

PROFESSIONAL DEVELOPMENT OF PRESERVICE BIOLOGY TEACHERS
THROUGH REFLECTIVE THINKING

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AYŞE SAVRAN GENCER

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submitted by AYŞE SAVRAN GENCER in partial fulfillment of the requirements
for the degree of **Doctor of Philosophy in Secondary Science and Mathematics
Education Department, Middle East Technical University** by,

Prof. Dr. Canan Özgen
Dean, Graduate School of **Natural and Applied Sciences** _____

Prof. Dr. Ömer Geban
Head of Department, _____
Secondary Science and Mathematics Education

Assoc. Prof. Dr. Jale Çakıroğlu
Supervisor, **Elementary Education Dept., METU** _____

Assoc. Prof. Dr. Ceren Tekkaya
Co-Supervisor, **Elementary Education Dept., METU** _____

Examining Committee Members:

Assoc. Prof. Dr. Ceren Tekkaya
Elementary Education Dept., METU _____

Assoc. Prof. Dr. Jale Çakıroğlu
Elementary Education Dept., METU _____

Assist. Prof. Dr. Semra Sungur
Elementary Education Dept., METU _____

Assist. Prof. Dr. Esen Uzuntiryaki
Secondary Science and Mathematics
Education Dept., METU _____

Assist. Prof. Dr. Necla Köksal
Educational Sciences Dept., Pamukkale University _____

Date: 21.01.2008

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name : Ayşe SAVRAN GENCER

Signature :

ABSTRACT

PROFESSIONAL DEVELOPMENT OF PRESERVICE BIOLOGY TEACHERS THROUGH REFLECTIVE THINKING

Savran Gencer, Ayşe

Ph.D., Department of Secondary Science and Mathematics Education

Supervisor : Assoc. Prof. Dr. Jale Çakıroğlu

Co-Supervisor: Assoc. Prof. Dr. Ceren Tekkaya

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The study aims to explore preservice biology teachers' reflective thinking content and levels by examining the use of a reflective framework integrated into one semester Practice Teaching course. More specifically, this study focused on the development of reflective thinking skills of preservice teachers and their metaphorical images about learning and teaching process. Data were collected through both qualitative and quantitative approaches. The written documents and audiotaped debriefings taken during the activities of reflective autobiography and journal writing, metaphor using, peer coaching, microteaching, and problem discussion along with the summative interview were the main data sources of the qualitative data. The written and transcribed data collected through these sources were then utilized through the selected three case studies in order to reach a deep understanding on their reflective thinking skills and content. The quantitative data were collected through the instruments of Reflective Thinking to evaluate the

development of the preservice biology teachers' reflectivity and Metaphorical Images to explore their beliefs about learning and teaching process.

Results indicated that the reflective activities offered opportunities preservice biology teachers to reflect on their experiences and strive for a conscious awareness of their professional development through experience, collaboration, guidance, and modeling. All of the participants were able to reflect mostly at the technical level, followed by contextual and dialectical levels of reflective thinking among the content categories of teacher characteristics, instructional processes, classroom management, students, and teaching profession. Results of reflective thinking instrument indicated that all participants individually perceived a developmental reflective thinking skill.

Keywords: Reflective Thinking, Reflective Journal, Peer Coaching, Professional Development, Preservice Biology Teacher

ÖZ

BİYOLOJİ ÖĞRETMEN ADAYLARININ MESLEKİ GELİŞİMLERİNİN YANSITICI DÜŞÜNCE İLE GELİŞTİRİLMESİ

Savran Gencer, Ayşe

Doktora, Orta Öğretim Fen ve Matematik Alanları Eğitimi Bölümü

Tez Yöneticisi : Doç. Dr. Jale Çakıroğlu

Ortak Tez Yöneticisi: Doç. Dr. Ceren Tekkaya

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Bu çalışmanın amacı, Öğretmenlik Uygulaması dersini yansıtıcı ilkelere dayanarak planlamak ve yansıtıcı etkinliklerden oluşan bir çerçeve kullanarak öğretmen adaylarının yansıtıcı düşünme seviyelerini ve içeriklerini ortaya çıkarmaktır. Ayrıca, öğretmen adaylarının yansıtıcı düşünme becerilerinin gelişimi, öğrenme ve öğretme sürecine yönelik metaforları sorgulanmıştır. Bu çalışmanın verileri hem nicel hem de nitel yöntemlerle toplanmıştır. Yansıtıcı otobiyografi, yansıtıcı günlük, metafor, akran rehberliği, mikro öğretim ve problem tartışması etkinliklerinden elde edilen yazılı dokümanlar, banda kaydedilmiş yansıtıcı tartışmalar, değerlendirme görüşmeleriyle birlikte nitel verileri oluşturmaktadır. Bu veriler, durum çalışması için seçilen üç öğretmen adayının yansıtıcı düşünme seviyelerinin ve içeriğinin daha derin incelenmesinde kullanılmıştır. Öğretmen adaylarının yansıtıcı düşünme seviyelerini ve öğrenme-öğretme sürecine yönelik düşüncelerini ortaya çıkarmak için

kullanılan yansıtıcı düşünme ve metafor anketleri ise araştırmanın nicel verilerini oluşturmaktadır.

Bu araştırma, yansıtıcı stratejilere dayalı yansıtıcı çerçevenin öğretmen adaylarının deneyimler, işbirliği, rehberlik ve modeller aracılığı ile yansıtma yapabilmelerini ve böylelikle kendi mesleki gelişimlerine farkında olarak katkıda bulunmalarını sağlamıştır. Araştırmanın sonuçları, öğretmen adaylarının büyük oranda teknik ve uygulama alanında olmak üzere her üç alanda yansıtıcı düşünebildiğini göstermektedir. Buna göre, öğretmen adaylarının teknik, uygulama ve diyalektik alanda; öğretim süreçleri başta olmak üzere öğretmen özellikleri, sınıf yönetimi, öğrenciler ve öğretmenlik mesleği ile ilgili konularda yaşadıkları deneyimler üzerinde yansıtma yapabildikleri belirlenmiştir. Araştırmanın nicel sonuçları ise, öğretmen adaylarının bireysel olarak yansıtıcı düşünme becerilerinde gelişme olduğunu göstermiştir.

Anahtar Kelimeler: Yansıtıcı Düşünme, Yansıtıcı Günlük, Akran Değerlendirmesi, Mesleki Gelişim, Biyoloji Öğretmen Adayı

To my daughter Ilgin,

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CHAPTER 1

INTRODUCTION

“not all thinking about teaching constitutes reflective teaching” Zeicher and Liston (1996, p.1)

The study draws attention to the preservice teachers to reflect on concrete experience and build a professional knowledge base from this experience during the practice teaching course. In fostering preservice teachers’ professional development, preservice teachers’ reflective thinking throughout the reflective framework will be analyzed in terms of content and level in order to address what and how teachers know about their own and others’ teaching practice through acquiring experience.

1.1 Background of the Study

Reflective thinking, proposed by Dewey (1910/1998) early in this century, defined as the “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (p.9). Reflective thinking has emerged as a theory for the beginning a journey to teachers and students’ learning based constructivist and inquiry oriented paradigm shifts in education. Since starting with the Deweynian time, ‘the process of inquiry’ has gaining an increasing acceptance as a very influential or necessary component of a reflective teacher education (Adalbjarnardottir & Selman, 1997; Rodgers, 2002; Wubbles & Korthagen, 1990) in response to the deficiencies of the

existing models that are 'behavioristic', 'personalistic', 'traditional craft' (Zeichner, 1983, cited in Roth, 1989) and 'technical rationality' (Schön, 1983, cited in Hoban, 2000; Zeichner & Liston, 1996).

The theory of technical rationality focuses on the transfer of professional knowledge produced by academicians to the teachers. When applied to authentic settings, the process ends with an oversimplification as technical solutions to narrow educational problems (Ekiz, 2006; Hoban, 2000). From the perspectives of inquiry-oriented and technically-oriented paradigms shift in teacher education, Zeichner and Liston draw attention to the distinction between reflective teaching and technical teaching. Zeichner and Liston characterize a teacher who engages in reflective teaching by questioning the goals and the values that guide his or her work, the context in which he or she teaches, or examining his or her assumptions. In contrast, a teacher was characterized as technician who "narrowly construe the nature of the problems confronting them and merely carry out what others, removed from the classroom, want them to do" (Zeichner & Liston, 1996, p.4). Reflective teaching then is regarded as an international movement in that "the slogan of reflective teaching has been embraced by teachers, teacher educators, and educational researchers all over the world" (Zeichner & Liston, 1996, p.4). Like in many teacher education programs from the global perspective, in Turkey, teacher education system also is under the effect of 'technical rationalist' model that implies the application of scientific theories and principles in classroom settings without systematically inquiring on it within the predetermined framework of national goals (Ekiz, 2003).

Whitaker (1995) also valued experience and reflection as the central to the development of a new paradigm for the management of learning. Whitaker referred reflection as 'experiential learning', developed by David Kolb et al., (1971). Experiential learning involves a cycle of discrete mental processes following concrete experience and requires to reflect on experiences and to think about them in order to make sense of them. That is the new educational paradigm shift emphasizes on learning how to learn and needs the focus less on curriculum and methods of

teaching and more on practice and process. It is realized as challengeable to make students more active and dynamic in their learning in satisfying the needs of fast changing elements of education during the journey of learning as a process.

Recently, it has been realized that conventional or traditional education programs that are based upon performance and technical competence are not enough to cultivate students who are sophisticated and inquiry oriented individuals who enable to think over issues. Therefore, reflective thinking has started to be used in education as reflective teaching. In fact, reflective teaching proposes educational system being not only a technical matter but also an ethical or value oriented act, an art. In sum, reflective teacher development implies "...continuous inquiry into practice" (Lieberman and Miller, 1992; cited from Posnanski, 2002, p.190). Then, reflective teaching consists of a conscious, systematic and deliberate acting in classroom through on-going inquiry in which teachers continually are capable of making instructional decisions as regard to students' needs and re-evaluate their instructional decisions and the outcome of those on student learning (Posnanski, 2002).

Inquiry oriented paradigm, from the aspect of students, requires participation of the students democratically and freedom of their thoughts, beliefs and values. This is the main idea of student centered approach in education. In so doing, Posnanski asserted a challenging way to make teachers reflective practitioners through deliberative strategies under a constructivist approach of professional development for positive changes in science teaching to promote effective teaching and student learning. In this way teachers develop a repertoire of the knowledge base and continually construct and re-construct their knowledge for reframing their instructional practices in enhancing student learning. Therefore, the pre-service teachers need to be educated in accordance with the strategies of reflective thinking under a constructivist approach to continually professional growth. Then, the idea comes in mind that "teachers teach as they were taught" (Posnanski, 2002, p. 190).

In terms of enhancing the quality of education to meet the needs of advanced educational innovations, becoming a reflective teacher can facilitate capturing the new challenges. Therefore, reflection in education should be elaborated in terms of the effectiveness in learning and teaching contexts to help teachers and students to think critically and improve themselves continually. Continued research in teacher education indicates that there is a steady move towards teacher education programs that encourage reflection and reflective practices. As time passed, Dewey's theory of reflective inquiry and its rules, principals and inspiration on this pedagogy were restated by educators and researchers and have taken an esteemed place in theories of learning and teaching (Danilo, 1999). Especially, for the last 15 to 20 years, as Rodgers (2002) point out that national powers in education have embedded reflective thinking or inquiry as a standard toward which all teachers and students must strive for more effective teachers' and students' learning. However, in Turkey reflective teaching has gained popularity recently among a few researchers in education (Atay, 2003; Ekiz, 2003; 2006; Genç, 2004; İskenderoğlu-Önel, 1998; Köksal, 2006, Oruç, 2000; Öviz, 2001; Şanal-Erginel, 2006; Ünver, 2003).

Even the saying comes back to nearly two decades ago, it is noticeable that is true for the present as well that; deliberative processes of reflection at least seem still to be "the exception rather than the rule" (Dreyfus & Dreyfus, 1986, p. 28 cited from Day 1999). It can be realized that reflection should be an essential component of the teacher preparation rather than just for popular for academic studies. It is the responsibility of higher education giving teachers intellectual, affective and practical support to continue their professional development and help them move from routine to reflective practice by engaging in sustained, systematic reflection on and about practice in partnership with others to be competent teachers in coping with the changing needs of students with the changing society. Being aware of reflection as a way to improve practice, teachers need to be educated to become and remain practitioners at the heart of whose practice is reflection (Day, 1999; Huang, 2001).

1.2 Purpose of the Study

Reflective thinking has emerged as an important construct in teacher education over the past two decades to capture more elusive concept of constructivist and inquiry based orientation paradigm shifts in education. Hence, to become more effective learners and teachers, teachers should engage in reflective thinking in providing conscious awareness of their own actions. With this understanding, it becomes important to how teachers develop reflective thinking and how it can be improved. In an attempt to gain insights into teacher's professional development; therefore, the study aims to provide a description of preservice biology teachers' reflective thinking throughout the reflective framework in terms of content and level in order to address what and how teachers know about their own and other colleagues' teaching practice along with acquiring experience. More specifically, based on the main problem, The research questions to be addressed in this study are as follows:

R.Q.1: What are the preservice biology teachers' reflective thinking levels before and after the practice teaching course?

R.Q.2: What are the most representative metaphorical images of the secondary preservice biology teachers' high school biology teachers, their cooperating teachers, and themselves as future teachers?

R.Q.3: What are the content and the levels of the secondary preservice biology teachers' reflective thinking?

R.Q.4: In what ways do secondary preservice biology teachers perceive their professional development?

1.3 Significance of the Study

Being aware of the significant role of schools in the context of the professional development, Cole (1997, cited in Day, 1999, p.225) points to an important deficiency of schools that are “lonely places” for teachers. Furthermore, Loughran (2002) points out “experience alone does not lead to learning” (p.35). In fact, it is not a way to encounter with experience in an actual classroom to learning from experience. Rather, it is essential to reflect on experience (Loughran, 2002). Therefore, the first challenge of this research is to sustain a reflective practice teaching course in which preservice teachers have opportunities to reflect on their experiences throughout the reflective activities in understanding the concerns and level of their reflection.

This study can contribute as a mean of insight to insufficient literature about reflection and the utilizing reflective strategies in educational settings in Turkey by providing a thick and deep investigation of reflective thinking throughout a reflective teaching framework. Within this study, the personal and professional development of the preservice teachers will be dealt with or valued in the matter of their feelings, opinions, views, attitudes and beliefs while reflecting upon experience in the process of learning to teach.

Further, the findings of the study will provide a knowledge base about the nature of reflection in terms of the investigation of preservice teachers’ reflection content and reflective thinking abilities in the process of learning to reflect on experiences gained during teaching practice. In addition, this study provides an insight into the effect of reflective strategies that were used to facilitate reflective thinking such as autobiography, metaphor, reflective journal, peer coaching and microteaching on the nature and depth reflective behaviors of preservice teachers. In essence, teacher educators and researchers need to identify the reflective strategies that provide successful or unsuccessful experiences during practice teaching. Provision of relevant positive and beneficial reflective strategies specifically can be designed to

enhance the capability of preservice teachers' reflection on thinking and practice for more meaningful reflection in their professional development.

This research should help to call attention to the need for more effective programs of preservice education based on the notions of reflection. The findings that emerge from this study, therefore, have important implications for educational researchers, teachers, and teacher educators. Given the data of this study may prove useful in understanding the preservice biology teachers' nature and depth reflection on thoughts and actions during their practice teaching experience. Teacher educators can use these results to examine their preservice education programs as well as their teacher education practicum experiences for preparation and continuing education of teachers.

1.4 Definition of Terms

Through the process of the present study the following terms and definitions were used:

Reflective thinking: It refers to “the process of making informed and logical decisions, then assessing the consequences of those decisions” (Taggart & Wilson, 1998, p.2)

Professional development: It means to capture the growth of preservice teachers as a professional through reflective thinking based on experience, guidance, collaboration, and modeling.

Practice teaching: The last stage of preservice teachers' scheduled education program before their graduation where they are trained with some activities in real classroom environment and they are given opportunities for acquiring and applying the skills and requisities to get ready for teaching on their field.

Preservice biology teacher: An officially registered graduate student teacher undergoes professional education of the non-thesis master program of faculty of education offering a certification program.

Cooperating teacher: An officially employed teacher working in the practice school, having experience on teaching and responsibilities for some duties to carry out the professional development of the preservice teachers. The cooperative teacher is a mentor, a guide, a critical advisor, and a good friend to the preservice teachers during the practice teaching experience (Wentz, 2001).

Supervisor: A teacher education faculty staff specialized within a subject area of curriculum and instruction, taking on the task of providing the preservice teachers practice teaching course underlining the theoretical foundations of teaching beyond experiencing in the practice school.

CHAPTER 2

REVIEW OF THE LITERATURE

“if you, as a teacher, are not thoughtful about your professional work, how do you expect your students to be thoughtful about their learning?” (Henderson, 1996, cited in Farrell, 1999, p.170)

In order to reach more profound understanding about the place and the role of reflection in teacher education, this chapter provides insights to the conceptualization of reflection. Although philosophical roots of reflection go back Aristotle, the ideology that has a great impact on education was expressed by Dewey (1910/1998) early in this century. Even, after so many years, with the works of Schön (1983, 1987) on this ideology many teacher educators have begun to view classroom teachers as reflective thinkers. On the way of preparing teachers as reflective thinkers, John Dewey has been fundamental in understanding the nature of reflective thinking. On the other hand, Donald Schön has been fundamental in understanding the nature of reflective practice (Spalding & Wilson, 2002). Therefore, the first section begins with Dewey’s theory of reflective thinking and Schön’s framing and reframing to constitute ways for understanding of the process, the focus and the level of reflective thinking. The second section involves the impacts of reflection on teacher education through reflective strategies and reflective models with promising studies the extent to which reflective thinking content and level are under investigation to give a shape for a reflective teacher. It concludes with a summary of the literature underpinning this study.

2.1 Reflective Thinking

Starting with Dewey's book "How We Think" (1910/1998) reflective thinking has started to be mentioned in literature. But, many teacher educators have begun to give attention to reflective thinking in practice through their programs with the works of Schön (1983, 1987). Since reflective thinking arose out as reflective teaching in the area of education, it has played a central role in the preparation of future teachers. Even though there are various descriptions of reflective teaching, there is not a consensus on the exact definition of it or it is defined as a set of exceptions instead of rules (Danilo, 1999; Davis, 2006; Dinkelman, 1997; Freese 1999; Jay & Johnson, 2002; Loughran, 2002; Rodgers, 2002). Therefore, it is necessary to examine this elusive concept from the views of Dewey's reflective thinking theory and Schön's detailed works on it to understand reflective thinking and reflective teacher education from different perspectives.

2.1.1 Dewey's Model

It is a well known fact that John Dewey is the pioneer in the conceptualization of reflection in education. In his book "How We Think", Dewey introduced "the theory of reflective thinking" that was substituted in his later work as "the theory of inquiry" (cited in Danilo, 1999). In this book, Dewey described reflection as a process of a kind of thinking and made a clear distinction between impulsive action, routine action, and reflective action. Impulsive action was characterized as that grounded in trial and error; routine action as that grounded mostly in authority and tradition; and both of them are perceived in a passive and unthinking way (cited in Griffiths, 2000). Griffiths added that reflective action is "motivated by the need to solve a particular problem" (p.540). It was also presumed that routine action may draw teachers to depend their actions on preconception and prejudice whereas reflective action should have an educational purpose the extent to which involves wider considerations of a moral and ethical nature (Griffiths, 2000).

Rodgers (2002) characterized Dewey's (1910/1998) theory of reflective thinking under four criteria. Firstly, reflective thinking valued as a meaning-making process that prompts learner from one experience into the next with deeper understanding through continually reconstruction or reorganization of experience in ensuring the learning and progress of the individual. Secondly, reflection was commented as "a systematic, rigorous, disciplined way of thinking, with its roots in scientific inquiry" (p.845). Thirdly, it was pointed out that reflection needs to happen in social context in interaction with others. The last criteria emphasized that reflection requires attitudes that value the personal and intellectual growth of oneself and others. Whole-heartedness, directness, open-mindedness, readiness and responsibility are the main attitudes that a reflective teacher should adopt. In definitions, these attributes were elaborated in detail with the others' comments in the section of characteristics of reflective teacher.

2.1.2 Schön's Model

Schön (1983, 1987) also accepted Dewey's concept of reflection as a notion of problem-solving, inquiry, and a way of thinking. More preciously, Loughran (2002) claimed that it was emerged as a wave of a new trend after Schön introduced reflective practice emphasizing the link between reflection and practice/action. In teacher education, since that time, Schön's conception of reflection has very influential on the development of professional knowledge through the actions of frame and reframing when professionals encounter unique, complex, uncertain, and conflicted problems of practice (Griffiths, 2000; Lee & Loughran, 2000). According to Schön, framing is an attempt to recognize the problem whereas reframing is an attempt to make use of an existing repertoire of examples, images, understandings and actions to see the problem from different perspectives (cited in Lee & Loughran, 2000; Loughran, 2002). Then, reframing involves "changes in the ways of 'seeing' classroom events, problems and practices" (Lee & Loughran, 2000, p.70). This ability to frame and reframe is regarded as the most important aspect of developing

reflective practice due to its impact on the subsequent actions in practice which may then be enormously impetus for development of professional knowledge on teacher education (Loughran, 2002; Griffiths, 2000).

According to Schön (1983), a further the link between reflection and action take place on the context and time frames. Schön introduced two types of reflection-on-action and reflection-in-action. Reflection-on-action occurs after an action has taken place or before (cited in Freese, 1999). In contrast, reflection-in-action occurs during action and requires modifying this action consciously and instantaneously. But, for both forms of reflection, a rational and moral process was to need in making reasoned judgment about preferable ways to act (Hatton & Smith, 1995). Then Schön (1987) endorsed "reflection in action" as a process which requires practitioners to "remake their practice worlds," and "promote flexibility and creativity" (cited in Huang, 2001, p.2). Griffiths (2000) asserted that reflection-in-action is a spiraling process in which professionals draw on their repertoire of examples to reframe the situation and find new solutions rather than applying theory or past experience in a direct way. It was pointed out that "his [Schön's] conception of teaching is a complex and sophisticated process, in which the teacher is actively engaged, and has a vital part in shaping, interpreting and changing situations" (Griffiths, 2000, p.541).

In the preparation of the future teachers, reflection has become an integral part as an inquiry oriented approach. Related with the elusive definitions of the subject matter some researchers have studied the content of reflection, others have studied process of reflection. From the concept of content it can understand what teachers reflect upon, from the concept of process how teachers think about their practice, and others have studied programmatic practices of reflection (Jay & Johnson, 2002). The complexity and ambiguity of reflection make it difficult to define (Zeichner & Liston, 1996); therefore, by describing how reflection is understood and taught, a more consistent understanding of the concept may emerge. In the following section, Dewey's and Schön's notion of reflection will be expanded and specified in terms of process, content and level in understanding underlying pedagogy of it.

2.1.3 Process of Reflective Thinking

Reflective thinking is a part of a process of inquiry for solving problems (Danilo, 1999). To Dewey's (1910/1998) sense of the term reflective thinking involves "turning a subject over in the mind and giving it serious and consecutive consideration. ... [and] not simply a sequence of ideas, but a *con*-sequence" (pp.3-4). In essence, reflective thinking consists of a chain of thoughts leading to the successive growing out thought of one another and support one another rather a simple sequence of ideas (Griffiths, 2000; Dewey, 1910/1998). According to Dewey, reflective thinking is then not a linear process in which teachers used step by step procedures underlined with pre-established set of techniques; rather it is a holistic approach of meeting and responding to problems (cited in Zeichner & Liston, 1996). In the same line, Schön's (1983) reflection-in-action involves a spiraling process that rarely ends with a simple solution, but ends with a new meaning to reframe the question, and improves understanding (cited in Griffiths, 2000; Jay & Johnson, 2002). Further, reflective action is a dialectical process that involves "more than logical and rational problem-solving process" expands to comprise of "intuition, emotion, and passion" (Zeichner & Liston, 1996, p.9).

Although a holistic view of reflection adds to its complexity, one feature of reflection that is common to view is a self-awareness of a problem (Hoban & Hastings, 2006) that is a situation of "a puzzling, curious, or perplexing" (Loughran, 2002, p. 33). That is the first step to reflective thinking emerged from Dewey's sense of crucial element on the way of thinking about a problematic situation that needs to be resolved. Dewey (1910/1998) articulated that "the function of reflective thought is, therefore, to transform a situation in which there is experienced obscurity, doubt, conflict, disturbance of some sort, into a situation that is clear, coherent, settled, harmonious (pp.100-101). Beyond the recognition of uncertainty involving a problematic situation, Lee (2005) pointed out that "the stages of the process of reflective thinking should not simply indicate progress towards the solution of the problem, but rather the degree of awareness of the situation" (p.701). Therefore, it is

a crucial factor not only becoming aware of a problem but also seeing the problem in different ways to sustain the process of reflection (Hoban & Hastings, 2006; Hoban 2006, Loughran, 2002).

As cited by Danilo (1999) to Dewey, “reflective activity occurs when a person decides to face a perplexed, troubled or confused situation and prior to a clear-up, unified and resolved situations” (p.259). There are five phases or aspects of reflective thought. The first consists of suggestions. The mind works out for a possible solution. It is “a vicarious, anticipatory way of acting, a kind of dramatic rehearsal”. The second phase is the intellectualization of “the difficulty or perplexity that has been felt into a problem to be solved”. The third phase is hypothesis “the use of one suggestion after another as leading idea. Insights into these suggestions correct modify and expand the suggestions that originally occurred, making the suggestion a definite supposition or hypothesis”. The fourth phase is the reasoning “the mental elaboration of the idea or suppositions” The fifth phase is testing the hypothesis “by overt or imaginative action to give experimental corroboration, or verification, of the conjectural idea” (p.259). The phases mentioned above are flexible and not in a strict order. They might pass ahead of each other to conceptualize and emerge the problem and finally to solve the problem.

Taggart and Wilson (1998) synthesized a reflective thinking model from the works of Dewey and Schön (see Figure 2.1). The first step to reflective thinking involves an episode as a problem within its context. The second step to frame and reframe the problem involves observation, reflection, data gathering, moral judgments, schema, and context. The third step to search for possible solutions involves interventions based on reasoning. The fourth step to systematically test involves experimentation based on judgment and observation. The next stage to evaluate involves acceptance or rejection based on the implementation process and the consequences of the solution. If the solution is successful, the episode may become routine. If the solution is not successful, the episode may be reframed through the cyclical process.

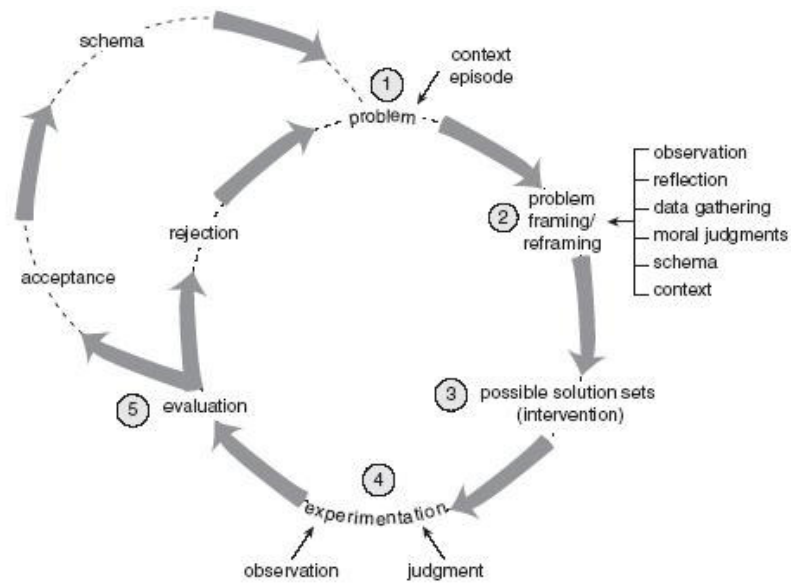


Figure 2.1 Reflective Thinking Model Adapted from Taggart and Wilson (1998)

Based on the assumption of Zeichner and Liston (1996), Jay and Johnson (2002) believed that Dewey’s theory of reflection and Schön’s underpinnings of his theory should be expanded to which reflection takes into consideration the social, moral, and political aspects of teaching. The scholars claimed that this is a more extended scope of vision from what teachers do to what they might do when they reflect on their practice in order to examine the content of reflection.

2.1.4 Focus of Reflective Thinking

The focus of reflective practice displays what one reflects upon during the process of learning to teach. Jay and Johnson (2002) agreed that reflection is a process of experience in which any preservice teacher to be reflective should focus on some dimension of their pedagogy in understanding his/her knowledge base development

as well as putting his/her thoughts, values, attitudes, and beliefs into this process. It is a crucial way of in-depth understanding the reflective practice that focusing on what teachers reflect about. Mansvelder-Longayroux, Beijaard, and Verloop (2007) asserted:

how they [preservice teachers] interpret the concept of reflection mirrors the aspects that teacher educators and researchers consider to be important in the training of teachers. Consequently, the main focus of the professional literature has been on the content of reflection (what it focuses on, such as problems in teaching practice, social and political aspects of education); and the product of reflection (the intended outcome of reflection, such as improving teaching practice or the teacher gaining insight into him/herself as a teacher (p.2).

The potentials of reflection seem to be limitless. According to Zeichner and Liston (1996), it is a way to examine the worth of reflective teaching more profoundly that focusing on what teachers reflect about. The researchers suggested five traditions for the content of teachers' thinking: the academic "stresses reflection on subject matter", the social efficiency "highlights the thoughtful application of teaching strategies", the developmentalist "builds on students' backgrounds, interests, thinking, and patterns of developmental growth", the social reconstructionist "stresses reflection about the social and political context of schooling...to enhance equity, justice, and more human conditions in our schools and society", and the generic "emphasizes thinking about what we are doing without attention to the quality or substance of that thinking" (pp.51-52). That is to name a work reflective teaching a teacher should know the goals and the values inside the action and question those thoughts (Zeichner & Liston, 1996).

In order to understand what teachers know about their teaching practice, the focus of reflective practice should provide a wide range from technical aspects of teaching to the values of "equality and respect for differences... that aspires to be democratic..." (Zeichner & Liston, 1996). In a review of teacher education literature, Huang (2001) pointed to the lack of studies investigating what teachers know about their teaching practice. On the other hand, Huang believed that it should be amazing to deal with

because teachers become in the classroom with their thoughts, values, beliefs, and attitudes that constitute many aspects of the classroom, and it is an effective way to gain insights into teachers' professional development. Furthermore, Huang asserted that preservice teachers' reflection content should comprise Shulman's (1987) seven types of teacher knowledge: general pedagogical knowledge, content knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational context, knowledge of educational ends, purposes, and values, and the philosophical and historical grounds. Huang suggested exploration the ways of preservice teachers' professional knowledge construction to help them expand their scope of reflection:

Their [pre-service teachers] initial reflection on general pedagogical knowledge needs to be connected with other types of teacher knowledge. For example, pre-service teachers have to reflect on how to develop curriculum out of particular subject matters with adaptation to the diverse interests and abilities of students. They need to ask themselves whether the instructional decisions are considered in light of the political and social conditions. They should write about how their teaching practice relates to normative questions about the purpose and goals of education. (p.9)

Another perspective to conceptualize reflection is whether a hierarchy of reflective thinking exists or not (Johnson, 2005). There have been various attempts to explain reflective thinking in this manner. Among the various approaches to measure reflection, Van Manen (1977) was presumed as first by suggesting a hierarchical model. Van Manen's (1977) three-level hierarchical model has been used extensively by teacher educators or drew to reconstruct new frameworks or typologies to measure reflective thinking (Davis, 2006).

2.1.5 Level of Reflective Thinking

Taggart and Wilson (1998) proposed that reflective thinking can be grouped "according to the mode of thinking or the process an individual progresses through to reach a level of reflection that complements both the context of the situation and the

background the individual brings to the episode” (p.2). In an attempt to further describe and delineate characteristics and modes of reflective thinking through the development and application of Van Manen’s (1977) typology of reflection, Taggart and Wilson (1998) proposed a “Reflective Thinking Pyramid”, represents three levels of reflective thinking: technical, contextual, and dialectical (see Figure 2.2). By definition, the pyramid “builds progressively from a basic general premise to a peak of reflection epitomized by individual autonomy and self-understanding” (Taggart & Wilson, 1998, p.41). Each level represents various characteristics of reflective thinking in a nature of increasingly developmentally complex corresponding to the growth of the individual teacher from novice to expert or master teacher.

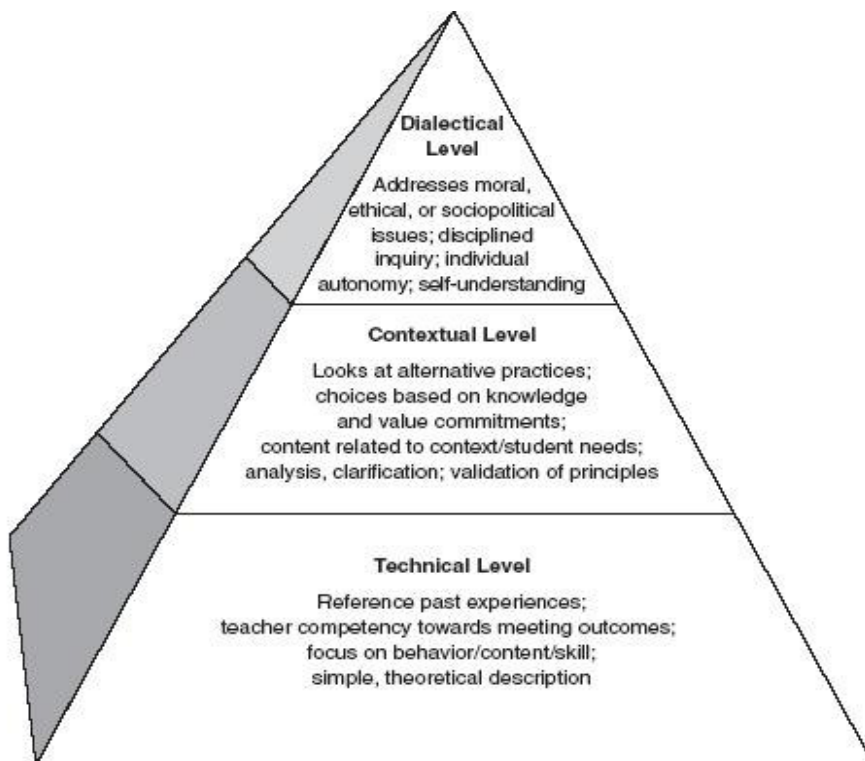


Figure 2.2 Reflective Thinking Pyramid Adapted from Taggart and Wilson (1998)

According to Taggart and Wilson (1998), the base of the pyramid is a technical level that is referenced to knowledge from past experience or theory of educational pedagogy, content, and methodology focusing on behaviors, content, and skills. Teachers who are thought to be in the lowest level of this pyramid select the methods appropriately and implement lessons effectively along with the predetermined schedule in terms of meeting outcomes. According to the technical practitioners “the objectives are not problematic nor does the practitioner deliberate on the context of the situation. Acquisition of skills and technical knowledge is important...” (Taggart & Wilson, 1998, p.2). They do not question alternative methods or ways through which they do teach. Therefore, they cannot produce new approaches or adjust themselves for the changing environment and for non-routine problems. Novice teachers are thought to function at a technical level with a lack of schema in dealing with educative problems. However, they may be “transitioning into linking theory development to practice and identification of the relevancy of activities and objectives. Practitioners need to be making observations and processing information to move toward solving problems and testing possible solutions for decision validity” (Taggart & Wilson, 1998, p. 4).

The second level of the pyramid is contextual level. Practitioners reflecting at the contextual level understand well the relationship between the theory and practice with analysis, clarification, and validation of principles or practices found in teaching. Outcomes for practitioners at a contextual level may be “understanding concepts, contexts, and theoretical bases for classroom practices, then defending those practices and articulating their relevance to student growth” (Taggart & Wilson, 1998, p.4). Contextual level reflection is referenced to obtain knowledge and personal values through the deliberation on theoretical bases, concepts, context, and practices that enable practitioners to clarify assess implications and consequences of actions and beliefs. This result in evaluating predetermined objectives and alternative methods to make comparisons in finding the best one that fits the context of education according to the students’ needs and other environmental and subject related issues. Thus, this level of reflective thinking requires inquiry and decision

making process in the scope of the development some routines and “rules of thumb” beyond being put in front of the schedule.

According to Taggart and Wilson (1998), the highest level of reflective thinking is dialectical level. Practitioners reflecting at the dialectical level of the pyramid should not only understand every detail of the assumptions, theories, methods and context but also evaluate and adjust curriculum in practice on in related with cultural, moral and ethical values. They make useful derivations from their knowledge and relate them to sociopolitical issues. Also, the teachers examine the norms and rules and compare the theories and assumptions in a detailed, open-minded, responsible, and willing way. Thus, the reflective teachers at this level of the pyramid “have progressed to an autonomous state evidenced by disciplined inquiry, reflection-in-action, self-actualization, and [self-efficacy]...” (Taggart & Wilson, 1998, p.42). Practitioners “are developing expert knowledge and ability to reconstruct action situations as a means for reviewing self-as-teacher and questioning assumptions previously taken for granted. Examinations of contradictions and systematic attempts to resolve issues are probable outcomes” At this level, practitioners “contemplate ethical and political concerns relative to instructional planning and implementation. Equality, emancipation, caring, and justice are assessed in regard the curriculum planning” (Taggart & Wilson, 1998, p.5). This level requires working professionally by questioning instructional planning and implementation in terms of students’ needs and ethical and moral values in a permanent and disciplined way without personal bias.

2.2 Reflective Thinking and Teacher Education

Jay and Johnson (2002) pointed out the accepted value of reflection for teachers due to teaching preservice teachers as a means of promising “think like a teacher” in many ways during their teacher education through the holistic nature of reflection derived from Dewey and Schön’s studies. Parkinson (2002) simply defined the

cyclical process of reflection as “moving through the planning and teaching of a lesson to collecting and analyzing evidence on its effectiveness that can be used to inform future teaching” (p.10). This process requires not only classroom experience, but also a good understanding about teaching and learning while teachers are deliberately undertaking an inquiry to improve their teaching practices (Parkinson, 2002). Reflective teaching grounded in a dynamic base because teachers monitor, evaluate and revise their own practice continuously through successive cyclical or spiraling process to capture higher-quality standards of teaching (Pollard, 2002). Similarly, Cruickshank, Metcalf, and Bainer (1995) described the benefit of reflecting on teaching is that it enhances learning about teaching, increases ability to analyze and understand classroom events, enhances classroom life, draws to self-monitor and self-understanding on the way of personal and professional development of teachers. Consequently, reflective teaching is a constructive process that requires creativity of teachers in making instructional decisions according to their students’ needs, feedbacks, and contexts; hence, “the process of reflection feeds a constructive spiral of professional development and capability” (Pollard, 2002, p.4).

Pollard asserted that Dewey’s notion of reflective thinking when developed and applied to teaching is both challenging and exciting. Given the insight into the complexity of reflective thinking, Pollard summarizes the characteristics of reflective teaching as follows:

1. Reflective teaching implies an active concern with aims and consequences, as well as means and technical efficiency.
2. Reflective teaching is applied in a cyclical or spiraling process, in which teachers monitor, evaluate and revise their own practice continuously.
3. Reflective teaching requires competence in methods of evidence-based classroom enquiry, to support the progressive development of higher standards of teaching.

4. Reflective teaching requires attitudes of open-mindedness, responsibility and wholeheartedness.
5. Reflective teaching is based on teacher judgment, informed by evidence-based enquiry and insights from other research.
6. Reflective teaching, professional learning and personal fulfillment are enhanced through collaboration and dialogue with colleagues.
7. Reflective teaching enables teachers to creatively mediate externally developed frameworks for teaching and learning (pp.12-13).

Reflective teaching is a valuable process because it brings about changes in teachers' professional practice (Griffiths, 2000). It can be concluded that reflective teaching consists of a conscious, systematic and deliberate acting in classroom by implementing a cyclic inquiry on the teaching practice. In this practice, teachers are reflective practitioners as being active participants and being capable of making decisions about the curriculum by evaluating the position of the students in the program as a means of achieving a planned end and improving themselves how they better achieve this goal. In essence, it requires the teachers to develop themselves through critically examining their own practice during their teaching action, as a consequence reflective teacher characteristics have evolved as outcomes of the process of learning to teach.

2.2.1 Characteristics of Reflective Teachers

Valli (1997), in particular, captures the spirit of Dewey's words in her description of reflective teachers, whom he says "can look back on events, make judgements about them, and alter their teaching behaviours in light of craft, research, and ethical knowledge" (cited in Jay & Johnson, 2002, p. 74). Zeichner and Liston (1996) noticed that reflection as a slogan for educational reform implies a recognition that

the process of learning to teach continues throughout a teacher's entire career. According to Zeichner and Liston (1996), a reflective teacher who examines, frames, and attempts to solve the dilemmas of classroom practice; is aware of and questions the assumptions and values he or she brings to teaching; is attentive to the institutional and cultural contexts in which he or she teaches; takes part in curriculum development and is involved in school change efforts; and takes responsibility for his or her own professional development (p.6).

According to Henderson (1992), reflective teachers are expert teachers who know their subject matter and are able to teach it well. They must be experts in time management, discipline, psychology, instructional methods, interpersonal communication, and learning theory. Reflective teachers willingly embrace their decision-making responsibilities. They regularly reflect on the consequences of their actions. They are receptive to new knowledge and regularly learn from their reflective practice through ethics of caring, the constructivist approach to teaching, and artistic problem solving (cited in Danilo, 1999, p.262).

Parkinson (2002) characterize a reflective teacher who "thinks about what goes on in the classroom, makes an appraisal of the situation and then uses the information to improve" (p.8) from the simplest level of taking into account something that happened during the lesson to the deepest level of involving a rigorous analysis of what has happened during the lesson by asking the question 'why?' Hence, reflective teachers hold thoughtful, careful, and purposeful reflections on themselves or their teaching/practice in a manner of recognizing continually the need for personal and professional development. In doing so, they can develop a deeper understanding of teaching and learning and move from common-sense thinkers to reflective thinkers. The below table (Table 2.1) was adapted from Huang (2001) indicates the characteristics of common-sense thinkers and reflective thinkers.

