academic year. According to the research results, pre-service teachers evaluated themselves with the highest grades and evaluated school administrators with the lowest grades. Moreover, although pre-service teachers found School Experience course beneficial, in order to make it more efficient practice process and cooperation should be developed.

The results supporting the findings of the Aksu and Demirtaş's (2006) study were gained from Özkılıç, Kartal and Bilgin's (2008) study. Özkılıç, Bilgin and Kartal (2008) examined pre-service teachers' perceptions about the evaluation of themselves, faculty members and cooperating teachers during the School Experience II course. The sample of the study was 146 senior pre-service teachers (106 Female and 40 Male) from the department of Primary School Teaching Program of Education Faculty of Uludağ University. The data was collected by means of an instrument developed by the researchers by means of activities that were carried out during School Experience course. According to the research results, pre-service teachers were not supported by cooperating teachers and faculty members sufficiently. Pre-service teachers found themselves as sufficient in instructional process. In the same way, cooperating teachers and faculty members perceived pre-service teachers as sufficient in instructional process.

In the similar way, but taking also perceptions of cooperating teachers into consideration, Gökçe and Demirhan (2005) performed a study. Three hundred forty one senior students from Faculty of Education of Ankara University and Primary School Teaching Programme and Social Studies Teaching Programme of Gazi University and 80 cooperating teachers were composed of the sample of the study. Data was collected by means of 2 surveys which were developed separately for pre-service teachers and cooperating teachers by the researchers during the 2003-2004 academic year. When we look at the results obtained from pre-service teachers, cooperating teachers have a low percentage in the guidance of some areas such as prerequisite level of students, lesson plan, and preparation of lesson plan, equipment supply, and evaluation. It is found that however, cooperating teachers think that they supported pre-service teachers.

In another study, Eraslan (2008) investigated the perceptions of 47 pre-service elementary mathematics teachers in 2006-2007 academic year. Data was collected by means of a one-two page reflection of their school based experiences. In this reflection pre-service elementary mathematics teachers wrote their positive and negative experiences to reply an open-type question. This study showed that experiences of pre-service elementary mathematics teachers were proportional to approaches of cooperating teacher and faculty members. According to the results, negative experiences were more than positive ones. Considering the pre-service teachers as distracting surplus by cooperating teachers, being not aware of their tasks, not exhibiting model behaviors, not concerning the students and not giving feedback are some of the negative experiences that the pre-service teachers faced. Positive experiences gained during School Experience II were seeing the real school environment and feeling like a teacher.

Up to this point, studies of School Experience I and School Experience II courses in Turkey have been mentioned, from now on studies done out of the country related to these courses will be examined. Peterson and Williams (2008) investigated the effects of conversations between pre-service teachers and cooperating teachers. The sample of this study was pre-service secondary mathematics teachers and their cooperating teachers. Teachers' beliefs about mathematics and teaching were different in that one of them focused on controlling student behavior and rarely talked about mathematics and the other one focused on having students actively participate in the lesson. The results of the study showed that student teaching can have a profound effect on pre-service teachers' understanding of mathematics. This study demonstrated how cooperating teachers' views on teaching might play an important role in forming future teachers' views. It also demonstrated how these views provide an opportunity for pre-service teachers to learn more about mathematics teaching.

Another study emphasizing the importance of conversation between pre-service teachers and cooperating teachers was done by Talvitie, Peltokallio and Mannisto (2000). The participants of the study were 15 female and one male pre-service teacher on a pedagogical course in the teacher education program at the University of Jyväskylä. The data was collected by means of journals that were

written at the beginning and the end of the teacher education practicum. This study showed that cooperating teachers and university supervisors played a meaningful role in their professional development. The most important factor seemed to be the quality of the dialogue that was maintained during the practicum.

In another study, Capel (1997) examined the changes in pre-service teachers' anxieties and concerns after their first and second teaching experiences. That is, the concern was to examine whether there was a change over time as pre-service teachers gained experience of teacher or not. The data was collected from 106 pre-service secondary physical education teachers by means of a questionnaire that was given at the end of the first and the second teaching experiences. According to the results there was no difference between the level of anxiety or concern after the two teaching experiences. Results also showed that although there were a number of specific causes of anxiety and concern for pre-service teachers on teaching experience, these causes were the same on both teaching experiences. In addition, the greatest reason of anxiety and concern for these pre-service teachers on both teaching experiences was being observed, evaluated, and assessed by the teaching experience supervisor.

Poulou (2007) examined pre-service teachers' concerns and potential topics of reflection after their teaching experiences. The sample of the study was the 59 fourth year (52 females and 7 males), Department of Elementary Education students at the University of Thrace. The data was collected by means of the journals and including information about the teaching process and the teaching profession, and their emotions. The journals were content-analyzed by the researchers into the above three categories. The results showed that classroom management was an important issue during the teaching experience. Pre-service teachers compared their knowledge gained in the university courses and the real life situations. This gave the pre-service teachers the opportunity to organize their personal and professional identity. The results also showed that pre-service teachers' emotions changed during the teaching experience. For example, pre-service teachers were anxious in the first week of teaching experience but this anxiety converted into energy when the pre-service teachers faced with pupils. In

addition, that teaching is a profession that someone must really love children or job was found.

By using a different method, Anderson, Barksdale and Hite (2005) also conducted a study that obtained similar results. They investigated the value of early field experience. The data was collected by means of journals and data form packets from 34 pre-service elementary education teachers enrolled in their last semester of coursework before the final student teaching experience. In the data packet form, there were three sessions which are first, the presenter informed the observer what he/she would be teaching and what behaviors the observer should target. Then, the presenter taught the lesson and the observer recorded the lesson. Finally, the observer and the presenter came together and discussed the data. When the journals were analyzed, major themes, which were classroom discipline/management, pedagogy, and general positive influence, and minor themes, which were self-reflection/action, questioning strategies, and observations about pupils, were identified. Among the major themes, classroom management was the most occurring theme. By means of observing teachers they learnt which type of classroom management strategies work well. The second major theme was pedagogy. Although teachers' voices, being confident in front of pupils were not mentioned in any of the university courses, they learnt the importance of these. The final major theme was general positive influence. Pre-service teachers learnt very many things from observing cooperating teachers. Although some behaviors of teachers were not appropriate, pre-service teachers learnt from these by saying they would not do these in their future teaching life.

A study drawing attention to the importance of classroom management indirectly was made by Laursen (2007). Laursen (2007) investigated the student teachers' understanding of theory and practice and the relation between them. Data was collected by means of interviews in groups (17 first year pre-service teachers, 17 fourth year pre-service teachers). Pre-service teachers viewed teachers' work as complex and according to them, students' personal and social development were more important than the subject matter teaching. They thought that if the atmosphere was positive, then subject matter learning would be achieved. In teaching work the most important thing is that teacher must be committed to being with children. The results showed that the faculty members

teach theories but do not give information about how these theories are used in practice.

2.7 Summary of the Literature Review

Since the society always faces with some innovations, necessary changes and developments are done in education. That is, in line with these changes and developments, regulations are necessary in the education programs (Özden, 2002). The final elementary program was put into practice in 2005-2006 education year throughout Turkey (MoNE, 2005). Since there were some changes in the instruction, assessment, and classroom management part, teachers' roles in these issues also changed. The quality of education faculties where pre-service elementary teachers are educated is therefore investigated. School Experience courses that give opportunities of making observations about their jobs and Practice Teaching course that gives opportunities of applying their observations in real class environment to pre-service teachers are the most important elements of teacher education programs (Hoşgörür, Kuşdemir, & Katrancı, 2006). That is, pre-service teachers understand the relation between theory and practice by means of these practice courses. There are several studies related to the pre-service teachers' perceptions about practice courses, School Experience I and School Experience II, in the literature (Aksu & Demirtaş, 2006; Cephe, 2001; Gökçe & Demirhan, 2005; Oral & Dağlı, 1999; Özkılıç, Kartal, & Bilgin 2008; Turgut, Yılmaz, & Firuzan, 2008). Although there are several research studies about the effects of School Experience I and School Experience II courses separately on pre-service elementary mathematics teachers' professional growth, less focus is given to the changes of pre-service elementary mathematics teachers' views and reflections from School Experience I to School Experience II course. More specifically, no studies have investigated pre-service elementary mathematics teachers' views and reflections on instruction, assessment, and classroom management issues which are important current issues in the new elementary mathematics education program. In an attempt of examining pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues is believed to give feedback to teacher educators and researchers to understand what pre-service elementary

mathematics teachers learnt from School Experience I and School Experience II courses. Thus, in this study, my aim was to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses.

CHAPTER 3

METHOD

In this chapter, the research design and procedure, information about the subjects of the study, the data collection instrument and the data collection process, the data analysis procedure, the quality of the study, and the limitations of the study will be described.

3.1 Design of the Study

This study intends to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. The data of the study was collected by means of school experience course reports from the pre-service elementary mathematics teachers enrolled in the teacher education program at METU. Details of the reports will be given in the following parts. In an effort to attain the purpose of this study, data were collected through qualitative research techniques.

3.2 Conceptual Overview

The qualitative research technique was used in order to investigate the extent to which university education influences on pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes.

Denzin and Lincoln (2005) defined qualitative research as a field of inquiry in its own right. They defined qualitative research as “a situated activity that locates the observer in the world” (p. 3). They added that qualitative research “consists of a set of interpretive, material practices that make the world visible”

(p. 3) and these practices “turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self” (p. 3). In addition to Denzin and Lincoln, Merriam mentioned that "qualitative researchers are interested in understanding the meaning people have constructed, that is, how they make sense of their world and the experiences they have in the world" (1998, p. 6). Similarly, Patton explained the qualitative research as "the nature of that setting--what it means for participants to be in that setting, what their lives are like, what's going on for them, what their meanings are, what the world looks like in that particular setting ..." (1985, cited in Locke, Myers, Herr, 2001, p. 482). Likewise, Merriam stated that qualitative research was "abstractions, concepts, or hypotheses, or theories rather than (testing) existing theory" (1998, p. 7).

As it is understood from above, the researcher makes observations in the natural setting that is the researcher makes contact with their participants in their natural setting in a qualitative research. In order to get further information the researcher asks planned and unplanned questions to their participants. By means of all these, the researcher understands the situation and participants' behaviors truly. These in-depth understandings are described in words rather than numbers (McMillan and Schumacher, 1997).

This study aims to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. In other words, the study strives to understand how pre-service elementary mathematics teachers construct their views and reflections about instruction, assessment, and classroom management issues while involving in real mathematics classroom settings during their school experience courses. The attempt is not to predict what pre-service elementary mathematics teachers' views and reflections are, but to report the actual case. That is, I want to gain an in-depth understanding of what their views and reflections were after School Experience I course and after School Experience II course. For this purpose, a qualitative method was used to analyze the nature of changes in pre-service elementary mathematics teachers' views and reflections throughout the university

education. In other words, qualitative technique was used to get an in-depth understanding of the meaning that pre-service elementary mathematics teachers constructed about instruction, assessment, and classroom management issues in elementary mathematics classes.

3.3 Participants of the Study

“Qualitative inquiry seeks to understand the meaning of a phenomenon from the perspectives of the participants thus it is important to select a sample from which the most can be learned” (Merriam, 2002, p. 12). These participants were “information-rich cases” that was described by Patton (2002) as “cases from which one can learn a great deal about matters of importance and therefore worthy of in-depth study” (p. 242). For this reason, in this research study purposive (purposeful) sampling technique was used in order to select the participants of the study.

Purposive sampling is appropriate in occasions where the researchers need to select participants who have particular characteristics needed for the study. That is, by purposive sampling method, the researchers select people who are believed to provide the data needed (Fraenkel & Wallen, 2006). Therefore, purposive sampling method was used to obtain the representative sample of this study. School Experience course was the criterion that was taken into consideration to select the representative sample. Since this study investigates pre-service elementary mathematics teachers’ views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes by means of school experience course reports, the participants were selected based on their enrollment in a School Experience I course during the spring semester of 2004–2005 academic year and in a School Experience II course during the fall semester of 2007-2008 academic year. Twenty-nine pre-service elementary mathematics teachers enrolled in School Experience I course during the spring semester of 2004–2005 academic year and 31 pre-service elementary mathematics teachers enrolled in School Experience II course during the fall semester of 2007-2008 academic year. Because only 19 pre-service elementary mathematics teachers took both School Experience I and School Experience II courses, they were asked whether they would voluntary to

participate in this study. All of those 19 pre-service teachers accepted to be a participant of the study. Furthermore, 90% of pre-service elementary mathematics teachers graduated from Anatolian Teacher High Schools. The sampling procedure and participants of this study was summarized in the Figure 3.1.

