

# **PRESERVICE TEACHER'S REFLECTIVE PRACTICE: GUIDE FOR LEARNING ABOUT TEACHING**

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*The purpose of this study is to investigate the reflections of a pre-service teacher who has practices consistent with traditional teaching style during the act of planning the lesson, the teaching of the lesson and at the end of the lesson. Data was collected during the spring semester of 2011-2012 academic year. Qualitative design was used to collect and analyze data. The framework used in this study was developed by Artzt and Armour-Thomas (1996) for reflection on teacher cognition and instructional practice. Results revealed that when pre-service teacher had traditional teaching practice, the discrepancies between teaching at the university and at the elementary school became more obvious and reflections became less useful. Creating environments that pre-service teachers can reflect on their instructional practices could help them in enhancing their awareness towards the complexities of classroom environments.*

## **INTRODUCTION**

Researchers argue that students should be given the opportunity to actively explore mathematical concepts by focusing on reasoning (e.g. why it works) and building on their personal knowledge (Ball, 1993; Cobb et al., 1993; Goldsmith & Schifter, 1997; Fennema et al., 1993; Lampert, 1991). In order to make sense of those concepts individually, an environment should be created where students could represent their ideas, make conjectures, collaborate with other students, and give explanations and arguments (NCTM, 1989; 2000). Studies show that when students give explanations or make conjectures, they elaborate, clarify, and reorganize their thinking. There is no doubt that teachers have essential roles in order to create this environment. In order to achieve these practices in the class, teachers also need to know what reorganizing means. Thus, they need to be given opportunities to learn about these practices.

Studies show that reflection is also essential practice for pre-service teachers (Calderhead & Gates, 1993, Loughran, 2002; Ward & McCotter, 2004). It helps pre-service teachers to make decisions for their teaching strategies and evaluate them. Thus, the act of reflection has a central place in the practices of pre-service teachers during their enrolment in teacher education programs.

In general, Dewey (1933) defined reflection as turning a subject over in the mind and giving it a serious consecutive consideration. Indeed, reflection perceived as a process of cognitive learning generating from an in-depth analysis of individuals own practice (Bell, 1993). Munby and Russell (1990) stated that with the help of reflective practice, teachers could re-organize their experiences from a different point

of view and improve their teaching. Research studies emphasize the importance of reflection for understanding the complexities of teaching and learning environment (Zeichner, 1996).

Schon (1983) stated that since it is hard to observe reflection, verbalizations of the behaviors are so essential during the reflective process. He added that “what/why I was doing” are critical questions in the act of reflection. Schon (1983) classifies reflection in two categories: reflection-in-action and reflection-on-action. While the former refers to thinking about the action during it is performed, the latter refers to reflecting on the action after it is performed. Hence, within the scope of this study, reflection is used on behalf of reflection-on-action. Schon (1983) argues that over time as the person reflects on the actions that she performed, she acquires knowledge and starts to be able to reflect in the action by asking herself what she is doing at that point and what her purpose in doing it. Although experience is very important to reflection, knowing about more about students’ thinking as well as the mathematical content are also crucial components of reflection (Cooney et al., 1998).

Unexpected and uncertainties are daily routines of pre-service teachers since they engage in new and unpredictable environment during their teaching. Thus as teacher educators we need to create an environment where pre-service teachers could analyze and evaluate the difficulties that they may encounter while teaching and the most appropriate strategies that enhance students’ understanding. In other words, we should offer them opportunities that they will learn about their teaching. Therefore, the aim of this study is to investigate pre-service teacher’s reflections on their teaching practice during the act of planning the lesson, the teaching of the lesson and at the end of the lesson.

## **METHOD**

A qualitative study is conducted in order to gain an in-depth understanding of pre-service teacher’s reflection regarding the tasks that she prepared for School Practice. This study involves a case study of pre-service teacher who enrolled in School Practice Course. A case study has been commonly used in education research where the aim is to examine a specific phenomenon in a bounded system (Merriam, 2009).