Table 2.1 Characteristics of Common-sense Thinkers and Reflective Thinkers

Common sense thinkers	Reflective thinkers
Self-orientation	Student-orientation
Short-term view	Long-term view
Reliance on personal experience in learning to teach	Grounded in knowledge of self, children, and subject matter
Unaware of need to learn, feeling of already knowing much from having been in classrooms as a student	Open to learning, growth-oriented
Metaphor of teacher as transmitter	Metaphor of teacher as facilitator

Dewey (1910/1998) postulated that open-mindedness, whole-heartedness, and responsibility were the necessary attitudes to act in a reflective way for a teacher. Dewey's conception of open-mindedness includes "an active desire to listen to more sides than one; to give heed to facts from whatever source they come; to give full attention to alternative possibilities; to recognize the possibility of error even in the beliefs which are dearest to us" (p.30). Zeichner and Liston (1996) asserted that an open-minded teacher continually seeks out conflicting evidence, considers his/her own the strengths and weaknesses and others' perspectives of students, learning, and schooling. Pollard (2002) referred the open-mindedness as the sense of teachers' willingness to reflect upon themselves to challenge their own "assumptions, prejudices and ideologies, as well as those of others" (p.17).

The second prerequisite for reflective action, according to Dewey, an attitude of having responsibility, "involves careful consideration of the consequences to which an action leads. Responsible teachers ask themselves why they are doing what they are doing in a way that goes beyond questions of immediate utility..." (Zeichner & Liston, 1996, pp. 10-11). According to Zeichner and Liston, this attitude of responsibility also involves reflection about the unexpected outcomes of teaching

because teaching always involves unintended outcomes as well as intended ones. Pollard (2002) suggested that the moral, ethical, and political issues should be argued and considered in the worth of making professional and personal judgments.

Being whole-hearted is Dewey's third attitude describing reflective thinking act. Whole-heartedness refers "essentially to the way in which such consideration takes place" (Pollard, 2002, p.18). Zeichner and Liston (1996) postulated that wholehearted teachers "regularly examine their own assumptions and beliefs and the results of their actions and approach all situations with the attitude that they can learn something new" (p.11). Then, being whole-hearted puts the person as dedicated, single-minded, energetic, and enthusiastic into the teaching event with all of his/her heart and attention (Pollard, 2002). Whole-heartedness enables pre-service teachers to overcome fears and uncertainties for a meaningful change and evaluate themselves, students, schools and society in a critical way (Yost, Sentner, & Forlenza-Bailey, 2000)

All reflective teachers should behave in a whole-hearted, open-minded and responsible way. Open-minded teachers try to find alternative views and question even firmest beliefs that are always accepted as natural and true. Responsibility requires considering long-range goals as well as immediate issues. Wholeheartedness requires criticizing the school, society, the student, and the teacher herself/himself. Pollard concluded that "maintaining a constructive engagement, a willingness to imagine new futures, and a self-critical spirit are thus all connected to reflective practice" (p.18).

2.2.2 Reflective Programs

Freese (1999) synthesized that throughout reflective teaching practice, the preservice teachers rethink, reevaluate and reframe their experiences and theories from various points of view. By admitting that the teaching act is a complex and vague act, she

believed that there should be a way in which the preservice teachers question and interpret their knowledge and learn to be flexible and deep analyze the action they do. Acknowledging that novices may have limited knowledge bases from which to accurately evaluate and reflect on their experiences (Richardson, 1990, cited in Kaminski, 2003). In response to, reflection as a process should be provided to help novice teachers more in-depth understandings about teaching and learning through reflective teaching programs. In so doing, preservice teachers learn by doing in a social context and finally improve their understandings of teaching (Freese, 1999).

Preparing teachers to be active decision makers and reflective thinkers can be an effective component of the teacher preparation process in which preservice teachers develop a profound understanding from engaging in the interplay and dynamic process of learning and teaching. It can be referred to the study of Gore (1987, cited in Kaminski) that reflective teaching approaches offer opportunities to engage in and consider teaching and learning situations purposefully and analytically. Consequently, during the last two decades there has been a growing body of literature related to programs underpinned by reflective strategies or models for cultivating challenge teachers based on these typologies. A review of literature about reflective teacher education programs reveals the varied research efforts in order to assist preservice teachers in becoming more reflective. Some of these programs were given in detail below.

In understanding and facilitating preservice teachers' reflection through a school-based teaching training program at Monash University, Lee and Loughran (2000) used a model that is basically derived from Schön's (1983, 1987) conception of reflection: framing and reframing and an adaptation from Mackinnon (1985, 1987). The model consisted of three phases 'reflective cycle' which are initial problem setting/framing, reframing and resolution. In order to articulate pre-service teachers' reflection in the three phases of teaching involving preactive, postactive and interactive, they employed an interview-video-interview cycle corresponding to pre-lesson interviews, post-lesson interviews and while-viewing video interviews held

after lessons. It was found that student teachers' reframing occurred more than once as their professional knowledge and pedagogical experiences developed; the more experience preservice teachers gained, the more likely they saw their experiences from new perspectives. It was also concluded that preservice teachers learn more about and through reflection on school-based experience rather than classroom experience.

In part of their review of the literature on reflection, Jay and Johnson (2002) developed a Teacher Education Program (TEP) typology in response to the complexity of reflection by describing how reflection is understood and taught. Reflective practice and strategies were modeled within coursework for bridging theory and practice in an effort to teach reflective practice to preservice teachers in the University of Washington's TEP program through a weekly seminar based on reflective dialogue. The typology with three dimensions of reflective thought: descriptive, comparative and critical reflection was valued as an effective tool to model reflective practice and to encourage reflection not only on multiple levels but also from multiple points of view. In the TEP program preservice teachers were required to compile a portfolio for their reflections on educational theory and teaching practice in making implicit knowledge explicit. These artifacts were examined for the evidence of descriptive, comparative and critical reflection. As a conclusion, it was suggested that the types of reflective thought presented in the TEP typology might be used to teach purposeful thinking for better understanding. In addition, it was acknowledged that reflection was an evolving concept, and the typology was a flexible pedagogy.

Freese (1999) used a reflective framework to guide secondary preservice teachers and their mentor teachers in systematically reflecting on their lessons incorporated through Master's of Education in Teaching (MET) Program, in which social practice is a central feature through the interaction, coaching, feedback between the preservice teacher and mentors. It was presumed that the works of Dewey (1933), Schön (1983), and Loughran (1995) had influenced and shaped the MET program as

well as the practices and experiences of the preservice and mentor teachers in this study. The program that required reflection for both preservice teachers and mentor teachers during the act of planning the lesson-anticipatory reflection and during the actual teaching of the lesson-contemporaneous reflection, as well as after the lesson-retrospective reflection conceptually based on Loughran's model as a guide to help them reframe their experiences by making the tacit explicit. Freese (1999) asserted that use of a three-part reflective framework prompted preservice teachers to actively think about their practice and improve their teaching and their students' learning. That was valued as a reflective teaching program emphasizing inquiry, collaboration and experiences to provide insight into how the preservice teachers purposefully think about their practice in order to make sense of their teaching experiences.

Gore and Zeichner (1991) conducted a self-study based on action research to promote critically reflective teaching in the elementary education program at the University of Wisconsin-Madison. The Wisconsin program was oriented with the social re-constructionist view of reflection considering social and political context into focus to defend the elimination of inequalities and injustices in schooling and society. Under the scope of the study, the aim of an action research was described as to understand and improve one's own practice through sharing concerns on the base of democratic intent. The written reports of action research projects through two consecutive semesters completed by 18 student teachers were then analyzed for evidence of the reflective teaching practice to which extent contributed. The analysis revealed three themes: only a small group concerned for moral and political issues; a larger group concerned for these issues but did not develop the ideas; and more than half of them did not concern for these issues at all. The scholars discussed the reasons for the lack of evidence to the critical domain of reflection and gave suggestions for the alterations of the student teaching course considering action research.

In a similar fashion, Wubbels and Korthagen (1990) introduced a Dutch program based on reflective teaching, the ALACT model, advocated student teachers learn to

proceed through the spiral model of five phases: action, looking back on the action, awareness of essential aspects, creating alternative methods of action, and trial. For this quantitative study, the quasi-experimental research design was used with a control and experimental group to compare long-term effects of reflective program with a more traditional subject-matter-oriented program in terms of reflective attitudes, interpersonal relationships, inclinations toward innovation, and job satisfaction. The participants were two groups in-service teachers who graduated between 1977 and 1986. Reflective attitude was measured with a five point scale Likert-type questionnaire under the four domains of the teacher, the students, the subject-matter and the situation in the school. Additional information was collected on inclination towards innovation and job satisfaction with a modified version of a teachers' questionnaire. It was concluded that teachers graduated from a program designed to promote reflective teaching have a better relationship with their students from both perspectives of students and teachers' perceptions and have the long term more job satisfaction, whereas there was no significant difference between two groups in terms of inclinations to reflect and towards innovation.

In reaction to the insufficient literature that has a notion of Schön's (1983,1987) model of the practicum in the field of initial teacher education, Wilson and I'Anson (2006) designed a model of the practicum for the initial teacher education (ITE) program based on microteaching as a practicum context shaped with Schön's concept. According to the crucial aspects of Schön's characterization of the practicum, microteaching lessons were conducted on the principles which simplified version of a real world, coaching relationships, and bridge between university and school were required. The microteaching lessons with small groups of pupils from local schools among the preservice teachers were discussed by themselves in dialogue with their university tutor and teacher fellow. The preservice teachers were all attributed benefits microteaching as being remote from the complex world of classroom life. It was found as generative of new problematic situations leading to a productive framing of both theory and practice.

In Turkey, the implications of reflection on education have become also under investigation with the increasing interest recently. Among the research attempts to promote and explore reflective practice of preservice teachers, Şanal-Erginel (2006) conducted a case study in the form of an action research in qualitative research paradigm with 30 pre-service teachers enrolled in an undergraduate teacher education program of English language in providing comprehensive analysis on the process of becoming reflective practitioners. Weekly guided journal entries, tape-recorded reflective interactions and interviews, assignment on videotaped microteaching, questionnaires and observations provided a rich data to consider preservice teachers' perceptions on becoming reflective and their focus of attention throughout their practicum. The findings of the study indicated that the preservice teachers perceived this process positively as being a reflective teacher. The preservice teachers valued collaboration as an important parameter in the promotion of their reflection, while they were concerned about instructional process, student motivation, assessment, and classroom management issues. Furthermore, the study revealed that there was a developmental process in preservice teachers' reflectivity through the course.

Köksal (2006) conducted a mix study of an experimental design and a case study design to explore the effects of the development of the preservice teachers' reflective thinking skills to the planning, implementation and the evaluation process of teaching. A reflective thinking curriculum was implemented in experimental group. The reflective curriculum involved two dimensions of conceptual and implementation of practice teaching. A conceptual framework to encourage the preservice teachers' sense of reflection was given preservice teachers on the theoretical part of the course at the university. In the second dimension of the program, preservice were provided to reflect on their experiences in the practice school. Data were collected through observation notes, camera recordings, interview form, self evaluation form, participant journals and lesson plans to evaluate the reflective curriculum. According to the findings of the study, reflective thinking curriculum provided positive contribution to the pre-service teachers' planning

decisions, preparation for teaching, teaching-learning and evaluation process as a mean of the curriculum implementation. More specifically, the preservice teachers' personal and professional qualifications as a creative reflective teacher were identified.

Oruç (2000) conducted an experimental study with ten inservice teachers in a high school to investigate the effects of a reflective teacher training program on teachers' perception of classroom environment and on teachers' attitude to teaching profession. A nine-week reflective teaching program for the experimental group was designed based on group discussions on the shared written journals emerged from three phases of the program: self-awareness phase; reflective activities phase of 'my best teacher', 'short aids', 'flashback', 'market stall', 'narrative autobiography' 'My wall of education', 'columns', 'the student mosaic', and 'arrows' mainly grounded in the techniques of Hancock and Settle (1990) and Korthagen (1992) for teacher education seminars; evaluation phase. Quantitative analysis revealed a significant difference in the innovation subscale of the classroom environment scale for the experimental group. Other variables indicated no significant differences between and within the two groups. On the contrary, the qualitative analysis of journals indicated that the program contributed positively to teachers' perceptions of their classroom environment and to teachers' attitude toward teaching profession.

In summary, on the process of learning to teach, teaching practice offers preservice teachers the opportunity to engage in reflection through systematic investigation of practice. On the other hand, reflection is regarded as an essential condition for teachers having the capacity to continue to steer their own development as teachers (Korthagen, 2001, cited in Mansvelder-Longayroux et al., 2007). In the same line, as a necessary but not sufficient condition for professional development, Day (1993) claimed that few discussions in the literature occur without some references to the central role of reflection in the learning life of the teacher. Reflection is then identified as being as essential part of learning (Day, 1993), and a fundamental process in enhancing professional development (Pollard, 2002).

Based on the assumptions that teaching improves as a result of increasing the quantity and quality of experience to reflect, from the literature there are many emerging strategies gaining acceptance in teacher education to supervise or construct these experiences in enhancing teachers' reflectivity. Sometimes, these strategies may be characterized under some promising approaches at improving teaching preparation. Some reflective strategies and approaches/models will be given in detail under the following sections.

2.2.3 Reflective Strategies

Teacher education programs and researchers use strategies to promote development of reflection varied in their nature, description and implementation. Recognizing that in the literature there are a wide variety of reflective strategies, even sometimes there is little evidence about the effectiveness of them, researchers have categorized them under different topics. Taggart and Wilson (1998) in their book presented some of these strategies to promote reflective thinking as observational learning; reflective journals; practicum strategies such as reflective teaching and microteaching; mental-model processes such as metaphors and repertory grids; narrative inquiry such as story, autobiographical sketches, and case study; and action research.

In addition to these strategies, the literature has supported the effectiveness of peer-coaching and portfolios as a means of promoting reflective thinking abilities among preservice teachers. The portfolio has been characterized as a tool for enhancing reflective practice, as a means of developing teaching and learning, as well as evidence of professional development in the process of learning to teach (Darling, 2001; Mansvelder-Longayroux et al., 2007; Orland-Barak, 2005; Wenzlaff & Cummings, 1996; Wolf & Dietz, 1998; Zeichner & Wray, 2001). Synthesis of relevant research has indicated that peer coaching is also gaining acceptance as a powerful teacher training and professional development tool (Kurts & Levin, 2000; Vidmar, 2006). In this study, reflective journals, peer coaching, microteaching,

autobiography and metaphors were employed to encourage student teachers to reflect. Therefore, in the following section these employed strategies were explained alongside with the effective implications.

2.2.3.1 Reflective Journals

Among these reflective strategies, writings that have often employed are regarded as an integral part of reflection. Especially, reflective journal is a powerful way of systematic and deliberative investigation that makes tacit thoughts and actions explicit to foster reflection (Hatton & Smith, 1995). Preservice teachers can use the journals as the medium and a safe place for recording and reflecting upon their school experiences (Maloney & Campbell-Evans, 2002), that is to provide a permanent record of thoughts and experiences (Spalding & Wilson, 2002). Wallace & Oliver (2003) proposed that journals provides a dialectical forum for reflection-on-action to preservice teachers who interact their prior knowledge systems with the real context of the teaching world to constitute a balance between action and reflection. Taggart and Wilson (1998) expanded that reflective journaling assists practitioners by making practice more educative that provides consistency between practice and the beliefs and values of practitioners. Research on journal writing supports the value of journals as a method that promotes reflective thinking on the process of learning to teach (Bain, Ballantyne, Packer, & Mills, 1999; Gipe & Richards, 1992; Langer, 2002; Maloney & Campbell-Evans, 2002).

Thus, reflective journal writing becomes a form of personal reflective research (Poirier, 1992) through which the preservice teacher gains understanding of the complexity of classroom learning which links personal, social, situational, and political influences. Based on critical examination of the past experiences, the preservice teachers use their individual experience to construct their virtual world in which the process of reflection works as a form of mental role play (Knowles & Holt-Reynolds, 1991). The reflection through the use of journals insights teachers'

initial perspectives about themselves, their needs, and their responses to the processes of becoming a teacher, and then it serves as chronological data about their thinking and learning. Reflective journals help them developing personal theories about practice, examining and evaluating held beliefs and concepts (Bain et al., 1999)

Maintaining of reflective journals can assist in creating a bridge between the student teacher and and the university supervisor. That is so, it serves as dialogical teaching tools as a means of establishing and maintaining relationships with students (Spalding & Wilson, 2002). Then, journals serve as a link to supervisors in monitoring and guiding preservice teachers in the process of learning to teach (Bolin, 1988). Acknowledging the dynamic and complex nature classrooms, the cooperative teacher and university supervisor can prevent preservice teachers living frustrations and help them professional development under the light of their writing and vice versa the preservice teachers observe in such classes during his or her classroom record, for their mentors can utilize them as a beginning themselves professional development. The below table (Table 2.2) illustrates a number of benefits of reflective journal use from two perspectives in promoting reflective thinking based on related research (Taggart and Wilson, 1998, p.91)

That is to say reflective journal is widely accepted as an effective component of teacher preparation for more meaningful reflection. In the literature there were numerous studies of reflection that have utilized journals as method in order to better understand preservice teachers' learning and thinking. Gipe and Richards (1992) analyzed journals of preservice elementary teachers and observed their teaching to demonstrate the link between preservice teachers' reflective thinking and growth in their teaching abilities throughout one semester method course. For the quantitative analysis, reflective statements in the journals were determined in terms of sense of their teaching experiences and considering more broader socio-political impacts on their practice. On the other hand, preservice teachers' teaching ability were rated by the mentor teachers to compare with their reflection level. It was suggested that

teacher preparation programs should foster reflective thinking as an important aspect of growth in teaching competencies.

Table 2.2 Benefits of Reflective Journal Writing

Journals provide the reflective practitioner with means of	Journals provide the facilitator with means for
Analyzing and reasoning through a dilemma	Challenging, supporting, and monitoring a practitioner's reflective thinking
Enhancing development and reflection	Promoting questions and discussion in educational course work and field experiences
Promoting growth in critical analysis of teaching	Analyzing teacher development, learning perspectives, and current level of understanding
Promoting awareness of relationships between educational psychology and practical experiences	Guiding instruction
Systematically reflecting on self-development and on actions within classroom and work contexts	Qualitatively analyzing instruction or a program
Practicing reflective inquiry	Effectively maximizing staff development
Building understanding by writing about what is learned	
Linking understanding with classroom practice	

Davis (2006) pointed to the power of the reflective journals as one of many approaches for encouraging written reflection. In order to further promote learning and to provide a window into teachers' thinking, Davis conducted a study among a sample of 25 preservice elementary teachers in field-based science method course. Data were collected through on-line journal writings considering personal teaching experience to characterize productive reflection corresponding to Loughran's (2002) notion of effective reflective practice in terms of integration of ideas among aspects

of teaching, such as learners and learning, subject matter knowledge, assessment, and instruction; and also how analytic the reflection was. It was illustrated that preservice elementary teachers integrated their ideas among aspects of teaching and analyzed their teaching in the matter of developing a more complex view of teaching.

McMahon (1997) conducted a case study on how two preservice teachers in their field-based method course used journals to react on emergent issues related to course issues or teaching. Both written and transcribed oral documents were analyzed to better understand how preservice teachers link theory to practice in creating bridge between their thinking related to course content and their classroom experiences. Analysis of the data revealed that the preservice teachers demonstrated very different ways of struggling with such an equity issues with the changing multiple levels of Van Manen's (1977) reflective thinking.

In an effort to conclude the benefits of reflective journal writing, Larrivee (2000) pointed to the ensuring to record by the way of keeping a reflective journal in which time is set aside for daily reflection. It provides a safe haven "for dumping daily frustrations, working through internal conflicts, recording critical incidents, posing questions, naming issues, solving problems, identifying relationships, seeing patterns over time, and tracing life patterns and themes" (p.297). From the perspective of teachers, through journal writing teachers can look more objectively at their behaviors toward students in the classroom and examine personal biases and prejudices. A further look into types of journaling is needed to appreciate the benefits the extent to which can be created in different shapes, sizes, and forms (Langer, 2002).

2.2.3.1.1 Dialogue Journal

As a type of journal, dialogue journal, is regarded as the most promising tool for the purpose of enhancing reflective thinking. A journal becomes dialogical teaching tool

when it requires thoughtful and meaningful feedback. According to Taggart and Wilson (1998), “dialogue occurs when the facilitator responds to journal entries either through discussion or through written entries” (p.90). Besides the benefits of journal writing, dialogue journal provides facilitators with a tool for responding to events and to reflections on events by practitioners (Taggart & Wilson, 1998). Knowles and Holt-Reynolds (1991) valued journal writing when it involves interactive dialogues between the mentor and the preservice teacher to reflect their orientations to teaching. Langer (2002) expanded that dialogue journals are widely used as a method to encourage the exchange and development of ideas between two or more writers.

Garmon’s (2001) study questioning the benefits of dialogue journals in teacher education as a means of promoting reflection among prospective teachers resulted in their enhancing learning, self-reflection, and self-understanding. On the other hand, the styles for giving written feedback on preservice teachers’ dialogue journals that are widely accepted as helpful in transition to more advanced level of reflective thinking vary in nature from supportive/affirming comments, through giving information, to questions implied challenging or suggestions (Bain, Mills, Ballantyne, & Packer, 2002; Maloney & Campbell-Evans, 2002)

The literature related to the given type of feedback to reflective journals provides the insight about the value of feedback. Spalding and Wilson (2002) analyzed the journals of four preservice secondary teachers to identify pedagogical strategies that help them improve their reflective thinking. Among them they found that personalized feedback on their journals from instructors and their relationship with their instructors were most important in helping them grow reflectively. Two subsequent studies in the same line with the impact of written feedback from the university supervisor on journals indicated that it was valued as its contribution preservice teachers to think in more depth about what they have written, to look at issues or incidents in a different way and to think about aspects of their learning experiences they had not previously considered, further feedback focused on the

level of reflection was found to be more effective than that is on the content in improving their reflective journal writing (Bain et al., 1999; Bain et al., 2002). They pointed to the major contribution of “constructive feedback” to the encouragement of growth in reflective writing by the ways of challenging their naive assertions and expressing alternative perspectives.

2.2.3.1.2 Guided Journal

Hatton and Smith (1995) depend the effectiveness of reflective techniques very much on their prior structuring. In the same line, Huang (2001) points to the need for a concrete conceptual guideline for directing reflection for more meaningful reflection. In the literature these guidelines are generally provided by the guiding questions to facilitate preservice teachers’ reflection upon their professional practice (Bain et al., 2002; Rodriguez, Sjoström & Alvarez 1998; Wallace & Oliver, 2003). Freese (1999) concluded that “an organizing framework can assist preservice teachers in evaluating their experiences and making sense of their teaching” (p. 907)

According to Langer (2002) an unstructured journal results in free format writings of students that is resembled a diary format. Langer draws attention to the difficulties due to the unstructured nature of this type of journal. It makes it difficult to compare with other formats used by students in the same class, and thus makes it difficult to compare how students are reflecting and learning as a group. On the other hand, benefits of structured journals are valued in a manner of its benefits that is comparable due to its specialized or constrained format. From the perspectives of mentors this allows them to compare student responses and reflections and obtain feedback on specific discussions and lectures. From the perspective of students, they are able to follow a template, which serves to provide guidance to students on approaching and developing journals.

A synthesis of literature indicates that reflective journal writing is such a technique which has been advocated in the related literature as a means of facilitating preservice teachers reflective learning ranging from simple description to higher order thinking and writing skills such as dialectical reasoning, dialogical reflection, critical reconstruction, problem solving, application, and metacognition (Bain, et al., 1999; Bain et al., 2002; Hatton & Smith, 1995; Holly, 1989 cited in Langer, 2002; Maloney & Campbell-Evans, 2002; Sparks-Langer, Simmons, Pasch, Colton, & Starko, 1990). In summary, the existing literature on the use of reflective journals in teacher education indicates that it seems to be a formal tool for developing reflective thinking.

2.2.3.2 Peer Coaching

In general meaning, Kurtts and Levin (2000) defined peer coaching as “a process in which two or more colleagues work together to improve their teaching skills by observing targeted behaviors of their partners in the classroom and providing constructive feedback” (p.298). Because of the social interactions among colleagues, the nature of peer coaching requires collaborative atmosphere of support and feedback.

Peer coaching has gained much acceptance in teacher education as one of the most challenging aspects of reflective thinking through social interactions (Göker, 2006; Kurtts & Levin, 2000; McAllister & Neubert, 1995; Vidmar, 2006). By collaborating, colleagues could have opportunities for sharing ideas, giving constructive feedback to each other on teaching skills, and generating alternative approaches for better understanding of their teaching practice and then improving teaching instructional techniques. At this point, it is necessary to explain collegial support as “helpful, constructive, and encouraging feedback provided in a collaborative manner from someone who is in a similar position” (Kurtts & Levin, 2000, p. 299). In contrast to potentially negative feedback from someone in a

position of power and authority, reflective peer coaching involves a reciprocal relationship between peers in which the coach acts as a facilitator offering prompts to encourage the teacher to think and talk about practice resulting in the teacher's self-exploration (Kurtts & Levin, 2000; Vidmar, 2006). The coach's responsibility is also to listen purposefully the instructor to build trust as a mean of correcting and suggesting, not responding (Vidmar, 2006).

In fact, peer coaching is a non-evaluative process of classroom practice to provide assistance, suggestions and support in a safe environment for which developing or improving instructional skills, strategies, and techniques as well as experiment with new strategies (Freese, 2006; Göker, 2006; Hasbrouck, 1997; Showers & Joyce, 1996). Reflective peer coaching appears to be as an integral part of professional development programs (Thijs & van den Berg, 2002). According to Vidmar reflective peer coaching is a formative process that potentially offers discussion of intentions/outcomes prior to teaching, then reflecting upon the experience for improving teaching and learning. That is to say, reflection on experience elicits self-awareness prior to, during, and after actual teaching action.

McAllister and Neubert's (1995) developed a model of peer coaching based on support and feedback for encouraging preservice teachers' reflective thinking. They developed Praise-Question-Polish (PQP) conferencing style form for giving feedback as the central to the model. The study with of a large sample of preservice teachers valued the model of peer coaching in encouraging reflective thinking while preventing the isolation and frustration of preservice teachers. In the same line, Kurtts and Levin conducted a study of peer coaching with 27 preservice elementary teachers based on McAllister and Neubert's PQP model for giving feedback. Analysis of coaching forms, written reflective summaries, and transcripts of debriefing sessions revealed that structuring peer coaching improved reflective practices of preservice teachers by engaging them in interpersonal interactions and self-analysis. It was concluded that peer coaching can be a powerful catalyst to pick a stance of reflective and inquiry-oriented teacher education program. Peer coaching

appears to help colleagues develop as reflective practitioners, acquire and transfer of newly learned skills, and encourage peer support and feedback (Kurtts & Levin, 2000, Vidmar, 2006). Further, it reduces isolation among teachers, enhances collaboration and sharing both accomplishments and frustrations (Hasbrouck, 1997).

2.2.3.3 Microteaching

Taggart and Wilson (1998) defined microteaching as a simulated teaching experience of short duration, with the practitioner teaching a lesson to a small group or to a small class of students. Taggart and Wilson provide the following rationale for the microteaching experience drawing from the literature. Microteaching allows the practitioner to; practice a technique, strategy, or procedure; reduce anxiety by practicing in a supportive environment; test innovative approaches to a teaching concept; develop specific delivery strategies, such as questioning or closure; experience facilitator, peer, and self evaluation; gain immediate feedback of experiences; practice team teaching in a supportive environment (p.116).

Although microteaching has originally evolved as the on-campus clinical experience method to master specific teaching skills, nowadays in many teacher education programs, “the use of microteaching has expanded from its original focus of helping preservice teachers to master discrete teaching skills, to giving them the complete teaching experience and orienting them to teach in the natural classroom during field experience” (Amobi, 2005, pp. 115-116). Whatever the purpose of microteaching, Amobi defined two essential components as videotaped micro lessons and feedback.

The use of videotaped lessons as a part in the process of reflection for the purpose of self-evaluation of teaching is a well accepted method of learning about teaching. Huang’s (2001) study is an investigation of secondary preservice teachers’ reflective practice through their self analysis on their video-taped microteaching performances for the course of teaching techniques. Forty-five secondary teacher education

program students were required to keep journals to reflect on their teaching after presenting microteaching lessons in a way of including strengths, weaknesses, and improvements. It was generally valued by the preservice teachers to offer opportunity to review the lesson and discuss students' reaction and feedback in verifying their fun.

Amobi's (2005) microteaching study with thirty one preservice teachers in field-base general methods course required them two microlesson activities based on self and peer evaluation. The reflectivity was examined in the written documents of preinstructional and postinstructional analysis of microteaching. It was reported that microteaching was appreciated as an favorable method for meaningful learning experience and a pressure-free environment for planning, teaching, and reflecting on their teaching.

On the other hand, in the study of Lee and Loughran (2000) with six preservice teachers taking the pre-service teacher training, an interview-video-interview cycle was conducted to analyze the videotaped lessons that were recorded during the school-based period of teaching practicum. Preservice teachers reflection in the three phases of videotaped teaching were articulated by conducting; pre-lesson interview was held before a lesson to probe their anticipation of a future pedagogical experience; post-lesson interview was held after the lesson to elicit their reflection about a past pedagogical experience; and while-viewing the video interview to elicit their interactive thinking. All interviews were audio-taped and transcribed by the researcher for the subsequent analysis. The methodology of interview-video-interview cycle was appreciated as the indicative of framing and reframing occurred over time.

Research from those in Turkey, Göde (1999) carried out a study with four English instructors at the preparatory school at Çukurova University in order to examine the use of video as an observation tool for stimulating teacher reflection and allows teachers to experience both being the observer and the observee. Alongside long term

effects of the analysis of videotaped classroom observation were under investigation. The videotaped lessons were watched together with the participants and researcher for the reflection sessions. Reflection categories as a result of the analysis of video-recorded self observations were use of speech, types of students, personalities, posture, and board usage. It was realized that participants were not aware of the process of their instruction in many aspects even they supposed to be in and they perceived positive attitudes being watched in the classroom. In addition, the follow-up interviews revealed that all of the participants experienced long-term effects of the study in a way they made changes that would encourage a continuation of reflection.

2.2.3.4 Autobiography

Solas (1992) described autobiography as “the life story of just one individual who is the central character of the life drama which unfolds” (p.212). Carter and Doyle (1996) used the personal biographies to enable preservice teachers to understand their attitudes, beliefs, and orientations to learning in their psychoanalytic theory (cited in Griffiths, 2000). That it was presumed “the person has developed an identity, individuality, and a consciousness in order to organize his or her own private history from the perspective of the present” (Solas, 1992, p.212). Henderson (2001) proposed that through autobiographical inquiry an individual can challenge himself/herself “to be in touch with the enchantment of teaching-learning transactions” (p.135). As a consequence writing autobiographies in a matter of reflecting on the meaning and relevance of the life story is a powerful tool for promoting professional growth (Taggart & Wilson, 1998). Particularly, Taggart and Wilson asserted that:

The perspective of education brought out in the practitioner’s story line is based on beliefs, intentions, interpretations, and interactions of a lifetime. An autobiographical frame of reference assists practitioners in making sense of current experiences and responding rationally to stimuli within those experiences (p.164).

Taggart and Wilson (1998) claimed additional advantages of self-exploration through autobiography as follows: enhancement of qualitative research by opening new avenues of thought; a vehicle for curricula and educational reform; a foundation on which to ground educational policy and practice; reclamation, emancipation and empowerment of practitioners; self-understanding, personal growth, and professional development (p.164). Writing an autobiography is an important reflective learning strategy as a way to reconstruct teachers' and students' experiences on the process of teaching and learning because it involves conscious and reflective elaboration of their educational lives, including personal and professional experiences as well as the background the individual brings to this process (Solas, 1992). Further, Holt-Reynolds (1991) claimed that autobiography revealed the underpinnings of practitioners' belief systems, goals, and arguments about 'good' teaching (cited in Taggart and Wilson, 1998, p.164). Henderson (2001) regarded the process of "becoming" as a lifelong endeavor that offers teachers to infuse their artistic expression with their love of teaching and learning. Five dimensions of autobiographical inquiry were elicited as a framework for helping teachers get to know themselves better for purposes of greater understanding, living, and ultimately teaching. These dimensions are: awakening to yourself, traveling with a trusted guide, associating with self-aware others, engaging in dialogue, and becoming the individual you desire to be (Henderson, 2001).

In her study, Oruç (2000), as a requirement of a reflective teacher training program participants wrote narrative autobiography in addition to journaling. It was appreciated as to provide inservice teachers an insight and a link between their personal history and experiences and their current behaviors and its influence on their developing or already developed conceptions of teachers, students, schools, teaching and learning. Solas expanded that autobiographical and personal construct theory complement each other in understanding the preservice teachers' self-developed theories about learning.

Heikkinen (1997, cited in Oruç, 2000) proposed autobiography writing on the matter of relating stories about one's life as an inquiry of self. The student teachers were guided with a list of questions in writing their autobiographies and sharing autobiographies that were used as a part of the dialogue between the student teachers and supervisors. The researcher pointed out that the narratives helped the student teachers pay more attention to thinking and being a person instead of focusing on teaching behavior in the classroom. It was asserted that through autobiographical reflection, a preservice teacher may sustain a more integrated sense of self-reflective practice.

In Braun and Crumpler's (2004) study, elementary preservice teachers were encouraged to recall three incidents from their own life related to one of the social science discipline, the social memoir, a particular type of autobiographical writing. Those are the outcomes that this description of using autobiographical writing provides an initial view of how preservice teachers can develop reflective skills prior to having experiences in student teaching and a reflection upon how significant experiences have shaped their identities. It was suggested that "students should learn how to value life experiences as valid ways of developing legitimate knowledge about the world" (Braun & Crumpler, 2004, p.61).

2.2.3.5 Metaphor

Korthagen (1993) criticized conceptualization of reflection on the base of logical and analytical ways of information processing during teaching. The researcher described techniques for a broader view on reflection and reflective teaching evolved on non-rational process of the mental 'mirroring' which are metaphors, drawing, or painting, making photographs, guided fantasies etc. In recent years, among them, metaphors have been put as an effective mental process or a blueprint to understand teachers' professional thinking and cognition, further regarded as an important pedagogical tool to explore notions of teaching and learning (Hoban, 2000; Martinez, Sauleda, &

Huber, 2001; Marshall, 1990; Saban, 2006). These studies have made reference to and inspired by the book of “Metaphors We Live By” in which Lakoff and Johnson (1980, p.5 cited in Munby & Russell, 1990) who state that “the essence of a metaphor is understanding and experiencing one kind of thing in terms of another”. In his review essay, Saban claimed that a cognitive theory of metaphor has evolved, that is to emphasize metaphors as mental constructs that shape human thinking about the world and reality.

Wenzlaff and Cummings (1996) proposed that the use of metaphor can assist preservice teachers in structuring their thinking about new concepts, in integrating new ideas with their current understandings, and in changing their perceptions of their roles. Saban proposed that metaphors alone do not prove or demonstrate anything new, but merely provide a new insight on the way of doing or experiencing. Similarly, Taggart and Wilson (1998) defined metaphor as the transferring of meaning from one object to another on the basis of a perceived similarity. Based on the related studies, Taggart and Wilson summarize the benefits of using metaphors in teacher education and staff development as follows: aid in self-exploration of beliefs and values; help form boundaries and conditions of members; assist in simplifying and clarifying problems; help to summarize thoughts; enable and limit meaning; help develop alternative ways of looking at a topic (problem reframing); serve as bridges between a schema and new constructs; help form judgments about educational issues; assist with communication of abstract ideas; demonstrate underlying connections; gain insights into what is not yet understood (p.189).

For the context of Turkey, Saban (2004) conducted a study to constitute elementary preservice teachers' images of their elementary teachers, their cooperating teachers, and themselves as a future teacher. In his study, Saban gathered data from preservice elementary teachers in their last year through the administration of a Likert-style questionnaire consisting of 20 metaphorical images of classroom teacher. The constituting metaphors of the framework according to their theoretical perspectives were grouped conceptually as teacher-centered and student-centered based on the

relationships between the teacher, the student, and the goals of education. Quantitative analysis of the metaphorical images indicated that the preservice teachers appeared to be less teacher-centered and more student-centered in their self-metaphorical images than their both elementary and cooperating teachers. Also, female preservice teachers appeared to be less teacher-centered and more student-centered than their male peers.

Martinez et al., (2001) conducted a study to investigate preservice and experienced teachers metaphorical conceptions a means of thinking of teaching and learning. The analysis revealed three theoretical perspectives: the behaviorist perspective-learning as transmitting of knowledge; the cognitivist perspective-learning as an individual construction process; and the socio-historic perspective-learning as a social process. The results of comparison revealed that majority of teachers from experienced group expressed behaviorist metaphors to relate teaching and learning and then at less percent they expressed constructivist metaphors. Conversely, majority of teachers from prospective group expressed constructivist metaphors and at less percent they expressed behaviorist metaphors when describing learning. While only a little percent of experienced teachers expressed metaphors depicting learning as a social process that were under the socio-historic perspective, a bit more prospective teachers perceived that learning required social process. The scholars drew a conclusion that the idea of social learning was not widespread among prospective and experienced teachers but without taking the situated cognition or socially distributed intelligence into consideration it was at least problematic to reflect on learning and to decide on teaching.

As a conclusion, a metaphor has a powerful function by linking two usually unassociated concepts or ideas in order to manifest a similarity or similarities between them (Saban, 2004). Educational importance of metaphors have come to be associated with the power to explore teachers' notions of teaching and learning according to the various teaching approaches and philosophies, particularly ones they considered close to their own hopes and ideal (Darling, 2001).

2.2.4 Reflective Models

In the light of the above discussed literature, in order to sustain learning to reflect on experience, researchers designed teacher education courses based on variety of reflective approaches and techniques to encourage preservice teachers reflect on their teaching practice for their professional development. Given the insight into the complexity of reflection, researchers have proposed reflective teaching strategies and many underpinning techniques that provide opportunities for teachers to engage in teaching and learning situations purposefully and analytically. An examination of the literature under the scope of this study about assisting preservice teachers in becoming more reflective has converged on some promising assumptions such as sharing reflection, guidance/feedback, and modeling.

2.2.4.1 Collaboration: “critical friend”

Huang (2001) points to the need for sharing and articulating reflection with colleagues so teachers support one another to engage in more meaningful reflection. The sharing of reflection requires preservice teachers to come together in collegial groups and actively involves them in a group process in which knowledge is generated and exchanged and preservice teachers recognize their role in professional development and decision making. That is the social perspective of reflection emphasizing on the creation of a learning community where “teachers can support and sustain each other’s growth” (Zeichner & Liston, 1996, p.60). The idea of sharing and negotiating the reflection can be the underpinning assumptions of social constructivist perspective of learning. From this aspect, collaboration is congruent with Vygotsky’s (1978) views on the role of language and social interaction in learning. Moreover, the aspect should be within teachers’ zone of proximal development corresponding to Vygotsky. According to Vygotsky, the more knowledgeable other facilitates the learner’s growth, further helps move him/her along toward higher levels of knowledge and understanding, that is to provide a

sound basis for providing preservice teachers with opportunities to work with a competent peer in order to maximize one's growth (Garmon, 2001; Yost et al, 2000).

Rodriguez et al., (1998) assumed that collaborative approach coupled with critically reflective teaching fits preservice teachers' professional development well because this model offers collaborative relationships among the cooperating teacher, the student teacher, and the university supervisor as well encourages preservice teachers to be reflective about their practice and provides preservice teachers with taking part as an active participant in their professional development. Day (1999) articulates the boundaries of a partnership model in which teacher educators, student teachers and teachers are actively involved in negotiating processes and outcomes in order to overcome the power relationships of traditional models. Within this partnership model, roles vary in such a way that the ethical and practical principle is equity rather than equality. Collaboration in this model requires the establishment and maintenance of long term relationships co-equally among the stakeholders to produce a new pedagogic knowledge rather than merely the consumers of the professional knowledge produced by academics and educational researchers.

Synthesis of relevant research findings has indicated that the establishment of collaborative support through reflective strategies have increased their value as a tool to promote reflection. Research suggested ways to encourage collaborative inquiry rather than individualistic approaches to reflection in that case preservice teachers can collaborate, question, challenge, and contribute each other to the development of their reflection (Hatton & Smith, 1995). This body of research suggests strategies to develop collaborative inquiry and social context in the process of learning to teach such as critical friend dyads, peer discussions, conversations, and collaborative action research and dialogue journals. Throughout critical friend dyads practicing teachers can work together, observe each other and provide feedback. Hatton and Smith's study revealed that as a collaborative strategy critical friend dyads reinforce practitioners by the way of talking with, questioning, even confronting, in a mutual trust, in order to examine planning for teaching, implementation and its evaluation.

Kaminski's (2003) study with primary preservice teacher education students, through their involvement in such a number sense program framed in a socio-cognitive approach in which they were encouraged to reflect on their experiences related to the teaching and learning of mathematics in group discussions and their reflective journals. Such discussions appeared to promote reflective thinking of preservice teachers in the manner of not only justifying and defending their mathematical thinking abilities and solutions, but also re-interpreting problems and providing alternative solutions. In the same line, Hatton and Smith appreciated the value of the supervised peer discussions after videotaped microteaching episodes in encouraging reflection among pre-service teachers. Such discussions, particularly, in the form of group work as argued by Ross (1989, cited in Kaminski, 2003) prompted pre-service teachers to engage more in reflection.

Farrell (1999) explored reflective practice of three experienced EFL teachers throughout the teacher development group drew on group discussions of their work in a weekly period in which they discussed. He concluded that teacher development groups could offer opportunities for teachers to develop into professional educators as a means of critically reflective teachers. For the similar sample, English language instructors at a university in Turkey, Arıkan (2002) valued the using a Teacher Study Group (TSG) as a way to contribute their professional and personal development throughout sharing ideas and knowledge, and improving collegiality.

