

INVESTIGATING THE QUALITY OF TEACHER REFLECTION AND
THE NATURE OF CHANGES IN THE QUALITY OF TEACHER
REFLECTION THROUGH CRITICAL INCIDENTS ANALYSIS

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NATURE OF CHANGES IN THE QUALITY OF TEACHER REFLECTION
THROUGH CRITICAL INCIDENTS ANALYSIS**

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ABSTRACT

INVESTIGATING THE QUALITY OF TEACHER REFLECTION AND THE NATURE OF CHANGES IN THE QUALITY OF TEACHER REFLECTION THROUGH CRITICAL INCIDENTS ANALYSIS

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This embedded mixed methods research is an investigation to explore the current status of teachers' reflections and the role of the guided reflective practices through critical incidents analysis in the development of teachers' reflections and their teaching actions. To address this purpose, a multi-case study design is embedded in the survey study. The study involved a sample of 236 teachers from 66 public elementary schools in Ankara that are selected through cluster random sampling. From the sample, ten teachers volunteered to become a study group. This study is carried out between 2017 and 2019 through utilizing multiple sources, including the Vignette-Based Assessment of the Quality of Teacher Reflection Instrument (VBAQTRI), semi-structured interview schedules, reflective journals, video records of reflective discussion sessions, field notes and memos. Descriptive statistics, content analysis, within and cross case analysis are used to analyze the data. Overall, findings of the survey

study suggest that teachers generally relied solely on pedagogical preferences and instructional related issues used to accomplish predetermined objectives. Their reflections are limited to their thoughts about lack of students' engagement and students' disruptive behaviors. In the multiple-case study, teachers' reflections indicated growth over time and as the study progressed deeper reflections are evidenced in reflective discussions compared to the reflective journal writings. This combination of findings highlights that the current status of the quality of teacher reflection is evidence-based, and indicates a significant impact on how teachers engage in guided reflective practices through critical incidents analysis and what they take away from them through empowering their instructional decisions and actions.

Keywords: Quality of Teacher Reflection, Critical Incidents Analysis, Guided Reflective Practices, In-Service Teachers, Mixed Methods Research Design

ÖZ

ÖĞRETMENLERİN YANSITICI OLMA DURUMLARININ NİTELİĞİ VE KRİTİK OLAY ANALİZİ ARACILIĞIYLA YANSITIMLARINDAKİ NİTELİK DEĞİŞİMİN İNCELENMESİ

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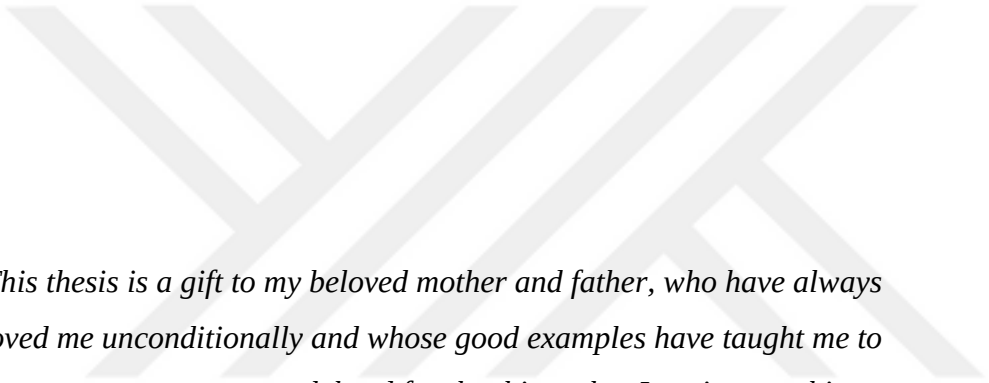
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Karma yöntem araştırma deseni kullanılan bu çalışmada, öğretmenlerin yansıtıcı olma durumlarının niteliğini incelemek ve kritik olaylar analizi aracılığıyla yansıtma temelli rehberliğin öğretmenlerin mesleki gelişimlerine ve yansıtıcı olma niteliğine katkılarını ortaya koymayı amaçlamıştır. Bu amaç doğrultusunda, Ankara ilinde bulunan ve küme örnekleme yöntemi ile seçilen 66 devlet ortaokulunda çalışmakta olan 236 öğretmen tarama çalışmasına dâhil olmuştur. Bu öğretmenlerden 10 kadın öğretmen gönüllü olarak çoklu durum çalışmasına katılmıştır. Veri toplama aracı olarak, Vinyet Tabanlı Öğretmen Yansıtma Niteliğini Değerlendirme Anketi, yarı yapılandırılmış görüşmeler, yansıtıcı günlükler, yansıtıcı tartışma toplantılarının video kayıtları, saha notları ve araştırmacı memoları kullanılmıştır. Toplanan verilerin analizinde betimsel istatistikler, içerik analizi ve durum içi ve çapraz durum analiz yöntemleri kullanılmıştır.