A research team involving three instructors, one research assistant and seven senior students at the department of elementary mathematics education was formed for the overall study. The seven pre-service teachers were selected based on their academic achievement, personality and willingness. The students prepared a lesson plan in order to be implemented both at the university with classmates and at the elementary school. The research team gathered immediately after the development of the lesson plans in order to discuss and give feedback for the lesson plans. Here, the aim was to make the pre-service teachers reflect on their lesson plans and evaluate the appropriateness and applicability of the plans. After the pre-service teachers made the necessary revisions, they implemented their plan at the university (campus

teaching). The pre-service teachers were video-taped during their teaching. At the end of their campus teaching, they took their videos and reflected on them via a written reflection paper. They also got oral and written feedback related to their planning and teaching performance from their classmates as well as the instructors. Here, the aim was to help them improve their lesson plan before they make teaching practice in real classroom environment. After making the final revisions the pre-service teachers implemented their plans at the elementary school. Lastly, the participants were interviewed and asked to reflect on their experiences throughout the whole process.

The overall process of the study can be summarized as follows:

Lesson Plans → Group Meeting → Revisions → Campus Teaching → Feedbacks →  
Revisions → School Teaching → Interview

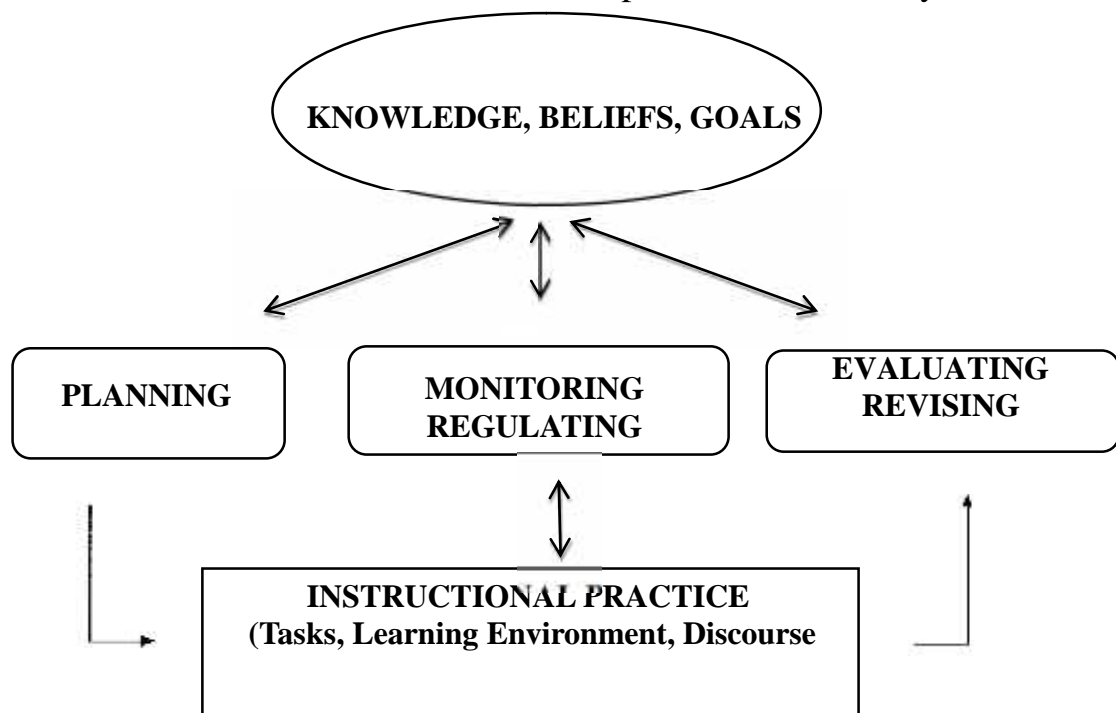
### **Selection of Case**

The case (Deniz) in this study is selected since she has more strict traditional teaching practices than the other participants. Deniz has a moderate success in her academic life and even though she favors reform-based teaching and wants to teach in that way, she has practices consistent with the traditional teaching style. Hence, the case is considered as intrinsically interesting and we want to have a full understanding of the effect of the reflection on a pre-service teachers' traditional type of teaching practices. Besides, her case is found to be interesting at the end of the data collection, since her two teaching practices were different from each other in many aspects and she encountered many unexpected events during her school teaching.