In the same line with collaborative reflecting, Freese (1999; 2006) conducted two subsequent studies. In the first study, Freese (1999) used collaborative reflections through a reflective framework among the preservice teachers and the mentors to guide them in systematically reflecting on their lessons. Freese proposed a three-part reflective framework that has a notion of social practice the extent to which the preservice teachers and the mentor teachers collaboratively study their teaching and reflect their practice in order to explore their understanding of how to reflect on their teaching and their students' learning. The framework was appreciated as an important aspect of the teacher education program. All of the participants of the

program committed to collaborative decision making, planning, teaching, questioning, inquiry, and practice all these activities. She was concluded that the program assisted preservice teachers to reexamine their beliefs, values, assumptions and theories about teaching and learning. Freese's (2006) self-study was also conducted collaboratively by a preservice teacher and a teacher educator to appreciate the development and growth of the preservice teacher over an extended period. It was concluded that the preservice teacher's journey from student to teacher was envisaged by challenges and obstacles through systematically examining his own teaching.

In their study, Sparks-Langer et al. (1990) designed a preservice teaching program, the Collaboration for the Improvement of Teacher Education (CITE), stimulates students' reflective thinking about curriculum, methods, and sociopolitical issues through blocked classes and structured field experiences. On the reflective thinking process of preservice teachers, data was collected through interviews and journals: the students were interviewed for a particularly successful teaching event and vice versa a less successful teaching event to discuss conditions that might have influenced the outcomes; and the students completed a reflection journal after teaching action to describe instructional events, to identify ideas where they had learned, to discuss factors that influenced the outcome and to consider what they would do alternatively and why. The researchers then developed (described) the framework for reflective pedagogical thinking, a coding scheme corresponding seven types of language and thinking to evaluate students' ability to reflect on pedagogical principles underlying teaching decisions, contextual factors affecting the application of the principles, and moral, ethical, or political issues surrounding a teaching experience. Alongside with two studies, it was further concluded that CITE students indicated greater gains in reflection than other students not involved in the CITE program. In addition, the Framework for Reflective Thinking was valued as a pedagogical framework to measure reflective thinking.

Being aware of the fact that teaching portfolios encourage student teachers and teachers to reflect more about their teaching, Zeichner and Wray (2001) claimed that the value of constructing teaching portfolios is greatly enhanced when teachers are given opportunities to interact with others on a regular basis in their construction. In the same manner, Mansvelder-Longayroux et al., (2007) emphasized that reflection should not just be a matter for the individual, and they labeled discussion and cooperation among the preservice teachers about their own experiences and themselves as the departure point on the construction of an effective portfolio. On the other hand, conversations, along with the written reflections included in the portfolios, offered an opportunity for student teachers to articulate their thoughts and feelings about teaching and to become clearer and more focused in their understandings as being a teacher in their development (Wenzlaff & Cummings, 1996).

As regard to Burbank and Kauchak (2003), collaborative action research that involves groups of teachers in the design, implementation, and evaluation of action research projects acts as a stimulus to reflect on their professional development. In their study, Burbank and Kauchak supported collaboration in the professional development, validated educators as producers of knowledge, and recognized their role in professional development and decision making process. The using of the dialogue journal as a method to promote preservice teachers' reflective thinking abilities is also considered as a powerful collaborative tool because it requires collegial reciprocal support in which the pre-service teacher and the supervisor become critical co-investigators of the act of teaching. In so doing, dialogue journals are voiced as an important reflective learning activity to encourage the exchange and development of ideas between two or more writers (Langer, 2002). Thus, Maloney and Campbell-Evans (2002) appreciated the interactive journal due to its potential to allow student teachers and supervisors to work closely together within a supportive and collaborative atmosphere.

2.2.4.2 Guidance/Feedback: “to see his or her practice through others’ eyes”

It is generally agreed that external intervention that offers support is a necessary component of continuing professional development (Day, 1999). In the same vein, Huang (2001) points to the need of a concrete conceptual guideline for directing reflection, because reflection on teaching practice requires more broader issues of purposes, goals, values and constraints. The literature suggests that students benefit more from the guided and structured reflection in developing self-reflective critical thinking (Freese, 1999; Huang, 2001; Langer, 2002; Rodriguez et al., 1998). Another study by Mansvelder-Longayroux et al., (2007) investigated the nature of reflection in the learning portfolios of student teachers. They proposed that the guidance and supervision during this process is extremely important for learning activities.

Reflective journals’ guideline and peer coaching’s feedback questions or comments designed to encourage the preservice teachers to reflect on their experiences are regarded as essential in facilitating preservice teachers’ reflective thinking skills as discussed in previous related sections. Rodriguez et al., (1998) appreciated the effectiveness of reflective journal guideline as a metacognitive tool to facilitate preservice teachers’ ability to understand their own process of acquiring professional knowledge, developing teaching practice, and ultimately becoming teachers. Furthermore, Ward and McCotter (2004) asserted that some well-intentioned questions as a guide can be needed for deliberate thought and facilitating self-improvement.

The giving feedback has a wide scope of application in enhancing reflection. In an attempt for more meaningful reflection alternated by the way encouraging “one to see his or her practice through others’ eyes” contending of Loughran (2002, p.33), Hoban and Hastings (2006) proposed the using views of classroom teachers’ own students in seeking alternative perspective as feedback. Hoban and Hastings’s study describe a 10-year collaboration between a teacher educator (researcher) and a high school science teacher to help him develop as a reflective practitioner. In doing so,

the high-school students in this science teacher's class were required to give feedback through four different procedures to contribute their teacher's reflection; these are interviews, learning logs, classroom observation schedules, and a survey. From the four procedures, the most meaningful for teacher reflection was found as the student interviews in ascertaining what helped the students to learn in class because they were the most personal data in providing a rich source of student comments on their classroom experiences about teaching and learning. Student interviews were then coded as two categories according to factors influencing learning; personal and social influences on learning. Over a period of 3 years, the science teacher listened to these tapes with the researcher in monthly professional development and often a discussion resulted in changing practice of the science teacher in his own classroom. Therefore, it was suggested that an implication for using student feedback as the content for teacher reflection could be a way to inform participants about the complex nature of teaching.

In her study, Dantas-Whitney (2002) argued on the use of content-base reflective audiotaped journals made by the eighteen students involving in a university-based English as a second language (ESL) course as a tool for critical reflection. It was presumed that the use of spoken journals could provide feedback on students' oral skills and allow more spontaneity and free expression on the part of the learner in response to the strict rules of coherence and cohesion as written discourse for language learning. The course teacher listened the reflective audiotaped journals prepared by students and responded by recording her comments and observations on the same cassette is that a type of asynchronous dialogue with students. Through audiotaped journals, the participants in this study were able to investigate course content in ways that were particularly relevant to them. Thus, the journals encouraged students to build connections between the themes explored in class and their personal experiences, values and beliefs and to engage in critical and reflective thinking. Moreover, they perceived the journals as valuable opportunities for oral language practice and self-assessment.

In her qualitative study, Bağcıoğlu (1999, cited in Ünver, 2003) investigated the effectiveness of supervisor's feedback for the lesson plan before practice teaching; supervisor's, mentors', and peers' feedback; journal writing, self-evaluation of their teaching reports, and seminars on the preservice teachers' reflective thinking. Findings of the research indicated that amongst them feedback for planning from supervisor, peer discussions, and self-evaluation had important role in the development of preservice teachers' reflective thinking abilities and the improving their teaching skills.

2.2.4.3 Modeling: “thinking aloud”

Dinkelman (2003) emphasized modeling as a tool for prompting reflection from the theoretical aspect of self-study. The rationale for this assertion is that preservice teachers learn from the methods and manner of their teachers, teachers therefore should consider the ways in which their own work models reflective thinking of their students. On the other words, “simply put, students learn reflection from watching their teachers reflect” and “self-studies are made visible to students” (Dinkelman, (2003, p.11).

It was advocated by Loughran (1997) who prompted the idea of modeling reflection as a technique to promote reflection among preservice teachers. He pointed out that there were little works that aimed to explore the effect of modeling of reflection by a teacher educator on the development of student-teachers' reflective practice. As a consequence, a study was conducted with nine students during one of his preservice teacher education course based on his view of modeling, “thinking aloud” approach, to the extent which his teaching and thinking were needed to be visible further through sharing journals about his teaching with preservice teachers and giving them an opportunity to outline his thoughts about teaching and learning. Interviews to explore preservice teachers' perceptions about how his own efforts systematically reflect were understood by them indicated that they not only recognized and

acknowledged the value of his efforts to make his reflection explicit to them, but also they adjusted this process of modeling into their own reflective practice on the matter of learning and thinking about teaching.

Acknowledging the importance of making science teachers tacit knowledge of practice explicit, Loughran (2006) proposed a new science approach for teaching about science teaching in teacher education in which science teacher educators are explicitly modeling who must be able to make their knowledge of science teaching and learning explicit for their student teachers by underlying pedagogical reasoning in concert with the emerging theoretical perspectives of practice. In doing so, teacher educators consider deliberately not only why they teach particular content, but also how they teach it. If student teachers are to see into their teacher educators' pedagogical reasoning in order to better apprehend the complex nature of teaching and learning, then teacher educators need to be able to make sure that such reasoning is clear and explicit for their student teachers.

2.2.4.4 Content and Level of Reflective Thinking

Synthesis of relevant research findings indicates that there are many researches which either investigated reflective thinking content or reflective thinking level and those that focus on perception of reflective thinking. That is to say, the research investigating two or more dimensional reflections are more limited. Huang (2001) proposed that facilitating the process of preservice teachers' professional development requires the understanding of what and how they think about their teaching. Moreover, analyzing reflections in terms of content and process provide teacher educators a way to assess their development as a reflective practitioner. Fund, Court and Kramarski (2002) pointed out the need to assess student teachers' developing reflective abilities in order to appreciate the deserved value as an important competency that students should acquire during teacher training and use in life-long process of professional and personal development. Ward and McCotter

(2004) further appreciated the value of a rubric or a scale as an assessment tool to recognize the importance of reflection on student learning. It can be concluded that content and level analysis of reflective thinking can be the most promising way to profound understanding of preservice teachers' practice and actions. In this part of this current study, therefore, the studies that can offer challenging evaluation tools or rubrics are presented.

Wallace and Oliver (2003) designed a two-dimensional matrix of ideas as an instructional tool to facilitate reflections of preservice science teachers in the journal. The scholars analyzed reflective journals according to the content, level, and interest of reflection (see Table 2.3). The findings of overall patterns revealed that they reflected most often on mentor teachers' teaching, as well as upon their own teaching strategies; they successfully analyzed their own teaching interest, from technical, personal, and problematic standpoints; their reflection level often moved from reporting to evaluation levels and directly commented on future. It was concluded that journals included focus on others, selves, and future teaching in that a vehicle to help preservice teachers explore their future teacher identity. Less frequent topics that arose in journal entries included equity, nature of science, teacher as scientist, teacher as motivator, science content, and self as a science learner.

Fund et al., (2002) constructed a two-dimensional framework for assessing preservice science teachers written reflective tasks in theoretical teacher-training course, the WRITT evaluative tool. The first dimension was the object of writing content involved subject matter content, didactic content, and personal content; the second dimension was the form of writing involved description, personal opinion, linking, and critical bridging (see Table 2.3). For each week of the course, preservice science teachers were required to submit a personal document concerning the previous lesson, including their thoughts, feelings, hesitations, questions, links to previously learned issues and to relevant papers, and further to link between the learned material and the students' experiences. According to the analysis of the written reflective tasks, the evaluative framework was regarded as sensitive and

valuable enough to examine the students' various reflective statements that improved from the descriptive to a more deliberative form of critical bridging.

Ward and McCotter (2004) claimed that at the field of education a main alteration from input to output model of evaluation was on the way. On the other hand, according to them, standards impeded the very important aspect of reflection that was to say deliberately thinking about action with the process of dialogue and questioning. Then, they realized that existing reflection frameworks were not sufficient for a good interpretation of reflection on student learning due to the fact that they described a process but could not be related to improvement of reflective teaching in practice. Therefore, Ward and McCotter designed a two dimensional rubric to evaluate teachers' reflection which indicated the dimensions and the qualities of reflection in the light of two different approaches to outcomes-based teacher preparation (see Table 2.3). They used three dimensions of reflection; focus, inquiry, and change. The focus was on students' learning process and understanding it. The focus dimension raised the question of "what is the focus of concerns about practice?" The inquiry dimension raised the question of "what is the process of inquiry?" and emphasized the style of questions. The last dimension change raised the question "how does inquiry change practice and perspective?" Qualitative levels to describe reflection were labeled as routine, technical, dialogic, and transformative. Routine reflections revealed the classical problems of the lack of resources, time, blaming others without a sense of responsibility and questioning on problems. Technical level of reflection was thought as a means to solve some problems without questioning the problem itself. Dialogic reflection was the discussion or talking with others and learning their ideas to take into consideration. Such a critical level or upper level, transformative requires a deep inquiry into the problems and self-questioning during the teaching process including historical and moral issues. In this level the reflective teacher questions the theories and the goals of work. As a conclusion, Ward and McCotter appreciated the value of a rubric, as an assessment tool, including dimensions for process and emphasizing broadening perspective and fundamental questions as a way recognizing the importance of student learning.

Table 2.3 Identification of Teachers' Reflective Thinking Content and Levels

	Reflection Content	Reflection Level	Reflection Interest
Wallace & Oliver (2003)	Mentor teacher's teaching	Reporting	Technical
	Preservice teachers' teaching	Analysis/Synthesis	Personal
'Two dimensional matrix'	Plans for future teaching	Evaluation	Problematic Emancipatory
	Posing questions		
	Affective interactions		
	High school students Collegial interactions		
	Content Dimension	Form Dimension	
Fund et al., (2002) 'the WRITT evaluative tool'	Subject matter content	Description	
	Didactic content	Personal opinion	
	Personal content	Linking, Critical bridging	
	Reflection Content	Reflection Level	
Farrell (1999) Liou (2001)	Theories of teaching	Descriptive	
	Approaches and methods	Critical	
	Evaluating teaching		
	Questions about teaching		
	Self-awareness		
	Classroom management Evaluation of lesson plan		
	Dimensions	Qualities	
Ward & McCotter (2004)	Focus	Routine	
	Inquiry	Technical	
	Change	Dialogic Transformative	
	Reflective Thinking Content	Reflective Thinking Level	
Lee (2000)	Teachers	Recall	
	Students	Rationalization	
	Curriculum/content	Reflectivity	
	Context		
	Pedagogy Miscellaneous comments		
	Focus Categories	Reflection Level	Reflective Categories
Subramanian (2001)	Self	Technical	Description
	Student	Competency	Analysis
	Teaching	Analysis of	Suggestion
	School	teaching decision	
	Supervision	Critical	
	Learning	Reflection	
	Preparation		

Two subsequent studies in a similar notion of reflection content and reflection level, Farrell (1999) investigated experienced EFL teacher's reflective practice via the teacher development group whereas Liou (2001) investigated that of preservice teachers during their practice teaching course. Theoretically, Farrell drew heavily on Pennington's (1992) broad definition of reflection as a guide "teachers analyze their own practice and its underlying basis, and then consider alternative means for achieving their ends" and Richard's (1990) critical reflection "experience is recalled, considered, and evaluated, usually in relation to a broader purpose" (p.158). Farrell found that experienced teachers reflected mostly on their personal theories and problems in teaching when evaluated their teaching. The reflection content related to classroom teaching involved theories of teaching, approaches and methods, evaluating teaching, self awareness, questions about teaching under the levels of descriptive and critics (see Table 2.3). As a result, it was found that all teachers were different in their ability to reflect on experience. According to reflection level experienced teachers used the group meetings for a critically reflective experience.

The other investigator about reflective practice is Liou (2001) who examined preservice teachers' observation reports and practice teaching reports to describe their reflective practice. It was emerged from while they were taking a practice teaching course offering different activities such as lesson plan writing, microteaching, teaching observation, practice teaching, and school observation. As a result of the analysis, in addition to Farrell's reflection categories, two more categories were emerged from the data including classroom management and evaluation of lesson plan under the level of description and critics as it can be seen in Table 2.3. It was revealed that they focused mainly on practical teaching issues and evaluation of others' teaching or their own teaching; further, more critical reflective thoughts were recorded on the practice teaching reports than the total of observation reports with three categories.

Another researcher about the preservice teachers' reflective thinking is Lee (2005) who proposed that reflections of preservice teachers could be assessed from two

perspectives: content and depth. His study included insights into how to measure the quality of reflective thinking and how to enhance reflective thinking and cultivate reflective practitioners, including the kinds of experiences that could be incorporated in a teacher education program. It was stated that the main purpose of reflective teacher education was to develop teachers' reasoning about why they employ certain instructional strategies and how they can improve their teaching to have a positive effect on students. In doing so, all participants were provided to involve in journal writing, clinical interviews, dialogues, narrative inquiry, observational learning, and reflective teaching and this resulted in their improvement in reflected teaching. In his prior study, Lee (2000) proposed a reflective thinking model in which attitudes, process, content, and depth all constitute reflective thinking process; according to this model, the content of reflective thinking addresses preservice teachers' main concerns, and the depth of reflective thinking evaluates how they develop the thinking process. As a consequence, a coding scheme was described to focus on the content and the depth of reflective thinking. In this model, the depth of reflective thinking was assessed regarding to the corresponding levels of recall, rationalization, and the highest level of reflectivity in which teachers describe, interpret with rationale, and improve their experiences by analyzing, respectively (see Table 2.3).

Subramanian (2001) identified the focus, the categories, and levels of reflectivity emerged from the preservice teachers' journal writing (see Table 2.3). Inductive analysis of the data for the focus categories comprised of self, student, teaching, school, supervision, learning, and preparation, and for the reflection categories comprised of description, analysis, and suggestion. As regard to deductive reflection level analysis based on Van Manen's three levels of reflectivity, the study revealed that most of the participants reflected only at the first level of technical competency and the second level of analysis of teaching decision whereas none of them reached the third level of critical reflection.

2.3 Summary of the Literature

In the present study, a comprehensive review of literature on the conceptualization of reflection in teacher education was provided. Developing teaching in a deliberative and systematic way is the main issue in reflective teaching. Practice on action is embedded on the core of reflection or reflective thinking. Preservice teachers construct their knowledge by reflecting on experiences from a simplistic way of thinking by making simple descriptions and extended to the context of the situation, to a complex way of thinking by considering ethical, moral, and sociopolitical issues of teaching. Thus, reflective thinking is a meaning making process and metacognitive skill enables preservice teachers to problem solve, make judgments depend on context, and learn from their experiences systematically and deliberately by becoming more conscious of their thinking on the way of their professional development. In fact, teachers are reflective inquirers who are the researchers of themselves and their behaviors “to draw on and use them to inform their teaching practice” (Pollard, 2002, p.8).

Pollard highlighted the boundaries of implications of reflective thinking in teacher education. According to Pollard, four assumptions guide reflective teachers. Firstly, reflective practice involves a process of solving problems and reconstructing meaning. Secondly, reflective practice in teaching is manifested as a stance towards inquiry. Thirdly, the demonstration of reflective practice is seen to exist along a continuum or ‘reflective spectrum’. Finally, reflective practice occurs within a social context. In essence, Dewey’s sense of reflective thinking is the process of inquiry in which teachers should investigate their practice through deliberate, conscious and systematic inquiry.

According to the literature related with the nature of reflective thinking, it can be concluded that reflective teachers are able to continually analyze, discuss, and evaluate their own practice, all of which are parts of their professional development. Teachers, through reflective thinking, can become aware of their intuitive knowledge

base and engage in problem solving that helps to strengthen that base, and promotes professional growth. The literature suggests that reflection is a developmental process to the extent proposed by models and principles of authentic experiences, collaboration, guidance, and modeling. In the light of these principles, in the current study, preservice biology teachers in the context of teaching provided to reflect on experiences in a collaborative and guided manner through different data sources under the qualitative and quantitative research paradigms.

CHAPTER 3

METHOD

This chapter investigates the research method on the designing the current study that aimed to describe preservice biology teachers' reflective thinking levels and content in the context of teaching by examining the use of a reflective framework integrated into one-semester practice teaching course. The chapter begins with the presentation of the overall research design and the research questions. Then, the chapter proceeds with a brief description of the context of the study and participants, reflective framework, course outline and data collection procedure, data sources, data analysis, and the researcher role. The chapter ends with the trustworthiness and limitations of the study.

3.1 Overall Research Design

A framework to explore the preservice biology teachers' reflective thinking levels and content was prepared based on the reflective strategies and activities such as reflective autobiography and journal writing, metaphor using, peer coaching, microteaching, and problem discussion. More specifically, this study focused on the development of reflective thinking levels of preservice teachers during their practice teaching experience over a one-semester time period and the exploring their metaphorical images about learning and teaching process. The complementary use of both qualitative and quantitative research is appropriate for the aims of the present research. A quantitative design was used to address research questions 1 and 2. A qualitative case study design was used to address the research questions 3 and 4.

Philosophically, the qualitative research is grounded from “the view that reality is constructed by individuals interacting with their social worlds” (Merriam, 1998, p.6). Then, qualitative research has emerged as a broad approach to investigate social phenomena within the complexity of social interactions, the natural settings, and the context dependent (Marshall & Rossman, 1999). The concern of qualitative research is to understand “the meaning people have constructed, that is how they make sense of their world and the experiences they have in the world” (Merriam, 1998, p.6). Moreover, Bogdan and Biklen (1998) pointed out the portraying goal of qualitative research ranging from the developing grounded theory and sensitizing concepts to the understanding human behavior and human experience. Qualitative researchers are concerned primarily with ‘process’ rather than outcomes or facts and ‘meaning’ about how people construct as a matter of context or natural settings (Bogdan & Biklen, 1998; Creswell, 1994).

Among the qualitative research design, a case study design enables to gain an in-depth understanding and interpreting of the educational phenomenon within its real-life context (Merriam, 1998). A case study might be “a detailed examination of one setting, or a single subject, a single depository of documents, or one particular event” (Bogdan & Biklen, 1998, p.54). Merriam values the case study as the particularly appropriate design for interesting in process due to its uniqueness to reveal knowledge about a phenomenon. Further, Merriam describes a case study as “an intensive, holistic description and analysis of a single, bounded unit” (p.193). When the study involves more cases of subjects, settings, or depositories of data, it is called multi-case studies (Bogdan & Biklen, 1998). For a multiple case study, Merriam describes two stages of the within-case analysis and the cross-case analysis. In the first step, the within-case analysis is conducted to reach a comprehensive case in itself. The next step is cross-case analysis to build abstractions across cases.

In the present study, therefore, the qualitative research paradigm as a multiple case study was used as the main approach, but also quantitative research paradigm was used to present the result of the qualitative analysis as well as the descriptive and

inferential statistics of quantitative data. For this study, it was regarded that quantitative approach was supporting and complementary to the qualitative approach. Beyond providing triangulation, Creswell (1994) gave a rationale to combine qualitative and quantitative methods as complementary in which “overlapping and different facets of a phenomenon may emerge” (p.175).

Because the nature of the problem for the present study indicated that both of qualitative and quantitative approach for data collection would be appropriate, the data collection methods were also both qualitative and quantitative. In this study, a variety of qualitative data collection methods were utilized throughout reflective autobiography and journal writings; metaphorical images about learning and teaching; the written reflections of peer coaching, microteaching, and problem discussion; lesson plans; video-taped lessons; audio-taped debriefings and interviews. The interpretations of the pre-service biology teachers’ conceptions and understandings of reflective thinking were captured through the transcriptions and analysis of debriefings and interviews, and through the examination of their written reflection journals and metaphors. The quantitative data of the research were collected through the instruments of Reflective Thinking to evaluate the preservice biology teachers’ perceptions of their reflective thinking ability and Metaphorical Images to explore their beliefs about learning and teaching process from the point of behaviorist and constructivist view of education

3.2 Research Questions

By placing the importance of reflective thinking as a construct on teachers’ professional development, this study aims to explore preservice biology teachers’ implicit thoughts about teaching and learning throughout engaging in reflective activities during the practice teaching course. More specifically, this study focuses on the development of reflective thinking skills of preservice biology teachers and their perceptions about metaphorical images of their high school biology teachers, their

cooperating teachers, and themselves as future teachers. The specific research questions with hypotheses to be addressed in this study are as follows:

R.Q.1: What are the preservice biology teachers' reflective thinking levels before and after the practice teaching course?

H₀1.1: There is no statistically significant difference between the preservice biology teachers' reflective thinking levels before and after the practice teaching course.

R.Q.2: What are the most representative metaphorical images of the preservice biology teachers' high school biology teachers, their cooperating teachers, and themselves as future teachers?

H₀2.1: There is no statistically significant difference between the preservice biology teachers' metaphorical images of their high school biology teachers and their cooperating teachers.

H₀2.2: There is no statistically significant difference between the preservice biology teachers' metaphorical images of their high school biology teachers and themselves as future teachers.

H₀2.3: There is no statistically significant difference between the preservice biology teachers' metaphorical images of their cooperating teachers and themselves as future teachers.

R.Q.3: What are the content and the levels of the preservice biology teachers' reflective thinking?

R.Q.4: In what ways do the preservice biology teachers perceive their professional development?

3.3 Context of the Study

The present study was conducted within the ‘Practice Teaching Course’ offered at the Department of Secondary Science and Mathematics Education at Pamukkale University. The practicum courses in teacher education faculty in Turkey were restructured in 1998 by YÖK within the reform in teacher education. Further, faculty-school partnerships were empowered to provide more school experience and practice teaching in the practice (co-ordinating) Schools by this revision. It offers School Experience I, School Experience II, and Practice Teaching courses into a teacher-education program. Preservice teachers were assigned to practice schools for School Experience I at the beginning of their journey, for School Experience II prior to their last term, and for the Practice Teaching course in their last term (Asan, 2003). With this reform, a new certification program was also introduced to train teachers for the secondary schools, non-thesis graduate program, requires a Bachelor of Science degree from the Faculty of Arts and Sciences. Because, it has duration of three terms, the above mentioned practice courses were given in the subsequent terms. The course under investigation was the Practice Teaching within this certification program. The course is designed to acquire required teaching skills in a real classroom environment.

The Practice Teaching course has application both on campus and in the practice school with duration of 14 weeks of a term. In contrast to previous school experience courses, the practice teaching course requires not only observation but also teaching experiences in the practice school. In principal, for observations and teaching, the preservice teachers expected to be in the practice school for six class periods in a week; and they expected to have at least three hours of the work load of the cooperating teachers to teach (YÖK, 1998). But, in practice such for the present study, the preservice teachers were required to observe weekly for a two or three class periods for a 10 week, and they thought for two or three class periods over this time period. There were several reasons that restricted observation and teaching periods. The participants in this program had time restriction, because some of them

worked as private tutoring, and some of them did not dwell in the same city, they came from the other near cities. Also, some cooperating teachers do not seem to enjoy so much giving opportunities to preservice teachers to teach.

Prior to the practice teaching course, the practice (co-ordinating) secondary public school in the city center and the cooperating teachers to work together were determined. The preservice teachers were assigned to the classes of the cooperating teachers as a pair in the same school. In this study, for ten preservice teachers, four cooperating teachers were allocated (see Table 3.1). One of the cooperating teachers had more than one pair of students for her different classes. The four cooperating teachers were biology teachers with at least ten years teaching experiences in different secondary schools.

Traditionally, the practice teaching course involves guided observations to observe the cooperating teacher and an evaluation form filled out by the cooperating teacher or the university supervisor when the preservice teacher teaches the lesson. For the present study, the practice teaching course was redesigned based on reflective teaching strategies for both its practice and seminar parts within a framework to examine the preservice biology teachers' reflective thinking levels and content. For the campus site of this course, the seminar was also held for two hours in a week.

3.4 Participants of the Study

The participants in this study are secondary 10 preservice biology teachers who enrolled in the non-thesis master program of Secondary Science and Mathematics Education Department at Pamukkale University. The research was conducted in the spring semester of 2005-2006 education years during the practice teaching course. All the participants' names appearing in this study are pseudonyms.

All of the participants had undergraduate degrees in biology major. Generally, the participants had prior or still continuing teaching experience as private tutoring. The table given below (Table 3.1) displayed the detailed information about the ten preservice biology teachers who participated in the study.

Table 3.1 Characteristics of Secondary Preservice Biology Teachers

Preservice Teachers	Gender	Age	Prior or continued teaching experience	Cooperating Teachers
Beren	F	26	Continued private tutoring for two years	Mrs. Alga
Defne	F	24	No prior experience	
Sude	F	25	No prior experience	Mr. Sezen
Dora	F	23	Private tutoring for one year and substitute teacher for three months	
Lal	F	24	Private tutoring for one year	Mrs.Bilir
Boran	M	24	Private tutoring for one year	
Melisa	F	24	Private tutoring for two years	
Beril	F	25	Continued private tutoring for one and half a year	
Doruk	M	24	Continued private tutoring for two years	Mrs.Bulut
Yilmaz	M	26	Continued private tutoring for two years	

3.5 Reflective Framework

In the present study, a reflective framework was designed to integrate into the one-semester practice teaching course by recognizing that the aim of the course was to help the preservice teachers' personal and professional development (see Appendix A). The reflective framework involves activities for both the practice school site and the seminars on the campus such as reflective journal and autobiography writings, metaphors, peer coaching, microteaching, and problem discussion. For each week practice teaching course, preservice biology teachers were involved in the reflective activities in both on campus seminars and in the practice school. The seminar part of the course was the place for the problem discussions, microteaching, debriefings,

interviews, and the prior preparation phase of the activities in the practice school. Further, preservice teachers were encouraged to use one of the challenging methods for their teaching in the practice school. They were also required to do lesson plans for their practice teaching. At the end of the course preservice biology teachers were audio-taping interviewed in order to provide summative evaluation. The activities and theoretical rationale were given below in detail.

3.5.1 Pre-post Reflective Autobiographical Questionnaires

The preservice teachers were given structured questions to write their autobiographical data before starting the practice teaching course and after completed the course. The Reflective Autobiographical Questionnaire was developed in consistent with the related literature to encourage the preservice teachers to write their feelings, views, opinions, attitudes, and beliefs about teaching and learning (see Appendix B). Writing autobiography is regarded as powerful tool to prompt teachers to reveal their beliefs about teaching and learning to understand the complexity of their understanding of teachers, teaching, and learner as a creative means of expressing prior experiences, events, and feelings that gave shape them as a learner. That is to say “to become the responsible, caring, and inquiring adults we desire to be as teachers, we first need to challenge ourselves out of our comfort zones” (Henderson, 2001, p.135).

Pre-autobiographical questionnaire consisted of ten questions to explore the preservice biology teachers’ experiences about teaching and learning before starting the practice teaching course. Post-autobiographical questionnaire also included ten questions with the differences in some questions to understand the effect of practice teaching course on the preservice biology teachers’ teaching and learning experiences as a means of perceptions of themselves as a biology teacher. Also, the preservice teachers were provided metaphors to encourage them to write their beliefs and attitudes about learning and teaching.

3.5.2 Reflective Journals

Reflective journals for the practice teaching course were the main data source. Especially, for the class observations and practice teaching in the actual setting of the school. The preservice biology teachers were required to write reflective journals during their ten weeks school-based experiences. Journaling is proposed as a cognitive tool to encourage recording, thinking, and self-evaluation (Altnok, 2002; Hatton & Smith, 1995). While the preservice teachers were writing on their experiences, they followed two types of guidelines; Student Teaching Weekly Reflection Guide developed by Rodriguez et al., (1998) and Rubric for Reflective Journal developed by Wallace and Oliver (2003).

Student Teaching Weekly Reflection Guide (Rodriguez et al., 1998) involved structured critically reflective autobiographical questions to facilitate student teachers' ability to examine their assumptions, operational theories, and focus issues, and self-evaluation dynamics of becoming a critically beginning teacher (see Appendix C). It was also valued as providing evidence for teacher educators to assess the professional growth and development of beginning teachers and purposes for diversifying coaching and supervision during the student teaching experience. The guide originally included eight structured questions. Two questions at the beginning were added by the researcher. The total of ten structured questions within the guide can be seen in Appendix C. Because the practice teaching course requires both class observations and teaching practice, preservice teachers used the guideline to analyze for both in-class observations and their own teaching practice. The first two question in the guide required some perceived revision in terms of contex. For example, the first question asks "What are the weaknness of your cooperating teacher?" For their cooperating teachers' classes there was no change in perceiving the question, but for their peer partners' classes, they replaced "cooperating teacher" with "peer partner", and they perceived questions as it asked for themselves. Also, a small wording were necessary for a few questions either observation or teaching class. The preservice teachers usually preferred to utilize this guide at their first

journal while their own teaching and observing the cooperating teacher and the peers' teaching.

Rubric for Reflective Journal designed by Wallace and Oliver (2003) was a two dimensional matrix of ideas to provide the structure to the journal assignment (see Appendix D). The horizontal dimension included three domains of teaching which were *knowledge*, *affect* and *action*. The vertical dimension included six educational activities of planning, conducting instruction, evaluating learning, professional development, interaction with students, and interaction with peers. The intersections of the rubric offer multiple questions to write journals. For instance, at the intersection of knowledge and planning, a teacher might ask questions: Do I understand this concept? What do I need to learn before I teach this concept? The wording is also necessary while the preservice teachers is generating questions to write journals for the observed lessons of their cooperating teachers and peers' teaching.

The preservice biology teachers in this study, especially during their practice teaching, were encouraged to utilize the matrix to ask themselves such types of questions to reflect upon in their journals. Because, the preservice teachers taught in the practice school more than once, for their first teaching they usually preferred to use the Student Teaching Weekly Reflection Guide, and for others they preferred to utilize the Rubric for Reflective Learning.

For a week preservice teachers usually wrote journals by using one of the guideline. In some weeks there were two journals for some cases. This might be due to the fact that in the same week they both observed other's teaching and taught themselves. The participants submitted the previous week's journals when they came the university for the on-campus seminar part of the practice teaching course. These were usually used by the researcher to give them verbal feedback for the purpose of encouraging them to write more deeply about their experiences. The written structured feedback was not a main focus for this study; but especially at first it had

been provided more intense because the preservice teachers had never kept journals up to that time. Also, the researcher always provided face to face guidance and support during the whole process of the course to facilitate their reflective journal writing. In addition, in the seminar part of the course the preservice teachers always had opportunities to ask for a help about journal writing from the researcher.

3.5.3 Peer Coaching

In this framework, peer coaching involved collaborative works of preservice teachers as critical friend dyads to improve their teaching skills by observing targeted behaviors of their partners in the classroom and providing constructive feedback. The peer coaching model for this framework with minor revisions was adapted from McAllister and Neubert's (1995) detailed study entitled as "New teachers helping new teachers: preservice peer coaching". The preservice teachers are required to be pairs with their one of the friends. This is usually the person who they attend the class in the school together for the same cooperating teacher because of the teaching period of peer coaching taking place in the practice school. For the one cycle of the peer coaching activity, one of the preservice teachers (the teacher) teaches the lesson in the actual class and his/her peer partner serves as observer (the coach). For the next time, the roles are replaced, the previous coach this time teaches the lesson in the actual class and her peer partner serves as the coach.

The peer coaching process consisted of four steps; pre conference, conference, post conference, and reflection. In addition, the peer coaching cycle involved Praise-Question-Polish (PQP) form that was conferencing style for giving feedback during observation. The four phase of peer coaching model can be seen in Appendix E. *Pre Conference* was a phase of planning conference during which the teacher and the coach agree on the skill focus of the lesson to be taught and overview the lesson procedure. *Conference* was a phase of observation of the preservice teacher's lesson by the coach. It requires using Praise-Question-Polish (PQP) form for giving

feedback. It is described below in detail. *Post Conference* was a phase of debriefing conference during which the coach and the teacher used information on the PQP form to guide their reflective dialogue. The debriefing session was audio-taped and transcribed. The last phase was *reflection*. It occurs after the debriefing conference. The teacher and the coach wrote their reactions to the coaching experience by writing reflective summaries (McAllister &Neubert, 1995).

The debriefing conference is the most crucial part of the peer coaching model. The observed lesson is reviewed, analyzed, and reflected upon by the pair of peers around the guidance of Praise-Question-Polish (PQP) form that is filled out during observation phase based on non-directive conferencing style. Praise-Question-Polish (PQP) form includes four types of feedback (see Appendix E). *Praise Comments* are affirmations, statements of approval, concerning what the teacher was well in conjunction with the skill focus, and why this teaching behavior was effective. For instance, ‘the positive reinforcement you used through out the lesson was good. It encouraged the students to participate in the discussion’. *Clarifying questions* are questions the coach asks because he/she does not understand something that happened during the lesson or something said during the conference. Clarify questions can also be used by the coach to express, indirectly, reservations about some aspect of the lesson. Clarifying questions can also result in learning for the coach. Clarifying questions requires preservice teachers to reflect on why they chose to do something that is to express a rationale for their decision. For instance, ‘Why did you decide to bring in library books to show the students?’ *Eliciting Questions* are questions the coach asks to prompt the preservice teacher to explore alternatives or options. Eliciting questions, like clarifying questions are designed to encourage the preservice teacher to be an active learner and to reflect on choices. Such examples for the eliciting question: ‘Is there another way you might have...? Is there anything you might have done differently if you were to repeat this lesson?’ ‘What other methods of guided reading could you have used?’ *Leading Questions* are the coach’s suggestions or recommendations for improvement, stated in question form: Common leads for such question ‘Do you think ...? What would happen if...? Could

you have...?’ Such an example for the leading question ‘do you think the children would follow the story more closely if they read silently rather than out loud?’ (McAllister & Neubert, 1995)

The preservice teachers were given detailed information about the peer coaching model and the above-mentioned types of non-directive questions for conferencing style during the seminar part of the course. For the pre-conference meeting the preservice teachers made their discussions under the hours of this seminar part of the course. The conferencing phase takes place for a whole hour in the actual class in the school. Again for the debriefing phase they met at the seminar in the university. While they were debriefing, the researcher role was to record it audio-taped. After debriefing they wanted to write a reflective summary as a teacher and as a coach. Next time they changed their roles, thus for this study a preservice teacher acted once a time as a teacher and once a time as a coach within the process of peer coaching.

3.5.4 Microteaching

For the microteaching activity, pre and post microteaching self-analysis were required from the preservice teachers based on their personal perceptions of instructional performance as in the written format of self-reflection paper. Pre and post lesson questions were used to guide the preservice teachers while analyzing their microteaching experiences. The guiding questions were adapted from Lee and Loughran’s (2000) Interview-video-interview model, Lee’s (2000) and Amobi’s (2005) works (see Appendix F). Microteaching to build a repertoire of skills was appreciated mostly in the literature (Hatton & Smith, 1995).

Microteaching activity took place in the seminar part of the course. Preservice teachers taught their short lesson in front of their peers in the virtual classroom setting. Before microteaching sessions, the preservice teachers were reflected around the pre-lesson questions to focus on their teaching. For the activity, each student

taught a subject a 10-15 minute micro-teaching session in front of his/her friends. The lessons were videotaped by the researcher. Also, a copy of VCD was prepared by the researcher for each preservice teacher. Firstly, the preservice teachers watched themselves on the VCD to give feedback each other. Then, this was followed by individual post-lesson analysis to reflect on their experiences and to assess their teaching around the guiding questions and peers' feedback as a means of self-examination of their own teaching experiences.

3.5.5 Problem Discussion

For the campus site seminars of the course, problem discussion sessions were conducted. For the class discussions, the preservice teachers required to identify a problem that could be from their real experiences in the practice school or from an imaginary classroom situation. Then, each week one of the problems was provided to discuss among them in the class to set class interactions and increase collaborations. It also aimed to encourage preservice teachers to reflect upon their experiences in the school more in depth. The preservice teachers attended to different cooperating teachers' classes, so the problems from different classes would enable them to engage in different context. In addition, they were also free to share surprised problems or events they encountered in the school experience or any problem they want to discuss. Boud and Walker (1998) claimed that context is very influential on reflection and every aspect of learning. In addition, the class discussions are regarded as powerful context to promote reflective thinking of preservice teachers by the way of not only justifying and defending their ideas, but also re-interpreting problems and providing alternative solutions (Hatton & Smith, 1995; Kaminski, 2003). Such works are the opportunities for the preservice teachers to think about and practice viewpoints and ideas without fear of failure; further, Jay and Johnson (2002) claimed that "the virtual world created by reflective dialogue during the seminars of coursework time provides the opportunity for the students to begin to bridge the gap between theory and practice" (p.81).

While they were identifying and discussing their problem, they follow the steps that were adapted with some changes from Basile, Olson, and Nathenson-Mejia (2003) (see Appendix G). In a pre-determined sequence preservice teachers were expected to identify their problems and presented in the seminar each week with their draft report. After the problem was discussed among them deeply, s/he submitted a reflection report for her/his proposed problem that included these steps and reflections in the light of his/her peer friends' suggestions.

3.5.6 Reflective Summative Interview

At the end of the course preservice biology teachers were interviewed in order to provide summative evaluation of the reflective practice teaching course (see Appendix H). The semi-structured interview consisted of fifteen basic questions which explored their practice teaching experiences in the practice school and on-campus seminars highlighted in their reflective journals in terms of cooperating teachers, students, the university supervisor. The interview focus was also on the preservice teachers' changing feelings, thoughts, attitudes and beliefs about teaching and learning, and perception of their reflectiveness as teachers of biology.

3.6 Practice Teaching Course Outline and Data Collection Procedure

The researcher carried out a 14-week program designed to promote reflective thinking among secondary pre-service biology teachers during their practice teaching experiences over a one-semester time period. The below table (Table 3.2) displays the study design flowchart that provides the outline and data collection procedure of the practice teaching course.