Tarama çalışmasından elde edilen bulgular, öğretmenlerin çoğunlukla rutin ya da teknik düzeyde yansıtma yaptıklarını işaret etmektedir. Dahası, öğretmenlerin öğretim süresince alınan kararları ve bu kararların öğrenciler üzerindeki etkisini göz ardı ettikleri ve çoğunlukla kendi davranışlarına odaklandıkları ortaya çıkmaktadır. Çoklu durum çalışmasından elde edilen bulgular ışığında ise, genel olarak, öğretmenlerin yansıtmalarının niteliğinin zamanla olumlu yönde değişim ve gelişim göstermiştir. Bir başka önemli bulgu ise, öğretmenlerin sözlü olarak yaptıkları yansıtmalarda yazılı olarak yaptıkları yansıtmalara göre daha derin ve üretken oldukları görülmektedir.

Sonuç olarak, bu bulgular öğretmen yansıtmaları ile ilgili olarak kavramsal önermeye önemli bir katkı sunmaktadır. Ayrıca, bu çalışma ile kritik olaylar analizi içeren yansıtıcı uygulamaların öğretmenlerin mesleki karar verme süreç ve eylemlerinde onları güçlü kıldıkları sonucuna varılmaktadır.

Anahtar Kelimeler: Öğretmenlerin Yansıtıcı Olma Durumları ve Niteliği, Kritik Olaylar Analizi, Araştırmacı Rehberliğinde Yansıtma Temelli Uygulamalar, Hizmet içi Öğretmenler, Karma Yöntem Araştırma Deseni



This thesis is a gift to my beloved mother and father, who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve.

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LIST OF ABBREVIATIONS

Human Development Index: HDI

Human Development Foundation: INGEV

Ministry of National Education: MNE

Vignette-Based Assessment of the Quality of Teacher Reflection

Instrument: VBAQTRI



CHAPTER 1

INTRODUCTION

“Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning.”

Albert Einstein

This chapter establishes a background and the importance of this study, indicates its focus and purpose and explains the definition of key terms used throughout the study.

1.1. Background to the Study

Education improves our life in many different ways, especially helping us to shape our personality for better a life. Education has the first and foremost purpose of enabling learners to gain certain skills and knowledge for understanding themselves as individuals. Teachers are best known for the role of creating such a learning environment that learners can understand themselves. As far as teaching is concerned, it is widely accepted that becoming a teacher is emotionally rewarding as it provides a great opportunity to see learners grow cognitively, socially and emotionally, which makes a significant impact on their future lives. The truth of the matter is that we have enough knowledge about that teaching has the reputation of being a challenging and a highly demanding profession, in which teachers face different situations and complex dilemmas that require certain skills such as problem solving, critical thinking, and having autonomy (Danielson, 2007). Evidently, teachers must retain some degree of flexibility to resolve dilemmas (Campell, 2006) since they cannot be prepared for every situation they may face in their professional lives before they start to work (Cutforth & Hellison, 1992). The curiosity to know how to deal with the challenges

presented in the daily teaching process leads to look for strategies to perform better teaching practices within a complex and demanding work world. In spite of the fact that specific strategies for dealing with complicated issues effectively in teaching profession have unobtrusive contrasts, every one of them concur that teachers need to become thoughtful decision-makers and to cultivate reflection (Throsen & DeVore, 2013).