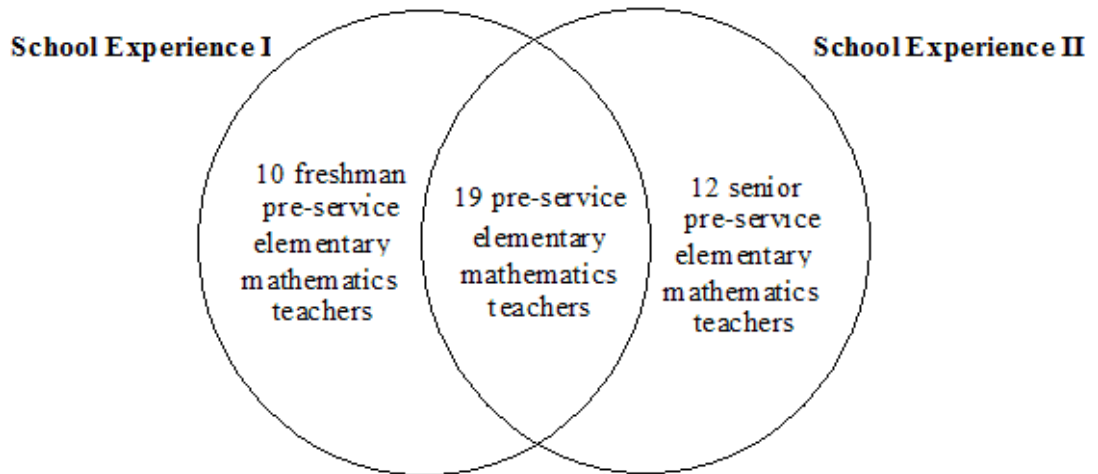


Figure 3.1: Sampling procedure and participants of the study

Nineteen pre-service elementary mathematics teachers involved in this study made their observations in their cooperating schools for 3 months during the spring semester of 2004-2005 academic year and fall semester of 2007-2008 academic year. The cooperating schools, which were private and public elementary schools, the participants made their observations in 2004-2005 academic year and in 2007-2008 academic year were given in Table 3.1

Table 3.1: Distribution of cooperating schools

Cooperating Schools	Students
Public-Public	S2, S5, S6, S9, S10, S14, S15
Public-Private	S1, S7
Private-Private	S8, S11, S13, S16
Private-Public	S3, S4, S12, S17, S18, S19

As seen from the table, 7 of the 19 pre-service elementary mathematics teachers observed the mathematics lessons in the public schools and 4 of them observed the mathematics lessons in the private schools both during 2004-2005 and 2007-2008 academic year. Although 2 of the 19 pre-service elementary mathematics teachers observed the mathematics lessons in the public schools during 2004-2005 academic year, they observed the mathematics lessons in private schools during 2007-2008 academic year. Furthermore, 6 of them observed the mathematics lessons in the private schools during 2004-2005 academic year, they observed the mathematics lessons in public schools during 2007-2008 academic year.

3.3.1 Teacher Education Program

Pre-service elementary teachers are educated through four year undergraduate education programs in Turkey. Universities arrange their programs' coursework according to HEC. HEC asked education faculties to start to implement the new programs in the 1998-1999 academic year (HEC, 1998a). In the new program, in addition to the course lists determined by the HEC, faculty members have opportunity to add courses that will be useful for pre-service teachers in their own universities. The 1998 program has four components: general education, professional education, subject matter specialty studies, and electives.

In this program, some of courses are new for the pre-service teachers, e. g. “School Experience I”, “School Experience II,” “Classroom Management,” and “Instructional Technology and Material Development” courses were not included in the previous program (HEC, 1998a). In the following section, details of elementary mathematics teacher education program will be given.

3.3.1.1 The Elementary Mathematics Teacher Education Program

In the university catalog the main purpose of the mathematics teacher education program is mentioned as “to educate mathematics teachers with a good self- image, an outgoing personality, a sense of humor and an interest in helping their students to understand mathematics in a meaningful way. In addition, the program also aims to develop teachers with a sound understanding of how children learn mathematics; confident in using technology; capable in problem-solving; attentive to human rights, democracy, and ethics. The program emphasizes critical thinking, personal reflection, and professional development of pre-service math teachers” (METU, 2003).

Pre-service elementary mathematics teachers during their 4 years of teacher training are required to take a number of courses in the different branches of mathematics, and several courses related to teaching profession. The courses offered by the 1998 program are given in Table 3.2 (METU, 2003).

Table 3.2: Courses taken by pre-service elementary mathematics teachers

FIRST YEAR	
<i>First Semester</i>	<i>Second Semester</i>
<i>MATH 111</i> Fundamentals of Mathematics	<i>MATH 112</i> Introductory Discrete Mathematics
<i>MATH 119</i> Calculus with Analytic Geometry	<i>MATH 120</i> Calculus for Functions of Several Variables
<i>PHYS 181</i> Basic Physics I	<i>PHYS 182</i> Basic Physics II
<i>ENG 101</i> Development of Reading and Writing Skills I	<i>ENG 102</i> Development of Reading and Writing Skills II
<i>EDS 119</i> Introduction to Teaching Profession	<i>ELE 132</i> School Experience I
<i>IS 100</i> Introduction to Information Technologies and Applications	
SECOND YEAR	
<i>Third Semester</i>	<i>Fourth Semester</i>
<i>MATH 115</i> Analytical Geometry	<i>MATH 116</i> Basic Algebraic Basic Algebraic Structures
<i>MATH 201</i> Elementary Geometry	<i>MATH 219</i> Introduction to Differential Equations
<i>CHEM 283</i> Introductory General Chemistry	<i>BIO 106</i> General Biology
<i>EDS 221</i> Development and Learning	<i>ELE 224</i> Instructional Planning and Evaluation
<i>ENG 211</i> Academic Oral Presentation Skills	<i>ELE 300</i> Computer Applications in Education
<i>HIST 2201</i> Principles of Kemal Atatürk I	<i>HIST 2202</i> Principles of Kemal Atatürk II
THIRD YEAR	
<i>Fifth Semester</i>	<i>Sixth Semester</i>
<i>MATH 260</i> Linear Algebra	<i>ELE 240</i> Probability and Statistics
<i>ELE 317</i> Instructional Development and Media in Mathematics	<i>ELE 332</i> Laboratory Applications in Science II
<i>ELE 331</i> Laboratory Applications in Science I	<i>ELE 336</i> Methods of Science and Mathematic Teaching
<i>TURK 305</i> Oral Communication	<i>EDS 304</i> Classroom Management
<i>Elective I</i>	<i>TURK 306</i> Written Communication
<i>Elective II</i>	<i>Elective III</i>
FOURTH YEAR	
<i>Seventh Semester</i>	<i>Eight Semester</i>
<i>ELE 437</i> School Experience II	<i>ELE 420</i> Practice Teaching in Elementary Education
<i>ELE 443</i> Methods of Mathematics Teaching	<i>ELE 448</i> Textbook Analysis in Mathematics Education
<i>ENG 311</i> Advanced Communication Skills	<i>EDS 424</i> Guidance
<i>Elective IV</i>	<i>Elective VI</i>
<i>Elective V</i>	

Source: (METU, 2003).

As you could see from the Table 3.2, in addition to those mathematics courses, pre-service elementary mathematics teachers take courses namely School Experience I, School Experience II, and Practice Teaching in Elementary Education courses that are directly related to teaching practice in elementary schools. Since all of the data collection procedure took place in the School Experience I and School Experience II courses, content of these courses are described below.

3.3.1.1.1 School Experience I

The School Experience I course is a first year course in the elementary mathematics teacher education program. The general goal of the course is to develop pre-service elementary teachers' gained knowledge and abilities in a school environment. In other words, school experience is a planned course to make teachers gain the qualities of teaching profession (MoNE, 1998). The content of this course includes classroom observations related to organization and management of school, school-family cooperation, school and related problems, daily activities in the school, a day of a teacher, a day of a student, group activities, various teaching learning activities, observation of major and non-major courses, examination of school's materials, and written sources (HEC, 2005). This course is mainly based on observation. In other words, pre-service teachers observe the mathematics lessons that were taught in their cooperating schools. In addition to the practices in schools, the course gives time for pre-service teachers to assimilate their experience, relate them to the work being done at the university, and to discuss them with the instructor and other students taking the same course. Therefore, it provides opportunities for an increase in their professional competence.

The School Experience I course is a 3 credits course in which 1 hour is theoretical and 4 hours are practice. That is, pre-service elementary mathematics teachers were required to attend mathematics lessons for 4 hours in their cooperating schools (per semester; total 40 hrs). In this course, the pre-service teachers were assessed by doing activities asked by cooperating teachers and 1 hour attendance to the course in the faculty. In addition to these, the pre-service elementary mathematics teachers were expected to complete two assignments;

namely, a portfolio including a journal writing (5 journals), and reports including reflection papers. In journal writing pre-service elementary mathematics teachers wrote their experiences day by day. The purpose of this writing was to allow the pre-service teachers to reflect upon and synthesize their learning experience and their attitudes.

The second assignment, reports, required students to write 4 reports. The first report was about mathematics lessons. The report should describe the conduct of mathematics lessons, including a description of the kind of work done, interactions, assessment procedures, habits, and such major characteristics of a mathematics lessons in the cooperating schools. The second report should include a description of how the curriculum is implemented in this school. In the third report pre-service elementary teachers needed to write about the other activities of the school, such as general rules, services, clubs, sports, and etc. In the fourth report pre-service teachers were supposed to interview with their cooperating teacher. By means of this interview, duties and responsibilities of a mathematics teacher related to teaching and other school tasks will be found out. The details of Report I that was used in this study will be given in the following parts.

All the reports mentioned above included five common basic sections. The first section was gathering data about the name of the report, activity number, pre-service elementary mathematics teachers' name, and pre-service elementary mathematics teacher's cooperating teacher's name and school name. The second part included general purpose of the report, specific questions that pre-service teachers were going to address and the importance of these issues. The third part included information about how pre-service teachers collected information and where and from whom they got the information. In the fourth part pre-service teachers described what they observed and obtained from the school about the report. The final part was discussion and conclusion part. Pre-service teachers interpreted and discussed data that they obtained, reflected on how their findings influenced their thinking about being a teacher.

3.3.1.1.2 School Experience II

The School Experience II course is a fourth year course in the elementary mathematics teacher education program. The general goal of the course is to

prepare pre-service elementary teachers for teaching practice. With this course, it is aimed that pre-service teachers will acquire teaching competence and develop their teaching skills. Whereas pre-service elementary teachers observe the classroom during School Experience I course, they put into practice what they observed and learned in School Experience II course. When pre-service elementary teachers complete the School Experience II course, it is expected that they developed the following abilities: planning the lesson, teaching mathematical topics, using classroom management techniques, asking questions, and evaluating of students' works (HEC, 1998).

The School Experience II course is a 3 credits course where 1 hour is theoretical and 4 hours are practice. The pre-service elementary mathematics teachers were expected to complete five assignments; namely, expectation paper, observation/investigation reports (4 reports), poster project, class discussion and end of semester reflection paper.

In expectation paper, pre-service elementary mathematics teachers reflected their expectations about the school context, students, teachers, and their own learning in the context. The observation/investigation reports required students to write 4 reports. By means of them pre-service elementary mathematics teachers reflected their true observations. In the first report, pre-service elementary mathematics teachers observed how their teachers taught specific mathematics concept and how students learn it. They tried to find the answers of some questions. Some of the questions were as the following:

- What are the students' difficulties, what do they struggle to learn?
- How much do you think is related to the concept/students' background knowledge/students' studying skills/teacher?

In the second report, pre-service elementary mathematics teachers observed whether their teachers implement the new curriculum or not. In the third report, pre-service elementary mathematics teachers described the culture of the school and the class where they observe. By means of this report pre-service elementary mathematics teachers understood the class and the school culture. In the fourth report, pre-service elementary mathematics teachers described the conduct of mathematics lessons, including a description of the kind of work done,

interactions, assessment procedures, habits, and such major characteristics of a mathematics lessons in the cooperating schools.

In the poster project, pre-service elementary mathematics teachers prepared posters that were focusing on an understanding of a mathematical concept for the students in their school. In the class discussion, pre-service elementary mathematics teachers read the texts that were assigned to them and wrote a reflection paper and participated to the class discussions. In the end of semester reflection paper, pre-service elementary mathematics teachers wrote a reflection paper on their school experience and what had they learned from this experience. Therefore, in the school experience courses the pre-service elementary mathematics teachers had many learning opportunities to see elementary and middle school classroom activities.

To become more specific, in this research study, since my aim is to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses, I need the assignments that were used in both School Experience I and School Experience II courses. Reports that are mentioned above were common in both courses. That is why those reports were my data collection instruments in this research study.

3.4 Data Collection Process

The data were collected from pre-service elementary mathematics teachers enrolled in Elementary Mathematics Teacher Education program during the spring semester of 2004-2005 and fall semester of 2007-2008 academic year. The reports were gathered two times as pre-test and post-test to compare pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues and to identify the nature of changes is. The first report that was collected at the end of the School Experience I course during the spring semester of 2004-2005 was used as pre-report. The second report that was collected at the end of the School Experience II course during the fall semester of 2007-2008 was used as post-report. A time schedule indicating the data collection procedure chronologically was given in Table 3.3.

Table 3.3: Time schedule for data collection

Date	Data Collection
May 2005 administration (Spring semester - at the end of the School Experience I course)	Pre-reports
December 2007 administration (Fall semester – at the end of the School Experience II course)	Post-reports

3.5 Data Sources

This study investigated the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. To gather information, a report, which was written by pre-service elementary mathematics teachers during the School Experience I course and School Experience II course related to instruction, assessment, and classroom management was used as a data collection instrument. The details related to the reports were given below.

3.5.1 The Reports

As mentioned above the first report that was used as a data collection instrument was about mathematics lessons. The report should describe the conduct of mathematics lessons, including a description of the kind of work done, interactions, assessment procedures, habits, and such major characteristics of mathematics lessons. The followings were some of the issues that pre-service elementary mathematics teachers may discuss in their reports:

- How teaching takes place? What is the method(s) teacher use in mathematics lessons? How s/he uses these methods (a description of the procedure)? Are there any traditions/habits of teacher in mathematics

lessons? How does s/he assess student learning? Are there any specific materials that teacher use (overhead projector, worksheets)? etc.

- How learning takes place? What are the expectations from students during, before, and after the lessons? What kind of interaction exists among students and between students and the teacher during math lessons? Are there any common learning problems?
- How the classroom management handled? What specific methods does teacher use to handle the misbehavior? How does s/he manage the orderliness of the lesson during teaching?