### **Theoretical Framework**

The main framework that guided this study is based on studying teacher cognition and practice, developed by Artzt and Armour-Thomas (1996). The framework supports that teachers' beliefs, goals and knowledge have essential role on their practices. What's more, there are different factors that affect teachers' practices before, during and after teaching. The major components that affect the ways of teaching can be categorized under three groups: (1) Planning during the preactive stage (Clark & Yinger, 1979); (2) Monitoring and regulating during the interactive stage (Clark & Peterson, 1981); and (3) Evaluating and revising during the postactive stage (Ross, 1989). These three components create a cycle with instructional practices which involves tasks, learning environment and discourse (see Figure 1). These components are named as cognitive processes. Here, it is important to note that these components are not distinct from each other; rather they are interrelated. Hence, this framework helped us in understanding the complexities of a teaching practice, seeing its pieces and comparing the teaching practices of participants that have different background. What's more, since the phases of

planning, monitoring-regulating and evaluating-revising are much related to our process of data collection the framework was helpful in order to analyze the data.



**Figure 1. Framework for reflection on teacher cognition and instructional practice (Artzt and Armour-Thomas, 1996)**

We also used the framework for the lesson dimensions and dimension indicators (Artzt and Armour-Thomas, 1996) which focuses on the most important dimensions of a mathematics lesson. It is not provided here due to page restrictions. When considered together with the lesson phases, this framework also helped us in seeing the complexity of a mathematics classroom and in comparing the practices of the pre-service teachers during the planning, monitoring and evaluating stages.

### **Data Analysis**

During the analysis, firstly the initial and revised lesson plans were examined in order to see the differences between them. Then video-tapes of group-meetings and two teaching practices, and the written transcripts of follow up interviews were studied in order to determine the discrepancies both between the revised lesson plan and teaching practices and also between the two teaching practices. Pre-service teachers' written reflections about both teaching practices and the entire process were also examined.

### **RESULTS**

We organized result section under three categories; planning, monitoring and evaluating. Additionally, we investigated each category in terms of tasks, learning environment and discourse as stated in the framework.

#### **Planning**

Deniz prepared a warm up question aiming at making students distinguish between the additive and multiplicative principles of counting. Then, she planned to make students groups of two and distribute the activity sheet including problems related to additive and multiplicative principles of counting. She also planned to use small pictures for the clarification of the terms being used as a mode of representation. She intended to make students read and discuss the problems with their peer-mates. Her lesson was planned to proceed with the discussion on the concept of probability and investigation of probability terms such as experiment, sample space and outcome. Deniz's initial lesson plan showed evidences of a teacher centered teaching practice by means of the type of activities and flow of instruction. Yet, when it comes to discourse, she indicated in her lesson plan that she will be careful about giving enough time for students' answers. She also put emphasis on observing and guiding students during peer work. She also indicated that she expects full explanations, justifications or demonstrations from students.

Deniz introduced her initial plan to the research team at a meeting and the research team suggested some changes in the context of activities in such a way that they will be more authentic. Additionally, it was suggested that the teaching could be more student-centered. Deniz started to revise and reorganize her lesson plan after getting feedbacks. Even though she kept her objectives same, she made some changes in the contexts of the activities and flow of instruction based on the feedbacks. Also, she added some extra discussion questions and extra examples. Besides, she shifted her instructional strategy in such a way that the students will solve the problems on the board yet she insisted on summarizing the lesson at the end by herself.