Although reflection is not considered as an easy job to do for teachers in today's busy and demanding world of their work, it still has various pedagogical importance for teachers. For Dewey (1933), reflection offers the chance for teachers to learn from teaching experiences for their professional growth. Here, reflection generally refers to practices through which teachers perceive what they do and why they use the particular teaching methods; it also refers to critical analysis of teachers' own beliefs on teaching and learning and thus feeling more responsible for their actions (Shapira-Lishchinsky, 2011). More importantly, with reflection, teachers are more likely to become more confident in their teaching and are self-motivated to learn more about contextual factors that have an influence on their teaching practices (Pedro, 2005). Given the many benefits of reflection in teacher professional development (Killeavy & Moloney, 2010), it is not surprising that teachers feel themselves more motivated to pursue their job when they reflect on their experiences (Throsen & DeVore, 2013). The relationship between teachers' job satisfaction and their reflective practices can be explained by the fact that teachers generally need to reflect on their teaching experiences when they have a desire to find solutions for classroom problems and when they do not have the answer for solving their problems by using their practical theories or as Schön refers their "*knowledge in action*" (Schön, 1987, p.8). Collectively, teachers' reflective practices can have positive and significant impacts on their teaching effectiveness. This link between effective teaching and reflective practices should not surprise us, as reflective practices are considered as means to possible actions to achieve change beliefs, assumptions and values for the improvement of teaching quality.

Given the significant value of reflection for the professional development of teachers, the notion of reflection cannot escape careful analysis. Obviously, when reflection involves careful consideration of both "seeing" and "action" and is supported by deeper and critical analysis in addition to self-awareness, we can expect significant changes in a teacher's actions, especially in more complex situations. For reflection to

lead to changes in teachers' actions, eventually for valuable teaching outcomes, I believe it is critical to address the quality of reflection. Various questions invited by the quality of reflection are complex and varied. The recognition of the quality reflection requires how reflection is to be understood. In that sense, these include queries about the nature of reflection (e.g. what reflection entails) and about its content and focus (e.g. the matters on which teachers are invited to reflect about). Moreover, discussion of its value predominantly involves the question of its quality since in developing reflective teachers, it is critical not only to determine whether or not teachers are reflecting on their practices but also to judge their quality of reflection. In the same way as effective teaching is essential to enhance better learning outcomes, the quality of reflection is critical for effective teaching. This implies that not every reflection can lead to effective teaching. Thus, several critical questions arise about the development of reflection (e.g. whether reflection occurs naturally or not, how one can recognize a reflective teacher, which criteria can be specified relevant to judgements of adequacy and how one can assess reflection to see whether it is adequate judgment in action). Overall, this study has an attempt to respond to these overarching specific questions by developing a holistic understanding of teacher reflection, with the hopes of determining the conditions that have an influence on the quality of teacher reflection.

The rest of this chapter describes the purpose of the study to address the research questions, the significance of the study, and definition of key terms.

1.2. Statement of the Problem

Getting to grips with a holistic understanding of reflection in teaching is the right place to start in this study. The concept of reflection in the teaching profession is not as new as we all imagine as educators and researchers. Still, reading about teacher reflection, no doubt, one can notice that reflection is complex, its varieties are numerous and unique and it is mostly based on personal experiences. Hence, there are several important issues related to the notion of teacher reflection where this study seeks to obtain data which will help to address them.