In addition to answering these questions, pre-service elementary mathematics teachers discussed these questions and made reflections about them. As it is understood from the reports' content, information about pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues can be gathered.

Up to this point, the design of the study, the information about the participants, the data collection instrument, and the data collection process were stated. From now on the data analysis procedure, the quality of the study, and the limitations of the study will be mentioned.

3.6 Data Analysis Procedure

Merriam (1998) categorized qualitative data analysis as the following: ethnographic analysis, narrative analysis, phenomenological analysis, the constant comparative method, content analysis and analytic induction. In this study, content analysis method was used.

“Content analysis views data as representations not of physical events but of texts, images, and expressions that are created to be seen, read, interpreted and acted on for their meanings, and must therefore be analyzed with such uses in mind” (Krippendorff, 2004, p. 13). Also, Holsti (1969) offers a definition of content analysis as, "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (p. 14).

According to Bauer, “content analysis is one of the classical procedures for analyzing textual material no matter where this material comes from ranging from media products to interview data” (Bauer, 2000 cited in Flick, 2006, p. 312).

“One of its essential features is the use of categories, which are often derived from theoretical models: categories are brought to the empirical material and not necessarily developed from it, although they are repeatedly assessed against it and modified if necessary” (Flick, 2006, p. 312).

In this study, in which an attempt to produce an in-depth description of the nature of changes in pre-service elementary mathematics teachers’ views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses, reports of 19 pre-service elementary mathematics teachers were analyzed. Thus, in this research study content analysis method was used in the analysis process of the data.

In this research study, pre-service elementary mathematics teachers’ reports were first read and main issues related to instruction, assessment, and classroom management that appeared in their writings were summarized. Recurring issues were noted and a table constructed including who mentioned that. The most recurring issues were considered as the subcategories of instruction, assessment, and classroom management for the data analysis. I compared these subcategories with the other pre-service elementary mathematics teachers’ reports in the same course. After finishing the comparison of reports with each other, I redefined my subcategories. During this process, I also defined the concepts, sentences, phrases, words that will be written under these subcategories. I followed the same strategy while analyzing the reports of 2007-2008 academic year. That is this process was performed for reports of 2004-2005 academic year and reports of 2007-2008 academic year separately. After the subcategories were finalized, the whole data were categorized once more.

This approach helped me to analyze the pre-service elementary mathematics teachers’ views and reflections of instruction, assessment, and classroom management issues. The first category was pre-service elementary mathematics teachers’ views and reflections about instruction process that teachers performed in their class. The second category was elementary mathematics teachers’ views and reflections about assessment techniques that teachers used in their class. Final category was elementary mathematics teachers’

views and reflections about classroom management techniques that teachers applied in their class.

3.7 The Quality of the Research

The practical standards that help researchers in judging the quality of the conclusions from the findings of the research can be referred as the quality of the research (Miles & Huberman, 1994). The efforts and skills of the researcher determine the quality of a qualitative research (Golafshani, 2003).

Reports were collected directly from the pre-service elementary mathematics teachers. They wrote what they observed in their cooperating schools in the reports in English. Thus, there will be no translation and intervention in pre-service teachers' reports where they reflected their own views. In addition, multiple coders coded the data during the data analysis and an expert monitored the whole data analysis process. The first coder was the researcher and the second coder was an MS student in the Elementary Science and Mathematics Education Program in the Faculty of Education at METU. Both coders initially read the reports of the pre-service elementary mathematics teachers in order to reach a common understanding of the data. Then, the coders determined the subcategories that would be used in the analysis and coded the data together. This helped the subcategories to reach a common understanding. The process of categorizing continued until no data was left uncategorized. The categorizing process and the final subcategories were monitored by an expert who is an instructor in the elementary mathematics teacher education program at METU.

3.8 Limitations of the Study

The number of participated teachers was limited with a total 19 pre-service elementary mathematics teachers in this study. The limited number of participating pre-service teachers did not allow the researcher to generalize the findings to a larger group of pre-service teachers. However, since this study is a qualitative one, I do not have purpose of generalization. Another limitation of this study is related to the reflections. Pre-service teachers' reflections are limited to their observations in their cooperating schools. That is, they may not write their actual opinions. The other limitation is whether pre-service elementary

mathematics teachers wrote the real data that they observed or not during their enrollment in School Experience courses. I mean since the reports are assignments of the courses, pre-service elementary mathematics teachers may write the general things apart from what they really observed in the schools. That is, using only reports that were graded by the instructor of the course may not reflect pre-service teachers' actual opinion. However, since 2-3 pre-service elementary mathematics teachers observed the same mathematics classroom, the similar issues that they mentioned in their reports could be evidence that they reflect from the real classroom environment that they observed. Moreover, pre-service elementary mathematics teachers wrote their reports in English. However, they might have felt difficulty in expressing their observations in English. Therefore, they might not have written what they really wanted to write. Thus, this is another limitation of the present study. In addition, pre-service elementary mathematics teachers observed the old mathematics curriculum during School Experience I course and the new one during School Experience II course. The change in their views and reflections about instruction, assessment, and classroom management might have resulted from the change in the elementary mathematics curriculum.

CHAPTER 4

RESULTS

The purpose of this study is to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. The results of the study are based on the qualitative data obtained from the pre-service elementary mathematics teachers' reports and these results are grouped under 3 major categories. These categories are (1) pre-service elementary mathematics teachers' views and reflections about instruction, (2) pre-service elementary mathematics teachers' views and reflections about assessment and (3) pre-service elementary mathematics teachers' views and reflections about classroom management.

In the first category, pre-service elementary mathematics teachers' views and reflections about instruction were grouped under subcategories: teachers' use of instructional methods, teachers' use of instructional material, and teachers' behavior as well as everyday routine habits. In the second category, pre-service elementary mathematics teachers' views and reflections about assessment were identified by taking into account the traditional assessment strategies and alternative assessment strategies used in the classroom. Lastly, pre-service elementary mathematics teachers' views and reflections about classroom management were identified by the punishment, minimum intervention, and positive encouragement.

4.1 Organization of the Result Chapter

As it was stated above, in order to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction,

assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I to School Experience II courses, data was collected from pre-service elementary mathematics teachers' School Experience I and School Experience II course reports. Results obtained from these reports were presented in two ways. Firstly, an overview of subcategories of the fore mentioned categories were given in tables. These tables indicated the number and percentage of reports where these subcategories had been obtained. Then, pre-service elementary mathematics teachers' interpretations or direct quotes taken from their reports were given for these categories. While doing this, some corrections were done grammatically in order to make these interpretations or direct quotes more accurate. In other words, some corrections were done without changing the meaning of the phrases. An example of corrections to pre-service elementary mathematics teachers' quotes was given in Table 4.1.

Table 4.1: Example of corrections to preservice elementary teachers' quotes

Preservice Teacher's Quotes	Correction to Teacher's Quotes
Use of materials enable the teachers to use the time properly and bring them that aims in a shorter way.	Use of materials enables the teachers to use the time properly and reach to the aims in a shorter period of time.

Since the purpose of this study is to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections of School Experience I and School Experience II, firstly analyses were done for School Experience I and then for School Experience II courses separately. Finally, a comparison of School Experience I and School Experience II courses will be given. In the following parts, pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues for School Experience I course and School Experience II course will be given respectively.

4.2 Pre-service Elementary Mathematics Teachers' Views and Reflections about Instruction

How the success of the students in mathematics can be increased can be understood by discussing the issues related with mathematics instruction; therefore, these issues are important. How teaching takes place, what the method(s) teacher use(s) in mathematics lessons, how s/he uses these methods (a description of the procedure), what materials are available for mathematics instruction (computers, laboratories, library, and others) were some of the questions that were asked to pre-service teachers to write their views and reflections in their reports. Pre-service elementary mathematics teachers' answers to these questions were gathered under the instruction category.

4.2.1 Pre-service Elementary Mathematics Teachers' Views and Reflections about Instruction in 2004–2005 Academic Year

An overview of subcategories of instruction and the number and percentage of pre-service elementary mathematics teachers' reports, where these subcategories were derived, are given in Table 4.2.

Table 4.2: Subcategories derived from pre-service elementary mathematics teachers' 2005 reports related to instruction

Subcategories of instruction	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about		
Teachers' Use of Instructional Methods		
Question-answer method	10	53%
Problem solving method	1	5%
Group working	2	11%
Student centered	2	11%
Giving examples from daily life	9	47%
Showing different ways of solutions	4	21%
Using word problems	1	5%
Induction method	4	21%
Making students discover	1	5%
Deduction method	1	5%
Explanation method	2	11%
Demonstration	1	5%
Direct teaching	1	5%
Teacher centered	2	11%
Giving basic information	2	11%
Giving definition	4	21%
Giving formulas	2	11%
Solving routine examples	6	32%
Teachers' Use of Instructional Material		
Using materials (manipulative, OHP...)	18	95%
Using different textbooks	2	11%
Teachers' Behavior		
Using body language	1	5%
Making jokes	3	16%
Being enthusiastic	2	11%
Giving opportunity to students	1	5%
Giving equal permission to students	2	11%
Encouraging students to ask questions	6	32%
Ignoring unsuccessful students	2	11%
Teachers' Everyday Routine Habits		
Making connection between previous subjects	6	32%
Asking questions about previous subjects	2	11%
Giving clues about the new topic	2	11%
Starting lesson with an interesting question	1	5%
Caring about whether the subject is understood	2	11%

As seen from the table, nearly all of the pre-service elementary mathematics teachers (18 out of 19, 95%) expressed the importance of *using materials* in mathematics classes. Based on pre-service elementary mathematics teachers' observations of their cooperating teachers' use of materials, they expressed that use of the materials during instruction helped students learn the concepts meaningfully and easily.

For instance:

"Use of materials enables the teachers to use the time properly and reach to the aims in a shorter period of time. As a result of these, using materials gives them sense of confidence and comfort about what they should do for better teaching" (S8).

Another pre-service teacher mentioned that:

"In my opinion, using materials in geometry is logical because students require more concrete examples in geometry and using materials is very beneficial for students to understand the subject" (S9).

Similarly,

"Teacher should use overhead projector every lesson because with it she can show complicated figures easily and the message and the subjects are easily send to the students. Furthermore, the credibility and trustworthiness of the lesson can be increased" (S10).

As seen from pre-service elementary mathematics teachers' reports, they believe that use of materials facilitates the teachers' work of instruction. Also, students construct their knowledge meaningfully and easily by means of materials. That is, in order to make the lessons more effective, teachers should use materials during the instruction.

While 10 (53%) of the 19 pre-service elementary mathematics teachers expressed views about *question-answer method*, 3 of them were positive, 2 of them were negative and 5 of them did not make any reflection. They stated that question-answer method makes the students think and discover.

Some of the positive statements were:

"I think question-answer is a good method, because teacher propels the students to think in this way. She does not give the information readily. I think this method prevents memorizing the subjects without learning" (S5).

“Asking questions to arise the interest on the topic is useful in mathematics instruction so that the students pay attention to the lesson” (S8).

Similarly,

“By means of question-answer method, the teacher learns both how much the student knows and where to start teaching” (S12).

As can be seen pre-service teachers stated that since the teachers know how they teach the subject and what their students already know about the subject, they can make the students interested in the lesson by means of question-answer method. Therefore, students learn the conceptual meaning rules instead of memorizing of them. On the other hand, some of the pre-service teachers mentioned negative views about using question-answer method in mathematics classes.

For instance:

“There are several learning intelligence and learning abilities. For example, some students can understand the topics by listening, whereas some of them need visual things to understand. Students can construct a link with their knowledge by themselves, on the other hand, some links need to be constructed by teacher. In other words, the teacher should address the students’ needs. Therefore, in my opinion my cooperating teacher should use different methods. She should try to reach more students’ learning style” (S10).

The other pre-service teacher mentioned that:

“Although question-answer method encourage students and make students’ learning more effective, they may sometime lead to more waste of time” (S18).

As was stated, pre-service teachers believed that although using different styles may be time consuming, because of different learning intelligences, teachers should still use different styles.

In addition to methodology and question answer method, pre-service teachers mentioned that in order to get a better result in instruction process, *making connection with and asking questions about a previous subject* is also important. Pre-service elementary mathematics teachers (8 out of 19, 43%) emphasized this as expressed below:

“The teacher asks the students what they know about the subject that he will discuss. By doing this, he can learn about their background. He can learn whether the concepts of that issue are clear in the students’ mind or not. He sees the level of their knowledge, after that he decides how he will teach the lesson. If the students do not know a lot about the topic, he tells it in more detail and gives more examples” (S7).

Another pre-service teacher said that:

“Making a comparison between the previous topic and the new topic prevents the student from forgetting the previous issues. Asking the students previous issues make them participate in the lesson” (S19).

In the same way,

“My cooperating teachers start lesson with asking questions about previous lecture. By means of making her students remember the topic, she tries to deep silence” (S10).

The other important issue raised in the pre-service elementary mathematics teachers’ reports related to instruction is *giving examples from daily life* as illustrated below:

“Teacher uses the current events when lecturing so this provides the lesson to be more fun and interesting. Therefore, the students learn and understand the subject easily. For example, she gave some examples for the usage of milliliter and liter in the daily life. She said that “we use milliliter in medicine and chemistry”; in addition, she made a joke about the usage of them that was; “in movies bombers use these units to make a bomb” and everyone laughed including me. By this way classroom management was provided and she got all the attention on the subject and provided students concentrate on the subject” (S3).

Another pre-service teacher mentioned:

“He showed shopping as an example of rounding numbers in the last digit. He told that people pay 100 although the price of the product is written as 99 on the ticket” (S7).