Table 3.2 Practice Teaching Course Outline and Data Collection Procedure

Week	The seminar on campus	The experience on the practice school
1st week	Presentation related with the reflective teacher education	—
2nd week	Pre Questionnaires : Pre Reflective Autobiographical Questionnaire Reflective Thinking Attributes Instrument	—
3rd week	Problem discussion Description of journal writing	Observation of the cooperating teacher
4th week	Problem discussion Description of peer coaching	Observation of the cooperating teacher
5th week	Problem discussion Pre-conference discussions (peer coaching)	Observation of the peer partner
6th week	Problem discussion Pre-conference discussions (peer coaching)	Practice Teaching
7th week	Problem discussion Pre-conference discussions (peer coaching)	Observation of the peer partner (peer coaching)
8th week	Problem discussion Audio-taped debriefings (peer coaching)	Practice Teaching (peer coaching)
9th week	Problem discussion Audio-taped debriefings (peer coaching)	Observation of the cooperating teacher
10th week	Problem discussion Audio-taped debriefings (peer coaching)	Practice Teaching
11th week	Problem discussion Microteaching	Observation of the peer partner
12th week	Problem discussion Microteaching	Observation of the cooperating teacher
13th week	Post Questionnaires: Post Reflective Autobiographical Questionnaire Metaphorical Images Instrument Reflective Thinking Attributes Instrument	—
14th week	Reflective Summative Interview	—

The course comprised of two hours at the university and two-three hours at the practice school for a week. A two-hour per week seminars hold on the campus served two purposes; preparation for the school activities and class interactions through discussions around the proposed problem of the week. Of course, they were also free to discuss surprised problems during their experiences at the practice school. The first part of the seminar that was allocated to class discussions on the problem aimed to create an atmosphere in which the preservice teachers to reflect on their experiences in the light of their theoretical knowledge. A list of problems that

proposed by the preservice teachers to discuss was given in Appendix I. The second part of the course usually was used by the researcher as an instructor to inform them about reflective activities how they would apply them in the partner school. In addition, the seminar part of the course served for the pre and post conferences of the peer coaching activity. Preservice teachers sometimes worked as a pair prior to their peer coaching activity in the practice school. After the peer coaching, the pairs were also expected to conduct the audiotaped debriefings. Finally, videotaping microteaching sessions were held and discussed on the seminar part of the course (see Table 3.2).

For the practice school part of the course, preservice teachers were assigned as a pair both to observe and practice teaching for 2-3 hours in a week during the time period of ten weeks. Over this period, they were required to teach at least for two whole classes with the guidance of the cooperating teacher. For each week during the practice school, pre-service biology teachers were involved in reflective activities. Each week, they bring their related written tasks of the previous week to the seminar part of the course. In sum, in this semester long practice teaching course, reflective activities included autobiography writing, metaphor using, journal writing during observing other's teaching and their own teaching, peer coaching, microteaching and problem discussion sessions.

3.7 Data Sources

The Table 3.3 provides an overview of data sources for both qualitative and quantitative. The study used written documents, debriefings, videotaped lessons, interviews, and questionnaires. The data sources were allocated as regard to focus of self- autobiography, observation of teaching, and practice teaching.

Table 3.3 Qualitative and Quantitative Data Sources in terms of Modes of Focus

Data source	Data type	Focus
Written Documents	Autobiographical Data	Self-Autobiography
	Reflective Journals	Observation Teaching
	PQP Forms (Peer coaching)	Practice Teaching
	Reflective Summary as a Coach (Peer coaching)	Observation Teaching
	Reflective Summary as a Teacher (Peer coaching)	Observation Teaching
	Pre-post Self-Analysis Reflective Papers (Microteaching)	Practice Teaching
Audiotaped Debriefings	Reflective Report (Problem discussion)	Self-Autobiography
	Debriefing (Peer coaching)	Observation Teaching
Videotaped lessons	Microteaching	Practice Teaching
Audiotaped Interviews	Reflective Summative Interview	Observation Teaching
		Self-Autobiography
Questionnaires	Metaphorical Images Instrument	Self-Autobiography
	Reflective Thinking Attributes Instrument	

3.7.1 Qualitative Data Sources

In the present study the qualitative data were collected from the written documents, debriefings, interviews and videotaped lessons. Written documents consisted of open-ended autobiographical questionnaires, reflective journals, PQP Forms, reflective summaries, reflective papers, and reflective reports. For the required written data sources, preservice teachers would have a choice to write on hand or type on computer.

3.7.1.1 Autobiographical Data

The preservice teachers answered the open-ended guided questions in the Pre-post Autobiographical Questionnaires (see Appendix B) at the beginning and at the end of the course to reflect on their educational journey including their thoughts, feelings,

opinions, views, attitudes, and beliefs. Each preservice teachers submitted the autobiographical data with an average of 3-4 pages for each questionnaire.

3.7.1.2 Reflective Journals

For the preservice teachers experiences in the practice teaching course, reflective journals were the main data source. While the preservice teachers were writing about their experiences, they had opportunities to follow two types of guidelines (see Appendix C and Appendix D). All of the preservice teachers preferred the Student Teaching Weekly Reflection Guide for their first reflective journal for both observing others' teaching and their own teaching. The preservice teachers usually responded the questions in the guidelines in the given sequence. Some of them also wrote in the narrative format instead of following questions. The preservice teachers were expected to write a reflective journal for each week when they attended to the practice school either for observing others' teaching or for their own teaching practice. The preservice teachers generally submitted one reflective journal for each week. But, they sometimes submitted two journals when they also taught in the practice school. They were suggested to write no less than one page for each journal.

All of the preservice teachers' journals were collected at the end of the semester as a written data source. At the end of the practice teaching experience, for the observation period, each preservice teacher submitted approximately 5-6 reflective journals with an average of 2-3 pages each, focusing on his/her cooperating teacher and partner's teaching actions. For practice teaching period, each of them also submitted approximately 2-3 reflective journals with an average of 2-3 pages, focusing on their own teaching.

3.7.1.3 Peer Coaching Reflections

PQP Forms, debriefings, and reflective summaries constituted the peer coaching reflections for observational and teaching data. The preservice teachers in the peer coaching activity were expected to fill out the PQP Forms (see Appendix E) to give feedback while observing their partner in the conferencing stage. Each preservice teacher submitted PQP Forms at average of one page based on the three guiding questions. In the audio-taped debriefings, the partners were discussed the issues about the feedback form. The transcribed debriefings were at average of 1-2 pages for each preservice teacher. On the other hand, at the end of the peer coaching activity each preservice teacher wrote a reflective summary as a teacher and as a coach with an average of half a page for each of them.

3.7.1.4 Pre-Post Self-Analysis Reflective Papers of Microteaching

The preservice teacher used their videotaped micro lessons to evaluate themselves. The preservice teachers were expected to write pre-post self-analysis reflective papers before and after the microteaching based on the guiding questions (see Appendix F). For practice teaching data, each preservice teacher submitted a paper with an average of 1-2 pages for pre and post self-analysis.

3.7.1.5 Reflective Reports

As a written document, the preservice teachers were expected to write a reflective report after the problem was discussed in the seminar part of the course. In each week seminar part of the course, a problem proposed by one of the preservice teachers was discussed among them according to the outline in the Appendix G. A list of problems that were identified to discuss by the preservice biology teachers were given in the Appendix I. Only one of the preservice teacher who proposed the

problem required to submit the reflective report for this week. Totally, 10 reflective reports were collected from the preservice teachers as a written data source. For self-report data, each preservice teacher submitted a reflective report with an average of 1-2 pages.

3.7.1.6 Reflective Summative Interview

The semi-structured individual interviews were audio-taped and transcribed (See Appendix H). The interviews lasted approximately 30-35 minutes and focused on their observations and self as a future teacher to explore changes in their beliefs about classroom practices as well as evaluation of the reflective framework. The interviews were held in the last week of the practice teaching course in the same classroom for the seminar. Each preservice teacher's transcribed interview data was at average of 3-4 pages for observational and self-autobiographical data.

3.7.2 Quantitative Data Collection Instruments

Quantitative data were collected through the instruments of Metaphorical Images and the Profile of Reflective Thinking Attributes. The Profile of the Reflective Thinking Attributes Instrument was administered to the preservice biology teachers as pre- and posttest. The instrument of Metaphorical Images was administered to the preservice teachers only as a post-test. The instruments were given at the first meeting seminar before the preservice teachers began their practice in the practice schools and at the end of the course during the final seminar meeting.

3.7.2.1 The Instrument of Metaphorical Images

The instrument of Metaphorical Images was generated from the pertinent research literature in order to provide insights the images of preservice teachers about teaching and learning in terms of behavioristic and constructivist view of education (Saban, 2004) (see Appendix J). The instrument has two broad theoretical perspectives in education; teacher-centered (instruction-oriented perspective) and student centered (learning-oriented perspective). The organizing framework for the grouping of the metaphors is based on the relationships between the teacher, the student, and the goals of the education. The instrument consists of 20 metaphorical images based on a three-point Likert-scale to indicate the preservice teachers most representative images of their secondary school biology teachers, their cooperating teachers, and themselves as future teachers. For the present study, the researcher added an open-ended question that asked the preservice teachers to select and explained specifically one of the metaphor out of 20 as the most representative images themselves as future teachers. The Instrument of Metaphorical Images was administered as only as a posttest at the end of the practice teaching course.

A pilot study was performed on the instrument of Metaphorical Images using data provided by 40 secondary preservice teachers (biology, chemistry, and physics) who enrolled in the non-thesis master program of Secondary Science and Mathematics Education Department at Pamukkale University in the spring semester of 2004-2005 education years. The analysis of the pilot study produced the Cronbach's alpha reliability coefficient of .79.

3.7.2.2 The Profile of Reflective Thinking Attributes Instrument

The Profile of the Reflective Thinking Attributes Instrument developed by Taggart and Wilson (1998) was used to assess the preservice biology teachers' levels of reflective thinking. The profile illustrates three levels of reflection as a self-

evaluation tool designed to explore an individual's current level of reflective thinking. Taggart and Wilson proposed that a set of attitudes and abilities to be a reflective practitioner and the self-assessing profile's scores correlates to the levels of reflection illustrated on the Reflective Thinking Pyramid. The instrument consisted of 30 items presented four-point Likert-style format (see Appendix K). Reflective thinking levels of the profile were described as dialectical level (105 to 120), contextual Level (75 to 104), and technical level (Below 75). The reflective thinking instrument was administered as a pre- and posttest in order to evaluate the changes of the preservice biology teachers' perceived reflective thinking levels through the study.

The instrument was adapted from English version. The translation was made by the researcher. For the validation of the instrument, a committee of three experts' suggestions were valued to reach an exact translation. A pilot study was performed on the reflective thinking instrument using data provided by 40 secondary preservice teachers (biology, chemistry, and physics) who enrolled in the non-thesis master program of Secondary Science and Mathematics Education Department at Pamukkale University in the spring semester of 2004-2005 education years. The analysis of the pilot study produced the Cronbach's alpha reliability coefficient of .91.

3.8 Data Analysis

The written and transcribed documents taken during the activities of reflective autobiographies, metaphor using, reflective journals, peer coaching, microteaching, and interviews are the main data sources of the qualitative data to reach a deep understanding on the preservice teachers' reflective thinking content and levels as means of providing insights into their personal and professional development. In addition to qualitative data, the instrument of Metaphorical Images and Reflective Thinking provided quantitative data for the study. In the following subsections, the data analysis procedures for qualitative and quantitative are given separately. Data

analysis consisted of descriptive and inferential statistics for quantitative data, and content analysis for qualitative data. Descriptive statistics were also used in the presentation of the qualitative data.

3.8.1 Data Analysis of Qualitative Data

Data analysis was conducted as a “simultaneous activity” in qualitative research (Merriam, 1998, p. 151). In this study, the data were analyzed two dimensionally. In the first dimension, the qualitative data were interpreted throughout an inductive approach of content analysis to reach a thick and deep understanding on the conceptual categories of reflective thinking. The second dimension included a deductive coding approach for the labeling reflective thinking levels emerged from the literature. Hence, an inductive approach of content analysis allowed “generating categories, themes, and patterns from the data itself” (Marshall & Rossman, 1999). In contrast, the deductive coding approach was used to evaluate the level of reflection in terms of Taggart and Wilson’s (1998) levels of reflective thinking.

The process of qualitative data analysis consists of data reduction, data display, and conclusion drawing phases (Marshall & Rossman, 1999). Further, according to Marshall and Rossman “each phase of data analysis entails data reduction as the reams of collected data brought into manageable chunks and interpretation...” (Marshall & Rossman, 1999, p.152). The third research question addresses the content and level of reflective thinking. The first step in the content analysis was coding the data. All the written and transcribed data sources were read so many times for coding categories. After the preliminary coding noted in the margins, the emerging subtopics and then more general content categories of reflective thinking were organized. As illustrated in the Table 3.4, the content analysis revealed six major topic categories of reflective thinking throughout the case studies. The next step was counting of frequencies of recurrent subtopics and then reflective topic categories in each case study.

Table 3.4 Content Topic Categories and Subcategories of Reflective Thinking

Topic Category of Reflective Thinking	Subcategory
Teacher Characteristics	Strengths Weaknesses
Instructional Processes	Planning of instruction Teaching methods Questions Instructional materials Relation to real life Feedback Time management Monitoring Assessment
Classroom Management	Classroom management problems Classroom management strategies
Students	Motivation Active involvement Student needs
Teaching Profession	Definitions Values Role expectations Metaphor Attitudes
Professional Development	Experience Guidance Collaboration Further improvement Benefits of reflective framework Drawbacks of reflective framework

For the deductive level analysis, the written and transcribed documents were also analyzed according to the framework of Reflective Thinking Pyramid proposed by Taggart and Wilson (1998). Preservice teachers' comments on a particular theme or topic under each subtopic in the content analysis were labeled as the technical, contextual, or dialectical according to the Rubric of Reflective Thinking Levels (see Appendix L). Any comment focused on a specific teaching action or theme was considered as reflective at one of the levels of reflective thinking. In other words,

each understandable segment or comment was coded by using topical and level coding schemes. The comments were shaped mostly by the level coding scheme. So, some of the comments had more than one sub-topic category and reflective level. In this situations, the dominant subtopic and the higher level of reflective thinking was labeled for this comment. The results of reflective thinking content and level analysis with examples for each level are shown in Table 3.5.

Table 3.5 Examples for the Preservice Biology Teachers’ Reflective Thinking Levels and Content

Level of Reflective Thinking	Subtopics	Reflective Entry
Technical level “focus on teaching skill”	Questions	I really enjoyed today’s lesson. I mean the questions asked by the cooperating teacher provided students to think about and explore the things in-depth. ...
Contextual “content related to student needs”	Planning of Instruction	I revised my subject matter knowledge for the lesson [of the respiratory system]. I determined my deficiencies. I considered the ways how I can teach this subject to the students. I also considered students’ understandings. I listed intended behaviors in line with the lesson objectives.
Dialectical Level “contemplating socio-political aspect of education”	Classroom Management	I realized the importance of a democratic atmosphere. I believe in the necessity of students to involve in the decision making processes such as determining exam dates and type of exam questions. I observed that when the students take the exams on the date they determine, they become more eager, interested and happier to take the exam. ...

After the determination of reflective thinking content and level, the next step was counting of frequencies of recurrent subtopics and levels for each case study. According to the recurring themes and levels that emerged from the data, a two dimensional table was constructed to indicate both reflective thinking content and level for each case study. Each two-dimensional table includes ‘professional development’ as an emerged content category that addresses the fourth research

question as a means of the ways of preservice teachers' perceptions of reflective thinking. After the content and level of reflective thinking on the written and transcribed data were represented by using a matrix, the percentages were found within the modes of observation teaching, practice teaching, and self-autobiography. The percentages could be used for comparing cases within and across according to their modes of reflection. In the first step of the presentation of the analyzed data, the characteristics of reflective level and reflective content categories were described, then the representative entries from the data were exemplified following with theoretical underpinnings. This process was followed to create three preservice teacher case studies and to develop the cross-case analysis.

3.8.2 Data Analysis of Quantitative Data

The first and the second research questions require quantitative data analysis. In order to explore the changes in pre- and posttests scores of the preservice teachers' reflective thinking and the changes in the preservice teachers' metaphorical images of their high school biology teachers, their cooperating teachers, and themselves as future teachers, a non-parametric statistical analysis of Wilcoxon Matched-Pairs Signed-Ranks Test was used. The Wilcoxon test is commonly applied in designs that involve either repeated-measures of subjects or pre- and posttests, when it is not suitable to use t-test for dependent samples (Hinkle, Wiersma, & Jurs, 1998). Two related samples were used to compare the distribution of two variables. It tests the hypothesis that there is no significant difference in the distributions of the populations from which the sample comes from.

3.9 Researcher Role

As asserted by Bogdan and Biklen (1992), subjectivity of qualitative researchers has effect on the data with opinions, prejudices, and biases affect on data. Being aware of

the researcher subjectivity, the role of the researcher in the current study was to take charge of the teaching, managing, and assessing roles during the practice teaching course. Then, the researcher had a dual role as the course instructor and the researcher. The researcher conducted a prolonged study with the preservice teachers to provide the understanding the nature of the study on the campus seminars.

3.10 Trustworthiness

In establishing quality criteria for qualitative research, trustworthiness and authenticity are important stances on the question of validity and reliability. Determining the accuracy, discussing the generalizability, and advancing possibilities of replicating a study have long been considered as the scientific evidences for validity and reliability issues (Creswell, 1994). The informing all phases of the research from data collection to interpreting and presenting the data strengthen the validity issues (Yıldırım & Şimşek, 2005).

3.10.1 Triangulation

Triangulation implies using multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings (Merriam, 1998). According to Cresswell (1994), triangulation was the basic reason to combine qualitative and quantitative methods. In the current study, triangulation of methods and triangulation of sources were utilized extensively. Primarily, the research design was based on the combination of qualitative and quantitative methods. The two different research paradigms provided the enrichment of data sources involving the questionnaires, written documents, debriefings, and interviews.

3.10.2 Prolonged Engagement

The researcher carried out a 14-week program over a one-semester time period. So, the researcher and the preservice teachers had a prolonged time period to meet so many times. In addition to planned meetings, the preservice teachers were free at any time to consult as their course instructor/the researcher in the university. This provides the researcher to understand the atmosphere shared with the preservice teachers. The more prolonged engagement in the research atmosphere provides the more naturalistic atmosphere of research (Yıldırım & Şimşek, 2005).

3.10.3 Peer Debriefing

The qualitative data collected in this study were in Turkish. The content analysis was conducted by the researcher in the original language. The data needed to be translated into Turkish when it was decided to be taken as quotation. Especially, two peers of the researchers who knew English well involved in the translation process from the draft translations to the achieving the smooth translations by discussing on the meaning. The same peers also involved in the process of coding and deciding the reflective categories and levels for some parts of the data.

3.10.4 Audit Trial

Creswell (1994) points out that “another researcher might provide an ‘audit’ trail of the key decisions made during the research process and validate that they were good decisions” (p.158). One of the experts in qualitative research at the university reviewed emerged categories for a sample of the data. Another expert especially in the naturalistic reflective studies reviewed for the reflective thinking levels for a sample of the data. The results of their analysis were discussed with the researcher for the points in which they had different suggestions. The data in this study were

collected in Turkish and then translated into English when they were displayed as quotations in the case studies. The first translation was made by a peer committee as it was mentioned above. Then the supervisors of the study and an English teacher corrected so many times to reach an exact translation.

3.11 Limitations of the Study

As Marshall and Rosmann (1999) point out that there are no research designs without limitations. Qualitative studies are not generalizable rather transferable. Therefore, a discussion of limitations reminds the boundaries and context of the study. The findings of this study are limited with the data obtained from 10 preservice biology teachers in the non-thesis master program of Secondary School Science and Maths Education Department at Pamukkale University. So, the findings of the present study are limited to this sample, and the findings can be generalized to subjects having the same characteristics in the similar settings. Also, reliability check was not conducted for a whole qualitative data. The data were mainly coded by the researcher. Peer debriefing and audit trial were only provided for a sample of the data.

The participants in this study had a bachelor degree in biology. They had opportunities to work in private courses or as tutors. Some of them had a long time teaching experiences whereas the remainings had no experiences. It was the fact that more experiences would have a positive impact on the development of the preservice teachers' reflection. Conversely, it might create a negative impact on their reflections, beliefs or attitudes due to exposing to the complexity of real classrooms.

CHAPTER 4

RESULTS

The study aimed to explore the preservice biology teachers' reflective practice through a reflective framework integrated into one term practice teaching course in a deep understanding on their reflective thinking skills and content. Also, the preservice biology teachers' perceptions of the reflective thinking levels and metaphorical images about teaching and learning were examined. In order to realize the research questions, both qualitative and quantitative research methods were utilized in the analyses of data. This chapter, therefore, presents the results of quantitative and qualitative analysis under two separate sections.

4.1 Results of Quantitative Data

The results of the descriptive and non-parametric analysis the Profile of the Reflective Thinking Attributes Instrument and Metaphorical Images Instrument are discussed.

4.1.1 The Profile of Reflective Thinking Attributes Instrument

The first research question addresses the reflective thinking levels of preservice biology teachers. The reflective thinking instrument was administered as a pretest and posttest in order to evaluate the changes of the preservice biology teachers' perceived reflective thinking levels through the study.

4.1.1.1 Descriptive Analysis of the Profile of Reflective Thinking Attributes Instrument

Table 4.1. presents descriptive analysis related to the Profile of Reflective Thinking Attributes Instrument. The table illustrates the reflective thinking levels attained by the preservice biology teachers before and after the practice teaching course. Before the practice teaching course, preservice biology teachers reflected at the technical level reporting a mean of 73.90 and with a standard deviation of 13.52. Seven participants (70 %) scored at the lowest (technical) level. Three participants (30%) scored at contextual level and none were at the highest (dialectical) level.

Table 4.1 An Overview of Reflective Thinking Levels of the Preservice Biology Teachers

	Technical Level	Contextual Level	Dialectical Level	Reflective Thinking Levels	
Preservice Teachers	N	N	N	M	SD
Before practice teaching	7	3	0	73.90	13.52
After practice teaching	1	7	2	91.30	12.31

After engaging with the reflective activities during the course of practice teaching, participants' scores indicated an increase in perceptions of their reflective thinking skills from the technical to contextual level reporting a mean of 91.30 with a standard deviation of 12.31. While one participant remained (10%) at the lowest (technical) level, seven participants (70%) scored at contextual level. Two participants (20%) scored at at the highest (dialectical) level.

Table 4.2 indicates the results of the perceived individual scores from the Profile before and after the practice teaching course. Six of 7 participants, who previously were at the lowest level (technical), moved to the contextual level with an improved perception of their reflective thinking skills ranging from 14 to 30 points increase and only one of them remained at the lowest level with 14 points increase. Two of 3 participants, who were at the middle (contextual) level during pretest, moved to the highest (dialectical) level with an improved perception of their reflective thinking skills ranging from 11 to 13 points increase, and only one of them improved within the same level of at the contextual with 12 points increase.

Table 4.2 Pre-post Study Reflective Thinking Levels of the Preservice Biology Teachers

Students	Pre-study Score	Level	Post-study Score	Difference	Level
Defne	92	Contextual	105	13	Dialectical
Beril	94	Contextual	105	11	Dialectical
Boran	74	Technical	104	30	Contextual
Dora	91	Contextual	103	12	Contextual
Doruk	64	Technical	91	27	Contextual
Lal	71	Technical	88	17	Contextual
Sude	67	Technical	84	17	Contextual
Melisa	66	Technical	82	16	Contextual
Beren	63	Technical	80	17	Contextual
Yılmaz	57	Technical	71	14	Technical

Descriptive results of the profile indicated that all of the preservice biology teachers had an improved perception of their reflective thinking skills ranging from 11 to 30 points increase after they engaged with the reflective frameworks during the practice teaching course. Overall, there was an increase in the perception of the preservice

biology teachers' reflective thinking skills from technical level to contextual level according to the profile of Reflective Thinking Attributes Instrument.

4.1.1.2 Non-parametric Analysis of the Profile of Reflective Thinking Attributes Instrument

In order to evaluate the changes in pre- and posttest scores of the preservice biology teachers on the profile of Reflective Thinking Attributes Instrument, a non-parametric statistical analysis, Wilcoxon Matched-Pairs Signed Ranks Test was conducted to test the hypothesis H_0 1.1 at the significance level of alpha .05 (see Appendix M). Table 4.3 presents the Wilcoxon Test results for comparing the pre- and posttest scores of the preservice biology teachers on the scale of Reflective Thinking Attributes Instrument.

Table 4.3 Non-parametric Analysis of Reflective Thinking Levels of the Preservice Biology Teachers

Reflective Thinking Instrument	Pretest – Posttest
Z	-2.810
Asymp. Sig. (2-tailed)	.005

Wilcoxon test value was found as -2.810 and $p= .005$. The results revealed that there was a significant difference between the pre- and posttest scores of the study group on the profile of Reflective Thinking Attributes Instrument. It can be concluded that the preservice biology teachers' perceived their reflective thinking levels as increased through the reflective framework into one-term practice teaching course.

4.1.2 The Instrument of Metaphorical Images

The second research question addresses the metaphorical images of preservice biology teachers about learning and teaching process. The instrument of Metaphorical Images was used to understand the preservice biology teachers' perceptions of their high school biology teachers, their cooperating teachers, and themselves as future teachers.

4.1.2.1 Descriptive Analysis of Metaphorical Images of the Preservice Biology Teachers

The results reported in this section are based on the quantitative data obtained from the 20 Likert-style metaphor items questionnaire. Percentage was used to report the data related to participants' images of their high school biology teachers, their cooperating teachers, and themselves as future teachers. The instrument asked the preservice teachers to rate metaphorical images on a three scale of (1) not representative at all, (2) partly representative, (3) most representative. Only the third option that means "the most representative" was taken to calculate the percentage while creating an image of their high school biology teachers, their cooperating teachers and selves as future teachers.

Table 4.4 displays the percentages of metaphors selected by the participants to describe their most representative images of their high school biology teachers, their cooperating teachers, and themselves as future teachers. As shown in Table 4.4, the most representative high school teacher metaphors that received the highest ratings from the participants included the same percentage (30%) of jockey, judge, coach, and the same percentage (20%) of technician, guard, gardener and conductor.

Table 4.4 Metaphorical Images of the Preservice Biology Teachers

Student–CLASSROOM–teacher	High school biology teacher (M=18.00)	Cooperating teacher (M=16.50)	Self as a future teacher (M=15.80)
Teacher-centered and/or instruction- oriented metaphors	%	%	%
Customer–SHOP–shopkeeper	0	10	20
Passenger–BUS–driver	0	10	10
Race horse–HIPPODROME–jockey	30	0	10
Raw material–FACTORY–technician	20	20	10
Clay–WORKSHOP–potter	0	0	20
Patient–HOSPITAL–doctor	10	20	20
Car–REPAIR SHOP–mechanic	10	0	0
Soldier–ARMY–commander	10	0	0
Suspect–COURTROOM–judge	30	0	10
Criminal–PRISON–guard	20	0	0
Student-centered and/or learning- oriented metaphors	High school biology teacher (M=16.50)	Cooperating teacher (M=19.70)	Self as a future teacher (M=24.50)
	%	%	%
Child–FAMILY–parent	10		
Infant–CRECHE–baby sitter	10	0	30
Flower–GARDEN–gardener	20	30	80
Audience–CIRCUS–juggler	10	0	40
Audience–STAGE–comedian	0	10	20
Experimenter–LAB–tool provider	0	30	50
Explorer–NATURE–compass	10	20	90
Tourist–ISLAND–tour guide	10	10	70
Player–TEAM–coach	30	30	80
Musician–ORCHESTRA–conductor	20	40	40

Likewise, the most representative cooperating teacher metaphors that received the highest rating from the participants included the conductor (40%), the same percentage (30%) of gardener, tool provider, coach, and the same percentage (20%) of technician, doctor, parent, and compass. On the contrary, the most representative self-image metaphors that received the highest ratings from the participants included

compass (90%), gardener (80%), coach (80%), parent (70%), tour guide (70%), tool provider (50%), juggler (40%), and conductor (40%).

A descriptive analysis of the metaphor choice of the participants clearly reveals that while they picked a combination of metaphors at a low percent from both teacher-centered and student-centered theoretical perspectives as their most representative images of their both high school biology teachers and their cooperating teachers, they choose only the student-centered metaphors to describe their professional self-images at a high percentage.

4.1.2.2 Non-parametric Analysis of the Metaphorical Images Instrument

Wilcoxon Matched-Pairs Signed Ranks Tests were conducted to test the hypothesis $H_{02.1}$, $H_{02.2}$, and $H_{02.3}$ at the significance level of alpha .05 to compare the participants' metaphorical images of their high school biology teachers, their cooperating teachers, and themselves as a future teacher in terms of two types of images of teacher-centered and student-centered metaphors (see Appendix N). Wilcoxon Test Results indicated that there were significant differences between the participants' metaphorical images of their high school biology teachers and their cooperating teachers for both teacher-centered and student-centered metaphors, as seen in Table 4.5. Accordingly, the participants perceived their cooperating teachers as less teacher-centered ($M=16.50$, $p= .26$) and more student-centered ($M=19.70$, $p= .35$) than their high school biology teachers ($M=18.00$ and $M=16.50$, respectively).

Wilcoxon Test Results indicated that there was no significant difference between the participants' metaphorical images of themselves and their high school biology teachers in terms of teacher-centered metaphors, whereas in terms of student-centered metaphors there is a significant difference between participants images of themselves and their high school biology teachers (See Table 4.5). Accordingly, the

participants perceived themselves as more student-centered ($M=24.50$, $p= .005$) than their high school biology teachers ($M=16.50$).

Table 4.5 Non-parametric Analysis of Metaphorical Images of the Preservice Biology Teachers

Metaphorical Images	Teacher-centered			Student-centered		
	M	Self as a future	Cooperating teacher	M	Self as a future	Cooperating teacher
High school teacher	18.00	.082	.026	16.50	.005	.035
Cooperating teacher	16.50	.468		19.70	.005	
Self as a future teacher	15.80			24.50		
		Z=-1.740	Z=-2.232		Z=-2.805	Z=-2.103
		Z=-.725			Z=-2.816	

Wilcoxon Test Results indicated that there was no significant difference between the participants' metaphorical images of themselves and their cooperating teachers in terms of teacher centered metaphors, whereas in terms of student-centered metaphors there is a significant difference between participants images of themselves and their cooperating teachers. Accordingly, the participants perceived themselves as more student-centered ($M=24.50$, $p= .005$) than their cooperating teachers ($M=19.70$).

It can be concluded that preservice biology teachers in this study appeared to be more student-centered than both their high school biology teachers and their cooperating teachers. They also perceived their cooperating teachers as less teacher-centered and more student-centered than their high school biology teachers.

4. 2 Results of Qualitative Data

Qualitative part of this study consists of case selection process, case presentation, and discussion of selected cases.

4.2.1 Case Selection

According to the result of the Reflective Thinking Instrument, six participants at the technical level improved to the contextual level and two participants at the contextual level improved to the dialectical level. Although, the remaining two participants stayed at the same reflective level, they also improved within the same reflective level of technical and contextual. Among them two cases were selected as being improved reflective thinking levels from technical to contextual and from contextual to dialectical. The other case was selected as being in the same reflective thinking level category before and after the study. The three case from these conditions were determined purposefully to provide comprehensible and rich data for the analysis. First case was Sude who reflected at the technical level before the practice teaching course, and at the contextual level after the course. The second case was Dora who had a reflective thinking on the contextual level before and after the study. The third case was Defne who reflected at contextual level and then at the dialectical level before and after the study respectively.

4.2.2 Case Presentation

Cases were created in order to provide an insight of the aim of the study which depicted a deep description of using a reflective framework. The selected cases from the varied reflective thinking levels according to the results of the reflective thinking instrument were provided to evidence for the reflective thinking skills and reflection content by the written and transcribed data sources. Each case were presented under

five sections: the profile of the case, the content and the level of reflective thinking during observation teaching; the content and the level of reflective thinking during practice teaching; the content and the level of reflective thinking about self-autobiography; and an overview of professional development. Each case begins with a quotation from the autobiographical data to give his/her general point of view about teaching profession. The first section presents the profile of the case. In the description of the profile section, some demographic information and personal characteristics were given, as well as the conditions at the secondary school in which practice teaching took place.

The second section includes the content and the level of reflective thinking during observation teaching at the actual classroom settings at the secondary school. During observations, data were collected through the reflective journals, the reflective summative interview, and the peer coaching reflections of the PQP form, reflective summary as a coach, and audio-taped debriefing. The third section presents the content and the level of reflective thinking during practice teaching at the actual classroom settings and microteaching. During practice teaching, data were collected through the reflective journals, pre-post microteaching self-analysis reflection papers and the peer coaching reflections of reflective summary as a teacher.

The fourth section presents the content and the level of reflective thinking about self-autobiography. Self-autobiographical data about were collected through the pre-post autobiographical questionnaires, the reflection report of problem evaluation, and the reflective summative interview. On the other hand, in some cases it could be used to compare the reflections of preservice teachers before and after the practice teaching experiences in understanding their professional development, views, opinions, beliefs, attitudes toward teaching profession. The last section summarizes the content and the level of reflective thinking from the overall point of view. The percentages could be used for comparing cases within and across according to preservice teachers's reflective thinking levels and content.

The following sections include the description of the three cases under above-mentioned five sections by discussing findings relating to the sub-questions across cases which are depicted by not only preservice teachers' comments but also quotations from written and transcribed data. In each section, quotations are provided to represent predominant content topics within three reflective thinking levels. Also, samples at the dialectical level were sometimes provided without considering their dominance as topics. Comments were made about both reflective thinking content and level when relevant quotations were given to discuss issues under each theme.

4.2.3 The Case Studies

In this part, selected three cases are discussed under above-mentioned five sections. These cases were presented according to the reflective thinking content and level emerged from the qualitative data of reflective writings and transcribed data taken during the activities of reflective journal and autobiography writing, peer coaching, microteaching, and problem discussion. Also, qualitative findings obtained through semi-structured interviews are provided as a reflective summative evaluation.

4.2.3.1 The Case of Sude

I believe in the respectfulness of the teaching profession. I think you enjoy a greater pleasure when it is performed not only for economical reasons, but also and especially for the moral reasons. I believe in the importance of educating people. I enjoy teaching and I want to live the happiness of sharing knowledge with students. (Pre-Autbiographical Questionnaire)

4.2.3.1.1 The Profile of Sude

According to the responses to demographic questions, Sude was 25 years old female student. She graduated from the Department of Biology. She started the three semester non-thesis master program in the same year. Previously, she did not have any experiences of teaching. Sude's major characteristics of her reflections about self were her excitement and anxiety due to teaching for the first time. Another characteristic of her self-reflection was the lack of subject matter knowledge. Yet, she seemed to be very eager and impatient to teach something to students. For example, in her autobiographical data, she frequently emphasized the importance of education and bringing up individuals into society. As she stated in the above quotation, teaching gave her enthusiasm that she was looking forward to teaching and feeling the happiness of sharing knowledge.

Sude's practice teaching experience took place at a public secondary school in the city center. For a ten week practice teaching experience, Sude was scheduled to observe her cooperating teacher's two classes of 10th and 11th grade levels for two hours a week. Over this time period, she also taught three class hours in the classes she observed. Two of her teaching experiences took place in 11th grade and the other one in 10th grade. She was assigned as partner with Dora to observe the classes of the same cooperative teacher who had nearly 18 years teaching experience in biology at the secondary schools.

The following sections present the content and the level of Sude's reflective thinking as regard to the mode of reflection on observing others' teaching, her own practice teaching, and self-autobiography including her thoughts, feelings, opinions, views, attitudes, and beliefs about educational issues.

4.2.3.1.2 The Content and the Levels of Sude's Reflective Thinking during Observation Teaching

For observations, three data sources were utilized which are reflective journals, peer coaching reflections, and a reflective summative interview. Table 4.6 provides results of the extent and the levels of Sude's reflections on her cooperating teacher and partner's teaching obtained from qualitative analysis of the combined form of written and transcribed data. As seen in Table 4.6, Sude focused mainly on the topics of instructional processes, followed by students, teacher characteristics, and classroom management while concerning others' teaching. In addition, there was evidence for her perception of professional development after observing others' teaching. Sude's reflective thinking level changed in terms of the content topics of reflection in which the technical level predominated. But, the level of reflection in the content topic categories of students and professional development was predominantly contextual.

Table 4.6 The Content and the Levels of Sude's Reflective Thinking during Observation Teaching

Category	%	f	Subcategory	Observation Teaching		
				Level 1	Level 2	Level 3
Teacher Characteristics	18.07	15	Strengths	5	2	
			Weaknesses	8		
Instructional Processes	33.74	28	Planning of instruction	3		
			Teaching methods	7	1	
			Questions	4	1	
			Relation to real life	4	1	
			Instructional materials	2	2	
			Monitoring	3		
Classroom Management	8.43	7	Classroom management problems	3		
			Classroom management strategies	2	1	1
Students	20.48	17	Motivation	3	4	1
			Active involvement	2	1	
			Student needs	2	3	1
Professional Development	19.28	16	Experience	2	3	1
			Guidance	3	3	
			Collaboration	2	2	
Total	100	83		55	24	4
%		100		66.26	28.92	4.82

The major focus of Sude's reflections throughout observations was **instructional processes** with a dominant technical and then contextual reflection level. She was concerned with *planning of instruction, teaching methods, questions, relation to real life, instructional materials, and monitoring*. At the technical level, Sude reflected on the technical aspects of her cooperating teacher and partner's teaching actions and skills development for the meeting specified outcomes without critically analyzing the situations. For example, while observing her partner during the peer coaching session as a coach, Sude recorded a leading question on the PQP conferencing style form to give her partner a suggestion in terms of *monitoring* the class. Thus, in the following technical level reflection, she focused on teaching skill development of her partner:

Accepting students' questions in succession created a chaos in the classroom. Wouldn't you warn the students to wait the answer of the other student's question? (PQP Form/Peer Coaching)

With the increasing the contextual level reflection, Sude's concerns over **students** included ability to *motivate and involve students*, as well as *students' needs*. Under the subtopic of *motivation*, Sude usually related the students' interests and involvement to the success of the lesson followed by a reflection at the contextual level. The following quotation from the reflective summative interview revealed her thoughts about the worst lesson that was related to the genetics concepts. She pointed out that her cooperating teacher presented too many concepts and failed to attract the students' interests. As a consequence, it could be expressed that the pre-established goals were not achieved due to the contextual factors. In the following quotation, Sude clarified the reasons that impeded the achieving of the lesson goals:

Considering the previous lessons, the lesson of genetics concept was the worst one. My cooperating teacher presented too many concepts that made the students bored in a short time. So, they lost their interests. The teacher did not do anything to get them re-involved. It was the another aspect of the lesson that was getting worse. (Reflective Summative Interview)

She also reflected at the dialectical level related to *students' needs* subcategory under students' issues. In her observation journal, Sude wrote an event related to a problem of a student that worried her too much. She observed a female student crying throughout the lesson with her head down on her desk. During the break, the student became worse and the cooperating teacher asked for the reason of her crying. It was understood that the girl was over anxious about the university entrance exam that she was going to take just a few months later. From the moral and social aspect, the below quotation implies that Sude was affected positively by the cooperating teacher's interest in the student, and this situation helped her to realize the effects of the exam on students's psychology:

One of the female student was putting her head onto the desk and crying throughout the lesson.. ... When she was worse after the lesson, the teacher was interested in her problem. What impressed me was the cooperating teacher's interest in the student during the whole break. It could be understood that it was her body's reaction to the concentrated preparation period of the university entrance exam. ... (Reflective Journal II)

Another dialectical level reflection of Sude was related to **classroom management** category. She claimed that she learned a new *classroom management strategy* while observing her cooperating teacher. She realized the importance of students' involvement in the decision-making process in creating a democratic classroom atmosphere. She observed that students were happier and more willing to take an exam when their teacher asked them to determine both the date and the type of the exam. The following excerpt written at the dialectical level included socio-political aspect of education that she emphasized the importance of a democratic classroom atmosphere for a more effective classroom management:

I realized the importance of a democratic atmosphere. I believe in the necessity of students to involve in the decision making processes such as determining exam dates and type of exam questions. I observed that when the students take the exams on the date they determine, they become more eager, interested and happier to take the exam. ... (Reflective Journal VI)

Teacher characteristics also dominated in Sude's reflections. Sude's reflections on her cooperating teacher and partner's characteristics were very descriptive; focusing on voice quality, non-verbal language (gestures), and personal traits, indicating reflection mostly at the technical level. Sude attributed the lack of students' interests toward lessons to some characteristics of teachers. She proposed that her cooperating teacher's calm personality and monotone voice were partly responsible for emerging discipline problems in the classroom. On her journals and summative interview for the classroom observations, she frequently identified these characteristics as a reason for the decrease in students' interests toward lessons and chatting among themselves. In regard to *weaknesses*, Sude mentioned her cooperating teacher's characteristics and teaching skills in a descriptive manner:

Generally, he [the cooperating teacher] delivered the lesson with the same voice and did not walk around in the classroom. (Reflective Journal I)

[Also], he has a calm personality. ... His calm personality and monotone voice sometimes caused students not to take further interest in the lesson, and they started to chat. (Reflective Summative Interview)

Sude seemed to perceive **professional development** through *experience, guidance, and collaboration* during observation sessions. It was noticeable that Sude was aware of the difficulties of teaching profession beyond delivering the subject in the reflective summative interview when she gained *experience* by analysing implications. For instance, she realized the importance of communication with students as a means of providing eye contact with each of them. Then what she talked about at the contextual level:

By observing lessons, I understood the fact that teaching is not only delivering the subject and leaving the class immediately after the lesson is finished. You have to communicate with all the of students in the classroom. You shouldn't even lose eye-contact with each student. ... (Reflective Summative Interview)

Sude also reached the contextual level at the subtopic of *guidance* after observing her partner as a coach. While guiding her friend, Sude had the opportunity to realize the consequences of being excited during her partner's teaching at the conferencing stage of the peer coaching session. She highlighted the consequences of her friend's excitement. One of her reflections at the contextual level from the reflective summary after the peer coaching session underlined her worries about the consequences of her peer partner's excitement:

As a teacher I have made the same mistakes that my partner did. Consequently, I could see my own mistakes more clearly by observing my friend. I was also excited at the beginning of the lesson and I know this does not give a good impression to the students. But I had not realized at that time, this situation could even cause losing control in the classroom. (Reflective Summary/Peer Coaching)

4.2.3.1.3 The Content and the Levels of Sude's Reflective Thinking during Practice Teaching

For practice teaching experiences, three data sources were utilized which are reflective journals, a reflective summary of peer coaching as a teacher, and pre-post self-analysis reflection papers to reflect what happened while she was teaching in the actual classroom settings and during microteaching. As presented in Table 4.7, Sude focused mainly on the content topics of instructional processes, followed by teacher characteristics, students, teaching profession, and classroom management when she considered on her own teaching. As seen in Table 4.7, the perceived professional development is evidenced in Sude's reflections after practice teaching experiences. The levels of reflective thinking evidenced in Sude's reflections were mainly at the technical level, followed by the contextual level, and very limited to the dialectical level.