First of all, given the difficult inherent of this multifaceted character of reflection, it is the main reason that why teacher reflection has been constantly negotiated and

disputed for thousands of years and have different meanings for different scholars (e.g. Dewey, 1933; Schön, 1983; Valli, 1997; Van Manen, 1977; Zeichner, 1996). Numerous scholars have been contributed to develop an appreciation of the concept of reflection in the field of teaching and understanding of reflection in the previous studies sheds light on the way I define teacher reflection in this study. Essentially, the previous conceptualizations of teacher reflection are largely based on the assumption that reflection is purely preoccupied with cognitive process and systematic aspects of reflection. This understanding has been misleading and given the message that what teachers reflect upon (content); how they reflect on their teaching (nature); and how they feel about their teaching (emotions) had been less important, even ignored. However, with the recent emphasis on the fact that teacher reflection is a complex and situation-specific effort, this study pays more attention to these three dimensions of teacher reflection as a whole, which also can be used to define and judge what good teaching is and to help teachers determine whether they are making good decisions. In that sense, through this study I want to expand on this notion of teacher reflection to the idea that teacher reflection is more than a cognitive process and entails an intermingling of different sorts critical examinations of theoretical knowledge, experiences and emotions with self-analysis and a sense of a commitment to take an action. From this perspective, I believe it is important to keep in mind that this process can be individual or collective as teacher reflection is construed as a situated practice, which enables me to focus on how the association between context and people play in creating this context. All in all, although extensive research has been carried out on teacher reflection, there has been little discussion about these dimensions of reflection together. The complex, situated, and active nature of teaching leads me as a researcher to work out the potential to elevate the roles of teaching. In order to fulfill this potential, this study provides an exciting opportunity to advance our knowledge of teacher reflection situated in a social context with all related dimensions.

Another incentive for conducting this study arose from the idea of that firm connections between reflective practices and the changes in the teaching and learning process must be established. Any teaching situation is not identical to one and another. Well-adapted teaching occurs when teachers respond properly to the uncertainties of a given situation. The key point is that reflective practices hold significant promise for the need for teachers to adapt teaching in response to each new situation. Despite the

strong focus on reflection in the literature, to date, there has been little discussion about how reflective practices influence teachers' teaching. This is because much uncertainty still exists about reflective practices being used on a significant scale to support the professional development of teachers due to several obstacles such as a lack of time of teachers to engage in reflective practices on a regular basis, lack of conscious (Ball & Cohen, 1999) and administrative resistance for supporting the development of teachers' reflective practices (Danielson, 2014; Etscheidt et al., 2012; Throsen & DeVore, 2013). Such shortcomings not only make it difficult for teachers to engage in reflective practices but also makes it difficult for researchers to obtain valid and reliable evidence on the current status of teachers' reflections. Notably, the reflections of teachers featured in this study serve two main purposes. The first one is associated with the quality of teachers' reflection. While the conceptualization of teacher reflection is essential, the quality of reflection also has a significant influence on how teachers gain benefits from reflection. Reflection is more valuable when it moves from surface reflection to a more substantial, deeper, more sophisticated one. For instance, some reflection of teachers might be trivial and others might be profound. The latter may have significant effects on teaching practices compared to the former. In short, this critical role of identifying the quality of teacher reflection in its development is well recognized in this study. This understanding could conceivably serve for the purpose of providing explicit ways to promote the quality of teachers' reflections. However, the main purpose of this study is not simply to categorize what teachers reflect upon, rather, it is to examine their reflections to understand whether and how reflective practices can be promoted. As a starting point, understanding the quality of reflection provides useful background information to prepare me as a researcher to understand the various ways of that teachers reflect on their teaching experiences, and to provide tools for analysis needed to view teachers' reflection for the purposes of designing instances of reflective practices. Combining these ideas in this study presents a more accurate picture of teacher reflection and this research attempts to shine new light on these debates through the detailed examination of teachers' reflections.

When teachers engage into reflective practices, one thing is chiefly sought: classifications of different types of reflections that they produce. The issue of how reflection is assessed has been controversial so far and yielded inconclusive findings.