Parallel to this view,

“Memorizing the formulas and the ways of the solutions are not beneficial in the mathematics teaching. This may be prevented by telling how the formula was gathered and in which areas these subjects are used in daily life” (S9).

“By giving the examples from their environment, teacher had less difficulty in abstract terms” (S12).

The above views and reflections showed that some of the pre-service elementary mathematics teachers believed that lessons are more meaningful and

interesting by means of examples from daily life. If the teachers make connection of the subject with the daily life, instead of memorizing the rules or the subject, the students will learn them meaningfully.

Also, there were less frequently mentioned subcategories by pre-service elementary teachers such as *using body language, starting lesson with an interesting question, giving opportunity to students and making students discover*.

For example, one of the pre-service teachers said that:

“Teacher starts a new topic with an interesting question(s). By means of this students start to think about the questions therefore about the subject” (S8).

Another pre-service teacher stated the importance of *making students discover*:

“While solving problems, teacher does not give the answer directly; she makes students find their answers themselves by asking other questions to them. Then they learn better since they become very excited and happy when they find the answer” (S17).

To sum up, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, nearly all of them stated the importance of using the materials. Use of materials gives time for the teachers for other activities especially in geometry subjects. Also, since students’ learning styles are different from each other, it gives more chance to teach the subjects. Although positive views were expressed for the question-answer method, negative views were also expressed for it. Pre-service teachers mentioned that making connection between the previous subject and the new one and between real life and the subject is also important for the understanding of the subject easily. In the following part, pre-service elementary mathematics teachers’ views and reflections about instruction for School Experience II course will be given.

4.2.2 Pre-service Elementary Mathematics Teachers’ Views and Reflections about Instruction in 2007–2008 Academic Year

An overview of subcategories of instruction and the number and percentage of pre-service elementary mathematics teachers’ reports, where these subcategories were derived, are given in Table 4.3.

Table 4.3: Subcategories derived from pre-service elementary mathematics teachers' 2007 reports related to instruction

Subcategories of instruction	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about		
Teachers' Use of Instructional Methods		
Question-answer method	3	16%
Problem solving method	2	11%
Group working	2	11%
Student centered	3	16%
Giving clues to find mistakes	1	5%
Giving enough time to think	4	21%
Giving feedback	1	5%
Explaining reason of rules	1	5%
Giving examples from daily life	8	42%
Showing different way of solutions	2	11%
Using word problems	2	11%
New curriculum	7	37%
Demonstration	1	5%
Direct teaching	14	74%
Teacher centered	3	16%
Giving formulas	1	5%
Traditional way	3	16%
Memorizing rules	4	21%
Erasing wrong solutions	2	11%
Students copy from the board	3	16%
Giving definition	6	32%
Discussion-discovery	3	16%
Teachers' Use of Instructional Material		
Using materials (manipulative, OHP...)	17	90%
Preparing activity	7	37%
Teachers' Behavior		
Using body language	1	5%
Being enthusiastic	1	5%
Being monotone	1	5%
Reinforcements, punishments, reprimands	3	16%
Giving equal permission to students	2	11%
Encouraging students to ask questions	3	16%
Trying gain students' interest	1	5%
Allowing students to ask/solve	2	11%
Teachers' Everyday Routine Habits		
Making connection between previous subjects	3	16%
Starting lesson with an interesting question	2	11%
Correcting misconceptions	1	5%
Well planned lessons	2	11%
Summary of lesson	2	11%

As seen from the table, nearly all of the pre-service elementary mathematics teachers (17 out of 19, 90%) expressed the importance of *using materials* in mathematics classes. They mentioned that teachers should use materials in order to make students better understand the concepts and to make the lessons more effective and interesting. They stated that materials were useful in mathematics instruction.

For example:

“Teachers think that if the student uses the materials on their own with the guidance of the teacher, they learn the concept easily and the usage of materials becomes effective in the lesson. As a result, they understand the concepts of mathematics by using materials and their thinking skills improve” (S4).

Similarly,

“The students would characterize and interpret the mathematical concepts easily by means of materials” (S6).

In the same way,

“Use of technology such as overhead projector or worksheets also facilitates learning and also makes math more concrete” (S14).

Another pre-service teacher stated that:

“To attract the students’ attention teachers make the lesson interesting with some materials. Otherwise, they will be bored after half an hour, so the lessons will not be productive” (S15).

In addition to the above mentioned results, most of the pre-service elementary mathematics teachers (14 out of 19, 74%) stated that implementation of the new curriculum was not efficient. These pre-service teachers expressed that teachers continued to use *direct instruction methods* instead of the new curriculum methods in their lessons. However, the pre-service teachers involved in the study objected to teachers’ methods of using direct teaching.

“I think the direct instruction method is not an effective way in students’ learning. Students only try to copy the notes from the blackboard in the direct instruction, because their only aim is to write, not to understand the concept. Since students’ attention easily decreases, their learning decreases” (S2).

“The teacher gives the information directly and then solves a question by herself and this also shows students how the procedure is applied. The students do not conceptually learn the topic; they could not relate the information given in the lesson with the information in their schema. That is, just introducing the definitions and the algorithm of the issues without posing meaning to them makes no sense and actual learning cannot be accomplished” (S17).

Similarly, another pre-service teacher mentioned that:

“Students’ learning took place in a classical way as a result of direct instruction. Lessons were generally teacher based and what students do commonly was to copy the problems on the board to their notebooks” (S9).

“Teachers who use direct instruction method encourage students to memorize. In fact, the students solve the questions by using the rules; however, they don’t know why they do this. These students don’t know the concepts but follow the rules. Such a learning leads the students confuse the rules” (S5).

“Since my cooperating teacher teaches topic directly, he does not let the students to construct their own meaning of topic” (S10).

“I think direct instruction discourages the students from developing their problem solving skills and making logical reasoning about the problems” (S19).

It could be deduced from the extracts above, pre-service teachers believed that since the students copy the writings from the board, they do not learn the subject, they only learn the rules and this leads to rote memorization. Therefore, since the students do not construct their meaning, as a result of which they forget the subject easily.

Regarding the pre-service teachers’ views and reflections on instruction, 8 pre-service elementary mathematics teachers (42%) emphasized the importance of *giving examples from daily life* as expressed below:

“The teacher sometimes gives real life examples in lessons. That will make sense for the students by connecting the mathematics and the real world” (S8).

Another pre-service teacher stated that:

“In my opinion my cooperating teacher should ask questions which provide a way to integrate communication into mathematics instruction. Through these activities, he can increase his students’ understanding of

methods and build connections between mathematical topics and real life” (S10).

“I like my cooperating teacher’s style of explaining the content because she does not leave the topic in one place; she generally makes connections with real world in her instruction and does not want her students to memorize the concepts that they learned. She tries to connect the mathematical concepts with the real world examples in order to be more comprehensible” (S13).

There were also less frequently mentioned subcategories such as *using body language, giving clues to find mistakes, giving feedback, explaining reason of rules, being enthusiastic, being monotone, and correcting misconceptions.*

One of the pre-service teachers stated her thoughts about *being monotone and enthusiastic* in the following:

“Since the teacher is not enthusiastic about teaching, I am sad about that. This makes his teaching monotonous and different from the requirements of the new curriculum. He solves some of the problems, and then asks students to solve the problems. I wish he would try to be more energetic and enthusiastic because the students lose their motivation” (S3).

Another pre-service teacher referred to the *body language and mimics*:

“Since the teacher can use his/her body language and mimics efficiently, students can understand the hint and the important points in the questions” (S16).

To summarize, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, most of them had negative views and reflections about the use of direct instruction method in mathematics classes in their School Experience II course reports. In addition, they did not observe the implementation of the new curriculum in their cooperating schools. Almost all of the pre-service elementary mathematics teachers expressed that use of materials were important for students’ better understanding during mathematics instruction. In addition, pre-service teachers mentioned that although materials were necessary for better implementation of the new curriculum, this could be also done by means of real world examples. In order to see the differences and similarities of pre-service elementary mathematics teachers’ views and reflections, which were mentioned in their 2005 and 2007 reports, a table of comparison is given in the Table 4.4.

Table 4.4: Subcategories derived from pre-service elementary mathematics teachers' 2005 and 2007 reports related to instruction

Subcategories of instruction	2005		2007	
	Number	%	Number	%
Pre-service Elementary Mathematics Teachers' View and Reflections about				
Teachers' Use of Instructional Methods				
Question-answer method	10	53%	3	16%
Problem solving method	1	5%	2	11%
Group working	2	11%	2	11%
Student centered	2	11%	3	16%
Giving examples from daily life	9	47%	8	42%
Showing different ways of solutions	4	21%	2	11%
Using word problems	1	5%	2	11%
Giving clues to find mistakes	-	-	1	5%
Giving enough time to think	-	-	4	21%
Giving feedback	-	-	1	5%
Explaining reason of rules	-	-	1	5%
New curriculum	-	-	7	37%
Induction method	4	21%	-	-
Making students discover	1	5%	-	-
Deduction method	1	5%	-	-
Explanation method	2	11%	-	-
Demonstration	1	5%	1	5%
Direct teaching	1	5%	14	74%
Teacher centered	2	11%	3	16%
Giving definition	4	21%	6	32%
Giving formulas	2	11%	1	5%
Giving basic information	2	11%	-	-
Solving routine examples	6	32%	-	-
Traditional way	-	-	3	16%
Students copy from the board	-	-	3	16%
Memorizing rules	-	-	4	21%
Erasing wrong solutions	-	-	2	11%
Discussion-discovery	-	-	3	16%
Teachers' Use of Instructional Material				
Using materials (manipulative, OHP...)	18	95%	17	90%
Using different textbooks	2	11%	-	-
Preparing activity	-	-	7	37%
Teachers' Behavior				
Using body language	1	5%	1	5%
Being enthusiastic	2	11%	1	5%
Giving equal permission to students	2	11%	2	11%
Encouraging students to ask questions	6	32%	3	16%
Ignoring unsuccessful students	2	11%	-	-
Making jokes	3	16%	-	-
Giving opportunity to students	1	5%	-	-
Being monotone	-	-	1	5%
Reinforcements, punishments, reprimands	-	-	3	16%
Trying gain students' interest	-	-	1	5%
Allowing students to ask/solve	-	-	2	11%
Teachers' Everyday Routine Habits				
Making connection between previous subjects	6	32%	3	16%
Starting lesson with an interesting question	1	5%	2	11%
Giving clues about the new topic	2	11%	-	-
Caring about whether the subject is understood	2	11%	-	-
Asking questions about previous subjects	2	11%	-	-
Correcting misconceptions	-	-	1	5%
Well planned lessons	-	-	2	11%
Summary of lesson	-	-	2	11%

As can be seen from the table, in addition to the similarities of subcategories such as using materials, giving examples from daily life, question answer method, direct instruction method, there were also differences such as giving clues to find mistakes, giving feedback, explaining reason of rules between the pre-service elementary mathematics teachers' School Experience I course and School Experience II course reports. For example, the subcategories of giving basic information, solving routine examples, induction method, deduction method, explanation method, making students discover, using different textbooks, ignoring unsuccessful students, making jokes, giving opportunity to students, giving clues about the new topic, caring about the subject is understood or not, and asking questions about previous subjects were mentioned in the 2005 reports only. On the other hand, the subcategories such as giving clues to find mistakes, giving enough time to think, giving feedback, explaining reason of rules, new curriculum, traditional way, students copy from the board, memorizing rules, erasing wrong solutions, discussion-discovery, preparing activity, being monotone, reinforcements, punishments, reprimands, trying gain students' interest, allowing students to ask/solve, correcting misconceptions, well planned lessons, and summary of lesson were emphasized in 2007 reports. In other words, the subcategories in Table 4.2 and Table 4.3 indicated that although there was commonality in the perceptions of pre-service elementary mathematics teachers' views and reflections in mathematics instruction, there was an increase in their knowledge in the way they perceived mathematics instruction as they progressed through their education. They perceived the mathematics instruction as more student-centered. Also, this situation is a good development regarding the new elementary mathematics program's principles. After mentioning the subcategories of instruction, the subcategories of assessment will be given below.

4.3 Pre-service Elementary Mathematics Teachers' Views and Reflections about Assessment

How do teachers assess their students' learning and what methods do teachers use to assess students' learning were some of the questions that were answered by pre-service elementary mathematics teachers in their reports. Their answers to these questions were gathered in the assessment category.

4.3.1 Pre-service Elementary Mathematics Teachers' Views and Reflections about Assessment in 2004–2005 Academic Year

An overview of subcategories of assessment and the number and percentage of pre-service elementary mathematics teachers' reports, where these subcategories were derived, are given in Table 4.5.

Table 4.5: Subcategories derived from pre-service elementary mathematics teachers' 2005 reports related to assessment

Subcategories of assessment	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about Traditional Assessment Strategies		
Exams	8	42%
Exams (Unassessed)	1	5%
Worksheets	6	32%
Asking questions	2	11%
Observation in class	4	21%
Homework	14	74%
Quizzes	4	21%
Quizzes (Unassessed)	1	5%

As seen from the table, nearly half of the pre-service elementary mathematics teachers (8 out of 19, 42%) stated their views about *exams* as an assessment strategy in mathematics classes. Some of the pre-service teachers agree on using exams in order to assess students' learning whereas some disagree on using them.

For example:

“Some students' background is good but some students' is not. Since this situation can not be changed in short time, dividing exams in two category as A and B is fair” (S1).

Another pre-service teacher expressed that:

“My cooperating teacher only makes exams to assign grades to the students. In my opinion, she should find different ways to assess them; she may give their grades by means of their homework” (S10).