Table 4.7 The Content and the Levels of Sude’s Reflective Thinking during Practice Teaching

Category	%	f	Subcategory	Practice Teaching		
				Level 1	Level 2	Level 3
Teacher Characteristics	12.50	7	Strengths	2		
			Weaknesses	4		1
Instructional Processes	51.78	29	Planning of instruction	5	4	
			Teaching methods	4	1	
			Questions	3		
			Instructional materials	4		
			Relation to real life	1		
			Time management	1		
			Assessment	2	3	1
			Classroom management strategies	1		
Classroom Management Students	1.79	1	Motivation	1		
			Active involvement	1		
			Student needs	2	1	
Teaching Profession	3.57	2	Attitudes	1		1
			Professional Development	21.43	12	Experience
			Collaboration	2	1	
			Further improvement	2	1	
			Total	100	56	38
%		100	67.86	25.00	7.14	

Like in the observation period, Sude’s reflections on the teaching period focused mostly on **instructional processes** involving six emerging subtopics; *planning of instruction, teaching methods, questions, instructional materials, relation to real life, time management, and assessment of instruction*. Compared to the observation period, Sude became more concerned about *the planning of instruction*. She decided to spend more time for lesson preparation and identifying the objectives clearly before her practice teaching lesson. As in the following example, she did not only examine the ways of teaching, but also questioned the lesson goals and behavioral objectives related to the student needs at the contextual level:

I revised my subject matter knowledge for the lesson [of the respiratory system]. I determined my deficiencies. I considered the ways how I can teach this subject to the students. I also considered students’ understandings. I listed intended behaviors in line with the lesson objectives. (Reflective Journal III)

Sude's reflections on her own teaching usually centered around teaching skills at the technical level. In many descriptive statements, she underlined how she effectively used *instructional materials* to achieve certain goals at the technical level. The following example from her reflective journal focused on the use of black board.

The topic was the respiratory system. I wrote on the blackboard what happens when we breathe. I showed the oxygen transportation on the figure. By this way, I tried to summarize the subject. I think that I used the board effectively. (Reflective journal III)

Following the use of instructional materials, Sude focused on *assessment* of instruction. She stated that she asked questions or administered a quiz to evaluate whether her students understood the lessons. She emphasized the importance of choosing the appropriate assessment techniques. The following example indicated that Sude's approach to the assessment technique was at the contextual level because her main criteria in this selection were the students' levels, interests, and nature of the subject:

I prepared questions for the quiz depending on the the students' level and the nature of the subject before the lesson. ... Specifically, I covered questions related to daily life to make the students interested in the subject matter. ... (Reflective Journal IV)

When Sude considered about her own teaching, the topic of **teacher characteristic** was extensively discussed in her reflective journals and pre-post self-analysis reflection papers. She commented especially on her weaknesses. For example, when she was asked to evaluate her microteaching lesson, she was aware of the consequences of her excitement as a *weakness* of her teaching and wrote at the dialectical level while reviewing self as a teacher:

I think it was not a good lesson. I was more excited than I expected. I repeated the same sentences many times and my voice trembled. Then I forgot what I was going to teach. I failed. I could not calm down. Actually, this situation provided me to realize my deficiencies.(Post Self-Reflection Paper/Microteaching)

Under **teaching profession** category, Sude expressed her positive *attitudes* toward teaching profession at the dialectical level after she had actual experiences. She stated that “I realized that the students behave me as if I’m a real teacher not a student teacher. ...”. Besides her positive attitudes toward teaching, she also has an attribution of ‘whole-heartedness’ involving criticizing herself. In the following example for the students’ failure, she blames on the teacher:

When students are not able to answer questions or answer wrongly, it is resulted from the teacher who cannot attract students’ attention or cannot teach in the manner that all the students understand. (Reflective Journal V)

She perceived **professional development** after her practice teaching *experience and collaboration* with her cooperating teacher and friend. It was seen that gained *experience* enabled Sude to attempt systematically to improve herself. For example, after her microteaching experience she reflected at dialectical level in promising for better preparation for the subject matter knowledge in the future:

... I will teach after preparing well. I will make practice at home loudly as if I am in the classroom. I’m frightened to make mistakes about the subject matter knowledge. Perhaps the reason why I am excited during teaching may be due to the making a mistake. (Post Self-Reflection Paper/Microteaching)

4.2.3.1.4 The Content and the Levels of Sude’s Reflective Thinking about Self-Autobiography

For self–autobiographical data, Sude responded the questions endorsed at the pre-post autobiographical questionnaires and the reflective summative interview to reflect on the changes in her views, opinions, attitudes, and beliefs about teaching profession and her personal and professional development. Also, her reflection report of the problem evaluation was investigated under the professional development category. As presented in Table 4.8, the content of Sude’s reflections included the topics of teacher characteristics, teaching profession issues, and perceived

professional development. The levels of reflective thinking evidenced in Sude's reflections were mainly at the technical and the contextual level, then slowly extended to the dialectical level.

Table 4.8 The Content and the Levels of Sude's Reflective Thinking about Self-Autobiography

Category	f	Subcategory	Self-Autobiography		
			Level 1	Level 2	Level 3
Teacher Characteristics	11	Strengths	4	2	1
		Weaknesses	3		1
Teaching Profession	18	Definitions	4	2	
		Values	2		1
		Role expectation		3	1
		Metaphor		1	
		Attitudes	3	1	
Professional Development	18	Experience	3	4	1
		Collaboration	1		
		Further improvement			1
		Benefits of reflective framework	1	5	1
		Drawbacks of reflective framework	1		
Total	47		22	18	7
%	100		46.81	38.30	14.89

According to **teacher characteristics**, Sude expressed her *weaknesses* at the end of the practice teaching through the post autobiographical questionnaire. She was able to reflect critically about herself and aware of her some deficiencies regarding subject matter knowledge. Yet she seemed to have self-confidence in overcoming her deficiencies in the future. In the following dialectical quotation, she criticized herself and promised to complete her deficiencies in confidence about subject matter knowledge:

Emerging from the practice teaching experience, I noticed that I have some deficiencies in my subject matter knowledge. I'm dedicated and working hard so that I can easily overcome my deficiencies in the subject content knowledge. (Post-Autobiographical Questionnaire)

Sude reflected extensively on her feelings, thoughts, views, attitudes and beliefs about **teaching profession** at all the reflective levels. She made *definitions* for the characteristics of good teaching, good learning, and good classroom management. Within the definition of ‘good teaching’, her perspective developed from a descriptive to a contextual level throughout the practice teaching course. Sude took into consideration students’ abilities and interests by validating principles. The following quotations from pre-post autobiographical questionnaires represent Sude’s changing beliefs on good teaching from the technical level to the contextual level, respectively:

Teaching is the purposeful and programmed educational activities in the schools. ... The accepted behaviors in the society are given in a planned way. (Pre-Autobiographical Questionnaire)

The important factor for good teaching is to contribute students’ development according to their interests and abilities. (Post-Autobiographical Questionnaire)

Sude further refined her beliefs on teaching profession under the subtopic of *role expectation* as a teacher at the dialectical level with self-actualization at the end of the practice teaching experience. When she described her future profile, she believed the importance of making students active-learner to provide long-lasting learning. As a future teacher, she imagined a learning environment in which students learn by doing instead of traditional way of learning. She extended her promise to utilize visual materials in enhancing retention rate of students’ knowledge. The following quotation from the interview data also indicated Sude’s ‘open-mindedness’ in defining her role not only from the teacher’s point of view but also from a student point of view:

Traditional techniques are still used in the schools. What I’m going to do when I start teaching is not lecturing. I will prepare such a learning environment that students are active and learn by doing. I intend to encourage them by assigning projects. With the use of various audio-visual materials, I aim to provide long-lasting learning. In this course, I identified what is missing in teaching and I will try to overcome these in my future class. (Reflective Summative Interview)

Metaphorical data also supported Sude's changing perspective toward the teaching profession. She seemed to have an approach to teaching on such an aspect that emphasizes constructivist learning to become an effective teacher. In the descriptive part of the questionnaire of Metaphorical Images, Sude selected a student-centered metaphor of 'explorer-nature-compass' as the most representative one for her image as a future teacher. In the following dialectical explanation, Sude seemed to achieve self-actualization while she was clarifying her beliefs about the role as a future teacher:

When I become a teacher, I can provide students different ways to learn the subject matter and help them choose the correct way to reach the knowledge. I will also help them to choose their own way. ... (Open-ended Question/Metaphorical Images Instrument)

As it was seen from the quotation in the first section, Sude had a positive attitude toward **teaching profession** at the beginning of the course. After the reflective program, she also had a *positive attitude* toward teaching profession addressing the socio-political aspect of teaching. She was more aware of the 'responsibility' for becoming a teacher and the importance of educating young people into society. The following autobiographical data revealed her self-understanding as a responsible teacher when she was asked the effect of the practice teaching experiences on her attitudes at the end of the course:

Practice teaching positively influenced my attitudes toward teaching profession. I realized the difficulties of teaching profession and the importance of educating young people. It is not easy to attract attention of students with diverse characteristics and make them interested in the lesson. (Post-Autobiographical Questionnaire)

Sude found all activities within **the reflective framework** effective in helping her professional development as a reflective teacher. In terms of *benefits*, she thought that the microteaching activity is the most efficient one to see her deficient qualities as a teacher. In general, she believed that her engagement in reflective activities

made her more attentive about her pedagogical practices. The following interview data displayed Sude's reconstructing her approach toward teaching and learning through reviewing self as a teacher from the pedagogical aspect at the dialectical level:

All of the activities were effective but the microteaching was the most effective one. I could evaluate my own teaching and identified my deficiencies. ... (Reflective Summative Interview)

Carrying out activities changed my perceptions about teaching and learning. I have become more considered about my teaching behaviors from the pedagogical aspect. (Reflective Summative Interview)

4.2.3.1.5 An Overview of Sude's Professional Development

Table 4.9 shows the content and the levels of reflective thinking in the combined data of reflective writings, audio-taped debriefing and interview, and pre-post questionnaires throughout her reflective practice teaching experiences. Results of content topic categories of reflective thinking showed that Sude focused mainly on instructional processes, followed by professional development, teacher characteristics, teaching profession, students, and classroom management. As indicated in Table 4.9, the levels of reflective thinking evidenced in Sude's reflections were mainly at the technical level (61.83%), followed by the contextual level (30.11%), and very limited to the dialectical level (8.06%). Sude's reflective thinking levels changed in terms of the content topics of reflection in which she had predominantly the technical level except from the topic of professional development. In this topic category, the contextual level of reflection was predominant.

Table 4.9 An Overview of Sude’s Professional Development

Reflective Thinking Categories	f	Reflective Thinking Modes			Reflective Thinking Levels		
		Observation	Teaching	Self	Level1	Level2	Level3
Teacher Characteristics	33	15	7	11	26	4	3
Instructional Processes	57	28	29	-	43	13	1
Classroom Management	8	7	1	-	6	1	1
Students	22	17	5	-	11	9	2
Teaching Profession	20	-	2	18	10	7	3
Professional Development	46	16	12	18	19	22	5
Total	186	83	56	47	115	56	15
%	100	44.62	30.11	25.27	61.83	30.11	8.06

Although the reflective thinking content topics of Sude’s changed as regard to the observation and teaching period, she always concerned about the instructional processes. Yet, her concern about instructional issues was increased during her own teaching. Especially, there was an increased interest on the planning of instruction. While she was observing others’ teaching, she became more interested in students and classroom management. This was also an evidence of her concern in practical issues while teaching.

Sude focused on teacher characteristics of herself and others. She identified her excitement as one of the major drawback of herself as a teacher. As it was mentioned at the beginning of the case, the reason for this might be that Sude’s practice teaching for the first time. Also, Sude often related her excitement to the weakness in her subject matter knowledge. Yet, she seemed to have a high self-confidence in overcoming her deficiencies about the subject matter knowledge at the end of the practice teaching course.

Sude explained her feelings, opinions, views, beliefs, and attitudes toward educational issues under the topic of teaching profession. She had a positive attitude

toward teaching before and after the practice teaching course. She also had the attributes of responsibility, open-mindedness, and whole-heartedness. In terms of beliefs, metaphorical data supported Sude's changing perspective toward teaching and learning and helped describe her role as a future teacher and students. She had an approach to teaching on such an aspect that emphasized constructivist learning to become an effective teacher. As a self-actualized teacher, she clarified her role as to provide a support to facilitate students' learning by taking into consideration the instructional materials.

The analysis of qualitative data also showed that Sude was able to reflect at all the reflective levels in a range of various content topics. At the technical level, she focused on behaviors and teaching skills. During practice teaching, she considered more practical issues to succeed in achieving certain goals and objectives. Regarding a problem evaluation, she also identified a problem at the technical level (see Appendix I). Besides technical aspects of teaching in achieving the lesson objectives, she considered contextual factors such as students' emotional needs, interests, levels, abilities, and nature of the subject while reflecting on decisions. Then, she reflected on issues slowly extended to the socio-political and moral perspectives in teaching with a level of awareness, self-actualization and self-understanding in future promises. As a reflective teacher, Sude indicated the attributes of open-mindedness, whole-heartedness, responsibility, and self-confidence while reconstructing her approach toward teaching and learning and reviewing self as a future teacher. On the other hand, the development of her reflective thinking skills was evidenced by the results of the reflective thinking instrument. The analysis pointed to a change in Sude's perception of her reflective thinking skills through the reflective practice teaching course. She displayed a developmental process that her reflective thinking skills transformed into the contextual level from the technical level.

It can be concluded that Sude perceived a personal and professional development through experience, guidance, collaboration and modeling by engaging with the reflective framework. In terms of her perceptions of the reflective framework, she

found that all the activities were effective in challenging her reflective thinking skills. Especially, Sude found microteaching activity as the most efficient one to determine her deficient teaching skills. She valued her friend's feedback for peer coaching, but she mentioned that a close friend might not be so objective to give critical feedback. In addition, Sude attributed the role of the metaphors that assisted considering the role of a good teacher as well as she expressing her attitudes, and beliefs about teaching and learning.

4.2.3.2 The Case of Dora

I like teaching. I believed that it is a special job and has a privileged place when compared with other jobs. Because they are the teachers who bringing up people becoming doctors, lawyers, engineers, and so on. ... My ultimate goal is to become a good teacher. (Pre-Autobiographical Questionnaire)

4.2.3.2.1 The Profile of Dora

Dora was a 23 years old female student. She graduated from the Biology Department. She had one year and three months teaching experience prior to entering the teacher education program. After completed her undergraduate degree, she taught for a year as a private tutoring, and for three months as a substitute teacher in a public school. After she started the program, she decided to give up teaching elsewhere to handle the practice teaching course well. In her pre-autobiographical data, she stated her willingness to become a good teacher. At the end of the practice teaching, she felt even a stronger commitment to teaching. The above excerpt displays her aspiration to become a teacher and her positive attitude toward teaching profession.

Dora had her practice teaching at the secondary school in the city center. Dora with her partner Sude were scheduled to observe 10th and 11th grade levels for a two hour a week for 10 weeks. During this time period, Dora taught two times in the classes where she made observations. One of her teaching experiences took place in 10th grade and the other one in 11th grade. Dora's cooperating teacher was a male teacher with 18 years teaching experience at the secondary schools as a biology teacher.

In the following sections, the content and the level of Dora's reflective thinking are investigated as regard to the mode of reflective thinking on observing others' teaching, her own practice teaching, and self-autobiography including her feelings, opinions, views, attitudes, and beliefs about educational issues.

4.2.3.2.2 The Content and the Levels of Dora's Reflective Thinking during Observation Teaching

For observations, three data sources were utilized which are reflective journals, peer coaching reflections, and a reflective summative interview. Table 4.10 provides the results of the extent and the levels of Dora's reflective thinking on her cooperating teacher and partner's teaching obtained from qualitative analysis of the combined form of written and transcribed data. Dora focused mainly on the topics of instructional processes, teacher characteristics, students, classroom management, and teaching profession while concerning others' teaching in terms of their dominant frequency. As seen in Table 4.10, the perceived professional development is evidenced in Dora's reflections after observing others' teaching. Dora's reflective thinking levels changed in terms of the content topics in which the technical and contextual level predominated, and slowly extended to the dialectical level.

Table 4.10 The content and the Levels of Dora’s Reflective Thinking during Observation Teaching

Category	%	f	Subcategory	Observation Period		
				Level 1	Level 2	Level 3
Teacher Characteristics	15.28	11	Strengths	4		
			Weaknesses	7		
Instructional Processes	43.05	31	Planning of instruction	2	1	
			Teaching methods	5	1	
			Questions	6		
			Instructional Materials	3	1	
			Relation to real life	5	2	
			Feedback	2		
			Time management	1		
			Assessment	1	1	
Classroom Management	5.56	4	Classroom management problems	3		
			Classroom management strategies	1		
Students	11.11	8	Motivation	3		
			Active involvement	1		
			Students needs	1	2	1
Teaching Profession	4.17	3	Attitudes	1	1	1
Professional Development	20.83	15	Experience	2	2	
			Guidance	3	4	
			Collaboration	2		
			Further improvement		1	1
Total	100	72		53	16	3
%		100		73.61	22.22	4.17

The major focus of Dora’s reflections throughout observations was **instructional processes** mostly at the technical level and gradually extended to the contextual level. She was concerned with *planning of instruction, teaching methods, questions, instructional materials, relation to real life, feedback, time management, and assessment* of students’ learning. She often mentioned about the use of *questions* as an instructional skill in providing students’ thinking, involvement, and motivation. In the following example at the technical level, she expressed her feelings in reaction to her cooperating teacher’s questioning style as a way of exploring the students’ knowledge about the subject:

I really enjoyed today's lesson. I mean the questions asked by the cooperating teacher provided students to think about and explore the things in-depth. ... (Reflective Journal I)

Dora reflected on the importance of using examples in making lesson objectives clear. During the summative interview, she stated that the most successful lesson was 'X-linked genetic disorders' because her cooperating teacher taught the subject clearly and understandable by *relating it to real life*. She focused mainly on whether her cooperating teacher's teaching action was efficient and effective. Hence, she regarded the success of the lesson as the attainment of pre-determined teaching and learning objectives:

I think that the most successful lesson that I observed among the cooperating teacher's classes was on the subject of "X-linked genetic disorders". Because the teacher taught the lesson in a clear and understandable way. The teacher explained the examples of disorders such as hemophilia and color blindness in terms of their dominant and recessive forms and appearance in the child by using real life examples. (Reflective Summative Interview)

Dora reflected extensively on **teachers' characteristics** at the technical level including *strengths and weaknesses* of observed teachers. Regarding to *weaknesses*, voice quality was the main concern when she wrote about teachers' characteristics of both her cooperating teacher and partner. While observing her partner during peer coaching session as a coach, she recorded a leading question on the PQP conferencing style form to give her partner a suggestion in terms of voice quality. The below leading question focused on the effective use of her partner's teaching skill at the technical level:

Do you think it would be better to increase your voice in stressing the important points then decrease it? (PQP Form/Peer Coaching)

The content category of **students** also dominated in Dora's reflections through all the reflective levels. Dora emphasized that teachers should consider the *students' needs*. Furthermore, she blamed on her cooperating teacher due to his irresponsible behavior

toward students by ignoring their emotional needs. She expressed that in the future she would not behave like this. The following dialectical level example from her reflective journal during observing her cooperating teacher indicates her reviewing self as a future teacher:

He [the cooperating teacher] taught the lesson without caring about whether the students listen to him or not. ... When I said to the teacher at the end of the lesson that there were students who did not listen and even slept. The teacher said that they were in such an age level that they knew what to do..., and he did not care about this matter much. I do not know how much right my teacher is. ... I will not be such a teacher in the future. (Reflective Journal II)

Dora perceived **professional development** through *experience, guidance, and collaboration*. Dora reached the contextual level at the subtopic of *guidance* after observing her partner as a coach. While guiding her friend, she realized that standing at the same point and speaking with the same voice led students to lose their interests toward lesson. Then, she reached a decision to be more careful at these points by evaluating the consequences of an action. In her reflective summary after peer coaching session, she wrote what she gained from the experience of guiding:

I realized the importance of posture and voice quality while guiding my friend, hence I should be more careful about these points. Standing at the same point and speaking with the same voice tone cause the students not to take further interest in the lesson. ... (Reflective Summary/Peer Coaching)

4.2.3.2.3 The Content and the Level of Dora's Reflective Thinking During Practice Teaching

For practice teaching experience, two data sources were utilized which are reflective journals and pre-post self-analysis reflection papers to reflect what happened while she was teaching in the actual classroom settings and during microteaching. As presented in Table 4.11, when Dora considered on her own teaching, the most frequently reflected topic was instructional processes, followed by teacher characteristics, teaching profession, and students with the dominant reflective thinking level of technical and contextual, and then slowly extended to the dialectical

level. Then, the perceived professional development was evidenced in Dora's reflections.

Table 4.11 The Content and the Levels of Dora's Reflective Thinking during Practice Teaching

Category	%	f	Subcategory	Practice Teaching		
				Level 1	Level 2	Level 3
Teacher Characteristics	16.67	7	Strengths	3		
			Weaknesses	3		1
Instructional Processes	45.24	19	Planning of instruction	2	4	
			Teaching methods	2	3	
			Questions	3	1	
			Relation to real life	3		
			Assessment	1		
Students	7.14	3	Motivation	1		
			Active involvement	1	1	
Teaching Profession	11.90	5	Attitudes	2	1	1
			Role expectation	1		
Professional Development	19.05	8	Experience	3		
			Guidance	1		
			Collaboration	2		
			Further improvement		1	1
Total	100	42		28	11	3
%		100		66.67	26.19	7.14

Like in the observation period, with the highest frequency of reflection content she focused on the topic of **instructional processes** the extent to which she reflected mainly at the technical level, and then the contextual level. Dora mentioned *planning* issues while she was preparing the lesson for her practice teaching. She considered more in depth about related concepts, goals, objectives, and behavioral objectives that students were intended to acquire relative to the context of the situation. The below example indicates her focus at the contextual level in which she considered the students' prior knowledge and the learning and teaching objectives in her teaching :

The topic is inheritance including genetic disorders, mutation and modification... While preparing the lesson plan before the class, I wrote down what I need to know about the subject, what the related concepts and terms are, what should be the goals and objectives of the lesson, and finally I considered what is students' prior understanding of inheritance. ... (Reflective Journal V)

Dora reflected on *teaching methods* at the contextual level after using a concept map in understanding the subject of inheritance. She reached a decision by analysing an educational implication. She emphasized the necessity of adjusting the methods according to time and subjects. The example indicates her decision about the use of different teaching methods depending upon sufficient time and nature of the subject.

I saw how much effective when the topic of inheritance was delivered by using concept map. I think that using concept map is good but the time might not be long enough for every subject. At least, therefore, different teaching methods should be used on each subject. ... (Reflective Journal V)

Like in the observation period, the topic category of **teachers' characteristics** was extensively discussed in the journals when Dora considered about her own teaching. Especially, she commented on her personal characteristics after microteaching lesson. Even though she did not enjoy microteaching much, her reflections about her own teaching involving her *weaknesses* were more critical. The following example implies her future promise for reviewing self as a teacher:

After I watched my teaching, I realized that I had presented the lesson very quickly. I was too excited, and so I spoke fast.... I wish I had asked more questions to involve the students into lesson. ... I will endeavour for teaching more effectively and try to overcome my excessive amount of excitement, and finally I will make the students more active. (Post Self-Reflection Paper/Microteaching)

Dora highlighted **professional development** through *collaboration* in her reflective journals. She expressed her pleasure related to her cooperating teacher's attitudes toward a collaborative work. She was impressed with personal characteristics of her cooperating teacher such as cheerful, helpful, and guiding. The following reflection indicates her positive feeling toward the cooperating teacher at the technical level

from a journal entry during the observation period. The example also indicates Dora's 'open-mindedness' to listen novel ideas:

... I have positive feelings about my cooperating teachers' cheerful, helpful, and guiding behaviors. For example, when I said to him that I was going to use different method, he was interested in the method and listened to me carefully for a help. (Reflective Journal IV)

Another parameter for professional development that Dora highlighted was *further improvement* through internet and publications to capture changing science content knowledge and teaching strategies. The below dialectical example indicates a systematic attempt in which Dora promised for the benefiting of advantages of the perpetually developing science to improve her development professionally:

I think that I can learn perpetually changing and developing science content knowledge and teaching strategies from internet and new publications. Therefore, I will be active continuously to benefit from the advantages of science. (Reflective Journal V)

4.2.3.2.4 The Content and the Levels of Dora's Reflective Thinking about Self-Autobiography

Table 4.12 displays the content and the levels of Dora's reflective thinking through the obtained data from qualitative analysis of pre-post autobiographical questionnaires and the reflective summative interview. Also, her reflection report of the problem evaluation was investigated. Some sample data from analysis of both the pre and post autobiographical questionnaires were provided at the same time to make comparisons. As illustrated in Table 4.12, the content of Dora's reflective thinking included the topics of teacher characteristics, teaching profession issues, and professional development. The levels of reflective thinking evidenced in Dora's reflections were mainly at the technical and the contextual level, then extended to the dialectical level. For the category of professional development, the level of reflection was predominantly contextual.

Tablo 4.12 The Content and the Levels of Dora’s Reflective Thinking about Self-Autobiography

Category	f	Subcategory	Self-Autobiography		
			Level 1	Level 2	Level 3
Teacher Characteristics	7	Strengths	3		1
		Weaknesses	2	1	
Teaching Profession	19	Definitions	4	2	
		Values	2		1
		Role expectations	1	1	
		Metaphor		2	
		Attitudes	2	1	3
Professional Development	18	Experience		1	
		Collaboration		2	
		Further improvement	1		
		Benefits of reflective framework	1	6	4
		Drawbacks of reflective framework	3		
Total	44		19	16	9
%	100		43.18	36.36	20.46

With regard to **teacher characteristics**, Dora’s expressions related to her *weaknesses* were predominantly characterized by the excitement and the fear of forgetting something to say in front of the students while teaching. Yet it was appeared that Dora succeeded to convert some of her weakest areas to *strengths* with an expressed self-confidence after engaging with the reflective activities. In addition to having self-confidence, the following example at the dialectical level illustrated that Dora was a ‘whole-hearted’ teacher because she seemed to overcome her fear of making a mistake:

I felt nervous and excited in the classroom earlier. I thought that I would be disgraceful and it would be the end of the world If I made a mistake. Now I feel more confidence because I eliminated my excessive excitement. I think that everyone may make mistakes and so I should not fear of that anymore. (Post-Autobiographical Questionnaire)

Dora explored her feelings, opinions, views, attitudes and beliefs about **teaching profession**. Dora’s reflective thinking levels changed with regard to the some *definitions* of good learning, good teaching, classroom management, and *role*

expectations. At the beginning, Dora's definitions of these terms were very descriptive to meet the certain outcomes. At the end of the reflective practice teaching course, for example, her definition of 'good learning' was at the contextual level in which she believed in the importance of active learning and individual differences in the learning process by validating principles:

Learning is the well understanding and comprehending of subjects by students. As a result of learning, behavioral changes occur in the students. (Pre-Autobiographical Questionnaire)

Learning is not transferring knowledge from someone or somewhere. In order to learn, students should be intellectually and physically active. A student can learn if only by discovering the concepts. Learning is an individualistic processes because every individual has his or her experience, so different behaviors can be observed for each individual. (Post-Autobiographical Questionnaire)

In the same manner, Dora's constructivist perspective toward teaching profession was also supported by the metaphorical data. In the descriptive part of the questionnaire of Metaphorical Images, she selected a student-centered *metaphore* of 'experimenter-lab-tool provider' as the most representative herself as a future teacher. In the following dialectical example, Dora seemed to achieve self-actualization and 'open-mindedness' while she was clarifying her beliefs about the teacher's role from the perspectives of both the teacher and the students:

I like investigating and learnig new things very much. I would like to my students search, too. Therefore, when I become a teacher I wish to orient my students searching new things and teach the ways how they can find things that want to learn. While they are learning in this way, I will try to supply necessary materials, supports, and so on. This is like a laboratory condition there are materials, and students learn by doing and experiencing. (Open-ended Question /Metaphorical Images Instrument)

Regarding the beliefs about *role expectations*, Dora progressed from the technical level to contextual level at the end of the reflective practice teaching course. At the contextual level, beyond teaching biology effectively, she considered students' needs that implied their attitudes toward biology. The followings are the examples of the technical and contextual level reflections on the teacher's role expectations before

and after the course. As it can be seen in the following contextual level example, she believed in the teacher's task as to make students like biology whereas the technical level example was very descriptive to meet outcomes involving only the teacher's perspective:

Being one who can guide students, provide them to be successful, make them gain different points of view and rescue them from their own solid thoughts or ideas is my ultimate goal. (Pre-Autobiographical Questionnaire)

As a biology teacher, the most important task should make students realize the importance of biology. Since biology is the field of the living things, no life could be imagined without biology. Then the task should make students enjoy biology and guide them to study on it. (Post-Autobiographical Questionnaire)

Dora's reflections on the *attitudes* toward **teaching profession** mainly reached at the dialectical level. As it can be understood from the quotation at the beginning of the case, Dora had positive attitudes toward teaching profession at the beginning of the practice teaching course. With the actual experiences, her attitudes and aspiration to teach further increased. The following example revealed Dora's strong commitment to the teaching profession as a 'whole-hearted' teacher as well as her self-understanding:

Practice teaching intensified my attitudes toward teaching profession. I feel a stronger desire to become a teacher. My aim is already to become a teacher at first. Then my desire increased after seeing the actual school atmosphere. ... (Post-Autobiographical Questionnaire)

The interview data revealed that she perceived **professional development** through engaging with the reflective activities within *the reflective framework* even with some of *drawbacks*. Dora stated a few drawbacks about the activities: as a disadvantage of microteaching she stated that the camera recording made her nervous; and she complained about the overloading of journal writing. On the other hand, Dora generally commented on the *benefits* of the framework relative to the moral and ethical aspects of educational implications after she engaged with the activities. The following quotation illustrated her general positive views about the

activities at the dialectical level involving achieved self-awareness, self-understanding and responsibility:

As results of engaging with the reflective activities, I learned what I should do as a good teacher. Also, I realized where I am as a teacher on this journey. I saw how much important the well use of teaching methods is. Also, these activities showed me that the experience is an essential factor to become a good teacher. (Reflective Summative Interview)

For a more deep insight to *the benefits of reflective activities*, Dora expressed her ideas about the selecting the most representative metaphorical images. By this way she claimed that she could identify her role more clearly as a teacher and the place of students in her changing approaches to teaching and learning. Metaphor using enabled her to comment on moral and ethical aspects of education relative to the instructional implications. The following example indicated that she started to question herself as a teacher and the students in terms of role divisions in the future from an ethical aspect the dialectical level:

I think that the advantage of using metaphor is providing different points of view in what ways a teacher accomplishes his/her role and the students' positions in this situation. This activity has changed my opinions about teaching and learning. By this activity, I have begun to question myself how a teacher I will be. I have considered about how I will behave students while accomplishing my teaching activity and about which pattern they will be in. ... (Reflective Summative Interview)

4.2.3.2.5 An Overview of Dora's Professional Development

Table 4.13 summarizes the distribution of the reflective thinking content topics according to the reflection mode and level in the combined form of data. Dora focused extensively on the instructional processes, professional development, followed by teaching profession, teacher characteristics, students, and classroom management. As indicated in Table 4.13, the level of reflective thinking evidenced in Dora's reflections were mainly at the technical level (63.29 %), then followed by the contextual level (27.22%), and very limited to the dialectical level (9.49%). Dora's reflections were predominantly technical through all the categories.

Table 4.13 An Overview of Dora’s Professional Development

Reflective Thinking Categories	f	Reflective Thinking Modes			Reflective Thinking Levels		
		Observation	Teaching	Self	Level1	Level 2	Level 3
Teachers Characteristics	25	11	7	7	22	1	2
Instructional Processes	50	31	19	-	36	14	-
Classroom Management	4	4	-	-	4	-	-
Students	11	8	3	-	7	3	1
Teaching Profession	27	3	5	19	13	8	6
Professional development	41	15	8	18	18	17	6
Total	158	72	42	44	100	43	15
%		45.57	26.58	27.85	63.29	27.22	9.49

Dora’s reflective thinking levels changed in terms of the content topics in which she had predominantly the technical level. With the highest frequency of reflective thinking content in both observation and teaching sessions, she focused on the topic of the instructional processes including the the achievement of learning and teaching objectives and effective use of teaching methods. She seemed to be task oriented to meet a set of objectives for a successful lesson as well as focusing on teaching skills and behavior. As regard to evaluating a problem to discuss in the seminar part of the course, she also identified a problem at the technical level (See Appendix I).

In terms of planning of instruction, comparing of her reflections indicated that she considered more in depth about lesson preparation, related concepts, goals and objectives, and students’ prior knowledge during practice teaching at the contextual level. The increase in concerns regarding planning issues at the contextual level during the teaching period reflected her willingness to teach effectively by considering students’ needs and understandings. On the other hand, there were evidences that she focused much on practical issues and ignored classroom management and student issues while teaching.

Another content topic when she considered about herself and others was teacher characteristics. As a whole-hearted and self-confident teacher, she enabled to criticize personal characteristics and professional skills as a teacher herself and others. As a whole-hearted practitioner seemed to overcome her fear of making a mistake. Furthermore, there were evidences of her open-mindedness to listen novel ideas and to see the educational implications from the perspectives of both the teachers and students. As a responsible teacher, she was also aware the role of good good teacher.

Dora explained extensively her feelings, opinions, views, beliefs, and attitudes about educational issues under the topic category of teaching profession. She seemed to have a great enthusiasm to become a teacher through the end of the reflective practice teaching course. In addition, metaphorical data supported of her changing beliefs toward teaching and learning, and strengthen the role division of students and herself as a future teacher. She had an approach to teaching on such an aspects that emphasized constructivist learning to become an effective teacher. She clarified her role as to provide support to facilitate students' learning by taking into consideration their attitudes toward biology.

In terms of quantitative analysis of reflective thinking instrument, Dora also perceived an improved reflective thinking skills through the same level of the contextual level. With the light of the qualitative findings, it can be concluded that Dora was able to reflect at all reflective levels and through the various teaching content. As regard to Dora, the achieving certain goals and teaching task had priority. It was extended to the beyond the assessment of students, she considered contextual factors such as students' emotional needs, interests, levels, attitudes as well as the nature of subject and time factor. These contextual factors enabled her to seek for the alternative teaching methods and make selections about which one is best approach for the context of education based on the analysis of educational implications. As an reflective practitioner at the dialectical level, she extended slowly to contemplate on the ethical and moral perspectives of educational implications with a progressed state

of self-understanding and self actualization. She promised to review herself for a future teacher based on gained knowledge from the experience, and to systematic attempt for further improvement as a means of improving herself professionally.

The analysis of qualitative data indicated that Dora perceived personal and professional growth through the reflective framework endorsed experience, guidance, collaboration, modeling, and further improvement. In terms of her perceptions of the reflective framework, she thought that all the activities were effective in challenging her reflective thinking skills. Especially, she found the peer coaching activity as the most efficient one although she stated that it might give an excitement to know being observed. But, she did not enjoy microteaching in anyway, and she complained overloading of journal writing. Further, she valued metaphor using to contemplate ethical aspect of education relative to instructional implications in terms of role divisions of the teacher and students.

4.2.3.3 The Case of Defne

I had a lot of teachers whom I liked and took as a model throughout my education life. Because I was interested in teaching profession, I observed many teachers. ... My evaluations were of course the ones that were made from the point of a student, yet it now helps me enable to see the teachers through the eyes of a student and establishing empathy with students. (Pre-Autobiographical Questionnaire)

4.2.3.3.1 The Profile of Defne

Defne was a 24 years old female student. She graduated from the biology major just starting the three semester non-thesis master program. Defne had no prior teaching experience. As she expressed in the above quotation from her autobiographical data, she felt a great enthusiasm toward teaching profession. Actually, her desire to

become a teacher arose from the times when she was a student. At the end of the practice teaching experience, she still seemed to be an enthusiastic person with a stronger commitment to teaching.

Defne's practice teaching experience took place at the secondary school in the city center. For her ten-week practice teaching experience, Defne was assigned with her partner Beren to observe the cooperating teacher's 10th and 11th grade level classes for three hours a week. Over this time period as regard to teaching experience, she taught for a total of three hours in the classes that she observed. Defne had an experienced cooperating teacher who had 15 years teaching experiences as a biology teacher in the secondary schools. Defne appeared to like writing. When compared with others, she submitted very detailed and long reflective journals that were typed on the computer.

In the following sections, the content and the levels of Defne's reflective thinking are investigated as regard to the mode of reflection on observing others' teaching, her own practice teaching, and self-autobiography included her thoughts, views, attitudes, and beliefs about educational issues.

4.2.3.3.2 The Content and the Levels of Defne's Reflective Thinking during Observation Teaching

For observations, three data sources were utilized, namely are reflective journals, peer coaching reflections of debriefing and reflective summary as a coach, and a reflective summative interview. Table 4.14 provides the results of the extent and the levels of Defne's reflections on her cooperating teacher and partner's teaching obtained from qualitative analysis of the combined form of written and transcribed data. As seen in Table 4.14, Defne focused mainly on the topics of instructional processes and classroom management, followed by, students, and teacher characteristics while concerning others' teaching. In addition, there was evidence

that she perceived professional development through experience, guidance, collaboration, and modeling. Defne's reflective thinking levels changed in terms of the content topics of reflection in which the technical level predominated excluding the topics of students with the dominant level of contextual.

Table 4.14 The Content and the Levels of Defne's Reflective Thinking during Observation Teaching

Category	%	f	Subcategory	Observation Teaching		
				Level 1	Level 2	Level 3
Teacher Characteristics	11.20	13	Strengths	8	1	
			Weaknesses	3	1	
Instructional Processes	31.90	37	Planning of instruction	7	2	
			Teaching Methods	7	3	
			Questions	3	1	
			Instructional materials	1	2	
			Time Management	4	3	
			Monitoring	3	1	
Classroom Management	27.59	32	Classroom Management Problems	13	3	1
			Classroom Management Strategies	12	3	
Students	12.07	14	Motivation	4	4	
			Active Involvement	1	5	
Professional Development	17.24	20	Experience	7	2	1
			Guidance	2	1	
			Collaboration	5		
			Modeling	2		
Total	100	116		82	32	2
%		100		70.69	27.59	1.72

The major focus of Defne's reflections throughout observations was **instructional processes** with a dominant technical and contextual reflection level. She was concerned with *planning of instruction, teaching methods, questions, instructional materials, time management, and monitoring*. While observing her partner's teaching instruction, she focused on means rather than questioning specified goals. According to her, the peer's *teaching methods* were suitable to meet specified lesson objectives.