Questions raised about assessing teachers' reflection have been primarily based on the assumption that reflection is subjective (Clarkeburn & Kettula 2012) and has a complex and personal nature which is inherently difficult to identify its evidence (Sumsion & Fleet 1996). In this regard, reflection has been described as an individual cognitive process, in which teachers possess such belief systems that are built up only through an all-knowing eye in their classrooms and that their reflection on the classroom situations are independent from their personal experiences and feelings. In that sense, previous exposition that bases reflection on a cognitive process is unsatisfactory. Even more surprising, within this aspect of the situated nature of teaching, teachers' assumptions, beliefs, values and emotions about teaching that and the role of language had not received considerable critical attention yet in the previous studies. It is well-known that teachers' assumptions, beliefs, values and feelings have a strong influence on how they frame classroom situations (Ball, 1990).

The notions of cogito that often ignores important contextual considerations involved in teaching and learning also fails to notice how knowledge is generated through language and social interaction. Indeed, when a teacher frames a situation to reflect upon, they see the situation depending on the belief systems that has been developed gradually, mostly in line with the predominant norms of teaching (Dewey, 1933). For Burke (1966), language powerfully identifies the belief system and this claim also confirms that teachers reflectively frame situations with their available terms and language. Collectively, the understanding that reflection is characterized as a situated practice has gained fresh prominence with few arguing that it is important to take into account the social, moral, and complex teaching-matter concerns. This study has more focus on reflection as a multidimensional and a situated practice within a sociocultural context is required in such a way that reflection is also influenced by teachers' emotions and the use of language when the affective aspect of teaching is considered, and when reflection is bound by language. As such, this study has attempted to expand the previous cognitivist understanding to the social constructivist perspective by bringing in different dimensions of reflection, i.e. language that teachers use while reflecting and emotions that teachers have for the issues that they reflect upon.

Another major issue that gives rise to this study is the fact that much of the available literature on reflection deals with the question of whether reflection occurs naturally or not. This view is supported by the understanding of that various factors have impacts

on what and how teachers reflect such as the knowledge, experience, attitudes teachers hold towards the issues they reflect on (Luttenberg, Meijer & Oolbekkink-Marchand, 2017), and the intrinsic motivation that they bring to the reflective process (Russell, 2005). By drawing on fulfilling the potential of reflective practices, teachers need to establish the firm connections between reflective practices and positive changes in their teaching actions (Kagan, 1990). To better understand the mechanisms of reflective practices and their roles, teachers need to make sense of their professional experiences in a structured way (Wallace, 1996). It is therefore essential to provide teachers with a variety of means for structuring their reflections. Otherwise, if the reflective experience is unstructured, teachers may reflect on too many issues and not focus on their actions, which does not result in a productive reflection that leads to change in their teaching practices (Pailliotet, 1995). Moreover, it is well documented that when support structures such as guiding practices are provided, teachers are left to their own understandings of teaching and learning in order to enrich their teaching experiences. However, relying on guided practices alone can be problematic. That is to say, merely using guided practices in the reflection process may not assure deeper reflection. As with all bodies of knowledge, even it is more useful to allow teachers to reflect on aspects of teaching that they want to reflect on (Husu, Toom & Patrikainen, 2008). In this regard, uncovering critical incidents is increasingly recognized as one of important ways in fostering the shift in the conceptualization of teachers in a way that teachers can move towards greater awareness of the reasons, beliefs and motives that regulate their teaching practices (Griffin, 2003). Thus, becoming reflective teachers is distinguished from being a teacher technician. In that sense, teacher technicians generally operate from a number of fixed assumptions about teaching and learning and act solely upon personal perspectives that may lead to maintain ineffective teaching practices (Dewey, 1933). Particularly, in Turkey, the education system is still based on top-down approach and regarding this approach, teachers are viewed as performers of a written and prescribed curriculum. This approach is opposed to the concept of twenty-first learning century that reflects the idea of education is not value-neutral and the need for teachers being reflective practitioners is urgent all over the world. This contradiction emerged with the role of teachers played in curriculum decision-making in such a way that teachers do not seem to think and act intentionally and consciously according to the curriculum mostly because they lack autonomy to make curricular decision independently. The initial impetus for this work emanated from this main