Similarly,

“There were lots of exams done in the school and I think that such exams make students just memorize the formulas. Instead, they can assign some projects to be searched in mathematics” (S12).

On the other hand,

“If there is a problem about the understanding of the lesson, teacher makes unassessed exams in order to evaluate who did not understand which subject and which subject was not understood in general. He can reduce problems about the subjects by means of these exams. But the number of these exams is not sufficient. He should do them more often” (S7).

As seen from pre-service teachers’ views and reflections, exams were one of the ways to assess students’ learning. Although there was no agreement on the number of exams that should be administered in order to assess students, pre-service teachers agreed that teachers should use them when there was a need to determine the level of students’ learning, and students’ difficulties on the related topics. On the other hand, 6 out of 19 (32%) pre-service teachers mentioned the importance of *worksheets* such as:

“Distributing the worksheets prepared by Tudem Dergisi may be useful for the students to learn effectively because the questions are different from the questions that the teacher solved in the class. The student may look at the subject from different aspects and learn them effectively in this way” (S5).

“Worksheets which are distributed and given as assignments help the teacher to determine whether the students in the class learn the new subject adequately or not” (S18).

Asking questions was another category derived from pre-service teachers’ reports. Similar to the situation above, some pre-service teachers favored asking questions whereas some of them were against for using them.

For instance:

“Teacher can make oral exams in every lesson in the last 10 minutes from the subject that has just been taught. In this way, all students feel an obligation to listen carefully the teacher to learn the subject because the student who will be examined will be one of them” (S15).

However, one of teacher objected that:

“Instead of asking oral questions, I think to make small quizzes of one or two questions at the beginning and at the end of the lesson about what I taught in that day and the previous day will be more beneficial. The students will have small papers in an envelope for these quizzes at the back of their notebooks. By means of this, they will be well prepared and have an idea about the questions that will be asked in the examination” (S6).

To summarize, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, they said that in order to determine students’ level, exams should be used when it was necessary. They also addressed that since students’ level could be determined by worksheets, they should also use worksheets. By means of which, students would be able to see different types of questions. One of the pre-service elementary mathematics teachers viewed that asking questions can help teachers to assess students’ learning. On the other hand, one of them mentioned that instead of asking questions, teachers can make quizzes at the end or at the beginning of the lesson. In the next part, pre-service elementary mathematics teachers’ views and reflections about assessment for School Experience II course will be given.

4.3.2 Pre-service Elementary Mathematics Teachers’ Views and Reflections about Assessment in 2007–2008 Academic Year

An overview of subcategories of assessment and the number and percentage of pre-service elementary mathematics teachers’ reports where these subcategories were derived are given in Table 4.6.

Table 4.6: Subcategories derived from pre-service elementary mathematics teachers' 2007 reports related to assessment

Subcategories of assessment	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about Traditional Assessment Strategies		
Exams	6	32%
Worksheets	11	58%
Asking questions	5	26%
Observation in class	5	26%
Homework	18	95%
Quizzes	7	37%
Alternative Assessment Strategies		
Peer evaluation	1	5%
Story problems	1	5%
Performance homework	1	5%
Poster Projects	1	5%

More than half of the pre-service elementary mathematics teachers (11 out of 19, 58%) reflected their thoughts on the use of *worksheets* in mathematics classes. Although some of them were positive, some of them were negative. Some of the positive ones were:

“Teacher distributes worksheets including questions related to the topic as homework. It will be a useful drill to solve these questions for OKS; however, if she prepared one or two questions assessing real learning, it would be more meaningful” (S5).

“Teacher should give out worksheets at the end of the lesson or he can want them to write what they have learned about topic and their thoughts about the topic to understand whether they learned or not” (S14).

“Teacher can give worksheets during lessons. He can follow the lesson through worksheets rather than writing them on the board in order not to waste time” (S15).

Some of the negative ones were:

“If teacher is sure about more than half of the students understand the topic, this kind of materials are useful. Otherwise, there is no meaning of giving homework or worksheets for students and teachers” (S16).

“Teacher can not assess students' learning with worksheets because students can do them with memorizing easily. It can not be an assessment task” (S15).

The use of *homework* was mentioned by 18 out of 19 (95%) pre-service teachers.

For instance:

“My master teacher gives weekend homework to students every week. I think it is a good method to give homework because students should review the learned concepts during the week in order to do their tasks” (S18).

“One student checks the homework. Since teacher does not check them, students are doing their homework carelessly” (S2).

“Controlling the homework is a waste of time for teachers in the lesson. Rather, s/he can collect them and check them later because she can not understand whether they did their homework correctly” (S18).

Five out of 19 (26%) pre-service teachers expressed their views and reflections about *observation in class* such as “assessing the work of the students during the lecture is an objective assessment way since the students are not aware of being assessed and are behaving naturally” (S6).

Moreover, six pre-service teachers expressed views on giving *quizzes* in mathematics classes as an assessment strategy.

For example:

“We can learn how much students have learned by distributing quizzes at the end of topics. It is important to assess students’ learning before the new topic. The teacher should give feedback after a quiz to emphasize the strengths and weakness of the students. Moreover, quizzes make students ready for the lesson because students care about their grades” (S8).

In addition to traditional assessment strategies, four out of 19 (20%) pre-service elementary teachers mentioned using alternative assessment strategies such as *peer evaluation*, *performance homework*, *story problems* and *poster projects* in mathematics classes.

For instance:

“It is quite well to ask a story problem rather than giving lots of worksheets” (S8).

“Poster projects can cause students not to memorize formulas but learn effectively. By means of them, the students can see math as a part of their daily life and learn it in an enjoyable way” (15).

“With the help of peer evaluation, students can see their friends’ point of view and learn different approaches” (S15).

In summary, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, although most of them reflected their views on the use of worksheet in the mathematics classes, some of these reflections were positive and some of them were negative in their School Experience II course reports. Some of the pre-service teachers believed that worksheets can be used in order to determine what students learned from the subject and help teachers use time efficiently. However, some of them reflected that, worksheets should be used when most of the students learned the subject. Otherwise, teachers can not be sure whether the students learn the subject or not, since students can memorize the questions easily. In order to avoid this, worksheets can include some interesting questions to assess students’ actual learning. Pre-service teachers expressed that homework can be used as an assessment tool, if they are checked by teachers. Moreover, pre-service teachers reflected their thoughts on the use of peer evaluation and poster projects. In order to see the differences and similarities of pre-service elementary mathematics teachers’ views and reflections of assessment which were mentioned in their 2005 and 2007 reports, a table of comparison is given in the following section.

Table 4.7: Subcategories derived from pre-service elementary mathematics teachers' 2005 and 2007 reports related to assessment

Subcategories of assessment	2005		2007	
	Number	%	Number	%
Pre-service Elementary Mathematics Teachers' View and Reflections about Traditional Assessment Strategies				
Exams	8	42%	6	32%
Worksheets	6	32%	11	58%
Asking questions	2	11%	5	26%
Observation in class	4	21%	5	26%
Homework	14	74%	18	95%
Quizzes	4	21%	7	37%
Exams (Unassessed)	1	5%	-	-
Quizzes (Unassessed)	1	5%	-	-
Alternative Assessment Strategies				
Peer evaluation	-	-	1	5%
Story problems	-	-	1	5%
Performance homework	-	-	1	5%
Poster projects	-	-	1	5%

As seen from the table, in addition to the similarities of subcategories such as exams, worksheets, homework and quizzes, there were also differences in categories such as unassessed exams, peer evaluation, story problems, and performance homework between pre-service elementary mathematics teachers' School Experience I course and School Experience II course reports. For example, unassessed exams were only mentioned in the School Experience I course reports. However, pre-service elementary mathematics teachers pointed out peer evaluation, story problems, performance homework, and poster projects in their 2007 reports only. Subcategories of Table 4.5 and Table 4.6 indicated that although there were some common points in the views and reflections of pre-service elementary mathematics teachers, there was a tendency in the way they perceived mathematics assessments changed as they progressed through their education. Pre-service elementary mathematics teachers gave more importance to the alternative assessment strategies.

4.4 Pre-service Elementary Mathematics Teachers' Views and Reflections about Classroom Management

How a teacher manages the orderliness of the lesson, what methods a teacher uses to handle the misbehaviors of students and how the classroom management is handled were some of the questions that were answered by pre-service elementary mathematics teachers in their reports. Their answers to these questions were gathered in the classroom management category.

4.4.1 Pre-service Elementary Mathematics Teachers' Views and Reflections about Classroom Management in 2004–2005 Academic Year

An overview of subcategories of classroom management and the number and percentage of pre-service elementary mathematics teachers' reports, where these subcategories were derived, are given in Table 4.8.

Table 4.8: Subcategories derived from pre-service elementary mathematics teachers' 2005 reports related to classroom management

Subcategories of classroom management	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about		
Punishment		
Giving (-) grades	6	32%
Changing student's sitting plan	5	26%
Sitting alone	1	5%
Expelling from class	3	16%
Sending student to administration	1	5%
Calling parents	4	21%
Compulsory etudes	1	5%
Minimum intervention		
Raising his/her voice	11	58%
Oral warning	11	58%
Eye contact	2	11%
Physical proximity	3	16%
Not letting students speak without raising their hands	1	5%
Ignorance	3	16%
Threatening students to call parents	1	5%
Changing the topic	1	5%
Positive Encouragement		
Making jokes	3	16%
Giving presents/praises/rewards	1	5%
Calling by name	1	5%

Pre-service elementary mathematics teachers said that in order to make the mathematics lesson effective, teachers must manage the classroom order. One of them stated that “the classroom management should be handled strictly in the math lesson. The teacher did not provide quietness in the math lesson so students could not understand the subject exactly. I think teacher must provide quietness. If she did not do it at the beginning of the lesson, she can not do it later” (S3).

Most of the pre-service elementary mathematics teachers (11 out of 19, 58%) reflected their thought on teachers' *raising the tone of their voice*. Although some of them stated that increasing his/her voice can help teachers to manage the classroom easily, some of them stated that this method is not beneficial. Instead of this method, they mentioned that teachers can use positive reinforcement like giving prizes or encouragement.

For example:

“Teacher usually says “please, be quiet, sit down, and do not talk to each other” and wants students to pay attention to her. For doing this, she sometimes raises her voice but silence does not last much. She rarely tries to prevent misbehavior by giving minus or plus, in other words, she provides silence by grading. However, students act as there is no teacher in the classroom. They usually talk to each other or walk around. All of these lead to loss of time and hinder students who really want to learn something” (S10).

Another pre-service teacher said that:

“Only being angry with students and shouting them to manage the classroom is not an effective method. My cooperating teacher does not punish students due to their misbehaviors but she does not make them eager and encourage to participate in the lesson. She can also make students be aware of their responsibilities in the future. But she does not do this. Therefore, I think all these cause an increase in the rate of unsuccessful students” (S9).

Similarly:

“As regards to classroom management, teacher’s manner is not nice. Increasing her voice is a temporary effect and also it has a negative effect on students’ psychology. She can use method of giving prizes instead of punishment” (S1).

Six out of 19 (32%) expressed positive and negative views about the *use of (-)*. The following reflections were some of them:

“Teacher has no good methods to handle the classroom management. She uses cliché methods such as threatening the students by giving a low mark. I was surprised that this worked. In fact, the teacher takes an advantage of being mathematics teacher and all of the students are aware of the importance of the lesson” (S5).

“Teacher is right to give (-) to talking ones. That is good because the students will be silent and this (-) will not affect their grade” (S8).

“While lecturing, to warn the students who are making noise is necessary. Giving them some punishments will control their misbehaviors. Pluses and minuses that my cooperating teacher used are appropriate” (S17).

Some of the subcategories such as *giving presents/praises/rewards, making jokes, not letting students speak without raising their hands, calling by name* were less mentioned in pre-service elementary mathematics teachers’ reports. The following views exemplified these subcategories:

“Sometimes to praise students increases their concentration to the lesson and prevents misbehaviors” (S17)

“My cooperating teacher manages the classroom very well. He does not abuse the students, he makes them relaxed but not too much. He permits the children to make jokes to each other but does not allow them to make so much noise. He wants his students only to raise their hands when they want to say something” (S7).

“It is really hard to manage the orderliness of the lesson at the same time to teach. My teacher makes jokes in the class; I would want to be as him. However, I will not let students prevent me from teaching. When they try to do this, I will realize that they are bored. So I will take them away from the lesson for a short time” (S6).

“The teacher knows her students’ names and calls them by their name. In this way, the teacher shows her interest towards in the students and increases their attention to the lesson” (S4).

To summarize, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, although some of the pre-service elementary mathematics teachers think that raising teacher’s voice is an efficient way for classroom management, most of them think that raising his/her voice has no effect in classroom management. Some of the pre-service elementary mathematics teachers mentioned that the use of (-) as a classroom management method was not appropriate. These methods can have negative effects on students’ psychology. Instead of these methods, pre-service teachers expressed that teachers can give prizes, know each student’s name, use eye contact and walk around in order to prevent students’ misbehavior. In the next part, pre-service elementary mathematics teachers’ views and reflections about classroom management for School Experience II course will be given.

4.4.2 Pre-service Elementary Mathematics Teachers’ Views and Reflections about Classroom Management in 2007–2008 Academic Year

An overview of subcategories of classroom management and the number and percentage of pre-service elementary mathematics teachers’ reports, where these subcategories were derived, are given in Table 4.9.