In the following example from the reflective journal, she underlined the effective implications of teaching methods at the technical level:

The lesson that I observed was effective. She [her peer partner] taught the concept by using the methods of direct instruction and questioning. She also used the transparencies and drew the figures on the board as visual materials. The students answered all the questions. It could be realized that ..., and they understood the topic well. (Reflective Journal III)

She frequently mentioned *time management* while observing her cooperative teacher's teaching. She stated that her cooperating teacher usually used overhead projector as an instructional material, but there was a routine problem to get and prepare the overhead projector for the lesson. She emphasized that preparation period waiting for the overhead projector caused lost of time. In addition, taking attendance caused extra time lost at the beginning of the lesson. According to her, the cooperating teacher might have used only direct instruction method due to her ineffective use of the time. In her reflective journal, she critically analyzed why her cooperating teacher used only one method which is traditional one. It was considered as the contextual level because she reflected on decision relative to the context of the problem by providing relations and reasons:

My cooperative teacher used only direct instruction by the help of overhead projector and transparencies. Anyway some part of lesson was passed because of taking attendance, preparation period for the overhead projector and a warning speech. ... Maybe the reason for the use of only direct instruction arises from the ineffective use of the time. (Reflective Journal V)

Another important issue for Defne was **classroom management** with the dominant reflection levels of technical, then contextual, slightly extended to the dialectical level. The focus was on *classroom management problems* including discipline issues such as noisy, being late, walking in the class, derisive behaviors, and cheating at the exam. Defne reflected at the dialectical level about a cheating event when her cooperating teacher gave both her and her partner main responsibility during the exam. She surprised when she saw that students tried to cheat from each other

during the exam. She began to question her assumption about the students and commented the cheating event with respect to moral and ethical aspects. Defne approached this problem ‘whole-heartedly’ because she blame on teachers or education system. In the following dialectical quotation, she questioned teacher qualifications and pointed out the need to challenge new developments in education:

I would not expect from the students to display a tendency to cheat at the exam. ... It is the fact that it must be questioned whether the teaching methods that are practiced in the classes are sufficient or whether the students are accustomed to the multiple choice technique. I realized the necessity of us, as educators, to continuously improve ourselves in the light of the new developments in education and to question the reasons for the misbehaviors of the students from the various points. (Reflective Journal VI)

As well as discipline issues above mentioned, she reflected extensively on *classroom management strategies* that her cooperating teacher and partner used when they encountered these discipline issues included eye contact, jest and mimics, gently warning, and sometimes threatening with a low mark. In the following contextual quotation, Defne emphasized that her cooperating teacher established classroom management by considering students’ emotional needs:

When the cooperating teacher started the lesson, the students got calm and concentrated on the lesson. Although there were some students who were making noise, our teacher warned firstly by eye contact. If it did not work, she went near them and warned gently. By this way, she provided them to involve the lesson again. (Reflective Journal IV)

The content topic category of **students** also dominated in Defne’s reflections mostly at the contextual level. In this category, there were two emerging themes in the journals written by Defne. She focused on students’ *motivation* and *active involvement* during teaching. *Active student involvement* was an important issue for Defne because she articulated that students would learn better when they involved actively in the lesson. She mentioned about the importance of student-centered instruction such as cooperative learning, brain storming, role playing, and using a concept map. In the following contextual reflection by validating educational

principles to practice, she strongly suggested the use of constructivist approaches in which students are active learner when she considered alternative teaching methods for the observed lessons:

We have learned many kinds of teaching methods in the courses that we have taken during the program. I realized that the valid one is the constructivist approach. ... However, the activities that the cooperating teacher has used generally the teacher oriented activities. I think that some teaching methods which do not impede the time and curriculum can be benefited by putting the students into the center. Cooperative learning, brain storming based on questioning techniques, role playing, and constructing a concept map can be considered as examples. (Reflective Journal V)

Another dominant content topic emerged from her reflections was **professional development** that implied professional competence. There were four emerging subtopics as the ways how she gained this competence through observing others' teaching including *experience, guidance, collaboration, and modeling*. She benefited from *experience* in a large scale in order to improve herself professionally through observing her cooperating teacher and partner's instructional skills, classroom management strategies, reactions to the events in the actual classroom settings like cheating or discipline issues, and a science fair. For example, the following quotation was related to her impressions about the science fair in the school at the dialectical level, implying a future implication with an achieved self-actualization:

Today, there was a science fair in the school. The projects that were performed by the students for a long time exhibited and presented in the fair. I think it was a wonderful experience for me. In the future when I get an opportunity to commit teaching, I have ideas about the projects that can be given students. (Reflective Journal IX)

Defne frequently emphasized the role of *modeling* in her professional development for the classroom management and teaching skills. It might be a reason that she felt her weak point as providing classroom management. Hence, she accepted her cooperating teacher as a model while seeking an answer how she would manage the class through her practice teaching. In the following excerpt from the interview data, she expressed her thoughts at the technical level:

I obtained a great deal of knowledge and models about classroom management strategies and teaching skills from my cooperating teacher. Even she [the cooperating teacher] used direct instruction method; she is very good at the subject matter knowledge and delivering the knowledge to the students. In addition, once she started to teach, she provided an effective classroom management. (Reflective Journal I)

4.2.3.3.3 The Content and the Levels of Defne's Reflective Thinking during Practice Teaching

For practice teaching experiences, three data sources were utilized as follows; reflective journals to reflect what happened while she was teaching in the actual classroom settings, pre-post self-analysis reflection papers for microteaching experience, and a reflective summary as a teacher after peer coaching. As presented in Table 4.15, when she considered on her own teaching, she focused mainly on the content topics of instructional processes, followed by classroom management, teacher characteristics, teaching profession, and students. In addition, there was an evidence for her perception of professional development after teaching experiences. The level of reflective thinking evidenced in Defne's reflections was mainly at the technical level throughout the content topics of reflection, followed by the contextual level, and very limited to the dialectical level, excluding the topics of teaching profession with the dominant level of contextual.

Like in the observation period, with the highest frequency of reflection content Defne focused on the topic of **instructional processes** such as *planning of instruction, teaching methods, questions, instructional materials, relation to real life, time management, monitoring, and assessment of instruction*. After her first teaching experience that was in a similar way of her cooperating teacher's, she worried about just teaching in a traditional way like her cooperating teacher. For the next practice teaching, therefore, she decided to use some other teaching methods involving more questioning strategies, concept map, discussion, and particularly visual materials to attract students' attentions and interests for the effectiveness of the lesson.

Table 4.15 The Content and the Levels of Defne’s Reflective Thinking during Practice Teaching Period

Category	%	F	Subcategory	Practice Teaching		
				Level 1	Level 2	Level 3
Teacher Characteristics	10.29	7	Strengths	2		
			Weaknesses	5		
Instructional Processess	47.06	32	Planning of instruction	3	4	
			Teaching methods	4	3	
			Questions	3	1	
			Instructional materials	1	4	
			Relation real life	1		
			Time management	3		
			Monitoring	4		
			Assessment	1		
			Classroom Management	14.71	10	Classroom management problems
			Classroom management strategies	4		1
Students Teaching	2.94	2	Active involvement	1	1	
Profession Development	7.35	5	Attitudes	1		
			Role expectation		3	1
Professional Development	17.65	12	Experience	2	5	
			Guidance	2		
			Collaboration	3		
Total	100	68		44	22	2
%		100		64.71	32.35	2.94

In addition, Defne and her partner criticized the cooperating teacher’s teaching style utilizing unrevised and uninteresting transparencies that were presented on the overhead projector. First of all, together with her partner, they decided to prepare a visual material for their next teaching experience. Hence, the idea of using visual materials was also a great concern during the lesson preparation, indicating mostly the contextual reflection because of making decision based on context of the situation and relating the content to students’ needs. Consecutively, they decided to plan an instruction by using a power-point presentation as an instructional material with more colorful pictures, and some animations. Then the following example started with *planning of instruction*, and continued with the underlined importance of using visual materials on the subtopic of *instructional materials* at the contextual level:

We [Defne and her partner] had observed that the students were bored while the cooperating teacher was presenting the subject through the help of uninteresting transparencies. So, while preparing our power-point presentation, we asked ourselves how we could prepare a better teaching activity for the students by taking our previous experiences into consideration and the demands of the cooperating teachers. (Reflective Journal VII)

Therefore, we [Defne and her partner] tried to prepare a power-point presentation that included more colorful pictures and figures, and less writing with some animations by using different resources to attract students's attention and conduct a more effective lesson. (Reflective Journal VII)

In terms of looking for alternative teaching methods and using instructional materials to increase students' interests and motivation toward the lesson, the following example from her reflective journal illustrated her self-analysis at the contextual level. Beside technical aspects of her teaching action, she continued on the alternative *teaching methods* based on her gained knowledge at the contextual level:

Instead of using only direct teaching, I processed my lesson in the way of benefiting from a power point presentation to ask questions.... I also used a concept map at the beginning of the lesson and in some parts of the lesson to relate for the sub-titles for more meaningful learning. In doing so, I believe that I provided students' long-lasting learning and retention rate of knowledge. (Reflective Journal VII)

Like in the observation period, another content topic category she reflected on extensively was **classroom management** issues. During her teaching, she stated that she encountered *classroom management problems* involving talking of students, walking in the class, and throwing papers in the air. She reported that she had difficulties to establish control and discipline over the class. In order to provide classroom management, she mentioned that she used eye contact, verbal warning, jest and mimics, and sometimes she shouted with an increasing voice. But, she claimed that she would not manage the class, and even she asked to help her cooperating teacher who was sitting at the back in the class. Beside lack of students'

interests toward the lesson, she concluded that her smiling face also caused the discipline problems. She seemed to have a conflict because she did not look like with sullen face. During her first teaching experience, she had become more sullen face and she claimed that she did not encounter so much discipline issues when it was compared with this second experience where she decided to become more cheerful. Even though she wanted to be a teacher with smiling face, she surprised with the outcomes that becoming more smiling face caused more discipline issues. This experience made her reconsider her classroom management strategies. Consequently, she decided not to be so friendly toward students. She believed that she should be more authoritative to prevent discipline problems in the classroom. The following example is about *classroom management strategies*, indicating dialectical reflection where she reflected on decision made during the action:

When I realized that I seemed to be a serious and authoritative teacher in my first teaching experience, I had decided to be less authoritative and more cheerful in the second one. As a result of my non-authoritative approach, I observed that students felt more comfortable. But I continued my cheerful attitude in order to be able to see the outcomes and to compare the lesson with the former one. (Reflective Journal VII)

An example of the dialectical level reflection took place under the content topic of **teaching profession**. After description and analysis of her teaching actions, she became more aware of *role expectation* of a teacher in the future. She noticed that becoming a teacher was difficult because the teacher must struggle to be perfect to the extent of the attitudes toward students and selection and appreciate using of teaching methods. She believed that once a model takes place in the students' minds, it was too difficult to change it. The reason for this view might be that her indecisiveness about her classroom management approach whether she should be authoritative or not. In the following dialectical quotation, she developed a moral and ethical contemplation to the educational implications:

I understand better now. It is difficult to become a competent teacher. A teacher should be perfect in so many factors in a range from the attitudes toward the students to selecting teaching methods and applying them effectively. If an image of yours is formed in the minds of students, it is very difficult to change this image and also make

students get rid of their prejudices. Therefore, a teacher should always be prepared before going in front of the students and should be balanced and consistent in the attitudes towards the students. (Reflective Journal VIII)

Another dominant theme that emerged from analysis of her teaching experiences in practice teaching and microteaching was **professional development**, indicating mostly technical and contextual reflection acquired through *experience, guidance, and collaboration*. An example of contextual level reflection comes from her reflective journal in which she analyses an action related with *experience*. Defne expressed her positive feelings when the cooperating teacher asked to her to teach another class in the same way. She admired because she had a chance to live one more experience, explaining that she had an opportunity to be able to compare the classes where she taught the same subject in the same manner. Her enthusiasm to teach also indicated that she was a ‘whole-hearted’ reflective practitioner:

After my second practice teaching experience, my cooperating teacher requested me to teach the same subject to another class. ... Of course I accepted it with a great pleasure. ... It was going to be a different experience for me to apply the same instruction with different students. (Reflective Journal VIII)

4. 2.3.3.4 The Content and the Levels of Defne’s Reflective Thinking about Self - Autobiography

For self–autobiographical data, Defne responded the questions endorsed at the pre-post autobiographical questionnaires and the reflective summative interview to reflect on the changes in her thoughts, views, attitudes, and beliefs about teaching profession and her personal and professional development. Also, her reflection report of the problem evaluation was investigated under the professional development category. As presented in Table 4.16, the content of Defne’s reflections included the content topic categories of teacher characteristics, teaching profession issues, and perceived professional development. The levels of reflective thinking evidenced in

Defne's reflections were mainly at the technical and the contextual level, and then slowly extended to the dialectical level.

Table 4.16 The Content and the Levels of Defne's Reflective Thinking about Self-Autobiography

Category	%	f	Subcategory	Self-Autobiography		
				Level 1	Level 2	Level 3
Teacher Characteristics	15.09	8	Strengths	2	3	
			Weaknesses	2		1
Teaching Profession	32.08	20	Definitions	1	5	
			Role expectations		1	2
			Metaphor		1	
			Values		1	
			Attitudes	5	1	
Professional Development	52.83	28	Experience	2	2	
			Collaboration	3		1
			Modeling	1	1	
			Benefits of reflective framework	4	8	4
			Drawbacks of reflective framework	2		
Total	100	53		22	23	8
%		100		41.51	43.39	15.09

In the pre-autobiographical questionnaire, regarding **teacher characteristics**, Defne's expressions related to her *weaknesses* were predominantly characterized by the fear of getting excited in front of students and not providing classroom management while teaching in an actual classroom setting. Yet, the following contextual quotation indicates that Defne succeeded to convert some of her weakest areas to *strengths* with an expressed self-confidence at the end of the reflective practice teaching course:

During my first teaching experience and the others, I realized that I overcame my excitement. The reason for this, I believe that a good preparation for the lesson with my cooperative teacher's support made me feel less excitement. (Post-Autobiographical Questionnaire)

Defne reflected extensively on **teaching profession** at all the reflective levels including her thoughts, views, attitudes, and beliefs about teaching profession as well as general educational issues. Throughout *definitions*, Defne reflected her attitudes and beliefs about ‘good learning’ and ‘good teaching’ at the contextual level before and after the reflective practice teaching course. On the other hand, with regard to ‘classroom management’ she became more focused on the contextual factors at the end of the course. For example, in the following quotation from post-autobiographical questionnaire data she reflected on the characteristics of a ‘good classroom management’ at the contextual level because she considered students’ needs as a means of taking into decision-making process and motivating them to participate actively in the lesson:

The teacher should make prior preparations for a good classroom management. S/he should prepare the class for the education, decide the class rules with the students, and provide them obeying the rules for sustaining of education effectively. Also the teacher should motivate the students and provide them to participate actively in the lesson. (Post-Autobiographical Questionnaire)

The following interview data further refined her beliefs on **teaching profession** under the subtopic of *role expectations* as a teacher at the dialectical level at the end of the practice teaching experience. Beside students’ needs, she further extended the teacher’s role such as cultivating individuals and giving democracy consciousness, ethical, moral, social values, and rules. The following example illustrates her values about teaching profession at the dialectical level in terms of considering ethical and social values. She was aware of her ‘responsibilities’ to become a teacher in the society:

Teachers’ main responsibility should be not only teaching the subject knowledge to the students but also preparing the students to the life, providing them as a good individual of the society, installing democracy consciousness, and inoculating with ethical and moral values. If we do not give the moral, social and humanity values alongside with the subject matter knowledge, we cannot prepare the students to the life and they cannot be acquired these values. (Post-Autobiographical Questionnaire)

Defne's reflections on the **professional development** indicated that she improved herself through *experience, collaboration, and modeling* by engaging with the reflective activities. Her *experiences* while observing others' teaching, her own teaching, and microteaching helped her improve her professional competence. She emphasized that experiences in the actual settings helped her overcome her anxiety, learn and improve some instructional skills such as classroom management strategies, new teaching methods, and the ways to motivate students. The following example reveals her thoughts about the practice teaching at the contextual level, emphasizing students' needs and motivation:

Practice teaching provided me an insight to learn many things about teaching profession. For instance, I realized how to provide classroom management and how to motivate the students while teaching. I also learned that using various teaching techniques leads to positive effects on students' learning. Moreover, I realized that I need to give students some research projects to motivate them. (Reflective Summative Interview)

For Defne, *collaboration* with both the cooperating teacher and the peer partner was regarded to be another important way in acquiring and elaborating new skills and knowledge. Especially, Defne and her partner displayed a good collaborative work. Defne worked with her peer partner collaborately from the starting of the planning phase of teaching to the execution. They also asked for a help their cooperating when needed. Thus, they discussed so many things to be able to make decisions together. It was also an evidence of Defne's 'open-mindedness'. She seems to be willingness to listen more than one side and alternative ideas. In the following excerpt, Defne expressed this process from the dialectical aspect:

I am at the beginning of the way to be a teacher. Yet, I believe I can complete my deficiencies by the help of other expert and experienced people. I do not hesitate to consult to my supervisor at the university, my cooperating teacher in the practice school, and my peers about any subject related to teaching that confuses my mind. I think this should be a characteristic of a teacher who needs to develop herself/himself continuously. (Post-autobiographical Questionnaire)

According to *the benefits reflective framework*, Defne found all the activities effective in developing her reflective thinking skills. She believed that engaging with reflective activities made her more thoughtful in her teaching skills and behaviors (from the pedagogical aspect). Especially, throughout the reflective journal writing she had many good opportunities to observe and analyze more critically her cooperating teacher and partner's teaching as well as her own teaching experience. The following interview data displays her comments on the reflective journal writing at the dialectical level:

The reflective journals provided me opportunity to analyze and evaluate more widely the events during my own teaching and others' teaching. By doing so, I saw my deficient sides and tried to eliminate them. ... But thanks to the reflective journals did I observe my cooperating teacher and partner better and enable me to think more critically. (Reflective Summative Interview)

4. 2.3.3.4 An Overview of Defne's Professional Development

As seen in Table 4.17, results of two dimensional reflection analysis revealed that Defne focused mostly on instructional processes, professional development, classroom management, teacher characteristics, teaching profession, and students, while reflecting predominantly at the technical level (62.45%), followed by the contextual level (32.49%), and slowly extended to the dialectical level (5.06%). Defne's reflective thinking levels changed in terms of the content in which she had predominantly the technical level except from the topics of students and teaching profession. Throughout these categories, Defne's reflections were predominantly contextual.

Table 4.17 An Overview of Defne's Professional Development

Reflective Thinking Categories	f	Reflective Thinking Modes			Reflective Thinking Levels		
		Observation	Teaching	Self	Level 1	Level 2	Level 3
Teachers Characteristics	28	13	7	8	22	5	1
Instructional Processes	69	37	32	-	45	24	-
Classroom Management	42	32	10	-	33	7	2
Students	16	14	2	-	6	10	-
Teaching Profession	22	-	5	17	7	12	3
Professional Development	60	20	12	28	35	19	6
Total	237	116	68	53	148	77	12
%	100	48.95	28.69	22.36	62.45	32.49	5.06

Although the reflective thinking content topics of Defne's changed as regard to the observation and teaching sessions, she always concerned about the instructional processes. Yet, her concern about instructional issues was increased during her own teaching whereas there was a decreasing interest with regard to classroom management and students categories. With the highest frequency of reflective thinking content at the technical level, she focused on the topic of the instructional processes including the achievement of learning and teaching objectives and effective implications of teaching methods.

Beside instructional processes, Defne was more concerned with the classroom management issues while observing others's teaching and her own teaching. The reason for the concern regarding classroom management issues might be due to her low-confidence in providing classroom management. She also concerned about her abilities with respect to classroom management strategies because she could not decide how to behave students in an manner whether authoritative or not.

Another content topic when Defne considered about herself and others was teacher characteristics. As a whole-hearted and self-confident teacher, she enabled to

criticize personal characteristics and professional skills as a teacher herself and others in terms of weaknesses and strengths. In addition, as a whole-hearted teacher, she blamed on teachers or education system for the students misbehaviors. Also, there were evidences of her open-mindedness to listen novel ideas coming from her cooperating teacher and partner to set alongside her own views as well as awering of her responsibilities as a future teacher.

Defne explained extensively her feelings, opinions, views, attitudes, and beliefs about educational issues under the topic of teaching profession. Defne seemed to have a great enthusiasm to become a teacher before and after the reflective practice teaching course. Also, the parameter while expressing her attitudes and beliefs about good teaching and good learning was similar before and after the study. It was the meeting of students' needs. In addition, mmetaphorical data supported her beliefs about teaching and learning. She selected the metaphor of "child-family-parent". She believed in the necessity to closely deal with the students, their problems, and their personality development. In terms of good classroom management, she believed that the students should be taken into decision making process. Defne's beliefs about the teacher' role usually reached dialectical level to the extent of considering ethical and moral values in educational implications.

In terms of quantitative analysis of reflective thinking instrument, Defne perceived an developmental reflective thinking skills from the contextual level to the dialectical level. With the light of the qualitative findings, it can be concluded that Defne was able to reflect at all reflective levels and through the various teaching content. As regard to Defne, the achieving certain goals and teaching task had priority. She seemed to be task oriented to meet objectives. At the contextual level, she made decisions based on the context of the situation and the gained knowledge from practice. By relating content to students' needs, she considered contextual factors such as students' emotional needs, motivation, and interest as well as contextual factors of time, curriculum, and technological equipment. These contextual factors enabled her to seek for the alternative teaching methods in which students are active-

learners and to make selections about which one is best approach for the context of education. Further, regarding evaluating a problem to discuss in the seminar part of the course, she identified a problem at the contextual level involving students' motivation (See Appendix I). Then, by slowly extended to the ethical, social, socio-political, values and rules, she contemplated on the educational implications. As a reflective practitioner, She achieved awareness, self-understanding, and self-actualization through reflecting on decisions and consequences during the course of action.

The analysis of qualitative data indicated that Defne perceived personal and professional growth through the reflective framework implied experience, guidance, collaboration, and modeling. In terms of her perceptions of the reflective framework, she found all the activities were effective in challenging her reflective thinking skills. Especially, she thought that reflective journal writing enabled her to become more critical about educational issues. She enjoyed observing her friend who was at the same level during the peer coaching session as a means of taking model in some teaching behaviors in developing her professionally. Also, metaphor using valued in providing the teacher's position in the class.

4.2.3.4 Cross Case Analysis

Results of content topic categories of reflective thinking emerged from the reflective writings and autobiographical questionnaires, interviews, and debriefings revealed that all preservice biology teachers enabled to evaluate and criticize others' teaching and their own teaching actions among the general categories of teacher characteristics, instructional processes, classroom management, students, teaching profession, and professional development. In the teacher characteristics category, all preservice teachers could realize their strengths, weaknesses, and improvements as well as others. During observing others and their own teaching, teaching skills and personal characteristics of voice quality and non-verbal language (gesture),

communication skills with students, excitement, self-confidence, and subject matter knowledge were commented extensively as strengths and weaknesses.

Results indicated that each participant reflected upon at all the three levels of reflective thinking among the categories of reflection content, as it can be seen in the Table 4.18 of the cross-case. Although they reflected predominantly at the technical level, their reflective thinking levels changed in terms of the reflection content. From the perspective of technical aspect, in the instructional processes category they reflected mostly about delivery of instruction in which teaching methods were all evaluated in terms of their suitability and effectiveness for meeting the specified outcomes. Preservice biology teachers also reflected on the importance of the instructional materials, relating to real life, questions, time management, monitoring and assessment of students learning. During the teaching period, their concern for pedagogical issues, especially planning of instruction, increased significantly, while concern for classroom management and students showed a decreasing tendency. That is, their reflections were self-performance oriented rather than focused on students in the teaching period. But from the perspective of the students, they reflect mostly upon at the contextual level. All participants reflected on the subcategories of students' motivation, active involvement, and students' needs. On the other hand, classroom management was the major concern for only the one participant while observing others' teaching and partially her own teaching. By depending on the more observation hours rather than teaching, the preservice biology teachers reflected more on observing others' teaching, but there were not noticeable differences in terms of reflective thinking levels between observation and teaching periods. But, the participants reflected mostly at the contextual level in terms of mode of self-autobiography depending on the evaluating questions in the questionnaires and interview.

Table 4.18 Cross Case Analysis of the Preservice Biology Teachers' Reflective Thinking Content and Levels

Case Studies	Reflective Thinking Modes			Reflective Thinking Levels		
	Observation	Teaching	Self	Level1	Level2	Level3
Sude	44.62	30.11	25.27	61.83	30.11	8.06
Dora	45.57	26.58	27.85	63.29	27.22	9.49
Defne	48.95	28.69	22.36	62.45	32.49	5.06

The preservice teachers expressed their positive and negative feelings, attitudes, and beliefs about teaching profession through the reflective autobiographical writings by the help of metaphors. All preservice teachers hold a positive attitude to become a teacher. After the practice teaching course, they appeared to feel a stronger commitment to teaching with the attributes of self-confidence to overcome their deficiencies, whole-heartedness to apply contemporary teaching methods with enthusiasm, open-mindedness for novel ideas, and responsibility. At the beginning of the practice teaching course, their attitudes and beliefs for some of terms about good teaching, good learning, and classroom management were usually task oriented, but at the end of the practice teaching course they expressed their feelings to meet students' interest and needs. On the other hand, besides contextual factors, the role expectations of the preservice teachers usually included the ethical and moral aspect of education for their future teacher identity at the beginning and end of the course. The participants changing perspective toward teaching and learning was also supported by the qualitative metaphorical data. They selected student-centered metaphors to strengthen their own roles and the students. These metaphors implied facilitating student learning by providing academic support and meeting the individual needs and interests from the constructivist perspective of learning. The Instrument of Metaphorical Images also assisted preservice biology teachers to

explore their perceived metaphorical images for themselves as a future teacher, for their high school biology teachers, and for their cooperating teachers in identifying the teacher's and students' roles. Quantitative analysis of metaphorical images of preservice biology teachers revealed differences among their perception for themselves, for their cooperating teachers, and for their high school biology teachers in terms of behavioristic and constructivist view of education.

In terms of quantitative analysis of Reflective Thinking Instrument, all participants perceived a developmental reflective thinking skills in a range from the technical level to the dialectical level. With the light of the qualitative findings, it can be concluded that they were able to reflect at all reflective levels and throughout the various teaching content. At the first technical level, the preservice teachers were concentrated on the realization of the content, skills, and model behaviors; the achieving certain goals and teaching task had priority, and they do not seek alternative approaches to the teaching. Beyond the assessment of students, at the contextual level the preservice teachers considered contextual factors such as students' needs, interests, levels and attitudes as well as contextual factors of time, curriculum, and technological equipment. These contextual factors enabled them with the gained knowledge to seek for the alternative teaching approaches and make selections to decide about which one is best approach for the context of the education. They could evaluate and adjust the predetermined objectives and content related to the students' needs. Then, preservice teachers at the dialectical level could not only understand every detail of the assumptions, theories, and methods of practice, but also evaluate and adjust the curriculum in practice in relation with ethical, moral, and socio-political values. They also displayed a progress to a self-monitoring state by self-understanding and self-actualization to reconstruct situations as a means for reviewing self as a teacher and systematic attempts to resolve problems.

Except from a few drawbacks, all preservice teachers valued the reflective activities as a tool that helped them understand reflection and learn criticizing themselves as

well as others. The preservice teachers found the reflective journal writing effective in evaluating more critically other's teaching and their own teaching, but they admitted the overloading of journal writing. Among the peer coaching, observing their peer instructions or accepting a feedback from their peer were enjoyable for their professional development. The preservice teachers enjoyed watching their microteaching lesson, but for one participant recording by a camera made her nervous. Metaphors were voiced as a good way to strengthen their own roles, and their students from the perspectives of behavioristic or constructivistic view of education.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

5.1 Conclusions

In the present study, in an attempt to gain insights into teacher's professional development, preservice biology teachers' reflective practice through the reflective framework were analyzed in terms of reflective thinking content and level in order to address what and how teachers know about their own and others' teaching practice through acquiring experiences. According the results of the study, the emerging themes from the qualitative analysis will be discussed in two main sections with the support of quantitative findings.

5.1.1 Attitudes and Beliefs

According to Larrivee (2000), the way to change beliefs cannot be direct; but it should be through critically examining assumptions, interpretations, and expectations. In the same vein, Wellington (1996) pointed to the importance of considering the ways that encourage practitioners to discover, reconsider or revise their belief systems, goals, and values about teaching and learning. Being aware of the holding beliefs and attitudes about teaching and learning, in the current study, the preservice teachers were assisted to reflect on their own thoughts, feelings, attitudes, beliefs and actions during the practice teaching course through the reflective writings in the forms of reflective journals and pre-post autobiographical questionnaires. Also, metaphorical data provided a support for the clarification of their attitudes and

beliefs about teaching and learning as a means of future teachers and their previous impressions.

Results of qualitative analysis of the study indicated that reflective autobiographical writings provided the opportunity for the preservice teachers to become aware of their beliefs, values, and assumptions of practice in order to change their understanding of their practice. It can be concluded that reflective thinking is a metacognitive process that provided deep examinations of beliefs and made students become more conscious of their own thinking, beliefs, values, and assumptions to trigger changes in their beliefs. The preservice teachers' attitudes and beliefs about good teaching, good learning, and good classroom management changed from the perspective of task-oriented technical aspect to the meeting of students' needs by considering from the both sides of the teachers and the students' roles under the constructivist view of education at the end of the reflective practice teaching course. On the other hand, according to the beliefs of the preservice biology teachers' role expectations, they usually implied students' needs and the ethical and moral values of teaching. In addition, the qualitative explanations for the most representative metaphor of their self images as a future teacher strengthen their beliefs about teaching and learning as a future teacher. They selected student-centered metaphors that implied facilitating student learning by providing academic support and meeting the individual needs and interests from the constructivist perspective of learning. It can be concluded that the preservice teachers appeared to achieve considerable progress from a view of science as transmitting knowledge to a view of science as investigation while promising for their future teaching.

Quantitative findings of the Instrument of Metaphorical Images also supported the changing beliefs and attitudes of preservice biology teachers about teaching and provided clarification of their beliefs for their cooperating teachers, their high school biology teachers, and selves as a future teacher in terms of behavioristic and constructivist view of education. A descriptive analysis of the metaphor choice of the preservice teachers revealed that while they picked a combination of metaphors at a

low percentage from both teacher-centered and student-centered theoretical perspectives as their most representative images of their both high school teachers and cooperating teachers, they chose only the student-centered metaphors to describe their professional self-images at a high percentage. According to the results of the non-parametric statistical analysis of the questionnaire, the preservice biology teachers in this study appeared to be more student-centered than both their high school biology teachers and their cooperating teachers. Also, preservice biology teachers perceived their cooperating teachers as less teacher-centered and more student-centered than their high school biology teachers.

Hutchinson and Allen (1997) highlighted that one of the goals of teacher education is to develop each preservice teacher into a reflective practitioner. According to Larrivee (2000), a reflective practitioner is a lifelong learner who perpetually grows and expands as a means of challenging approaches toward classroom situations and individual student behaviors. Therefore, Larrivee believed the necessity of teachers challenging continually the underlying personal beliefs systems and attitudes that drive their present behavior. Most educational researchers are well aware of the significance of the prior personal beliefs, attitudes, values, and feelings on the approaching teaching as a reflective practitioner that requires fusion of these into a professional identity to behave deliberately (Day, 1999; Griffiths & Tann, 1992; Huang, 2001; Larrivee, 2000).

Furthermore, according to Day, the reflective process is dialectic between thought and action on the core of the evolutionary change in practice that requires the fundamental shifts in beliefs, attitudes, values, and feelings about teaching and learning if the outcome of reflection is the possibility of change. Further, Larrivee emphasized that “critical reflection involves a deep exploration process that exposes unexamined beliefs, assumptions, and expectations and makes visible our personal reflexive loops” (p. 296). In the same manner, Tillema (2000) claimed that reflection on action especially immersed in practice teaching “promotes the reconstructing of beliefs, as well as the metacognitive awareness which provides the necessary

condition for reflection upon one's own beliefs" (p.578). Hence, the model of reflective practice is a powerful force for professional development when it is underpinned with understanding beliefs and personal theories (Griffiths & Tann, 1992).

In terms of Dewey's (1910/1998) three attributes of reflective individuals, the findings of the present study indicated that the preservice teachers had the characteristics of open-mindedness, whole-heartedness, and responsibility. They were open to receive feedback from both mentors and their peers and to share their knowledge with others for alternative viewpoints for the classroom implications as well as they were willing to analyze themselves critically as a means of strengths, weaknesses, and improvements. In addition to the open-mindedness, the preservice teachers' great enthusiasm to commit teaching and willingness to adopt challenging teaching methods and techniques indicated their whole-heartedness. Whole-hearted preservice teachers blamed the teacher for the unsuccessful students and seemed to overcome the fears of being criticized and making mistakes. As regard to responsibility, analysis showed that the preservice teachers became aware of the sensitiveness of the teaching, and their tasks as a future teacher involving consideration of outcomes of their actions or decisions.

5.1.2 Professional Development

In the light of a great deal of literature about reflective practice that has been continuing since Dewey and Schön's times, Day (1999) summarizes with a saying in its simplest form that "at the heart of adult learning lies reflection" (p. 221). As a consequence of this widely accepted literature of reflection, one of the principles for teacher education programs has emerged as reflection that is a cornerstone of preservice teachers' learning and of their continuing growth and development as a professional (Huang 2001, Spilkova, 2001; Wallace & Oliver, 2003; Wu, 2003). Thus, self-reflection facilitates the process of preservice teachers' personal and

professional development in a way of systematic investigation of their own and others' teaching practice.

The interplay between reflection and professional development are placed on the centre of teacher education. Reflection is regarded as a parameter for teachers to continually steer their own development as teachers (Korthagen, 2001, cited in Manswelder-Longgayroux et al., 2007). In fact, continuing professional development may be the main approach by which teachers can renew themselves in response to perpetually changing needs of society and students in a broad range from their knowledge about subject matter and pedagogy to their attitudes, willingness and enthusiasms toward teaching profession and their students (Day, 1999; Spilkova, 2001). Furthermore, professional development needs to be an ongoing process. Therefore, preservice biology teachers in the current study were encouraged to reflect on their own and others' teaching practice for the generating the conception of teaching as a matter of contributing professional development of the preservice teachers in the present study. In doing so, a reflective practitioner is "a lifelong learner who perceives every experience as an opportunity for growth, change, and development of understanding" (Hutchinson & Allen, 1997, p.226).

For the present study, it was also an outcome that reflective practice led to professional development of preservice biology teachers the extent to which engaging authentic experiences, collaborative interactions with partnerships, guidance and feedback, modeling, and problem discussion within the framework of reflective activities. Hence, the professional knowledge can be developed through reflective practice offering a window into the complex nature of actual classroom settings from different viewpoints. Also, it offers a way of framing problematic situations for enhanced meaning making process may result in further informing one's wisdom-in-practice (Loughran, 2002).

Thus, in the present study, it seems that preservice teachers had a variety of opportunities to engage in reflection in a way of considering systematically and

analytically their professional practice in teaching and learning situations through the reflective thinking activities during practice teaching course, and this would contribute to their professional development such a way of experience, guidance/feedback, collaboration, and modeling. As a consequence, the process of reflection led the preservice teachers to question their own views, to collaborate with colleagues, to seek for professional knowledge for classroom experiences and their educational conflicts in searching for alternative perspectives. In the following sections, what range and aspects of teaching and learning that preservice teachers gained insights into their personal and professional development will be discussed.

5.1.2.1 Experience

In the present study, the variety and quality of experiences preservice teachers engaged throughout analyzing the observations of other's teaching, their own teaching, and evaluating problems provided opportunities for their professional development. In addition to experiences, the findings of the present study indicated that the preservice teachers had a variety of opportunities to reflect on those experiences that enabled them to construct their knowledge on learning to teach. In fact, the preservice teachers in their reflective journals mentioned that reflection on experience gave opportunities them to compare various educational situations, provided to see the outcomes of using different methods regarding to subject and student's level, and provided more experience about instructional and classroom management strategies, and the ways to motivate the learners effectively. The preservice teachers perceived that engagement in various authentic experiences during practice teaching course helped them develop their professionalism as a future teacher. Thus, it seems reasonable to conclude that experience is regarded to be one of the ways which provide professional development.

Throughout the reflective framework incorporated into the one-term practice teaching course, the preservice biology teachers in this study were involved in a

range of learning and teaching experiences as a means of analyzing observations other's teaching and their own teaching. It is widely accepted notion of recent approaches in teacher education to professional development that learning to reflect on experiences gained during practice teaching is a crucial aspect (Manswelder-Longgayroux et al., 2007; Wolf & Dietz, 1998). Therefore, encouraging preservice teachers to reflect on experience is the best way to give them a true 'voice' in their practice (Huang, 2001) and to learn from those experiences. Further, Loughran (2002) argues that "...wisdom in practice... could only be developed through a serious of reconsideration of concrete examples..." (p. 40).

In the same manner, Wolf and Dietz (1998) underlined professional development through learning prompted by experience in authentic context in which practitioners reflect on the real problems. Lee and Loughran (2000), therefore, claimed that the framing and reframing process with extensive direct practice may provide developing perspectives or insights better. Especially, a school setting rather than a university offers preservice teachers more support and resources for the experiences with various pedagogical issues to redefine problems and resolve them. Lee and Loughran emphasized that "last but not least, with more exposure to the school context through residency like experiences, student teachers may gain more reflective opportunities through the various means available to them..." (p.73).

On the other hand, in his article titled as "effective reflective practice..." Loughran (2002) argued the scope of the experience in teacher education and how can be influential in the development of effective reflective practice and as a result how effective reflective practice might be important in the development of one's professional knowledge. On the way for sustaining meaningful reflection he claimed that experience alone does not lead to learning; conversely, it is essential to reflect on experience. Further, Loughran asserted that "reflection is effective when it leads the teacher to make meaning from the situation in ways that enhance understanding so that she or he comes to see and understand the practice setting from a variety of viewpoints" (p. 36).

Change in practice appears as an important outcome of reflection, so there is a need for reflection to achieve positive change in practice. Thus, reflection on experience is a valuable process because it brings about changes in teachers' professional practice. Huang (2001) asserted that effective reflective practice must change teachers' classroom practice or actions, and their process of making decisions the extent they make concerning curriculum and instruction. In the same line with the literature, the findings of the present study suggested that the preservice biology teachers' reflections had an effect on their classroom practice in concurrent with Loughran's (2002) study that reflection enabled them to decide to change in their action or view variety of points. That is to say that preservice biology teachers decided to choose different teaching methods and techniques by taking into consideration the nature of the subject, the students' level, and the context. Further, they decided to change their approaches toward classroom management issues and students. As a support the perceptions of preservice biology teachers in the current study, Liou (2001) asserted that critical reflection involves analyzing teaching experiences as a basis for evaluation and decision making process resulting in adjusting in practice. Rodgers (2002) made reference to Dewey (1916/1944) to underline the important function of reflection in the change processes of teachers' instructional decisions or actions through continually reconstruction or reevaluation of their own experiences.

Beside change in the preservice biology teachers' professional practice, self-awareness is another function of reflective practice in promoting their professional development as a future teacher. The findings of the present study also suggested that the preservice teachers' reflections had an effect on their self-awareness. The preservice teachers emphasized that while analyzing their observations and their own teaching, reflection on experience developed their self-awareness toward themselves in a sense of their weaknesses and strengths and helped them overcome these weaknesses during teaching and learning process. Indeed, it was emphasized by the preservice biology teachers that they were able to explore and examine their insight, excitement, frustration, happiness or their sadness in their teaching world. Liou (2001) supported that critical reflection is a metacognitive process that raises

teachers' awareness about teaching and enables deeper understanding of variables related to teaching. Similarly, Freese (1999) emphasized that the reflective preservice teachers examine their thoughts and actions in a depth to make sense of teaching situations and to evaluate their experiences.

Generally speaking, in the traditional teacher education programs, an incompatibility occurs between theory and practice because of insufficiency in experience. Reflection is somehow combines theory to practice in contributing better understanding of the pre-service teacher's professional development (Loughran, 2002). In terms of theory and practice connection in the present study, the preservice biology teachers highlighted that they utilized their knowledge on the instructional practices. They sometimes obtained some dilemmas to reflect through their incompatibility between theory and practice. This process was valued as being important for their professional development.

As a conclusion, the present study provided concrete examples to cultivate wisdom in practice. Preservice biology teachers emphasized that they acquired and elaborated new instructional skills, classroom management strategies, and learned the ways to motivate the students. The knowledge gained from practice would lead to change their instructional skills by enabling them to develop different instructional skills and choose different methods by taking into consideration the outcomes on the students as well as the nature of the subject, the students' level, interests, and context. In fact, it was regarded that preservice teachers had a variety of authentic experiences in a range of evaluating their own and others' teaching in the actual settings, peer coaching and microteaching sessions, and discussions real problems that they encountered. It can be concluded that this study provided preservice biology teachers the opportunity to develop their professional development through effective reflective practice as a means of observing others' teaching and their own teaching. The preservice biology teachers perceived that they engaged in effective reflective practice through the kinds of learning and teaching experiences as a means of what

Loughran (2002) asserted that reflection is regarded as effective reflective practice if it has an impact on practice.

5.1.2.2 Collaboration

In the present study, preservice teachers met together so many times in the campus for the seminar part of the course to identify, discuss, and evaluate problems that were encountered in the practice school, to share their views, opinions, and feelings about educational issues in determining appropriate way of teaching action. They also met together for their pre-conference and post-conference stages within peer coaching sessions to discuss on the planning and outcomes of the teaching action, respectively. The collaborative aspect of the reflective framework in the present study was utilized effectively by all of the preservice biology teachers in perception of their professional development. Collaboration was voiced as a fundamental process in enhancing the preservice teacher's professional development. The preservice teachers as a collaborative inquirer were able to generate knowledge, draw on, share with their peers, cooperative teachers and the university supervisor resulting in contributing to improve others' and their teaching practice. It can be concluded that all of the preservice teachers emphasized the value of collaborative aspect of the reflective framework assisting them to reflect on their experiences on the way of their professional development.

As argued by Kaminski (2003) group discussions and personal reflections enable preservice teachers not only to defend and justify their thoughts and opinions but also re-examine their view about teaching and learning. Huang (2001) also appreciated sharing and negotiating reflection in a collaborative atmosphere to envisage concrete alternative courses of action on the way of becoming self-sustaining in reflective processes. Freese (1999) made reference to Darling-Hammond (1994) to point out the new paradigm of teacher learning as a place in which opportunities are provided for students to learn by teaching, learn by doing and learn by collaborating. Freese

(1999) described this view of the teacher as an inquirer and a collaborator “who is constantly striving to make sense of her practice and the students’ learning, not in isolation but rather with other teachers” (p.897). As to conclude, collaborative efforts in collegial groups to reflect on action are powerful as a means of increasing an individual’s sense of satisfaction (Huang, 2001).

In the present study, as a part of the collaboration “critical friend” was another theme that was valued by the preservice biology teachers especially in the process of peer coaching as a critical aspect of their preparation for the future teacher. Other perspective is that collaboration potentially gave opportunities to engage in professional development through systematic investigation of practice with the help of a ‘mentor’ or critical friend. Critical friends are able to help each other to “challenge the regular routine and insular context of classroom, and to offer intellectual, affective and moral challenge and support” (Day, 1999, p. 229). All of the preservice teachers in the present study became aware of the value of having critical friend to discuss and to offer different perspectives or insights during their teaching actions. Thus, critical friend emerged as a valuable aspect of the reflective framework for this study.

The findings of the present study from the aspect of the collaborative nature of reflection were supported by Freese’s (1999, 2006) two consecutive studies that emphasized collaborative planning and reflecting as important parameters for the preservice teachers’ professional development. In the first one, the collaborative reflections through a reflective framework among the preservice teachers and the mentors were appreciated as an important aspect of having a critical friend to share and gain from various points of view. Further, in the longitudinal part of her study, Freese’s study revealed that the novice teachers continued to use the reflective framework to evaluate and make sense of their teaching by the ways of providing opportunities for examining their thoughts and actions in the context of teaching, as well as focusing on their objectives in improving their teaching. The other one is Freese’s (2006) self-study that was conducted collaboratively by a preservice teacher

and a teacher educator was also appreciated in revealing the preservice teacher's challenges and obstacles through systematically examining his teaching.