### **Monitoring**

Deniz started her campus teaching by asking a warm up question about the number of different selections of one fruit among one apple, one mandarin and one orange and got the expected and right answer from students who were her classmates. She continued with her activity. Students first read and solved the problems individually and shared their solutions with the class. While students dealt with the problems, Deniz wandered around the classroom observing student work but she did not guide any student. She waited for students to answer the questions and all the answers were correct at the first place. Some problems were solved on the board by students. The lesson ended as planned with no serious drawback. The students seemed dealing with the tasks during the process but they were not enthusiastic. They answered the questions yet they were not encouraged to ask more questions.

After the campus teaching, Deniz made some changes in line with the feedbacks given for her first teaching. The suggestions were in such a way to include inquiry-based teaching style with active student participation, more student discovery and more problem solving. She reflected on their first teaching and decided to carry out in her second teaching practice in such a way that she asks students about the

definition of terms, lets students solve the questions on their seats and share the solutions with the class.

In her teaching at the school, Deniz was surprised by her students' irrelevant answers just at the beginning of the lesson when she asked the same warm up question. She explained the situation and her feelings in the interview after the lesson as follows:

“Something that I had never expected occurred in the classroom. The students gave some answers that I can never imagine. When I asked how many ways we can choose a fruit among one apple, one mandarin and one orange they gave answers as they can choose the fruit according to its color, size etc. Also they claimed that they can choose one half from one fruit and one half from the other one. I couldn't guide and lead them to my point. This situation lasted approximately for seven minutes.”

By asking each student and getting no correct but irrelevant answers, Deniz gave the answer for the question herself and expected students to understand the situation. She continued her lesson by distributing students a worksheet including problems related to additive and multiplicative principles of counting. She waited for students to answer the questions, made one student read the question and give the answer. Then, she wrote and explained the solutions on the board and wanted students to copy the solutions. While students dealt with the solutions Deniz circulated around the classroom observing student work and helping them individually. Almost all the students seemed to cope with the task. If students couldn't give correct answers Deniz did not make any comment or judgment and asked another student to give an answer and she continued like this for the entire task until she got the correct answer for the entire task.

Throughout the task she encountered similar misunderstandings as before and she was unable to cope with those misunderstandings. When the teacher made students think about the definitions of basic terms in probability like sample space, experiment and outcome; she was again surprised by students' unexpected answers. For instance, students give examples from the science classes about scientific experiment when they heard the word “experiment” and also they confused the term “output” with computer output. She was not able to move on her activities in her lesson plan since the class time was over.

### **Evaluating and Revising**

In her follow up interview, Deniz evaluated the entire process that she underwent. These included her initial plan, revised plan, feedbacks that she took throughout the process and the two teaching practices. She acknowledged that there were inconsistencies between her plans and actual instructions and also between the two teaching practices.

While she considers her first instruction at the university effective, she accepts that there were some drawbacks related to her flow of instruction and relations with students.

“I did not face any serious problems during my first teaching. I was comfortable since I knew that the students were familiar with the content and the activities. I did not mind every little detail either about classroom management or instruction. For example, I just wandered around the students and checked whether they were dealing with the while they were doing group work. I was not interested in what they were doing. I carried out a teacher-centered lesson and I was able to finish my lesson almost as I had planned.”

When Deniz thought of her second teaching at the elementary school, she seemed to be unpleasant. Her main disappointments were about students’ unexpected answers and time management. Yet she stated that she had reached some of her initial objectives and goals.

“I was very nervous in my second teaching since it was the first time I was in a real classroom environment and I did not know them. Reflecting on my first teaching experience at the university, I tried to carry out the lesson in a more student-centered way. I also tried to observe and guide their work while dealing with the tasks. Students participated in the tasks yet I was unable to lead them. I asked improvised questions and I just waited for them to think more when they didn’t understand. I asked the same questions to other students until I got the correct answer. I wasn’t able to try another strategy, we lost lots of class time and I couldn’t reach my objectives. I think I should improve myself about effective time management.”