Table 4.9: Subcategories derived from pre-service elementary mathematics teachers' 2007 reports related to classroom management

Subcategories of classroom management	Number	Percentage
Pre-service Elementary Mathematics Teachers' View and Reflections about Punishment		
Giving (-) grades	3	16%
Changing student's sitting plan	3	16%
Sitting alone	1	5%
Sending student to administration	2	11%
Calling parents	2	11%
Asking questions	1	5%
Minimum Intervention		
Raising his/her voice	7	36%
Oral warning	5	26%
Eye contact	6	32%
Physical proximity	6	32%
Not letting students speak without rising their hands	2	11%
Noting names of students who do not listen	3	16%
Threatening students with disciplinary service	2	11%
Admonishing	3	16%
Being patient	3	16%
Moving to student who do not listen	1	5%
Not letting any action	1	5%
Positive Encouragement		
Giving presents/praises/rewards	1	5%
Making jokes	2	11%
Calling by name	2	11%
Asking reason of behaviors	1	5%
Private conference	4	21%

Seven out of 19 (36%) pre-service elementary mathematics teachers stated negative views about *raising his/her tone of voice*:

“To manage the classroom and handle the misbehaviors, a teacher should not scold all the time since sometime later students get used to this and they are not affected. Instead, a private talk or making eye contact can help for these” (S17).

Similarly,

“My cooperating teacher shouts at students very often, I think it is not a good way because some time later, the students do not care about these

warnings or start to rebel, and she may lose her prestige in the class” (S13).

Another pre-service teacher said that:

“The teacher manages that by shouting and scolding to her students. I think that shouting or scolding is not a good method for classroom management. I said that we learned many things about classroom management in our classroom management lesson in our university. She said that all I learned is a waste of time since a teacher does not use this kind of things during the lesson.” (S16).

Pre-service elementary mathematics teachers addressed their positive views about cooperating teachers’ classroom management styles in several subcategories such as *changing student’s sitting plan, making jokes, eye contact, asking reason of behaviors*:

“The teacher prevents the students from interrupting the class in a professional way. For instance, he changes the seats of disruptive students, draws the students’ attention to the lecture by telling funny things. The teacher treats the misbehaving students patiently. Another strategy he uses is making eye contact. These strategies are useful” (S2).

“Although managing a class is very difficult, teacher is successful in this. He uses various strategies in managing classroom but he may listen to the reasons for misbehaviors. Since students are very young they may make mistakes. Therefore, teachers should avoid shouting in order to preserve the dignity of students” (S8).

In the same way, another pre-service teacher said that:

“In my opinion a teacher should not use punishments. It causes students to lose their respect towards to teacher. Instead of them, s/he can use negative reinforcement” (S16).

“To get the students under control, teacher should walk around the class and observe what they are doing during the lesson” (S14).

Some of the pre-service teachers (3 out of 19, 16%) expressed that (-) *grade* was useless in the management of students’ misbehavior.

“I think threatening students with grades has no meaning since the importance of making sense of mathematics goes under the shadow of taking high grades, the purpose of the education is changing then” (S17).

To sum up, based on pre-service elementary mathematics teachers’ observations of their cooperating teachers, in their School Experience II reports

pre-service elementary mathematics teachers expressed that since the students get used to the raising teacher's voice, this method is not a good way to deal with students' misbehavior. In addition, they expressed that minuses should not be used for the classroom management. Because of these methods, mathematics instruction may lose its importance. Pre-service teachers mentioned that although managing the classroom is difficult, it may be achieved with eye contact, asking reasons of these behaviors, and drawing students' attention to interesting things. In other words, pre-service elementary mathematics teachers do not pay attention to punishments and minimum interventions. Instead of these, they defend positive encouragements in the classroom management. In order to see the differences and similarities of pre-service elementary mathematics teachers' views and reflections which were mentioned in their 2005 and 2007 reports, a table of comparison will be given below.

Table 4.10: Subcategories derived from pre-service elementary mathematics teachers' 2005 and 2007 reports related to classroom management

Subcategories of classroom management	2005		2007	
	Number	%	Number	%
Pre-service Elementary Mathematics Teachers' View and Reflections about Punishment				
Giving (-) grades	6	32%	3	16%
Changing student's sitting plan	5	26%	3	16%
Sitting alone	1	5%	1	5%
Sending student to administration	1	5%	2	11%
Calling parents	4	21%	2	11%
Expelling from class	3	16%	-	-
Compulsory etudes	1	5%	-	-
Asking questions	-	-	1	5%
Minimum Intervention				
Raising his/her voice	11	58%	7	36%
Oral warning	11	58%	5	26%
Eye contact	2	11%	6	32%
Physical proximity	3	16%	6	32%
Not letting speak without raising hands	1	5%	2	11%
Ignorance	3	16%	-	-
Threatening students with calling parents	1	5%	-	-
Changing topic	1	5%	-	-
Threatening with disciplinary service	-	-	2	11%
Noting names of students who do not listen	-	-	3	16%
Admonishing	-	-	3	16%
Not letting any action	-	-	1	5%
Being patient	-	-	3	16%
Positive Encourage				
Making jokes	3	16%	2	11%
Giving presents/prizes/rewards	1	5%	1	5%
Calling by name	1	5%	2	11
Asking reason of behaviors	-	-	1	5%
Private conference	-	-	4	21%

As seen from the Table 4.10, in addition to the similarities of subcategories such as giving (-) grades, changing student's sitting plan, raising his/her voice, and making jokes, there were differences such as calling parents, ignorance, admonishing, being patient, and threatening with disciplinary service between the pre-service elementary mathematics teachers' School Experience I

course and School Experience II course reports. For example, expelling from class, compulsory etudes, ignoring the students, threatening with calling parents, and changing the topic were mentioned in the 2005 reports of pre-service elementary mathematics teachers only. However, pre-service elementary mathematics teachers mentioned the subcategories of threatening students with disciplinary service, admonishing, being patient, asking questions, not letting any action, asking reason of behaviors, and private conference in their 2007 reports only. Subcategories of Table 4.8 and Table 4.9 indicated that although there was commonality in the perceptions of pre-service elementary mathematics teachers, there was an increase in their views and reflections in the way they perceived classroom management as they progressed through their education. Pre-service elementary mathematics teachers said more about classroom management in their 2007 reports when compared 2005 reports. Moreover, they defended more positive classroom management methods in their 2007 reports.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

The main purpose of this study was to investigate the nature of changes in pre-service elementary mathematics teachers' views and reflections about elementary mathematics classes based on their observations in School Experience I and School Experience II courses. In this chapter, major findings of the study, comparisons of them with the studies in the literature and recommendations for further studies are given.

5.1 Pre-service Elementary Mathematics Teachers' Views and Reflections about Instruction

The results of the study indicated that in addition to the similarities of subcategories such as using materials, giving examples from daily life, question answer method, and direct instruction method, there were also differences such as giving clues to find mistakes, giving feedback, and explaining reason of rules between the pre-service elementary mathematics teachers' views and reflections on School Experience I course and School Experience II course reports. For example, the subcategories of giving basic information, solving routine examples, using induction, deduction, and explanation method, making students discover, using different textbooks, ignoring unsuccessful students, making jokes, giving opportunity to students, giving clues about the new topic, caring about whether the subject is understood or not, and asking questions about previous subjects were mentioned in the 2005 reports only. On the other hand, the subcategories such as giving clues to find mistakes, giving enough time to think, giving feedback, explaining reason of rules, being monotonous, erasing wrong solutions, preparing activity, trying gain students' interest, copying from the board, memorizing rules, allowing students to ask/solve, correcting misconceptions,

summarizing lesson, using new curriculum, traditional way, discussion-discovery, reinforcements, punishments, reprimands, and well planned lessons were only emphasized in 2007 reports.

The pre-service elementary mathematics teachers indicated positive thoughts about the *use of instructional materials* during the mathematics instruction in their School Experience I and School Experience II course reports. The number and the percentage of this subcategory in School Experience II course reports was almost the same in the School Experience I course reports. Based on pre-service elementary mathematics teachers' observations of their cooperating teachers' use of materials in School Experience I course, they expressed that the use of materials during instruction help students learn the concepts meaningfully and easily. For example, in geometry lessons, since the students need concrete examples, use of materials is beneficial. Also, in School Experience II course, pre-service elementary mathematics teachers stated that the use of materials facilitates the teachers' instruction. Although there are several studies performed with students and teachers regarding the use of materials in elementary mathematics classes, there are not any studies done with pre-service teachers. Therefore, this study contributes to the literature in this context. For example, the findings of this study are parallel with the results of Özgün-Koca's (2002) study with teachers who pointed out that hands-on teaching materials are usually helpful in mathematics classrooms. In the same way, in Bulut's (2007) study, students expressed that since they generally use traditional materials instead of visual and technological materials, they get bored. Furthermore, in Güven and Karataş's (2004) study, it was emphasized that in order to make students acquire new knowledge, preparation of learning environments with visual and electronic materials are important in the new program based on the constructivist approach. Additionally, in Halat's (2007) study, it was stated that materials lead students to think, they increase their attention to lesson and they are effective for understanding mathematics subjects. In School Experience I course, since 90% of pre-service elementary mathematics graduated from Anatolian Teacher High School, they might have had some information about the importance of using materials in mathematics lessons. However, in School Experience II course, the reason of high percentage may be due to both

observation of cooperating teachers and active participation of pre-service elementary mathematics teachers in the teaching process. Moreover, the fact that the importance of use of materials in mathematics lessons is emphasized during their teacher education program might have lead to this percentage. Furthermore, since pre-service teachers completed many courses before School Experience II course, they had great pedagogical knowledge about how to teach mathematics effectively. Thus, they could have positive beliefs about using materials in mathematics classes.

Another important issue raised both in the pre-service elementary mathematics teachers' School Experience I and School Experience II course reports was the subcategory of *giving examples from daily life*. In School Experience I course, pre-service teachers mentioned that lessons are more meaningful and interesting by means of examples from daily life. Also, instead of memorizing the rules or the subject, the students will learn them meaningfully. In the same way, in School Experience II course, pre-service elementary mathematics teachers stated that by connecting mathematics and the real world the lessons will be more meaningful and comprehensible. There are no studies supporting the pre-service elementary mathematics teachers' views and reflections about this subcategory in the literature. Therefore this is one of the interesting points of this study that is believed to contribute to the literature in this context. This result is consistent with the aim of the new elementary mathematics program that underlined the importance of using mathematics in daily life (MoNE, 2005). Also, Yenilmez and Uysal (2007) mentioned that the students who make connection between mathematics and daily life are more successful than the students who do not. Thus, it could be deduced that in School Experience I course, pre-service elementary mathematics teachers might have observed the use of daily life examples during their practice and because of that they emphasized the importance of it. On the other hand, in School Experience II course, pre-service elementary mathematics teachers might have improved such knowledge through the courses that they took during their teacher education program or their knowledge about the aims of the new elementary mathematics program. In other words, it should be noted that between the data collection process, some changes and reforms were done in the elementary mathematics

curriculum. That is, the pre-service elementary mathematics teachers were informed about the new curriculum and they were brought up through this new curriculum. Therefore, the effects of this new curriculum might be observed in their reports.

In addition to the similarities of categories between School Experience I and School Experience II course reports, there were variations between pre-service elementary mathematics teachers' views and reflections regarding the *instructional methods* subcategory. Although the most frequent subcategory in School Experience I course reports was the question-answer method, the direct instruction method was the most frequent category in School Experience II course reports. Results revealed that pre-service elementary mathematics teachers have both positive and negative views about the question-answer method in their School Experience I reports. For instance, pre-service elementary mathematics teachers (3 out of 19) stated that since the teacher does not give the information directly to the students in question-answer method, they make students think about the subject. They also mentioned that the students pay attention to the lesson by means of the question-answer method. On the other hand, some of the pre-service teachers (2 out of 19) had negative views and reflections about the question-answer method. Those pre-service teachers expressed that since the learning intelligence and learning abilities of the students' are different from each other, the teachers should use different methods to reach each student. State differently, pre-service teachers expressed that in order to make each student learn, the teachers should teach the lessons by means of different methods. This finding has been supported by Temizöz and Koca's (2009) study where they mentioned that since the mathematics teachers have not enough information about different methods, the question-answer technique as one of the traditional methods is the most used technique by the mathematics teachers in their lessons. It could be deduced that the reasons for such views and reflections might be the ways that the pre-service elementary mathematics teachers were brought up in their education life. That is, during their education life, they had a chance to observe only traditional methods. Until School Experience I course, they did not take the methods courses which may also have led to their views. That is, since they did not learn and observe other teaching methods, they might defend this

method. In addition to School Experience I course, pre-service elementary mathematics teachers had negative views and reflections about the use of the direct instruction method in mathematics lessons in their School Experience II course reports. Pre-service elementary mathematics teachers believe that since the students copy the writing from the board, they do not learn the subject, they only learn the rules and this leads to rote memorization. Since the students do not get the knowledge directly, that is, they construct it on their own by means of their teachers who are seen as a guide, these findings are parallel with the features of the new elementary mathematics program (MoNE, 2005). Koç, Işıksal and Bulut (2007) also underlined this finding that students should think and develop their knowledge on their own. In the same way, Airasian and Walsh (1997) expressed that teachers should guide their students, and create necessary environments to make students' own meaning in the constructivist approach. Moreover, in Çınar, Teyfur and Teyfur (2006) study, it was stated that the new program is student-centered, it directs the students to think and it prevents the students from memorizing. The negative views and reflections might be resulted from the pedagogical knowledge of pre-service elementary mathematics teachers. That is, they took many courses giving information about effective teaching and they know how to reach each student by means of different teaching methods. Thus, they could have negative beliefs about direct instruction method in mathematics teaching.