Although, for the present study, there was no any specialized design to require more depth relations with their cooperating teachers, the preservice biology teachers perceived professional development through unstructured collaboration with their cooperating teachers. It was stated so many times by the preservice biology teachers that their cooperating teachers supported them through sharing their ideas and sometimes providing guidance, feedback, and suggestion. Furthermore, the preservice teachers gave a great importance to their supports or feedbacks in their professional development. From this perspective, Wentz (2001) highlighted the role of the cooperating teacher as a key facilitator in the professional development of any future teacher as a means of a mentor, a model, a critical advisor, and a good friend to the preservice teachers in the practice school. Being aware of the collaborative inquiry encouraging preservice teachers to reflect more about their teaching, it can be concluded that collaboration is one of the major ingredient of the reflective framework. It created a supportive atmosphere with the notion of democracy and socialization where the preservice teachers learned through interactions and reflected on their practice teaching.

5.1.2.3 Guidance/Feedback

In the current study, peer coaching activity has implications offering preservice teachers the opportunity to observe the peers' classrooms tends to make them feel more at confidence and comfortable and far less lonely in the practice school. After they taught for the conference part in the schools, they came together in pairs to debriefing conferences using PQP forms in the campus site seminar part of the course. Besides collaboratively deciding on observation focus and planning during pre-conference part of the peer coaching activity, it is much needed support and feedback during the debriefing (post-conference) after observation about the lesson

using PQP forms. Analysis of these audio-taped debriefing conferences indicated that preservice teachers guided each others with non-directive questions for giving feedback through their teaching action in an atmosphere of support and collegiality. Reflective peer coaching is a formative model. The goal of reflective peer coaching is to promote self-assessment and collaboration for better teaching and ultimately better learning. There are obvious benefits to colleagues collaborating and sharing ideas, thoughts, and observations. Coaching is one of the interpersonal activities which encourage skills of reflection for improving teaching and learning as a sound effect of innovative approaches (Bowman & McCormick, 2000; Hasbrouck, 1997; Kurts & Levin, 2000, McAllister & Neubert, 1995; Showers & Joyce, 1996; Vidmar, 2006). For example, McAllister and Neubert valued peer coaching as a method for reflective thinking due to the fact that structured peer coaching requires much needed support in a way of instructional feedback and practice for new teachers as they begin their teaching careers. In addition, the study revealed that the process of peer coaching not only encouraged reflective thinking of the participants but also prevented them from the discouragement, isolation, and frustration. Kurtts and Levin points to the need of organized support, especially collegial support for beginning teachers to become more willing to reflect on their practice, which in turn, enhances their understanding of both their personal and professional needs. In response to this need for support, they proposed peer coaching for a promising way.

Furthermore in the present study, the reflective summaries after peer coaching experience indicated that preservice biology teachers analyze their own lessons and those of their coaching partners. As a result, preservice teachers highlighted that by coaching their friends prompted them to consider their own teaching. It appears that the collegial feedback and suggestion enhance self-awareness more in the sense of acquiring professional development through practice teaching experiences.

In sum, analysis of both written and transcribed data reaction to peer coaching experiences revealed that it was an activator for different levels of reflection that moved beyond the technical level to the dialectical level throughout sharing their

views, opinions, feelings to determine appropriate way of teaching practice. As mentioned in the collaboration part of this chapter, all preservice teachers appreciated the value of having critical friend to discuss and provide different viewpoints or insights during their teaching actions. Further, all of the preservice biology teachers voiced the feedback and suggestion provided by others. These findings of the present study were supported; by the discriminated role of coach or critical friend as a fine line between assistance and assessment (Freese, 2006); and by Loughran's (2002) key claim for meaningful reflection is to "see his or her practice through others' eyes" (p.33). In the same vein, Mansvelder-Longayroux et al. (2007) emphasized that reflection should not just be a matter for the individual. To conclude that from the aspect of peer coaching both supporting and being supported through feedback can be important for preservice biology teachers to see themselves from various points of insights and exchange different views with their critical friends.

5.1.2.4 Modeling

In the current study, the preservice biology teachers valued modeling in the sense of their professionalism acquired through observations. The preservice teachers accepted the cooperating teachers and their peers as models in terms of some teaching skills and classroom management approaches that they liked. Conversely, some preservice teachers perceived models not to behave in the same manner like their cooperating teachers and their peers for some teaching skills or behaviors.

Modeling in the present study as it was supported by Loughran (1997), demonstrated some technical aspects of teaching such as the instructional and classroom management skills, or approaching toward students, and questioning techniques. Beyond the technical aspect of modeling, Lougran's views of modeling implies the processes of the teacher's reflection on practice that means to think aloud about what s/he is doing, the decisions s/he is making and why through journals outlining her/his thoughts about teaching and learning. Further, modeling reflective practice was

regarded as a way of looking into the relationship between reflection and action from the teacher's perspective; as a result, it rather highlights the processes of learning and thinking about teaching for their students and challenges their understanding of the use of reflection on practice.

In the present study, even though there was no structured modeling processes, all the preservice teachers acknowledged the value of modeling in their professional developments through reflections. In an effort to develop new and meaningful ways of making tacit knowledge of practice explicit there is an increasing interest to modeling which requires teacher educators who are capable to explicitly model for their students reflect on their thoughts and actions that underline one pedagogical approach (Loughran & Berry, 2005; Loughran, 2006). Loughran asserted that preservice teachers can better realize the complex nature of learning and teaching process when they see their educators' such pedagogical reasoning that is clear and explicit for students by thinking aloud. For Loughran, science teacher educators should be models who are able to make explicit their knowledge of science teaching and learning for their preservice teachers by underlying pedagogical reasoning congruent with the emerging theoretical perspectives of practice. In so doing, teacher educators consider deliberately not only why they teach particular content, but also how they teach it.

5.1.2.5 Content and Level of Reflective Thinking

It is emphasized as the essential way that is the understanding of what and how preservice teachers think about their practice teaching to facilitate the process of their professional development (Huang, 2001). Therefore, the current study provides a deep and thick understanding of the preservice biology teachers' reflective thinking content and skills on the way of understanding their personal and professional development. The preservice teachers reflections were analyzed two dimensionally as a means of reflective thinking content and levels. Qualitative

results of content analysis indicated that that all the preservice teachers were concerned about six major topic categories of teacher characteristics, instructional processes, classroom management, students, teaching profession, and professional development. According to the reflective thinking content, the study revealed that preservice teachers commented extensively on the instructional processes. The emerging subtopics were planning of instruction, teaching methods, questions, instructional materials, feedback, monitoring, and assesment. In the same line with the literature, preservice teachers were considered to focus on practical issues. The increase in concerns regarding planning issues while decreasing in students and classroom management issues in the teaching period was also evident of their technicality.

The results of the present study, were supported by Kaminski's (2003) study, the content of preservice teachers' reflection in a number sense program mostly focused on technical aspects of teaching, such as planning of instruction, good introduction, sequencing, use of teaching methods and aids, as well a few of them beyond technical rationality considered contextual factors as a means of understanding the learners. In the same line, Liou's (1999) study investigated preservice teachers' reflections as a matter of two dimensions. In terms of the topics of reflection, preservice teachers talked about mainly related to practical teaching issues and evaluation of other teachers' or their own teaching among seven major topic categories. Within the similar study for the inservice teachers, Farrell (1999) found that the inservice teachers were also concerned about their personal theories of teaching and the problems faced in their teaching. In the context of Turkey, Ekiz (2006) also found that planning stages of teaching, classroom management, time management, and the practical culture of teaching were main concerns for primary preservice teachers.

Lee and Loughran (2000) claimed that concerns/themes that are recognized, articulated and addressed during school-based teaching experiences provide better understanding of practice of preservice teachers. These concerns are crucial as a

starting point for the ‘puzzles’ or ‘problems’ which are the prompts for reflection. In their study, preservice teachers displayed an increased trend focusing on the issues of pedagogy and students which would give insights in viewing their pedagogical practice and developing learning about teaching through the real school context. Also, the study of Huang (2001) provided a support for reflection content that were emerged in three broad areas of teaching practice: the teacher, the student, and the curriculum/instruction.

In terms of second dimension of qualitative analysis, the results of the current study indicated that the preservice biology teachers reflect mainly at the technical, partially at the contextual, and rarely at the dialectical level. The preservice teachers’ reflective thinking levels changed in terms of the reflective thinking content in which all preservice teachers had predominantly the technical level except from the topics of students and teaching profession. Throughout these categories, some of them were predominantly contextual. At the technical level they focused on teaching skills and behavior. The preservice biology teachers concentrated on the realization of the content, skills and model behaviors. At this level, the preservice teachers focused on the effective implication of instructional skills. They did not seek alternative approaches to the education. It was clear that preservice teachers’ reflections on practical issues were descriptive in nature and task oriented to meet objectives, indicating reflection at the technical level. Achieving certain goals were come first, then they considered students’ understandings, interests, level, needs, and emotions.

With an increased focus on the students at the contextual level indicated that the preservice teachers acknowledged the complexity of issues such as the facilitation of active learning, motivating, and meeting the students’ needs to increase their learning. Hence, the preservice teachers began to look beyond planning and implementing lessons that challenged their students to think. Then, the preservice biology teachers at the contextual level could evaluate the predetermined objectives and methods and make comparisons to find the best one that fits for the context of education. They seeked for the alternative approaches. The techniques were

examined and the goals were questioned so that the suitability of them could be determined relative to the context. This enabled the preservice teachers to adjust the teaching methods according to the students' needs and other environmental and subject related issues. They would make selections and preferences and decide which one is best. Thus, this level of reflective thinking requires research and decision making process. At the contextual level, preservice teachers' reflections focused on practical issues, they considered individual students' differences and their needs.

The dialectical level, preservice teachers would change the curriculum according to the students' needs and choices to draw an ethical and political form on them. Practice in action is embedded in this level of reflectivity. This level requires working very professionally by testing how much the used methods and programs met the goals. All of the preservice teachers reflected at the dialectical by engaging ethical, moral, and socio-political view of education. All of them reached self-monitoring, self-understanding, self-autonomy, and self-confidence with the attributes of open-minded, responsible, and whole-hearted.

The qualitative results of case studies also illustrated that there were not noticeable differences in terms of the content topics and level of reflective thinking on the period of observation and teaching whereas preservice teachers reflected on their feelings, thoughts, views, attitudes, and beliefs mostly at the contextual and dialectical level through self-autobiographical data. In contrast to this finding, Liou (2001) indicated that more critical reflective thoughts were recorded on the practice teaching reports than the total of observation reports with three topic categories of teaching approaches and methods, evaluating teaching, and self-awareness. In the same line, Lee (2005) found that reflectivity during the teaching period was deeper than reflections during the observation period.

The perceived levels of reflective thinking of preservice teachers were also supported by the results of quantitative analysis. According to the results of the quantitative analysis of reflective thinking skills, the current study indicated that providing

preservice teachers with the needed conditions and guidance to reflect on experience could have a positive effect on the perception of their reflective thinking skills to the highest level on the reflective thinking pyramid. All of the preservice biology teachers displayed individually a development in their perceived reflective thinking skills at least through the same reflective category. With the light of the other studies, it can be concluded that reflective thinking process is developmental in nature when the needed conditions are provided (Lee, 2005; Şanal-Erginel, 2006; Warden, 2004). In his qualitative study Lee (2005) indicated that the reflective thinking levels of the preservice teachers changed in terms of time factor. When it was compared before and after the field experience, the preservice teachers' reflective thinking at the first level of recall displayed a decreasing tendency whereas reflective thinking at the second level of rationalization and the third level of reflectivity were displayed a growing tendency.

The depth of reflective thinking has also been valued widely in the literature. The results of Huang's (2001) study showed that the preservice teachers' reflection contents were mostly at the level of reporting to describe what happened during their microteaching experiences, rather than at a level of analyzing. It was emphasized that the participants need to improve on their reflection content and level in order to become more critical reflective teachers. In the study of Wallace and Oliver (2003), all of the preservice teachers used evaluation levels readily to critique their own teaching and the teaching of their peers. Analysis/synthesis was often used when discussing university course material, such as concept mapping or assessment. The deepest journal entries often occurred when preservice teachers analyzed a specific interaction with high school students, or new ideas presented in the methods class. In the same manner, Farrell (1999) found that the inservice teachers could reflect critically to the certain extent of reflection content. For the preservice context, there were more incidents of critical reflection than descriptive ones (Liou, 2001).

On the other hand, Ward and McCotter (2004) suggested that reflection should be defined as to evaluate teachers' reflection on the student learning that makes the

qualities visible. The researchers attempted to examine preservice teachers' reflection content and reflection level in the context of practice teaching by examining the use of a reflective framework. Two dimensional analysis indicated that reflective framework provided preservice teachers to reflect on their experiences the extent to various contents and levels.

From a wider perspective, Lee's (2005) study provided insights into the other factors affecting development and changes in the preservice teachers' thinking such as personal history, communication style, and placement context. Having known the historical background of the preservice teachers results in better interviews and developing effective duties and activities aimed at cultivating reflective teachers. The preservice teachers' reflective thinking level is influenced by the way of communication. Some may be powerful in written communication while others in verbal one. So, preservice teachers should not be restricted to some rules of styles to flourish the reflective thinking. Also, the practice teaching opportunities and conditions may have a great impact on the preservice teachers' reflectivity on the scope of the cooperating teacher's characteristics, and the teaching context.

In relating the results of qualitative and quantitative analysis of preservice biology teachers' reflective thinking levels also provide different insights for the nature of the reflective studies. Although preservice teachers seemed to become at the different levels of reflective thinking categories according the result of the reflective thinking instrument, there was not a noticeable difference in their reflections through all the reflective categories emerged from the qualitative analysis. It can be concluded that reflective studies demand qualitative analysis in a depth understanding of the preservice teachers' reflective thinking levels. On the other hand, quantitative analysis can provide a support or understanding the developmental process of reflective thinking.

5.1.2.6 Benefits and Drawbacks of the Reflective Framework

In the current study, preservice biology teachers were engaged in a kind of experiences while observing others' teaching and their own teaching throughout activities within the reflective framework such as reflective journal and autobiography writing, metaphors, peer coaching, microteaching, and problem discussion. The analysis revealed that they perceived these activities as efficient and effective in enhancing their professional development. In general, they expressed positive and beneficial ideas about the activities, except from the stated a few drawbacks of them. From a more general perspective the conclusion can be reached that the reflective framework embedded in the practice teaching course helped them to expand their professional knowledge base and prepare them for future.

The preservice teachers perceived reflective journal writing as an analytical tool by which they became aware of their areas of weaknesses and areas of strengths as well as areas that need much more improvement. By observing others' teaching, preservice teachers also realized the others' weaknesses, strengths, and improvement. Weekly reflective journals were the main data source of experiences, thoughts, and feelings in the practice school for both their own teaching and others' teaching. All of the preservice teachers valued journals on the way of understanding their reflection. They can analyze and reevaluate more critically themselves and their teaching methods/skills as a future teacher. That is supported by Wallace and Oliver (2003) who proposed that the reflective journals were a vehicle for preservice teachers to explore their science teacher identity. Self-reflection and self-understanding increased throughout journal writing that provided opportunities for higher education students and preservice teachers to learn how to reflect (Garmon, 2001; Langer, 2002). A number of researchers have identified the use of journals as a technique for enhancing reflective thinking and facilitating self-discovery (Davis, 2006; Knowles & Holt-Reynolds, 1991; Subramanian, 2001; Spalding & Wilson, 2002; Taggart & Wilson, 1998; Wallace & Oliver, 2003). The preservice teachers also voiced that the guidelines for journal reflections facilitated their ability to focus

important issues and to examine their assumptions, principles, and theories in congruent with the related literature that offers evidence of importance of prior structuring (Bain et al., 2002; Freese, 1999; Hatton & Smith, 1995; Rodriguez et al., 1998; Wallace & Oliver, 2003). It can be concluded that the use of reflective journals have meta-cognitive effect, enable self-enquiry, facilitate critical consciousness (Holly, 1989, cited in Langer, 2002), and facilitate critical thinking and other higher thinking skills while assisting preservice teachers in conceptualizing abstract meaning and relating it to practice.

As a drawback of reflective journal writing each week, the preservice teachers mentioned they were overloaded. Because it requires a long time to write after their classroom experiences. Garmon (2001) referred this as time demands. Şanal-Erginel (2005) mentioned that the preservice teachers were discouraged with the extra workload it brings their already heavy schedule even they believed the benefits of it. Also, some preservice teachers mentioned that there were not different things to write about while observing their cooperating teachers' classes. As a drawback, this is associated with length requirement of reflective journal proposed in the study of Garmon. In the present study, two journal writing guidelines were used to facilitate the preservice biology teachers' reflection in a wide range of educational issues in their writings. Especially, the second guideline for journal writing was introduced when the preservice teachers informed the researcher that they started to write on the same things after their first or second observations.

In the same line, pre-post autobiographical writings were also an important data sources to understand the preservice teachers' thoughts, feelings, ideas, attitudes and beliefs about educational issues. Autobiographical writings helped preservice teachers critically examine their own learning experiences and personal theories. Pre-post autobiographical data provided to compare the preservice teachers' changing beliefs, attitudes, values, and role expectations (their future roles as teachers) before and after the study. In the literature, the autobiographical writings were appreciated to help the preservice teachers critically examine their own learning experiences and

personal theories. Knowles and Holt-Reynolds (1991) valued autobiographical writing in helping preservice teachers make records of their personal histories as they relate to education, learning, and teaching. Therefore, in the present study autobiographical writings were utilized to make the preservice teachers more introspective about their practice. Thus, keeping a journal and writing an autobiography are essential tools for sustaining an identity of a teacher as a person and professional. In an effort to further explore the preservice teachers' beliefs about teaching, learning, and their future roles, the preservice biology teachers appreciated metaphor as a good way to strengthen their own roles, and their students from the perspectives of behavioristic or constructivistic. The metaphorical findings were supported by Saban's (2004) claim that thought process is largely metaphorical in nature. Furthermore, Martinez et al., (2001) valued metaphors as a language linking everyday thinking and scientific thinking. In fact, according to Saban, the metaphors not only represent the way to perceive the world and reality but also shape professional ideas, attitudes, beliefs, and practices.

Among the peer coaching activity, giving feedback for their peer instructions or accepting feedback from their peer were enjoyable ways for the improvement of their professional development. Related literature also supported benefits of the peer coaching experience in terms of positive feedback, support, suggestion, sharing the same experiences, development of self-confidence, and less frustration during the observation process (Göker, 2006; Kurtts & Levin, 2000; McAllister & Neubert, 1995; Vidmar, 2006). In addition to challenging feedback, Kurtts and Levin proposed that peer coaching provided establishing an atmosphere of support and collegiality in fostering professional development of preservice teachers. It can be concluded that peer coaching has the potential to be beneficial to both the teacher and the coach in the creation of their own conception of teaching while supporting and being supported by their colleagues throughout their lifelong professional development. In terms of a drawback of peer coaching activity, one of the preservice teachers expressed that the partner as a coach might not be objective if he or she was a close friend of the teacher. Another stated drawback was the process of being

observed someone else that might be nervous. In addition, Kurtts and Levin (2000) pointed to the lack of professional knowledge for offering constructive feedback. In the present study, microteaching was also valued as an effective way to improve their teaching by critically examining themselves. The preservice teachers generally enjoyed watching their microteaching lesson except from one participant who stated that being recorded by a camera made her nervous. Amobi (2005) also found that microteaching was considered favorably as a meaningful learning experience by preservice teachers.

To sum up, teaching is not only an epistemological issue and a science in the form of positivist approach but also an art with values. A new paradigm of teaching is a constructive process that requires creativity of teachers in making instructional decision according to their students and context. In the theory of reflective thinking, therefore, teachers are reflective practitioners as being active participants and being capable of changing the curriculum according to their students' situations and feedbacks, and needs of students are foreword. In essence, concurrent with the literature about reflective thinking theory, the reflective strategies within the reflective framework worked well to help the preservice biology teachers develop themselves through critically examining their own practice in-on the process of learning to teach for their future profession.

5.2 Implications

In this section, in the light of the research findings some implications for practice and further research on the concern of reflective thinking are put forward for the development of the reflective courses and reflective practitioners in teacher education.

5.2.1 Implications for Practice

It is generally admitted that the preservice teachers' prior attitudes, beliefs, and values have a great impact on their approaches for teaching and learning. Reflective thinking involves a deep consideration of the consequences of those belief systems, assumptions, and expectations (Larrivee, 2000; Rodriguez et al., 1998). Zeichner and Liston (1996) emphasized that "reflective teaching entails a recognition, examination, and rumination over the implications of one's beliefs, experiences, attitudes, knowledge, and values as well as the opportunities and constraints provided by the social conditions in which the teacher works" (p. 33). Therefore, it is a need to help preservice teachers become more conscious about their beliefs and thoughts through the reflective autobiographical strategies to make sense in their practice. As a dialectical tool, metaphors can provide the exploration of the preservice teachers' beliefs about teaching and learning and help them strengthen their roles as a teacher. Specifically, the preservice teachers' beliefs can be well understood by the preservice teachers' metaphorical images for themselves as future teachers, their cooperating teachers, and their secondary school teachers. Having knowing the preservice teachers' well formed attitudes and beliefs about the teacher's role and their approaching toward learning and teaching as well as the changes in their beliefs can also inform the teacher educators about their approaching toward teacher education and their programs. In doing so, preservice teachers can be improved as better reflective practitioner to be a professional in teaching.

Learning is actually and naturally lifelong process so it must be flexible, dynamic, and inquiry oriented which are some core subjects of reflective thinking. From this perspective, the purpose of reflective teacher education should sustain best practices. The ways of reflective thinking and problem solving skills need to be provided to empower the preservice teachers for the development of the understanding and ability for lifelong learning.

Reflection is a valuable process because it brings about changes in teachers' professional practice. It requires the preservice teachers to develop themselves through critically examining their own practice by learning from experience. Experience is the crucial way to prompt reflection as a means of making tacit knowledge explicit and more meaningful. With the variety of authentic experiences, the preservice teachers can be enabled to think systematically and critically examine about their practice to deepen their knowledge to construct change in their practice.

Reflection is also somehow a professionalism in learning to teach. Beyond technical aspects of teaching, it is a necessary condition for continuing personal and professional growth through the way of engaging intellectual, affective and practical support. A great deal of literature supported various reflective models; collaboration, guidance/feedback, and modeling as ways to develop reflective thinking. Teacher education programs can offer such systematic and deliberative support by providing opportunities for the preservice teachers to reflect on authentic teaching experiences based on guidance and feedback within a collaborative atmosphere. Furthermore, the role of the cooperating teacher and the university supervisor as a guide should be to provide scaffolding and assistance to the preservice teachers rather than assessment. Therefore, by avoiding from the supervisory model, a context for co-reflection and co-inquiry should be created (Freese, 1999).

While a number of strategies have been regarded in the worthiness of promoting the reflective abilities of individuals using various means such as autobiographical journal writings, metaphors, peer coaching, microteaching, and reflective problem evaluation. Especially, autobiographical journal writings and using metaphors provide the opportunity for the preservice teachers to become meta-cognitive to bring to conscious awareness of their attitudes, beliefs, and values as well as strengths and weaknesses as a professional in order to be able make sense of their practice. While microteaching is valued as a way of self-critiques of teaching, peer coaching provides seeing themselves from others' eyes. It will be effective reflective practice when teacher education programs can be extended to the establishment of support

groups, peer coaching pairs dyads, microteaching lessons, and inquiry-based seminars through extensive autobiographical journal writings.

Reflection is a developmental process. However, Huang (2001) pointed out that the ability and capability to reflect on practice teaching is not automatically subject to growth. The teacher educators should model the process of helping preservice teachers to learn knowledge and skills of reflective practice. Many preservice teachers are already considered to reflect at the technical level based on a lack of schema in dealing with educative problems (Taggart & Wilson, 1998). So, the preservice teachers can be prompted to think from the technical level to the contextual and dialectical level. Overall, the development of the reflective thinking needs to be supported by educational approaches, principles or theories with the consideration of contextual factors, ethical, moral, and political issues.

Reflective thinking has moral, ethical, social-political aspects as a means of reconstructing the society and educational implications and curriculum. The reflective teacher must be provided such a classroom atmosphere that every person can argue each other's ideas, create inquiries and develop possibilities. Finally, the arguments should build the dynamics between schools and society. The preservice teachers increased their consciousness about socio-political issues.

5.2.2. Implications for Further Research

The preservice teachers need to be experienced along with the more experienced cooperating teachers in a real classroom environment to develop insights into their teaching through the interaction between personal reflection and theoretical ideas. On the other hand, Day (1999) emphasized an important problem that schools are lonely places for inservice teachers to work due to the fact that there were lack of regular professional dialogues about teaching resulting in discouraging teachers from challenging their practice and preventing production of knowledge about their own

teaching. It also seems a serious problem for the preservice teachers who practice in these schools. Further, Fullan (1999, cited in Hoban, 2006) argues that it is only through reflection from individual level to group, and organizational level that teachers will begin to question their own practice and think differently about classroom practice. Then, the more systematic and deliberative support system should be provided in practice school at the individual and organizational level.

Moreover, more school-based and extended practice teaching experiences, and case-based methods courses should be included as the most promising ways to enhance pre-service teachers' awareness of the problems and complexities that they will encounter in their classrooms. The extended practice teaching experience provides preservice teachers to delineate different perspectives of their pedagogical practice and to strengthen the preservice teachers and students' roles and responsibilities. Also, methods courses with field experiences in a variety of school settings should be integrated into the teacher education programs to provide more opportunities in addressing, recognizing, and articulating diverse educational needs on the way of their professional development.

The main goal of teacher education programs should enable the preservice teachers as a reflective practitioner to learn from and learn through experiences in sustaining their professional development for lifelong learning. Developing reflective thinkers as effective decision makers should be the ultimate goal of the of the teacher preparation process in which teachers can adjust curriculum or change implications by considering student's needs and other contextual factors.

More qualitative and quantitative studies need to be conducted to understand the nature and the development of reflection. Longitudinal studies should also be conducted to follow the preservice teachers in their practice teaching experience and the first or several years of teaching in contributing the literature related to reflective teacher education. In reflection studies, multiple strategies and data sources should be utilized to evaluate the teachers' reflective thinking content and levels.

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APPENDIX A

REFLECTIVE FRAMEWORK

The reflective framework is designed to promote your reflective thinking during the practice teaching experiences over a one-semester time period. The framework consists of activities based on the reflective strategies for each week. The framework will guide you for your activities in the practice school and on the campus site seminars of the practice teaching course.

YANSITICI ÇERÇEVE

Yansıtıcı çerçeve, sizin öğretmenlik uygulaması dersinde yansıtıcı düşünmenize yardımcı olmak için planlanmıştır. Yansıtıcı çerçeve, öğretmenlik uygulaması sırasında her hafta uygulayabileceğiniz yansıtıcı stratejilere dayanan aktivitelerden oluşmaktadır. Bu çerçeve öğretmenlik uygulamasının staj okulu ve seminer kısımlarında uygulayacağınız aktivitelere rehberlik edecektir.

APPENDIX B

REFLECTIVE AUTOBIOGRAPHICAL QUESTIONNAIRES

<p>Activity I Pre-Reflective Autobiographical Questionnaire</p> <p>Evaluate your development as a teacher;</p> <ol style="list-style-type: none">1. How have you become like this?2. What are your weaknesses?3. What are your strengths?4. What are your important values about teaching?5. What are your feelings, thoughts, attitudes, beliefs, and insights about teaching profession?6. How would you define good teaching?7. How would you define good learning?8. How would you define the relationship between the teaching and learning?9. How would you define good classroom management?10. What is your role as a biology teacher?	<p>Etkinlik I Ön-Yansıtıcı Otobiyoğrafik Anket</p> <p>Bir öğretmen olarak gelişiminizi değerlendiriniz;</p> <ol style="list-style-type: none">1. Nasıl bu hale geldiniz?2. Hangi alanlarda kendinizi zayıf hissediyorsunuz?3. Hangi alanlarda kendinizi güçlü hissediyorsunuz?4. Öğretmenlik ile ilgili en önemli değerleriniz nelerdir?5. Öğretmenlik mesleğinize yönelik hisleriniz, düşünceleriniz, tutumlarımız, inançlarımız ve görüşleriniz nelerdir?6. İyi bir öğretimi nasıl tanımlarsınız?7. İyi bir öğrenmeyi nasıl tanımlarsınız?8. Öğrenme ile öğretme arasındaki ilişkiyi nasıl tanımlarsınız?9. İyi bir sınıf yönetimini nasıl tanımlarsınız?10. Bir biyoloji öğretmeni olarak rolünüz nedir?
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<p>Post-Reflective Autobiographical Questionnaire</p> <p>Evaluate your development as a teacher;</p> <ol style="list-style-type: none">1. What are your weaknesses?2. What are your strengths?3. What are your important values about teaching?4. What will you change to address your weakness after practice teaching?5. In which ways has practice teaching affected your feelings, thoughts, attitudes and beliefs toward teaching profession?6. How would you define good teaching?7. How would you define good learning?8. How would you define the relationship between the teaching and learning?9. How would you define good classroom management?10. What is your role as a biology teacher?	<p>Son-Yansıtıcı Otobiyografik Anket</p> <p>Kendinizi bir öğretmen olarak değerlendiriniz;</p> <ol style="list-style-type: none">1. Hangi alanlarda kendinizi zayıf hissediyorsunuz?2. Hangi alanlarda kendinizi güçlü hissediyorsunuz?3. En önemli değerleriniz nelerdir?4. Öğretmenlik uygulamasından sonra zayıf yönlerinizi gidermek için ne gibi değişiklikler yapacaksınız?5. Öğretmenlik uygulaması, öğretmenlik mesleğinize yönelik hislerinizi, düşüncelerinizi, tutumlarınızı ve inançlarınızı hangi yönde etkiledi?6. İyi bir öğretimi nasıl tanımlarsınız?7. İyi bir öğrenmeyi nasıl tanımlarsınız?8. Öğrenme ile öğretme arasındaki ilişkiyi nasıl tanımlarsınız?9. İyi bir sınıf yönetimini nasıl tanımlarsınız?10. Bir biyoloji öğretmeni olarak rolünüz nedir?
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APPENDIX C

STUDENT TEACHING WEEKLY REFLECTION GUIDE

<p>Activity II Student Teaching Weekly Reflection Guide</p> <p>The following questions will serve as a guide to reflect on your experiences while you are observing or teaching. Feel free to expand, explain, and interpret further as needed.</p> <ol style="list-style-type: none">1. What are the weaknesses of your cooperating teacher?2. What are the strengths of your cooperating teacher?3. What were some of this week's highlights (significant experiences) in terms of your development as a teacher? And why?4. What were some of the obstacles which impeded your progress this week?5. What were some breakthroughs you had that fostered your knowledge or teaching practice this week?6. In comparing your experience this week, previous weeks, what stands out in your mind as improvements or mastery of techniques for planning, teaching, management, etc.?7. What action did you initiate which scared, worried, pleased or otherwise affected you? What do you think you felt this way?8. Is there anything you wish you had done differently this week? If so, what and why do you feel this way? (Ex: Can you think of another way you would have taught? How?)9. Is there anything in particular that you need your supervisor(s) to address this week or during the next visit?10. Additional comments or concerns.	<p>Etkinlik II Öğretmen Adaylarının Haftalık Yansıtıcı Günlük Rehberi</p> <p>Aşağıdaki sorular gözlem yaptığımız yada anlattığımız ders için günlük yazarken deneyimlerinizde yansıtmak için rehberlik edecektir. Daha açıklayıcı yada daha derin yorumlar yapabilirsiniz.</p> <ol style="list-style-type: none">1. Gözlemediğiniz öğretmenin zayıf yönleri nelerdir?2. Gözlemediğiniz öğretmenin güçlü yönleri nelerdir?3. Öğretmen olarak gelişiminizi olumlu yönde etkileyen bu haftanın önemli olayları nelerdir? Neden?4. Öğretmen olarak gelişiminizi olumsuz yönde etkileyen bu haftanın önemli olayları nelerdir? Neden?5. Bu hafta bir dönüm noktası olarak düşündüğün, öğretim uygulamanı veya bilgini geliştiren, bazı önemli noktalar nelerdir?6. Gözlemlerinizi veya deneyimlerinizi bir önceki haftalarla karşılaştırdığınızda planlama, öğretim, ve sınıf yönetimi tekniklerinde sizce nasıl bir gelişme oldu?7. Bu haftanın sizi üzen, memnun eden yada etkileyen olayları nelerdir? Neden?8. Eğer varsa, farklı düşünebileceğiniz bir durum var mı? (Ör: Gözlemediğiniz veya öğrettiğiniz dersi başka bir şekilde daha iyi öğretebileceğinizi düşünüyor musunuz? Nasıl?)9. Bu hafta herhangi bir konu hakkında üniversitedeki danışmanınıza yada staj okulundaki rehber öğretmenizin yardımına ihtiyacınız oldu mu? Açıklayınız.10. Eklemek istedikleriniz.
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APPENDIX D

RUBRIC FOR REFLECTIVE JOURNAL

Activity III: The general structure of the reflective journal should be constructed around the following rubric. There are numerous questions which might be asked in any given cell. You should think of questions for each cell. Across the top are three categories: *knowledge, affect and action*. These categories will guide you to reflect and react to situations in your life as a pre-service teacher. Knowledge is for those situations where *what you know* is most important. Affect refers to those situations in which *liking* or *feeling* is the dominate cognition. Finally, action refers to those situations in which *doing* is the most important issue. You can use the following two dimensional rubric to reflect on your experiences while you are observing or teaching.

	Knowledge	Affect	Action
Planning	What do I need to learn before I teach this topic?	What do I need to consider students' needs?	What will I do to attract interests of students?
Conducting Instruction	What is my knowledge base to conduct high quality instruction?	How did I communicate enthusiasm for this laboratory activity? What are my beliefs, values, and interests about the teaching of biology?	How did I teach the lesson? What would I have done differently?
Evaluating Instruction and Learning	How did I know that students understood what I was teaching? What are the different methods of evaluation?	What are the effects of evaluation on both teachers and students?	What did I pick the specific topics for the test?
Professional Development	Where can I learn about new activities to help teach this topic?	What is my feeling towards learning new things?	Can I attend the meeting of the GSTA later this school year?
Interactions with Students	What do I need to know more than superficial learning about students and their culture?	Why does Johnny not recognize that I am trying to help him? How relations with students do affect my feelings, attitudes, values, and beliefs?	How should I behave to students? How effective can I communicate with my peers?
Interactions with Peers	What level of certification does my mentor teacher possess?	How does my teacher identity develop? Who do I want to be as a teacher?	How effective can I communicate with my peers?

YANSITICI GÜNLÜK RUBRİĞİ

Etkinlik III

Bu günlükle, gözlem yaptığınız yada anlattığınız ders için ne düşündüğünüzü, ne hissettiğinizi ve ne öğrendiğinizi kaydedeceksiniz. Aşağıdaki tablo günlükte yazabileceğiniz konular için yol gösterecek. Tablonun üstünde *bilgi*, *duyuş (his)*, ve *eylem* kategorileri yer almaktadır. Tablonun sol tarafında ise öğretmenlik uygulaması esnasında karşılaşılabileceğiniz durumlar yer almaktadır. Bu kategoriler günlük deneyimlerinizi yansıtmaya yardımcı olacaktır. Bilgi kategorisi, bu durumlarda *en önemli neyi bilmeniz gerektiğini*; duyuş kategorisi, bu durumlardaki *hislerinizi ve duygularınızı*; eylem kategorisi, bu durumlarda *ne yapmanız gerektiğini* içermektedir. Gözlem yaptığınız yada anlattığınız ders için günlük yazarken deneyimlerinizde yansıtmaya için iki boyutlu bu rubriği kullanabilirsiniz.

	Bilgi	Duyuş(His)	Eylem
Planlama	Bu konuyu anlıyor muyum? Bu konuyu öğretmeden önce ne öğrenmeye ihtiyacım var?	Öğrencilerin ihtiyaçları nelerdir?	Bir sonraki dersim ne içerecek?
Dersin İşlenişi	Kaliteli bir öğretim için bilgi düzeyim nedir?	Laboratuvarları nasıl zevkli hale getirebilirim? Biyoloji öğretimine yönelik inanç, tutum ve değer yargıları nedir?	Dersi nasıl anlattım? Farklı olarak ne yapabilirim?
Öğretimin Değerlendirilmesi	Öğrencilerin ne anladığını nasıl ölçebilirim? Farklı değerlendirme yöntemleri nelerdir?	Değerlendirmenin öğretmen ve öğrenci üzerindeki etkisi nedir?	Neden sınavda sormak için bazı konuları özellikle seçtim?
Profesyonel Gelişim	Bir konu ile ilgili yeni aktiviteleri nereden öğrenebilirim?	Yeni bilgiler öğrenmeye yönelik düşüncelerim ve tutumum nedir?	Eğitim ile ilgili yapılacak bir sempozyuma katılabilir miyim?
Öğrencilerle İletişim	Öğrencilerim ve kültürleri hakkında ne bilmeliyim?	Öğrencim ona yardımcı olmaya çalıştığımı neden fark etmedi? Öğrencilerimle etkileşimim benim inanç, tutum ve değer yargılarımı nasıl etkiliyor?	Öğrencilerimle nasıl etkili bir iletişim kurabilirim? Öğrencilere nasıl davranmalıyım?
Akranlarımızla İletişim	Rehber öğretmenimizin sahip olduğu sertifikalar nelerdir? Öğretmenlerimizin ve akranlarımızın kültürleri hakkında ne bilmeliyim?	Öğretmen kimliğim nasıl oluşuyor? Hangi öğretmeni model alıyorum?	Akranlarımla nasıl etkili bir iletişim kurabilirim?

APPENDIX E

PEER COACHING

Activity IV: Peer coaching is the assistance that a preservice teacher receives is provided by another preservice teacher. The preservice teachers are expected to be pairs. For the one cycle of the peer coaching activity, one of the preservice teachers (the teacher) teaches the lesson and the other serves as observer (the coach) by using Praise-Question-Polish (PQP) form for giving feedback. The peer coaching process consisted of four steps:

I. Pre conference: the phase for planning conference during which the teacher and coach agree on the skill focus of the lesson to be taught and overview the lesson procedure.

II. Conference: the phase of observation of the preservice teacher's lesson by the coach using Praise-Question-Polish (PQP) Form for giving feedback.

III. Post conference: the phase of debriefing conference during which the coach and the teacher use information on the PQP form to guide their reflective dialogue. The debriefing session is audio-taped and transcribed.

IV. Reflection: the phase of after the debriefing conference during which the teacher and the coach each react to the coaching experience by writing reflective summaries. Students are asked to respond to the following questions.

1. What did you learn about your teaching as a result of this coaching experience?
(Question for the Preservice teacher)
2. What did you learn about teaching as a result of serving as a coach?
(Question for the Coach)

PRAISE-QUESTION-POLISH (PQP) Form

Teacher _____ Coach _____

Date _____ Class _____

Skill Focus _____

I. Praise comments: affirmations, statements of approval, concerning what the teacher well in conjunction with the skill focus, and why this teaching behavior was effective.

For example: You showed enthusiasm when you called the students to “biology time”

II. Questions: Clarifying questions asked by the coach for something not understood. Eliciting questions asked by the coach to prompt the teacher to explore alternatives or options.

For example: Why did you think it was necessary to write each answer on the board?

What other methods of guided reading could you have used?

III. Polish: Suggestions or recommendations for improvement in the form of leading questions.

For example: Do you think the children would follow the story more closely if they read silently rather than out loud?

AKRAN REHBERLİĞİ

Etkinlik IV

Akran rehberliği, aynı seviyede kişilerin birbirlerine kılavuzluk etmesi, yönlendirmesi ve destek vermesidir. Bunun için iki öğretmen adayının partner olması gerekiyor. Birinci öğretmen adayı ders anlatırken, arkadaşı onu izler ve Övgü-Soru-Öneri formunu doldurur. Aynı süreç öğretmen adaylarının rolleri değiştirilerek tekrarlanır. Akran rehberliği temel olarak dört aşamadan oluşuyor.

1. Konferans Öncesi: Ders anlatmadan önce iki öğrenci bir araya gelir, yapılan ders planı üzerinde tartışılır ve gözlem için bir odak noktasına karar verirler.

2. Gözlem: Öğrencilerden birisi dersi anlatır, diğeri ise aşağıdaki Övgü-Soru-Öneri geribildirim formunu kullanarak belirlenen odak nokta çerçevesinde dersi gözlemler.

3. Konferans Sonrası: Geribildirim aşamasıdır. İki öğrenci dersten sonra tekrar bir araya gelir ve geribildirim formuna not alınmış noktalar üzerinde tartışılır. Bu tartışma kasede kaydedilir.

4. Yansıtma: Geribildirim aşamasından sonra her iki öğrenci öğretmen olarak veya gözlemci olarak akran rehberliği deneyimlerini değerlendiren yansıtıcı özet yazar. Bunun için aşağıdaki soruları cevaplandırır.

1. Akran rehberliğinden sonra öğretmenliğiniz hakkında ne düşünüyorsunuz?
(Ders anlatan öğretmen adayı için)
2. Birisine rehberlik yaparak öğretmenlik hakkında ne öğrendiniz?
(Dersi gözlemleyen öğretmen adayı için)

ÖVGÜ-SORU-ÖNERİ Formu

Öğretmen _____ Gözlemci _____
Tarih _____ Okul _____
Gözlemlenecek davranış _____

I. Övgü: Ders esnasında hoşunuza giden ve olumlu etki bırakan davranışlar.

Örnek : 'Biyoloji zamanı' diyerek derse başlamanız, ne kadar hevesli olduğunuzu gösteriyordu.

II. Soru: Netleştirici ve aydınlatıcı sorular kullanabilirsiniz. Netleştirici sorular üzerinde düşünülmesi gereken noktaları, aydınlatıcı sorular ise farklı düşünmeye sevk eden yada alternatif yaklaşımları ortaya çıkaran sorular olmalı.