Besides, pre-service teacher stated that the feedbacks she got at the group meetings were useful and she also believed that her first instruction at the university was helpful to some degree for her second teaching.

## **DISCUSSION**

The purpose of this study was to investigate reflections of a pre-service teacher who has practices consistent with traditional teaching style during the act of planning the lesson, the teaching of the lesson and at the end of the lesson. The pre-service teacher in this case favored non-traditional ways of teaching as she stated in the interview; yet she had traditional type of teaching practices. Throughout the study, she was required and encouraged to reflect on the dimensions of tasks, learning environment and discourse of her instructional practice at each phase of her lesson (planning the lesson, the teaching of the lesson and at the end of the lesson). The framework for reflection on teacher cognition and instructional practice which was developed by Artzt and Armour-Thomas (1996) was used for the study. Then the practices and reflections of the pre-service teacher were systematically examined.

Analysis of the lesson plans, teaching practices and reflections showed that the pre-service teacher preferred to make little changes in her initial plan. The discussions among the team about the activities did not provoke her to come up with new ideas; instead she preferred to stick to her initial plan. She barely changed the tasks and the activities in her plan; instead she just decided to make students solve the problem individually on their seats for improving student participation but she insisted on summarizing the lesson by herself. It could be said that as a pre-service teacher who

was inclined to traditional teaching, she did not want to put herself in risk in an unfamiliar environment. The reason for this might be also due to her lack of experience of non-traditional ways of teaching mathematics. Although she stated that she wanted to teach in a non-traditional way, due to her missing knowledge about how to prepare and conduct such lessons; she was unable to imagine any other ways of conducting the lesson.

The results also revealed some variations in both between lesson plan and instructions; and also between the teaching at the university and the teaching at the elementary school. The pre-service teacher's initial lesson plan showed evidences of all the three dimensions tasks, learning environment and discourse. When she first applied her lesson plan at the university with her classmates, there was no serious drawback observed in relation with all the three dimensions. Yet the students did not seem to be willing and enthusiastic about the tasks. The pre-service teacher claimed that the reasons for this were the students' familiarity with the content and the tasks. But this might also be due to the fact that the students did not actually involve in the tasks.

Although the lesson plan showed evidences of a student-centered type of teaching, the two instructions of the pre-service teacher turned out to be teacher-centered. She might have thought that if she asks the questions to the students, they would answer correctly and learn the concepts on their own. But in the actual teaching, even though she asked many questions, the students had difficulties in understanding the tasks. This might be due to the pre-service teacher's lack of mathematical and pedagogical knowledge since it seems that she just prepared the questions to be asked without concerning about probable student thinking and answering. She did not worry about giving effective feedback for student answers and making generalizations or conclusions. This might also be due to her lack of knowledge and unfamiliarity with student-centered teaching styles. At the end, she was unable to create a positive and effective learning environment and direct discourse. Similar results were found in the studies who investigated the novice teachers' practices (Livingston and Borko, 1990) where they encounter many uncertainties and surprises. At this point, we can conclude that although the discussions at the meetings and self-experiences throughout teaching practices helped the pre-service teacher for changing her views about the non-traditional teaching styles; her practices showed no evidence of her views.

During the interview, the pre-service teacher claimed that although the practice made at the university was helpful for her second instruction to some degree, the real class environment is totally different. This might be resulting from the fact that the characteristics and background of the students at the elementary school are not the same as the students at the university. Thus, they encounter different type of problems and misconceptions in their school teaching. The lack of pre-service teacher's experiences in this type of environment makes them feel uncomfortable and



have challenges. In order to help them, more opportunities to teach at schools should be provided. Nevertheless, it is not always possible to practice at real classroom environments; hence the university practices of pre-service teachers might be enhanced by looking up the elementary school students' misconceptions about the related subject in the literature and providing possible student answers. Creating such environments where pre-service teachers could reflect on their instructional practices could help them in enhancing their awareness towards the complexities of classroom environments.

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