The other important finding of this study was related to the subcategory named as *activity*. Although this subcategory was not mentioned in the pre-service elementary mathematics teachers' School Experience I course reports, it was mentioned in their School Experience II course reports. Since the pre-service elementary mathematics teachers did not take an education through activities, not mentioning the activities subcategory may be accepted as normal. Up to School Experience II, since elementary mathematics curriculum changed and in the new program lessons were conducted by means of the activities, they might express their views and reflections about them. Also, this finding could be evidence that the pre-service elementary teachers comprehend the aims of the new elementary mathematics curriculum.

Subcategories that are mentioned above were the most distinctive ones in both School Experience I and School Experience II courses. The discussion of pre-service elementary mathematics teachers' views and reflections about assessment will be given in the following part.

5.2 Pre-service Elementary Mathematics Teachers' Views and Reflections about Assessment

The results of the study indicated that although some subcategories such as exams, worksheets, homework, and quizzes were similar, categories of unassessed exams, peer evaluation, story problems, and performance homework between pre-service elementary mathematics teachers' School Experience I and School Experience II reports were different. For instance, unassessed exams and tests were only mentioned in the School Experience I course reports. On the other hand, midterms, worksheets check, peer evaluation, story problems, performance homework, and poster projects were pointed out in School Experience II reports.

The pre-service elementary mathematics teachers expressed their thoughts about the *use of worksheets* in the mathematics lessons. The percentage of this subcategory in School Experience II reports was higher than that in School Experience I reports. In School Experience I reports, pre-service teachers thought that since the questions in the worksheets are different from the questions that the teacher solved in the class, worksheets may be useful for the students to learn the concepts effectively. In other words, the students can memorize the questions solved in the lesson. Also, pre-service teachers mentioned that worksheets help the teachers to determine whether the students in the class learn the new subject adequately or not. However, in School Experience II reports, pre-service elementary mathematics teachers stated both positive and negative views about the usage of worksheets. They expressed positive views like worksheets can be a useful drill for OKS; however, if they include one or two questions related to students' learning of the concept, it will be more meaningful. Moreover, pre-service teachers mentioned that teachers can use worksheets in order to assess what the students have learned about a topic. On the other hand, pre-service elementary mathematics teachers expressed negative views that since students can memorize the questions in worksheets easily, teachers could not use them as

effective assessment tools. The reason of the increase in the number of this subcategory in pre-service teachers' school experience II reports may have resulted from the new assessment tools such as observation checklists, portfolio, and other performance-based assessments that are emphasized in the new curriculum (Linn & Miller, 2005, cited in Koç, Işıksal & Bulut, 2007). In addition, since they have taken some courses related to measurement and assessment and since they have get experience about the uses of worksheets, the change might have been observed.

In addition to the similarities of categories between School Experience I and School Experience II course reports, there were variations between pre-service elementary mathematics teachers' views and reflections regarding the *alternative assessment strategies* subcategory. Although alternative assessment strategies including peer evaluation, story problem, performance homework, and poster projects were not mentioned in School Experience I reports, they were mentioned in School Experience II reports. Pre-service elementary mathematics teachers stated that it is quite good to ask a story problem rather than giving lots of worksheets to the students. Furthermore, they expressed that by means of poster projects, students can see math as a part of their daily life and learn it in an enjoyable way. The pre-service elementary mathematics teachers' views and reflections showed parallelism with the new elementary mathematics program requirements. Although there are several studies performed with students and teachers regarding the alternative assessment strategies, there are not any studies done with pre-service teachers. Therefore, this study contributes to the literature in this context. Instead of product evaluation, process evaluation which determines the shortcomings of students and gives feedback is emphasized in the new program (MoNE, 2006). Similarly, in Bulut's (2007) study, students were found to be more successful by means of alternative assessment strategies. Although pre-service elementary mathematics teachers observed the old mathematics program in their cooperating schools during their School Experience I, they observed the new one in School Experience II. That is, the reason for such views might be the ways that the pre-service elementary mathematics teachers observed and implemented the new ones. After giving the most distinctive subcategories above, the discussion of pre-service elementary mathematics

teachers' views and reflections about classroom management will be given below.

5.3 Pre-service Elementary Mathematics Teachers' Views and Reflections about Classroom Management

The results of the study indicated that there were similar subcategories such as giving minuses, changing student's sitting plan, raising his/her voice, and making jokes between the pre-service elementary mathematics teachers' School Experience I and School Experience II reports. However, there were also differences such as calling parents, ignoring the students, admonishing, being patient, and threatening with disciplinary service between them. Expelling from class, participating in compulsory etudes, ignoring the students, threatening students with calling parents, and changing the topic were only mentioned in the 2005 reports of pre-service elementary mathematics teachers. The subcategories of threatening students with disciplinary service, admonishing, being patient, moving to student who do not listen, asking questions, not letting any action, asking reason of behaviors, and making private conference were mentioned in 2007 reports only.

The pre-service elementary mathematics teachers indicated their views and reflections about *the raising voice* subcategory in their School Experience I and School Experience II reports. Although they expressed both positive and negative thoughts in School Experience I course, their views and reflections were negative in School Experience II course which is a desirable development regarding the implementation of the new elementary mathematics program. In School Experience I course, pre-service teachers stated that raising voice can help teachers to manage the classroom easily. However, 2 of them stated that instead of this method, teachers should use reinforcements or encourage students to participate in the lesson. In School Experience II, pre-service elementary mathematics teachers expressed that teachers should make private talk, have eye contact, and listen the reasons of their behavior. Memişoğlu (2005) underlined this finding that shouting at students was not an effective classroom management method. Conversely, it was one of the most common causes of unwanted behaviors. Since pre-service elementary mathematics teachers took the

Classroom Management course before the School Experience II course, they know how to handle with misbehaviors and how to manage the classroom. State differently, the negative views about raising voice might result from increase in their knowledge.

Although the pre-service elementary mathematics teachers expressed positive and negative views and reflections about the *use of (-) grades* in School Experience I reports, the views and reflections were all negative in School Experience II. In School Experience I, although some of them stated that threatening the students by giving low grades were not effective, some of them expressed that pluses and minuses were effective. On the other hand, in School Experience II, pre-service elementary teachers pointed out that if the teacher uses pluses and minuses in order to manage the classroom, getting high grades would be more meaningful than learning the mathematics. The pre-service elementary mathematics teachers' views and reflections showed parallelism with Memişoğlu's (2005) study. In this study, threatening the students with marks was found to be one of the most common causes of undesired behaviors. Changes in pre-service elementary mathematics teachers' views and reflections about the use of grades might result from their education. In School Experience I, the reason of the positive and negative views and reflections might be observation of their cooperating teachers who manage the classroom by means of grades. On the other hand, in School Experience II, the reason of the negative views and reflections might be the courses taken up to School Experience II course such as Classroom Management.

Another important issue raised both in the pre-service elementary mathematics teachers' School Experience I and School Experience II reports is the subcategory of *eye contact*. The percentage of this subcategory in School Experience I course was less than that of in School Experience II. This finding confirmed Türnüklü and Yıldız's (2002) claim that elementary school teachers coped with the most undesired students' behavior by having eye contact. This result was also underlined in Atıcı's (2001) study that teachers with high competence used positive methods such as looking at students. In School Experience I course, the low percentage of this subcategory may result from the observation of their cooperating teachers who use eye contact as a classroom

management method. On the other hand, in School Experience II, it may result from both observation of their cooperating teachers and their pedagogical knowledge improvement.

The other important finding of this study is related to the subcategory named as *private conference* and *asking reason of behaviors*. Although these subcategories were not mentioned in the pre-service elementary mathematics teachers' School Experience I reports, they were mentioned in their School Experience II reports. Türnüklü and Yıldız (2002) underlined that elementary school teachers deal with the most undesired students' behavior by talking with students about the behavior. In the same way, this result showed consistency with the study of Atıcı (2002). In her study, Atıcı (2002) found that private conference was the most commonly used methods by Turkish teachers. In School Experience I, since pre-service elementary mathematics teachers did not take any courses about classroom management and they observed the teachers who used punishments in order to handle misbehaviors, not mentioning these categories may be accepted as normal. However, in School Experience II, pre-service elementary mathematics took courses giving information about classroom management and they observed the teachers who used positive classroom management methods. Therefore, pre-service elementary mathematics teachers might mention these subcategories.

5.4 Recommendations and Implications

This study focused on the nature of changes in pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management issues in elementary mathematics classes based on their observations in School Experience I and School Experience II courses. Based on the analysis of the data, some recommendations for further researches could be offered.

The reports of pre-service elementary mathematics teachers during School Experience I and School Experience II courses were used for the data collection process in this study. A further study may be conducted by collecting their reports, interviewing with them and observing their teaching practices by video-

recording in order to have further evidence about pre-service elementary teachers' views and reflections in addition to their written reports.

This study analyzed the freshman and senior pre-service elementary mathematics teachers' views and reflections about instruction, assessment, and classroom management. However, when the data was collected during School Experience I course, freshman pre-service elementary mathematics teachers were observing the old mathematics curriculum in their cooperating schools. On the other hand, during School Experience II course, they observed the new mathematics curriculum. A similar study might be conducted with pre-service elementary mathematics teachers who observed the new mathematics curriculum both during Practice Teaching in Elementary School and School Experience II courses.

This study was conducted with only pre-service elementary mathematics teachers. This study could be performed with pre-service elementary teachers from other universities in Turkey.

Several studies showed that School Experience courses are beneficial for pre-service teachers' professional growth. Thus, the cooperation of schools and education faculties might be improved in order to make these lessons more effective. Besides, the content of School Experience courses may be improved to give more information regarding the instruction, assessment, and classroom management issues. In this way, pre-service teachers might have the opportunity of deeply comprehending these issues. Shortly, the results of this study may offer valuable information for teacher educators on how they improve pre-service teachers' professional knowledge during their enrollment in teacher education programs.

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APPENDICES

APPENDIX A

School Experience I Course Outline

ELE 132

SCHOOL EXPERIENCE IN ELEMENTARY EDUCATION

To send assignments use following e-mail address: ele132@gmail.com

COURSE OUTLINE

Goal: The school experience gives time for student to assimilate their experience to relate them to the work being done at the Faculty, and to discuss them with staff and other students. Therefore, it provides opportunities for an increase in professional competence.

General Rules

- 4 hours attendance to your cooperating school (per week; total 40 hrs)
- Doing activities asked by teachers
- 1 hour attendance to the course in the faculty
- Preparing a portfolio: journal writing (5 journals) and a reflection paper
- Writing reports

Assignments:

I. Journal writing (*Maximum 2 pages; total 5 journals*)

You have to maintain journals of your day to day experiences. The purpose of the journal is to allow you to reflect upon and synthesize your learning experience and your attitudes, keeping in mind the concepts of “writing for learning”. The following questions may guide you:

- a. What did you observe? (A general description of your observations)
- b. What was the most striking/ interesting classroom event that you observed?

- c. What confused you?
- d. What was new learning to you? / What discoveries are you making?
- e. How could you transfer what you observed to your own/future classroom?

II. Reflection Paper

Based on your observations throughout the semester, prepare a reflection paper. This should be a two to four page synopsis of the overall **experience** that includes the following three elements:

1. Fully describe one specific meaningful **experience** and reflect on its impact related to your growth as a teacher in training.
2. How has this **experience** effected your decision to pursue a career as a teacher? Include information related to working with this grade level.
3. Indicate the grade you feel you earned for this course and why?

III. Reports

Report 1: Mathematics Lessons

This is a report about mathematics lessons. The report should describe the conduct of mathematics lessons, including a description of the kind of work done, interactions, assessment procedures, habits, and such major characteristics of a mathematics lesson. The followings are some of the issues that you may discuss in your reports.

- How teaching takes place? What are the method(s) teacher use in mathematics lessons? How s/he uses these methods (a description of the procedure)? Are there any traditions/habits of teacher in mathematics lessons? How does s/he assess student learning? Are there any specific materials that teacher use (overhead projector, worksheets)? etc.
- How learning takes place? What are the expectations from students during, before, and after the lessons? What kind of interaction exists among students and between students and the teacher during math lessons? Are there any common learning problems?
- How the classroom management handled? What specific methods does teacher use to handle the misbehavior? How does s/he manage the orderliness of the lesson during teaching?

NOTE: Your report should not be limited to the questions given here. You should try to expand these issues.

Report 2: Planning for Mathematics Instruction

This report should include a description of how the curriculum is implemented in this school. The followings are some of the issues that you may discuss in your reports.

- How school and teacher plan the mathematics instruction? What resources do they use in planning and preparing the instruction? Are there any additions or revisions that school made in the curriculum (if yes , what are they, and why they are doing it)? What are the formats for daily and yearly plans?
- What materials are available for mathematics instruction (computers, laboratories, library, and others)? How frequently are they used? For what purpose are they used? How are they used (a description of the procedure)?
- What are the major characteristics of the textbooks? How textbooks are selected? What is the procedure they use in selecting textbooks?
- Is there any mathematics department (zümre) in your school? How does it work? What are the teachers' responsibilities in the department? How they make decisions in the department meetings? etc.

NOTE: Your report should not be limited to the questions given here. You should try to expand these issues.

Report 3: Other Aspects of School

In this report you need to write about the other activities of the school, such as general rules, services, clubs, sports, and etc.

- A description of school family cooperation
- Student clubs and some of their typical activities
- Counseling service and other services
- The rules of the school
- Infrastructure
- Specific and unique aspect of the school.

NOTE: Your report should not be limited to the questions given here. You should try to expand these issues.

Report 4: Mathematics Teacher Interview Report

In this assignment you will interview with your mentor teacher. The focus of this interview is to learn about duties and responsibilities of a mathematics teacher related to teaching and other school tasks.