Örnek: Neden bütün cevapları tahtaya yazma ihtiyacı duydun? (Netleştirici)

Örnek: Bu konuda kullanabileceğin diğer metotlar nelerdir? (Aydınlatıcı)

III. Öneri: Destekleyici, yol gösterici, öneri ve tavsiye niteliğinde sorular olmalı.

Örnek: Öğrenciler hikayeyi sesli okumak yerine sessiz okusalardı daha iyi takip edebileceklerini düşünüyor musun?

APPENDIX F

MICROTEACHING

Activity V: Microteaching Video-taped preservice teachers' teaching for 10-15 minutes	
Pre-lesson questions <ol style="list-style-type: none">1. How do you anticipate the lesson going?2. What problems do you see which may occur in the lesson?3. What changes do you think may happen?4. Do you think you can provide a good learning opportunity for students?5. How do you feel about teaching this lesson?	Post-lesson questions <ol style="list-style-type: none">1. Did the lesson work as planned?2. Would you rate this lesson as successful? Why?3. What were the weaknesses and strengths of the lesson?4. What would you do differently if you were to teach the lesson again?5. What, if anything, would you wish to behave differently?6. After you watch yourself, is there any change in your teaching?
Etkinlik V: Mikro öğretim Öğrenciler 10-15 dakikalık ders anlatırken videoya kaydedilecek	
Ders öncesi sorular: <ol style="list-style-type: none">1. Dersin nasıl geçeceğini düşünüyorsunuz?2. Dersde nasıl bir problemle karşılaşabilirsiniz?3. Derste ne gibi değişiklikler olabilir?4. Etkili bir ders olacağını düşünüyor musunuz?5. Kendinizi nasıl hissediyorsunuz?	Ders sonrası sorular: <ol style="list-style-type: none">1. Anlattığımız ders planladığımız gibi mi geçti?2. Anlattığımız dersi başarılı bir ders olarak değerlendirir misiniz? Neden?3. Dersin zayıf ve güçlü yönleri nelerdi?4. Dersi tekrar anlattıysanız farklı olarak ne yapabilirsiniz?5. Eğer varsa, keşke öyle yapmasaydım dediğiniz bir durum var mı?6. Kendinizi gözlemledikten sonra öğretmenliğinizde bir değişiklik olacak mı?

APPENDIX G

THE STEPS OF PROBLEM DISCUSSION

Activity VI: Problem Discussion

1. Clearly state the problem in your own words.
2. Define the problem in the context of the teacher's attitude and experience, students, and school.
3. What are your plans for addressing the challenge?
4. List and explain resources you will use to help you address the challenge (i.e. clinical teacher, site co-ordinator, other teachers, school counselors, principal, parents, special education co-ordinator, site professor, other professors, written materials or Internet information.
5. What are your results? What are your next steps?
6. How does this affect your ideas about teaching?
7. How does this affect your ideas about how students learn?

Etkinlik VI: Problem tartışma basamakları

1. Problemin tanımlanması.
2. Problem durumu öğretmeni, tutumunu, tecrübesini, öğrencileri, ve okulun özelliklerini içermeli.
3. Problem çözümü için uygun olan stratejiyi araştırma.
4. Problem çözümü için kullanabileceğiniz kaynaklar uygulama okulu rehber öğretmeniniz, üniversite rehber öğretmeniniz, okuldaki diğer öğretmenleriniz, akranlarınız, yazılı kaynaklar ve internet olabilir.
5. Problem çözümü için öneriniz.
6. Bu durum sizin öğretme ile ilgili düşüncelerinizi nasıl değiştirdi?
7. Bu durum sizin öğrenme ile ilgili düşüncelerinizi nasıl değiştirdi?

APPENDIX H

REFLECTIVE SUMMATIVE INTERVIEW

The interview questions that was asked at the end of the reflective practice teaching course

- | |
|---|
| <ol style="list-style-type: none">1. Describe the most successful lesson that you observed throughout the practice teaching? Why?2. Describe the least successful lesson that you observed throughout the practice teaching? Why?3. What do you think about students that you observed in the classrooms? And what have you learned about them?4. What are the characteristics of the observed teacher to be able to define as a good teacher or do you like?5. What are the characteristics of the observed teacher to define as weaknesses or do you dislike?6. How was your relation with your cooperating teacher? Helpful? How so?7. In which ways has the reflective practice teaching course affected your feelings, thoughts, attitudes and beliefs toward teaching profession?8. In which ways and what extent the reflective practice teaching course affected your thoughts toward teaching and learning process?9. Has the reflective practice teaching course contributed to think about your learning to teach?10. Has the reflective practice teaching course contributed to think critically about your and your peers' teaching performances? |
|---|

The following questions were asked separately for each activity of reflective autobiography and journal writing, metaphor using for explaining learning and teaching process, peer coaching, microteaching, and problem discussion

- | |
|--|
| <ol style="list-style-type: none">11. What were the benefits of using this activity?12. What were the disadvantages of using this activity?13. Has this activity contributed to change your thoughts about learning and teaching process?14. What have you learned about yourself as a teacher as a result of using this activity?15. Which activity is the most influential in assisting to develop your reflective thinking skill? |
|--|

GÖRÜŞME SORULARI

Yansıtıcı öğretmenlik uygulaması dersi sonunda sorulacak görüşme soruları
<ol style="list-style-type: none">1. Bu dönem gözlemlediğiniz derslerden en başarılısı size göre hangisiydi? Hangi açıdan yada neden?2. Bu dönem gözlemlediğiniz derslerden en kötüsü (başarısız) size göre hangisiydi? Hangi açıdan yada neden?3. Gözlem yaptığınız sınıflardaki öğrenciler hakkında ne düşünüyorsunuz? Onlar hakkında neler öğrendiniz.4. Gözlemlediğiniz öğretmenin sevdiğiniz yönleri /yada onu iyi öğretmen yapan özellikleri nelerdir?5. Gözlemlediğiniz öğretmenin sevmediğiniz /yada onun zayıf özellikleri nelerdir?6. Rehber öğretmeninizle ilişkileriniz nasıldı? Size yardımcı oluyor muydu? Nasıl?7. Yansıtıcı öğretmenlik uygulaması dersi, öğretmenlik mesleğinize yönelik hislerinizi, düşüncelerinizi, tutumlarınızı ve inançlarınızı hangi yönde etkiledi? Örnek verebilir misiniz? Uyguladığınız etkinlikler etkili oldu mu?8. Yansıtıcı öğretmenlik uygulaması dersi, öğretme-öğrenme sürecine yönelik düşüncelerinizi ne derece ve ne yönde etkiledi?9. Yansıtıcı öğretmenlik uygulaması dersi, öğrendikleriniz hakkında düşünmeye katkıda bulunuyor mu? Nasıl?10. Bu ders kendinizin ve sınıf arkadaşlarınızın performansı üzerinde düşünüp, eleştirmeye katkıda bulundu mu?
Aşağıdaki sorular, öğrenme ve öğretmeyi açıklamak için metafor kullanma, yansıtıcı günlük ve otobiyografi yazma, akran rehberliği, mikro öğretim, ve problem tartışma etkinlikleri için ayrı ayrı sorulmuştur
<ol style="list-style-type: none">11. Bu etkinliğin size göre avantajları nelerdir?12. Bu etkinliğin size göre dezavantajları nelerdir?13. Bu etkinlik öğretme ve öğrenme ile ilgili düşüncelerinizi değiştirdi mi?14. Bu etkinlik sonucu öğretmenliğiniz hakkında ne öğrendiniz?15. Hangi etkinlik yansıtıcı becerilerinizi geliştirmede en etkili oldu?

APPENDIX I

A LIST OF PROBLEMS

Problems guide discussions in the seminar part of the course
<ol style="list-style-type: none">1. It is difficult to understand the subject of 'respiration with oxygen' for students. (Dora-Technical Level)2. Students smoking in the school as a discipline problem. (Yılmaz-Dialectical Level)3. I cannot use the board effectively. (Beren-Technical level)4. I cannot use real life examples while I am teaching. Students get bored. (Defne-Contextual Level)5. Student cannot learn the names of the parts of the brain. (Sude-Technical Level)6. It was difficult to understand the subject of heredity with much of Latin words for students. (Melisa-Technical Level)7. The student who is always successful in the other subject areas, but fails in biology and does not involve the lesson. (Beril-Contextual Level)8. The teacher has a lack of self-confidence. (Lal-Dialectical Level)9. It is difficult to provide classroom management in the class for me. (Boran-Technical Level)10. The effectiveness of university entrance exam (OSS). (Doruk-Dialectical Level)
Öğretmenlik uygulamasının seminer bölümünde tartışılan problemler
<ol style="list-style-type: none">1. Öğrencilerin oksijenli solunumu kavrayamaması. (Dora-Teknik seviye)2. Bir disiplin problemi olarak çocukların okulda sigara içmesi. (Yılmaz-Diyalektik seviye)3. Tahtayı düzenli kullanamıyorum. (Beren-Teknik seviye)4. Ders anlatırken güncel olaylardan örnekler veremiyorum. Öğrenci dersten sıkılıyor. (Defne-Uygulama Seviyesi)5. Öğrenciler beynin kısımlarını terimsel olarak akıllarında tutamıyorlar. (Sude-Teknik seviye)6. Kalıtım konusunda çok yabancı kelime olduğu için öğrenciler anlamada zorluk çekiyorlar. (Melisa-Teknik seviye)7. Diğer derslerinin hepsinde başarılı olan bir öğrencinin biyoloji dersinde başarısız olması ve derse katılmak istememesi. (Beril- Uygulama seviyesi)8. Öğretmenin öz güven problemi. (Lal-Diyalektik seviye)9. Sınıfta disiplini sağlamak zorlanıyorum. (Boran-Teknik seviye)10. Üniversiteye giriş sınavı olan ÖSS'nin etkililiği (Doruk-Diyalektik seviye)

APPENDIX J

METAFOR ANKETİ

“Metafor ile kastedilen, bir şeyin (bir kavram, olgu veya olayın) başka bir şeye benzetilerek açıklanmasıdır. Metaforlar bazı karmaşık düşüncelerimizi, duygularımızı yada deneyimlerimizi somut olaylarla aralarında bağlantı kurarak, benzetme yaparak açıklamamızı sağlar.

Aşağıda öğrenim yaşantınızda “öğrenci”, “okul” ve “öğretmeni” temsil edebilecek benzetmeler var. Bu benzetmeleri, lisedeki biyoloji öğretmeninizi, şu anki uygulama okulu rehber öğretmeninizi ve gelecekte bir öğretmen olarak kendinizi düşünerek en uygun metaforu seçiniz.

1 Hiç temsil etmiyor 2 Kısmen temsil ediyor 3 En çok temsil ediyor

Öğrenci – Okul – Öğretmen	Lise Biyoloji Öğretmeniniz	Uygulama Okulu Rehber Öğretmeniniz	Gelecekte Bir Öğretmen Olarak Kendiniz
Hammadde-Fabrika-İmalatçı	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Suçlu-Cezaevi-Gardiyan	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Asker-Kışla-Komutan	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Yarış atı-Hipodrom-Jockey	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Yolcu-Otobüs-Şoför	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Hasta-Hastane-Doktor	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Turist-Ada-Rehber	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Gül-Bahçe-Bahçıvan	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Çocuk-Aile-Ebeveyn	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Seyirci-Sirk-Eğlendirici	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Oyuncu-Takım-Teknik direktör	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>

Müşteri-Mağaza-Tezgahtar	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Kil-Atölye-Çömlek	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Araba-Tamirci dükkanı-Tamirci	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Şüpheli-Mahkeme-Hakim	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Bebek-Kreş-Çocuk bakıcısı	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Seyirci-Tiyatro-Komedyen	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Araştırmacı-Laboratuar-Araç sağlayıcı	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Keşif-Doğa-Pusula	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>
Müziyen-Orkestra-Orkestra şefi	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/>

Yukarıda verilen metaforlardan, kendiniz için öğrenci-okul-öğretmen ilişkisini en iyi temsil ettiğine inandığınız bir metaforu belirterek, tercih nedenini kısaca açıklayınız.

Gelecekte bir öğretmen olarak ben.....gibiyim/benzerim; çünkü.....

APPENDIX K

THE PROFILE OF REFLECTIVE THINKING ATTRIBUTES INSTRUMENT

To explore your current level of reflective thinking, respond to the following questions. For each statement, circle the number of the indicator that best reflects your agreement.

When confronted with a problem situation,	Seldom	Situational	On a regular basis	Almost always
1. I can identify a problem situation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
2. I analyze a problem based upon the needs of the student	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
3. I seek evidence which supports or refutes my decision	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
4. I view problem situations in an ethical context	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
5. I use an organized approach to problem solving	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
6. I am intuitive in making judgments	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
7. I creatively interpret situations	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
8. My actions vary with the context of the situation	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
9. I feel most comfortable with a set routine	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
10. I have strong commitment to values (e.g., all students can learn)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
11. I am responsive to the educational needs of students	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
12. I review my personal aims and actions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
13. I am flexible in my thinking	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
14. I have a questioning nature	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
15. I welcome peer review of my actions	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
When preparing, implementing, and assessing a lesson,				
16. Innovative ideas are often used	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
17. My focus is on the objective of the lesson	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
18. There is no one best approach to teaching	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
19. I have the skills necessary to be a successful teacher	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
20. I have the content necessary to be a successful teacher	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
21. I consciously modify my teaching to meet student needs	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
22. I complete tasks adequately	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
23. I understand concepts, underlying facts, procedures, & skills	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
24. I consider the social implications of so- called best practice	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
25. I set long-term goals	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
26. I self-monitor my teaching	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
27. I evaluate my teaching effectiveness	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

28. My students meet my instructional objective when evaluated	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
29. I use a journal regularly	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
30. I engage in action research	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

YANSITICI DÜŞÜNME ANKETİ

Yansıtıcı Düşünme Anketi, yansıtıcı düşünme seviyenizi ve yansıtıcı düşünme özelliklerinizi belirlemenize yardımcı olacaktır. Her madde için size uygun olan bir seçeneği işaretleyiniz.

	Nadiren	Duruma göre değişir	Genellikle	Her zaman
Sınıfta bir problemle karşılaştığımda,				
1. Problemi belirleyebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
2. Öğrencilerin ihtiyaçlarına göre problemi analiz edebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
3. Kararımı destekleyecek yada çürütecek deliller ararım	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
4. Problem durumunu etik boyutları ile düşünebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
5. Problem durumunu çözmek için planlı bir yaklaşım kullanırım	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
6. Kararlarımı sezgilerime dayanarak veririm	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
7. Durumları yaratıcı olarak yorumlayabilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
8. Davranışım problem durumuna göre değişir	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
9. Kendimi rutine davranış kalıbıyla daha rahat hissederim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
10. Değerlere çok bağlıyım (örnek: bütün öğrenciler öğrenebilir)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
11. Öğrencilerin eğitimsel ihtiyaçlarına cevap verebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
12. Kişisel amaçlarımı ve düşüncelerimi gözden geçiririm	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
13. Düşüncelerimde esneğimdir	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
14. Soru sormayı severim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
15. Akranlarımda davranışlarımı değerlendirmelerine açığымdır	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
Bir dersi planlarken, uygularken ve değerlendirirken,				
16. Yenilikçi düşüncelere açığымdır	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
17. Dersin hedefine odaklanırım	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
18. Bir dersi öğretmek için tek iyi bir yöntem yoktur	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
19. Başarılı bir öğretmen olmak için gerekli becerilere sahibim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
20. Başarılı bir öğretmen olmak için gerekli alan bilgisine sahibim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
21. Öğrencilerin ihtiyaçlarını karşılayabilmek için öğretim şeklimi bilinçli olarak değiştiririm	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
22. Görevlerimi yeterli bir şekilde tamamlayabilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
23. Kavramları, gerçekleri, ilke ve prensipleri anlayabiliyorum	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
24. En iyi uygulamaların bile sosyal boyutlarını düşünürüm	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
25. Uzun dönemli hedefler belirleyebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
26. Öğretimimi kendim denetleyebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
27. Öğretimimin etkinliğini değerlendirebilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
28. Öğrencilerim değerlendirildiğinde benim hedeflerime ulaştıkları görülür	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
29. Düzenli olarak günlük tutarım	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
30. Aksiyon (eylem) araştırması yapabilirim	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

APPENDIX L

RUBRIC OF REFLECTIVE THINKING LEVELS

Taggart and Wilson (1998)

The first level the technical level

- Make simple descriptions of observations
- Focus on behaviors, content, and skills from past experiences or theory derived from readings or course works, without looking for alternatives
- Are task oriented, viewing teaching competency as meeting a set of objectives.
- Use appropriate educational vocabulary to correspond with current skill and pedagogy level

The second level of reflectivity the contextual level

- Reflect on practices as those practices affect students' learning
- Reflect on decisions relative to the context of the situation
- Reflect on content related to student needs
- Relate theory to practice
- Focus on action
- Look for alternatives to practice based on knowledge and personal values
- Analyze, clarify, and validate practices/principles based on sound teaching constructs
- Assess implications and consequences of actions and beliefs
- Clarification of assumptions and predispositions of practice and consequences

The highest level of reflectivity, critical reflection, the dialectical level

- Systematically question practices
- Suggest alternatives and competing theories
- Reflect on decisions and consequences during the course of the action
- Contemplate moral, ethical, and sociopolitical issues relative to instructional planning and implementation
- Express themselves verbally and in their writing with efficacy and self-confidence
- Reconstruct action situations as a means for reviewing self-as-teacher
- Examination of contradictions and systematic attempts to resolve issues
- Achieve disciplined inquiry, individual autonomy, self-understanding, and self actualization

APPENDIX M

WILCOXON SIGNED RANKS TEST OF THE PROFILE OF REFLECTIVE THINKING ATTRIBUTES INSTRUMENT

Ranks

Reflective Thinking Instrument		N	Mean Rank	Sum of Ranks
Pretest – Posttest	Negative Ranks	10(a)	5,50	55,00
	Positive Ranks	0(b)	,00	,00
	Ties	0(c)		
	Total	10		

a REF.PRE < REF.POST

b REF.PRE > REF.POST

c REF.PRE = REF.POST

Test Statistics

Reflective Thinking Instrument	Pretest – Posttest
Z	-2,810(a)
Asymp. Sig. (2-tailed)	,005

a Based on positive ranks.

b Wilcoxon Signed Ranks Test

APPENDIX N

WILCOXON SIGNED RANKS TEST OF THE METAPHORICAL IMAGES INSTRUMENT

Ranks

		N	Mean Rank	Sum of Ranks
COOP.TEAC – HIGH.TEAC	Negative Ranks	6(a)	3,50	21,00
	Positive Ranks	0(b)	,00	,00
	Ties	4(c)		
	Total	10		
FUT.TEAC – HIGH.TEAC	Negative Ranks	8(d)	5,56	44,50
	Positive Ranks	2(e)	5,25	10,50
	Ties	0(f)		
	Total	10		
FUT.TEAC – COOP.TEAC	Negative Ranks	5(g)	5,70	28,50
	Positive Ranks	4(h)	4,13	16,50
	Ties	1(i)		
	Total	10		
COOP.STU – HIGH.STU	Negative Ranks	2(j)	1,50	3,00
	Positive Ranks	6(k)	5,50	33,00
	Ties	2(l)		
	Total	10		
FUT.STU – HIGH.STU	Negative Ranks	0(m)	,00	,00
	Positive Ranks	10(n)	5,50	55,00
	Ties	0(o)		
	Total	10		
FUT.STU – COOP.STU	Negative Ranks	0(p)	,00	,00
	Positive Ranks	10(q)	5,50	55,00
	Ties	0(r)		
	Total	10		

- a COOP.TEAC < HIGH.TEAC
 b COOP.TEAC > HIGH.TEAC
 c COOP.TEAC = HIGH.TEAC
 d FUT.TEAC < HIGH.TEAC
 e FUT.TEAC > HIGH.TEAC
 f FUT.TEAC = HIGH.TEAC
 g FUT.TEAC < COOP.TEAC
 h FUT.TEAC > COOP.TEAC

- i FUT.TEAC = COOP.TEAC
- j COOP.STU < HIGH.STU
- k COOP.STU > HIGH.STU
- l COOP.STU = HIGH.STU
- m FUT.TEAC < LISESTU
- n FUT.TEAC > HIGH.STU
- o FUT.TEAC = HIGH.STU
- p FUT.STU < COOP.STU
- q FUT.STU > COOP.STU
- r FUT.STU = COOP.STU

Test Statistics

	COOP.TEAC – HIGH.TEAC	FUT.TEAC – HIGH.TEAC	FUT.TEAC – COOP.TEAC
Z	-2,232(a)	-1,740(a)	-,725(a)
Asymp. Sig. (2-tailed)	,026	,082	,468
	COOP.STU – HIGH.STU	FUT.STU – HIGH.STU	FUT.STU – COOP.STU
Z	-2,103(b)	-2,805(b)	-2,816(b)
Asymp. Sig. (2-tailed)	,035	,005	,005

- a Based on positive ranks.
- b Based on negative ranks.
- c Wilcoxon Signed Ranks Test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
HIGH-TEAC	10	18,0000	2,44949	14,00	22,00
COOP-TEAC	10	16,5000	2,54951	12,00	20,00
HIGH-STU	10	16,5000	3,74907	11,00	25,00
COOP-STU	10	19,7000	3,46570	14,00	24,00
FUT-TEAC	10	15,8000	3,52136	11,00	23,00
FUT-STU	10	24,5000	2,54951	20,00	28,00

APPENDIX O

TÜRKÇE ÖZET

Son yıllarda eğitimde bilginin yapılandırılması ve sorgulayıcı yaklaşımlara doğru olan değişimi yakalayabilmek için, yansıtıcılık öğretmen eğitiminde önemli bir yapı olarak ortaya çıkmaktadır. Kuramsal temelleri John Dewey (1933) ve Schön (1983, 1987)'nün çalışmalarına dayandırılan yansıtıcı düşünme öğretmen eğitiminde geniş uygulamalara sahiptir. Dewey yansıtıcı düşünmeyi, aktif, ısrarlı, bilinçli ve sistematik düşünme olarak tanımlar (Ekiz, 2003). Yansıtıcı öğretim başkalarının duygularına önem vermeyi ön plana çıkaran, öğretimde yapılandırmacılığı önemseyen bir sorgulama yaklaşımı ve yaratıcı sorun çözme etkinliklerinin bütünüdür (Arslantaş, 2003). Yansıtıcı öğretmenler öğretim durumunu analiz edebilen, duruma eleştirel bakabilen ve öğretme-öğrenme durumlarını değerlendirerek mesleki gelişimlerini sürekli olarak sağlayabilen kişilerdir (Ekiz, 2003). Yansıtıcı öğretmenler yeni bilgiler edinen ve bilgilerini sürekli yenileyerek güçlendiren kişilerdir. Yansıtıcı öğretmenler kendilerini yenileyerek ve durumları analiz ederek kendi öğretim etkinlikleri ve bunların öğrenci başarısı üzerindeki etkileri üzerinde sürekli düşünürler ve değerlendirirler. Yansıtıcı düşünen öğretmenler hem alanları ile ilgili gelişmelerden hem de pedagojik gelişmelerden yararlanırlar ve yenilikleri öğretimde daha etkili kullanırlar (Posnanski, 2002). Öğretimle ilgili bilgi toplayan öğretmen ve öğretmen adaylarının kendi davranışlarını, tutumlarını, inanışlarını, sorumluluklarını ve öğretim tekniklerini incelemeleri, öğretimde eleştirel yansıtmanın temel ilkelerinden elde edilen bilgileri kullanmayı kapsar (Arslantaş, 2003).

Dewey'e (1998) göre yansıtıcı bir öğretmen açık düşünceli, sorumluluk sahibi ve sağduyulu olmalıdır. Açık düşünceli bir öğretmen kendi görüşlerine ve öğretim uygulamalarına karşı soru ve tepkilere açıktır. Sorumluluk sahibi bir öğretmen öğrencilerin bireysel, eğitsel, ve duygusal gereksinimlerinden sorumludur. Sağduyulu bir öğretmen ise deneyimlerini tarafsız bir şekilde değerlendirebilir, alanıyla ilgilidir ve heveslidir (Ünver, 2003).

Yansıtıcı düşünme, Van Manen (1977)'nin teknik, uygulama ve eleştirel olmak üzere üç seviyeden oluşan modeli ile hiyerarşik bir yapı kazanmıştır. Van Manen (1977)'nin çalışmalarını dayanarak, Taggart ve Wilson (1998) ise teknik, uygulama ve diyalektik olmak üzere üç seviyede yansıtıcı düşünceden oluşan, fakat hiyerarşik olmayan, Yansıtıcı Düşünme Piramidini bir model olarak önermiştir. Yansıtıcı düşünce piramidindeki, teknik alandan diyalektik alana doğru olan gelişimsel süreç, deneyimsiz bir öğretmenin mesleki anlamda gelişerek deneyimli bir öğretmen olmasına benzetilmiştir. Teknik alanda yansıtıcı düşünen öğretmen öğretme-öğrenme etkinlikleri ile hedeflerin ilişkisini yalın ve kuramsal olarak tanımlar. Bu düzeyde, öğretmen yalnızca bir amaç için eğitsel bilgi ve eğitim programı ilkelerinin teknik uygulamasını düşünür. Sınıf, okul ve toplumun kuramsal yapısı problem olarak ele alınmaz (Ünver, 2003). Teknik alanda, öğretmenler davranış ve öğretim becerilerine odaklanarak, uygulamaların alternatif şekillerini düşünmezler (Taggart ve Wilson, 1998).

Uygulama alanında yansıtma, bir öğretim etkinliğinin eğitim hedeflerine ulaşma ve sonuçlarını değerlendirmenin altında yatan varsayımların açıklanması ile ilgilidir. Bu alanda öğretmen hedeflere ve davranışlara ulaşıp ulaşılmadığını, ulaşıldıysa nasıl ulaşıldığını yada ulaşılmadıysa neden ulaşılmadığını anlamak için öğrenci davranışlarını çözümler (Ünver, 2003; Altınok, 2002). Uygulama alanında, öğretmenler uygulamaları analiz ederek yada deneyimlerinden sonuç çıkararak alternatif uygulama geliştirebilirler (Taggart ve Wilson, 1998). Diyalektik alanda yansıtma ise eğitsel değerler ve uygulamanın daha çok etik açıdan ilişkisi ele alınır. Diyalektik yansıtma öğretime ilişkin etik ve sosyal değer yargılarını içerir.

Diyalektik alanda düşünen öğretmenlerin durumları yeniden yapılandırma ve kendini gözden geçirme becerisi gelişir ayrıca farklılıkları sınama ve sorunları çözmek için sistematik girişimlerde bulunma başarıları da yüksektir (Ünver, 2003).

Uzun süre davranışçı yaklaşımın etkisi altında kalan öğretmen yetiştirme programları, bilginin sosyal etkileşimle yapılandırıldığı yapısalcı felsefe çerçevesinde hızla yeniden yapılandırılmaktadır. Yapılandırmacılığa ve yansıtmaya dayalı profesyonel gelişim programları öğretmenlerin bilgi seviyelerini, öğretim durumlarını etkili bir şekilde analiz edebilmelerini, öğretim ortamlarını ve öğrenmeyi artıracak stratejiler seçebilmelerini sağlar. Yapılandırmacı yaklaşıma dayalı eğitim alan öğretmenler okullarda öğrencilerine öğretirken kullanacakları metot ve stratejilerle kendileri de eğitim almış olur (Posnanski, 2002). Etkili öğretim davranışlarını tanımlayabilmeleri ve kendi öğretmenlik davranışlarını analiz edebilmeleri için öğretmen adaylarının tutum ve inançlarını yansıtan öğretim deneyimleri yaşamaları öğretmen yetiştiren programlarda sağlanmalıdır. Öğretmenlerin yansıtıcı düşüncelerini sağlayan stratejilere, temel olarak yansıtıcı etkileşim içeren işbirliği ve çeşitli şekillerde sağlanabilen rehberlik ilkeleri temel oluşturmaktadır. Öğretmenlerin öğretim deneyimleri üzerinde yansıtımalarında yardımcı olabilecek, yansıtıcı otobiyografi ve günlük yazma, gözlem, mikro öğretim, akran değerlendirmesi, durum çalışması, eylem araştırması ve metaforlar gibi çok farklı yöntemler vardır.

Sonuç olarak, etkili bir öğrenme ve öğretme için öğretmenlerin kendi davranışları üzerinde eleştirel düşünebilmelerini sağlayan yansıtıcı deneyimlerde yer almaları gerekir. Bu bağlamda, öğretmen adaylarında yansıtıcı düşüncenin nasıl geliştiği ve nasıl yükseltilebileceği önemlidir. Bu çalışmanın amacı, Öğretmenlik Uygulaması dersini yansıtıcı ilkelere dayanarak planlamak ve yansıtıcı etkinliklerden oluşan bir çerçeve kullanarak öğretmen adaylarının yansıtıcı düşünme seviyelerini ve içeriklerini belirlemektir. Ayrıca, öğretmen adaylarının yansıtıcı düşünme becerilerinin gelişimi ve öğrenme-öğretme sürecine yönelik metaforları

sorgulanmıştır. Bu çalışmanın örneklemini, Pamukkale Üniversitesi, Eğitim Fakültesi Ortaöğretim Fen ve Matematik Alanlar Öğretmenliği Tezsiz Yüksek Lisans Programında 2005- 2006 bahar dönemi Öğretmenlik Uygulaması dersine devam eden 10 Biyoloji öğretmen adayı oluşturmaktadır. Yansıtıcı öğretmenlik uygulaması dersi, üniversite seminer dersleri ve uygulama okulu deneyimleri olmak üzere iki bölümden oluşmaktadır. Öğretmen adaylarının yansıtıcı düşünme becerilerini geliştirmek için uygulama okulunda gözlemledikleri ve kendilerinin anlattıkları derslerle ilgili yansıtıcı günlük yazmaları, akran rehberliği, ve mikro öğretim yapımları sağlanmıştır. Ayrıca öğretmen adaylarından, metafor kullanarak öğretmenlik mesleğine yönelik düşünce, tutum ve inançlarını ortaya çıkaran yansıtıcı otobiyografi yazmaları istenmiştir. Üniversitede yürütülen öğretmenlik uygulamasının seminer dersleri öğretmen adaylarının birbiriyle etkileşimini sağlamak amacıyla işbirlikli ve tartışmaya dayalı ortamda yürütülmüştür. Bunun için yansıtıcı çerçeve, problem tartışma etkinliği içermektedir.

Araştırmada nitel ve nicel desen birlikte kullanılmıştır. Nitel araştırma, olayların kendi bütünlüğü içinde ve doğal ortamında derinlemesine bir görüş ve anlayış kazanmasını amaçladığı için (Yıldırım & Şimşek, 2005), bu çalışmada öğretmen adaylarının yansıtıcı deneyimlerinin derinlemesine anlaşılmasında çoklu durum araştırması deseni seçilmiştir. Bu yöntem özel bir konunun veya durumun üzerinde yoğunlaşma fırsatı verir (Çepni, 2005; Merriam, 1998). Bu çalışmanın verileri hem nitel hem de nicel yöntemlerle toplanmıştır. Öğretmen adaylarının yansıtıcı otobiyografileri ve günlükleri, akran rehberliği, mikro öğretim ve problem tartışma yansıtıcıları, öğrenme-öğretme süreci ile ilgili metaforları, banda kaydedilmiş yansıtıcı tartışmalar ve görüşmeler nitel verileri oluşturmaktadır. Bu veriler, durum çalışması için seçilen üç öğretmen adayının yansıtıcı düşünme seviyelerinin ve içeriğinin daha derin incelenmesinde kullanılmıştır. Öğretmen adaylarının yansıtıcı düşünme seviyelerini ve öğrenme-öğretme sürecine yönelik düşüncelerini ortaya çıkarmak için kullanılan yansıtıcı düşünme ve metafor anketleri ise araştırmanın nicel verilerini oluşturmaktadır.

Öğretmen adaylarının uygulamalarında yansıtma yapmasını sağlamak için hazırlanan yansıtıcı çerçeve çeşitli etkinlikler içermektedir. Birinci etkinlik yansıtıcı otobiyografi yazmaktır. Öğretmen adaylarından uygulama öncesinde ve sonrasında rehber sorular çerçevesinde yansıtıcı otobiyografi yazmaları istenmiştir. Yansıtıcı otobiyografi öğretmen adaylarının bir öğretmen olarak kendi gelişimlerini değerlendirmelerini sağlayarak öğretmenlik mesleğine yönelik hislerini, düşüncelerini, tutumlarını, inançlarını ve görüşlerini yazabilmelerini sağlamıştır. Ayrıca, öğretmen adaylarının öğrenme-öğretme sürecine yönelik düşünceleri ve tutumları metaforlar aracılığıyla da incelenmiştir. Bunun için Saban (2004) tarafından geliştirilen Metafor Anketi otobiyografik dataya nicel destek ve bu anketten seçilen bir metaforun detaylı açıklaması ise nitel destek olarak kullanılmıştır.

Yansıtıcı günlükler ise öğretim olaylarının yazılı olarak ortaya konulmasıdır. Günlükler, olay ve düşüncelerin sonraki yansıtımlar için kaydedilmesini sağlar, öğrenmeye ve kendini değerlendirmeye yardımcı olur (Altınok, 2002; Hatton & Smith, 1995). Öğretmen adaylarından, gözlem yaptıkları yada anlattıkları ders deneyimlerinde yansıtma yapmalarını sağlamak için her hafta günlük yazmaları istenmiştir. Bunun için iki ayrı günlük rehberi sunulmuştur. Birincisi, Öğretmen Adaylarının Haftalık Yansıtıcı Günlük Rehberi'dir. Bu rehber, dersin zayıf ve güçlü yönlerini, derste geçen önemli olayları, öğretmen olarak gelişimlerini olumlu yada olumsuz etkileyen olayları sorgulayan sorulardan oluşmaktadır. İkinci rehber ise Yansıtıcı Günlük Rubriği'dir. Bu günlükle, öğretmen adaylarının gözlem yaptığı yada anlattığı ders için planlama, dersin işlenişi, öğretimin değerlendirilmesi gibi durumlar karşısında ne düşündüğünü, ne hissettiğini ve ne öğrendiğini kaydetmesi sağlanmıştır.

Ayrıca öğretmen adaylarının uygulama okullarında ders anlattıklarında akran rehberliği yapmaları sağlanmıştır. Akran rehberliği, aynı seviyede kişilerin (öğrenci, öğretmen, aday öğretmen) birbirlerinin derslerini karşılıklı gözlemleyerek arkadaşını yönlendirmesi ve destek vermesi temeline dayanır. Akran rehberliği temel olarak

dört aşamadan oluşur. Konferans öncesinde birlikte çalışan iki öğrenci ders öncesi bir araya gelerek ders planı üzerinde tartışır ve gözlemlenecek davranışa karar verilir. Gözlem aşamasında gözlemci ders anlatan arkadaşını dinler ve ÖVGÜ-SORU-ÖNERİ formunu kullanarak sonra tartışmak üzere not alır. Banda kaydedilen geribildirim aşamasında ise öğrenciler geribildirim formuna dayanarak ders sürecini kendi aralarında tartışır. Bu tartışmadan sonra gözlemci olan ve ders anlatan öğretmen adaylarından akran rehberliğinin öğretmenlikleri üzerindeki olumlu yada olumsuz yansımalarını içeren değerlendirme yapımları istenmiştir.

Mikro öğretim etkinliği için, öğretmen adaylarının öğretmenlik uygulamasının seminer derslerinde arkadaşlarına ders anlatmaları sağlanmıştır. Öğretmen adaylarının 10-15 dakikalık ders sunumları videoya kaydedilmiştir. Mikro öğretim etkinliği ders öncesi ve ders sonrası kendini değerlendirme sorularından oluşmaktadır. Bu sorular çerçevesinde öğretmen adaylarının kendi öğretim uygulamalarını yazılı olarak değerlendirmeleri sağlanmıştır.

Yansıtıcı çerçeve öğretmenlik uygulamasının seminer bölümü için öğretmen adaylarının belirlediği problemlerin tartışılmasını içermektedir. Öğretmen adaylarının gözlem yaptıkları eğitim uygulamalarından yada kendilerinin oluşturdukları bir problem durumunu arkadaşlarıyla tartışmaları sağlanmıştır. Bu etkinlik için öğretmen adaylarının belirledikleri problem durumu için yansıtıcı çerçevede yer alan problem tartışma adımlarını izleyerek yansıtıcı bir rapor yazmaları sağlanmıştır.

Yansıtıcı çerçeveye dayalı öğretmenlik uygulamasının değerlendirilmesi, dönem sonunda öğretmen adayları ile yürütülen yansıtıcı görüşmelerle sağlanmıştır. Öğrencilerin yansıtıcı otobiyografileri, yansıtıcı günlükleri, akran rehberliği yansıtımları, mikro öğretim yansıtımları, problem tartışma raporları ve yüz yüze görüşme sonucu elde edilen veriler üzerinde içerik analizi yapılmıştır. Nitel verilerin analizi öğretmen adaylarının, büyük oranda teknik ve uygulama alanında olmak üzere her üç alanda yansıtıcı düşünebildiğini göstermektedir. Buna göre, öğretmen

adaylarının teknik, uygulama ve diyalektik alanda; öğretim süreçleri başta olmak üzere, öğretmen özellikleri, sınıf yönetimi, öğrenciler ve öğretmenlik mesleği ile ilgili konularda yaşadıkları deneyimler üzerinde yansıtma yapabildikleri belirlenmiştir.

Öğretmen adaylarının nitel verilerden elde edilen yansıtıcı düşünme alanları, dönem başında ve sonunda doldurdıkları yansıtıcı düşünme anketinden elde edilen nicel verilerle de desteklenmiştir. Taggart ve Wilson (1998) tarafından geliştirilen Yansıtıcı Düşünme Anketi öğretmenlerin yansıtıcı düşünme seviyesini ve yansıtıcı düşünme özelliklerini nicel olarak belirlemekte kullanılmıştır. Öğretmen adaylarının bireysel olarak yansıtıcı düşünme anketinden aldıkları ön-test ve son-test sonuçlarına göre teknik seviyeden diyalektik seviyeye kadar değişen oranlarda yansıtıcı düşünme becerilerinde gelişme olduğu bulunmuştur. Yansıtıcı düşünme anketinin parametrik olmayan istatistiksel analizi sonuçlarına göre öğretmen adaylarının ön-test ve son-test sonuçları arasında da anlamlı bir fark bulunmuştur. Buna göre, öğretmen adaylarının uygulama öncesi teknik alanda, yansıtıcı öğretmenlik uygulamasından sonra ise uygulama alanında yansıtma yaptıkları gösterilmiştir. Bu sonuçlar, öğretmen adaylarının yansıtıcı düşünme becerilerinin gelişimsel bir süreçte sahip olduğunu göstermiştir. Eğitim sorunlarına ve çözümlerine ilişkin yeterli deneyimleri olmayan öğretmen adaylarının teknik alanda yansıtma yapması beklenir (Taggart ve Wilson, 1998). Öğretmenlerin deneyimleri arttıkça üst seviyede yansıtıcı düşünceleri kolaylaşır. Öğretmenlik mesleğinin başında olan öğretmen adaylarının yansıtma alanlarının ilk seviyelerinde olduğu nitel ve nicel verilerle desteklenmiştir. Bu üç alanda düşünme, uygun zamanda kullanıldığında etkilidir. Bu yüzden, öğrenci, öğretmen adayı yada öğretmenlerin her üç alanda düşünebilmesi sağlanmalıdır (Ünver, 2003).

Öğretmen adaylarının öğrenme-öğretme sürecine yönelik düşüncelerini ortaya çıkarmak için kullanılan Metafor Anketi ise öğretmen adaylarının gelecekte bir öğretmen olarak kendilerini, geçmişteki lise biyoloji öğretmenlerini ve uygulama okulu rehber öğretmenlerini davranışçı ve yapılandırmacı öğrenme-öğretme

anlayışını temsil eden farklı metaforlarla algıladıklarını ortaya çıkarmıştır. Metafor bir kavram, olgu veya olayın başka bir şeye benzetilerek açıklanmasıdır (Saban, 2002). Başka bir ifadeyle, metafor günlük düşüncelerle bilimsel düşüncelerimizi ifade edebilmemizi sağlayan bir dildir (Martinez, et al., 2001). Metaforların öğretmenlerin gelecekteki davranışlarının belirlenmesinde etkili olması önemini artırmaktadır.

Sonuç olarak, eğitim programları çağdaş yaklaşımların etkisi altında yenilenirken, bu yaklaşımları etkili bir şekilde uygulayabilecek öğretmenlerin yetiştirilmesinde yansıtıcı düşünme öğretmen eğitiminde önemli bir model olarak ortaya çıkmaktadır. Bu araştırma, yansıtıcı stratejilere dayalı yansıtıcı çerçevenin öğretmen adaylarının deneyimler, işbirliği, rehberlik, ve modeller aracılığı ile yansıtma yapabilmelerini ve böylelikle kendi mesleki gelişimlerine farkında olarak katkıda bulunmalarını sağlamıştır. Araştırmanın sonuçları, gerekli rehberlik sağlandığında öğretmen adaylarının değişik seviyelerde ve konularda yansıtma yapabildiğini, ve yansıtıcı düşünme becerilerinin geliştirilebileceğini göstermektedir.

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: SAVRAN GENCER, AYŞE

Nationality: Turkish

Date and Place of Birth: 26 April 1975, Denizli/Çal

Marital Status: Married

Phone: +90 2582691071

Email: asavran@pau.edu.tr

EDUCATION

Degree	Institution	Year of Graduation
MS	METU SSME	2002
BA	METU Biyoloji Öğretmenliği	1997
High School	Denizli High School, Denizli	1992

WORK EXPERIENCE

Year	Place	Year
1998-2001	The Ministry of National Education	English Teacher
2001-2005	Pamukkale University, Education Faculty	Instructor
2005-	Pamukkale University, Education Faculty	Research Assistant

FOREIGN LANGUAGES

Advanced English

Master Thesis:

Ayşe SAVRAN, Presevice Science Teachers' Efficacy Beliefs Regarding Science Teaching and Their Classroom Management Beliefs, ODTÜ, 2002.

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HOBBIES

Tracking, Swimming, and Music