The following are some of the questions you should ask. You may also add your own questions to the question list.

- Why did you select teaching as a career?
- What are your teaching responsibilities in this school?
- What are the responsibilities towards mathematics department?
- What are the responsibilities during the duty on (nöbet)?
- What is a typical day for you? Can you describe your daily routine tasks?
- What are the difficulties of being a mathematics teacher?
- What is most exciting about teaching mathematics?
- What kind of roles do you have in extra curricular mathematics activities?
- What kinds of resources are available for you?
- What do I most need to know to be an effective mathematics teacher?
- What do you consider two of the most important characteristics to be a competent upper elementary school teacher?

NOTE: Your report should not be limited to the questions given here. You should try to expand these issues.

The procedures you should follow during interviews:

Study your questions before you ask to the teacher. Try to anticipate teacher responses and ask more questions to reveal more information. For instance, if the teacher says “teaching mathematics is stressful” and doesn’t say anymore, ask to him/her “what makes mathematics teaching stressful?”

You need to carefully listen to the teacher’s answers and take notes to a notebook or blank sheets. During the interview if you need more time to write down your notes, ask the teacher to wait for a while. It can be also helpful to you, if you practice an interview with one of your friends.

Report Format:

Reports should be written by using MS-Word and submitted in printed form. At the end of the semester you will have 4 reports. The following plan should be followed in your report, in the given order:

1. Cover page: In the cover page include following information

- Name of the report
- Activity number
- Your name and last name
- Your master teacher’s name and school name
- Your instructor’s name

2. Introduction

- Write about the general purpose of the report.
- Indicate specific questions that you are going to address in this report (if applicable)
- Explain the importance/value of the issue(s).

3. Method

- Include information about how you collected information about this report in detail.
- Where did you get the information?
- How did you get it?
- How long it took to get the information and when did you collect data?
- Other relevant information related to your data/information collection procedures.

4. Description of collected information/data

- Include a description of what you observed/obtained from the school about this report. In this part you may use subtitles related to the topic of your report.

5. Discussion and conclusion

- Interpret and discuss each information/data you obtained.
- Can you generalize your findings? Why? Why not? Discuss it?
- Reflect on how your findings influenced your thinking about being a teacher.

NOTE: The due date will be announced by your instructor and late reports will not be accepted.

APPENDIX B

School Experience II Course Outline

ELE 437- School Experience II

Course description

Classroom observation including organization and management of school, daily activities in the school, group activities, a day of a teacher, a day of a student, school-family cooperation, observation of major and non-major courses, school and related problems, various teaching learning activities, examination of materials and written sources.

Required Texts:

No text is required for this course. The instructor will assign some readings during the semester.

Communication: Please, e-mail me all your questions. And, check your e-mails regularly.

Attendance & participation

Students are expected to attend all class sessions unless they have a documented evidence of medical excuse preventing their attendance. Students are also expected to arrive on time, and stay the entire class session. If you miss three (or more) class sessions without documented excuse, and/or if you establish a pattern of tardiness in class, the highest final grade you can earn in the class will be CC. Two instances of tardiness will be considered as being equivalent to one absence. If you have to miss a class because of an excused reason, it is your responsibility to provide instructor with evidence of doctor's visit no later than the next class session. After an absence, you should obtain class notes, hand-outs, other information from your classmates.

IMPORTANT NOTE: Students will not be assigned a final grade if they miss 5 or more class sessions with or without excused reasons. Thus, if you are sick for more than 4 class sessions, you may not pass the class regardless of your performance on the assignments and tests.

Academic Misconduct: I hope there will be no need to worry about academic misconduct (cheating, plagiarism, etc.). Plagiarism will not be tolerated.

Policy on Late Assignments

The expectation is that assignments will be turned in by the announced due dates. I will accept assignments after the due date but your grade will decrease by 10% of the allocated points for each calendar day the assignment is late. For example, a project worth 50 points that is turned in two days late will receive 10 fewer points (50 points x 10% per day x 2 days) than it would have if it had been turned in on time.

Field Experience

Attendance

Attendance is mandatory. Do not miss any field experience day. If it happens, you should make it up. Your final letter grade will be FD if you miss one or more field day.

Responsibilities & Expectations of Students

- Complete appropriate number of days/hours as designated by the instructors.
- Model professional behavior/dispositions for the educational community.
***NO GUM CHEWING!**
- Complete all field and seminar assignments, self-evaluations, or site evaluations when required.
- Notify the course instructors of any and all absences, as well as dates to be rescheduled as soon as realistically possible.
- Understand and observe rules and policies of each school site and classroom.
- Take all complaints to the course instructors.

Tips for a Successful Field Experience

- ✓ Become familiar with your students' curriculum and your cooperating teacher's schedule.
- ✓ Assist the teacher with classroom activities and duties. This is a great way of helping your supervising teacher. (Remember you are a pre-service teacher and not an aide). Work with your Supervising Teacher/Teacher Instructor to teach one of his/her lessons, consider taping this lesson for critiquing by yourself and/or the university instructor.
- ✓ Write a thank you note to your supervising teacher.
- ✓ Attend and participate in planning sessions.
- ✓ Attend and participate in at least one in-service.
- ✓ Review the school and classroom rules of your respective teachers.
- ✓ Always carry emergency contact information. Provide this to your cooperating teacher on the first day.
- ✓ Provide your cooperating teacher with your telephone number and/or electronic mail address in case he/she needs to contact you. Obtain

his/her preferred contact information in case you need to reach him/her before the next scheduled field visit.

Assignments

A. Expectation Paper (5/100)

You will be asked to write 2-5 pages self-reflection paper on what you are expecting to observe, experience, and learn in your school experience. Particularly, you will be reflecting on your expectations about the school context, students, teachers, and your own learning in the context. Submit this paper to class site on METU ONLINE no later than **October 1st, 2007**. Your file name should be: **name_surname_437_reflection.doc**

B. Observation/Investigation Reports (60/100)

You will be required to write three observation/investigation reports during the semester. These reports should be at most five-page long. They should be reflecting your true observations. You should not only describe what you have been observing, but also elaborate, critique, and reflect on the observation. **NONE OF THE OBSERVATION/INVESTIGATION REPORTS ARE A ONE WEEK ACTIVITY. YOU SHOULD WRITE A REPORT BASED ON AT LEAST THREE WEEKS OF OBSERVATION!** You will be notified about the deadlines of these reports. Reports will be submitted to METU ONLINE and your file name should be: **name_surname_437_report1.doc** (relatively report2, report3)

The three observation reports and their requirements are as follows:

1. Observe the teaching of a mathematics concept and report what the learning difficulties are with specific examples from the teacher's and students' behaviours. What are the students' difficulties, what do they struggle to learn? How much do you think is related to the concept/students' background knowledge/students' studying skills/teacher? (20)

You will be observing your teacher most of the time. Focus on how your teacher teaches a specific mathematics concept and how students learn it. Try to understand your teacher's teach way of teaching the concept. Which method, if any, does your teacher use? Do you think his/her way of teaching is effective in students' learning? How are the students trying to learn the concept? Are all classroom activities (such as questioning, learning activities, solving exercises on the board, quizzes, etc.) and out-of-class tasks (such as doing homework, completing worksheets, preparing posters, etc.) effective in students' learning? Why/why not? If you think that the students are learning, then how do you think a teacher can help them to learn?

2. Report how your teacher implements the new curriculum. In case your teacher does not implement the new curriculum, find another teacher implementing the curriculum. Observing science teacher is another option. We will talk about this in the class. (20)

In case your teacher is implementing the new curriculum: Is your teacher implementing the curriculum on a one-to-one basis or is he/she selecting some of the activities and not the others? What kinds of activities does your teacher specifically focus on? How do you think the students respond to such activities? What is your teachers' opinion about the new curriculum? Specifically, ask your teacher

- Have you ever attended a professional development course about the new curriculum? If so, what did the course include? Was it helpful in understanding and implementing the new curriculum?
- Do you think that students are learning mathematics effectively through the new curriculum?
- What are the new curriculum's strong and weak points?
- How do you support the weak points, if any?

In case you are at a school where the teacher is not implementing the new curriculum: This time, you will interview your teacher through the following questions:

- Have you ever attended a professional development course about the new curriculum? If so, what did the course include? Was it helpful in understanding and implementing the new curriculum?
- Have you investigated the new curriculum? What do you think the new curriculum brings to mathematics education and students' learning?
- What are the new curriculum's strong and weak points?
- What does the new curriculum need to be implemented? Does your school and classrooms have the sufficient conditions to implement the new curriculum?
- Can you list some of the reasons for not implementing the new curriculum? What kinds of factors impacted your decision?

3. Describe culture of the school and the class you observe the most. Try to understand the class and the school culture. (20)

I want a description of the characteristics of the students, the teacher, the physical environment of the class and the school. How do the teacher and students communicate? How do students communicate each other? How do you think the classroom environment is different than what you have expected? How does the school culture look like? How do the administrators communicate the teacher and the students? How do the administrators and the teachers communicate the parents? Feel free to ask your teacher and the school administrators about these issues. Through these and other questions you have in your mind, I am hoping that you will have an understanding of the elements of the class and school culture. Try to find out how these elements might have impacted teachers' teaching and students' learning.

THIS IS YOUR FINAL REPORT, BUT YOU WILL BE WORKING FOR THIS REPORT THROUGH THE SEMESTER.

C. Poster Project (20/100)

You will be preparing posters that are focusing on an understanding of a mathematical concept for the students in your school. This is a peer-group project. YOU WILL PREPARE THE POSTER WITH A FRIEND OBSERVING AT THE SAME SCHOOL. YOU WILL START PREPARING THE CONCEPT TOWARDS THE MID OF THE SEMESTER. Here are the steps of this project:

1. Inform your teacher about the poster project. This poster will stay at the school if the teacher and the administrators allows. This will be something students remember you when you left.
2. Ask his/her opinions about mathematical concepts that the students have difficulty in understanding. Remember your observations as well. Choose a mathematical concept which is a key concept for the other concepts.
3. Construct a learning activity that explains the concept through a poster or explain the concept with interesting examples and thoughtful questions.
4. Present your poster idea to your friends in the class and to your teacher. Try to get feedback and reframe your poster.
5. Put your ideas on a poster that will be sufficiently interesting but not distracting for students.
6. Kindly ask your teacher if he/she can announce this poster and where it is to the students. Always stand by your poster during the breaks and help students who want to view your poster.
7. Prepare a report on why you chose the concept, what you considered in planning your poster, your goals in preparing the poster, how you presented the material, the students' and the teacher's reaction to the poster and how do you think the poster could be improved. SUBMIT THIS PAPER TO METU ONLINE. Your file name should be: **name_surname_437_poster.doc**

D. Class Discussion (10/100)

You will be reading the below texts in this course. Readings will be assigned to you a week ahead of the class. You will be writing a two-page reflection paper only to the October 8th readings. I am assuming that you will read all the papers assigned. Most of them are interesting readings about the education in Turkey. You are to participate in the discussions about these readings during the class sessions. Your participation is the key to this class. You will submit your reflection paper to METU ONLINE no later than October 6th, 2007. Your file name should be: **name_surname_437_reflection.doc**

Reading List:

October 1st, 2007

Williams, M.O. (1929). Turkey goes to school. *The National Geographic Magazine, January*, 94-108.

October 8th, 2007

Tertemiz, N.I. (1999). Sekiz yıllık zorunlu ilköğretim: Hedefler ve uygulamalar. In Gök, F. (ed). *75 Yılda Eğitim*, 171 – 176. İstanbul: Tarih Vakfı Yayınları

T.C. Başbakanlık Kadının Statüsü Genel Müdürlüğü. (2006). *Kadın ve Eğitim*. Retrieved from: <http://www.kssgm.gov.tr/egitim.html> on September 22, 2006

Şengül, B. 8 Yıllık Eğitim ve Çocuk İşçiliği. Retrieved from http://www.cnnurk.com/OZEL_DOSYALAR/haber_detay.asp?pid=485&haberi_d=67901 on September 20, 2007.

October 15th, 2007

Talim ve Terbiye Kurulu Başkanlığı (2005). İlköğretim Matematik Dersi Öğretim Programı ve Klavuzu 6-8. Sınıflar (Taslak Basım), 1-21.

E. End of Semester Reflection Paper (5/100)

You will be asked to write a reflection paper on your school experience and what have you learned from this experience. This paper should include what you have observed and experience as expected and unexpected about the school context, students, teachers and possible reasons about why you did not expect what became as unexpected.

For all your assignments, the following general issues will be considered for grading purposes:

- Has the student done what was asked for and specified in the description of the assignment?
- Are the ideas discussed relevant for mathematics teaching and learning?
- Do they include important issues and discussions considered in the field of mathematics education?
- Is the work clearly presented and properly written? Are the ideas well developed? Are they coherently woven together and presented in an orderly fashion?
- Does the work demonstrate that the student spent time and thought in completing the assignment? Is the work thoughtful, insightful?

- Has the student made connections to pertinent readings discussed in class and to the literature on the subject under study?

WRITE IN CLEAR ENGLISH. IF YOU FAIL TO WRITE IN AN UNDERSTANDABLE LANGUAGE, YOU WILL LOOSE AT LEAST 20% OF YOUR POINTS.

APPENDIX C

An Example of the Code Sheet Obtained from Two Coders

Common instruction codes obtained from two coders

Induction method

Using materials

Giving examples from daily life

Question-answer method

New curriculum

Preparing activity

Common assessment codes obtained from two coders

Test

Exams

Quizzes

Homework

Common classroom management codes obtained from two coders

Raising his/her voice

Giving (-) grades

Changing student's sitting plan

Eye contact

Being patient