concern of how teachers can have freedom to decide what to teach and how to teach because it is crystal clear that teachers' own beliefs about curriculum have a strong influence on how they deliver the curriculum in their classes. This view directed me to focus on the understanding of curriculum as a belief system rather than a cookbook recipe, in which curriculum can change when a teacher changes beliefs and instructional practices based on the experiences in a real classroom setting. There appears to be scarce empirical evidence supporting the usefulness of reflective practices in transforming teachers into reflective practitioners who understand their own assumptions and can make better-informed judgements about instruction (Kim, Micek, & Grigsby, 2013). In that sense, reflecting on critical incidents offers an effective way of revealing the assumptions that inevitably influence teaching and learning, and eventually lead to better outcomes (Calandra et al., 2009).

Reflection on critical incidents is a worthwhile practice when teachers can reflect with other colleagues. This dialogic reflective practice through critical incident analysis allows teachers to understand their beliefs by interacting with other teachers so that they can visualize options beyond the scope of their own assumptions. The interactions among and between teachers illuminate another key to our teachers' reflective window as trust within a collaborative environment. In other words, reflection is productive only in the presence of significant others such as colleagues and teacher educators and conditions that nurture deliberative and systematic reflection. Hence, it is expected that reflection occurs as a wholly beneficial practice for teachers when they are supported and guided through engaging them in a critical and significant issue of reflection, with providing them with conditions that make reflection productive and collaboration with their colleagues for inquiring rigorously.

Considering the emphasis on the guided reflective practices through which teachers identify the classroom events that are critical for them to reflect on, it is important to investigate what the reflective practices are like for teachers who engage in processes including different ways of examining their own classroom practices (i.e. critical incidents analysis, reflective journals and reflective discussions), which forms one of the central foci of this study. In view of all that has been mentioned so far, I believe it is important to keep in mind that the combination of critical incidents analysis and interaction of teachers with their colleagues could provide support for key aspects of reflection. Rodgers (2002) points to reflection as a means of not only uncovering

preconceptions of teachers, but also analyzing and reducing them to workable localized theories of teaching. However, I believe much remains ambiguous about the combination of critical incidents analysis and collaborative reflective discussions and their roles in the facilitating the quality of teacher reflection and eventually resulting in better teaching outcomes. This indicates a need to highlight the gaps in the literature about the roles of these two support structures through a guided and structured way that have on teachers' reflection quality. Therefore, this study makes a major contribution to research on the understanding the various perceptions of that reflection is communal by demonstrating why the addition of critical incidents analysis through interaction with other teachers as a tool to aid in the guided reflective process is significant.

1.3. Purpose of the Study

This study is concerned with how reflection is practiced illuminate what teachers reflect on and provide additional information about the reasons why they alter their teaching practices. Therefore, primary attention is given to unpack the ideas about reflection in this inquiry in agreement with both theoretical and practical evidence through revisiting the notion of reflection as a situated practice. Given the emphasis on teacher reflection as a situated practice which is spawned by cognitive and affective aspects, I related teacher reflection to four different dimensions, named as *breadth of reflection*, *depth of reflection*, *form of reflective dialogue* and *affectivity of reflection*. In response to the calls for a holistic and systematic framework for assessing teacher reflection with the recent view, this account seeks to clarify four dimensions of teacher reflection. Through the use of a qualitative, multi-method, in-depth investigation, and working with teachers of varying backgrounds, this study attempts to explore and to describe how teachers themselves perceived the significance of seriously thinking about their own teaching behaviors had an impact on how they think about teaching in general, and why they do what they do when they are teaching as a result of regular participation in structured guided reflective practice sessions. Aspects of the teaching context that is the focus of the guided reflective practices during the investigation include:

- Teacher's beliefs about the subject-matter under consideration

- Teacher's beliefs about pedagogical methods and theory
- Teacher's beliefs about the characteristics of learners

Collectively, the present study has multipurpose as its nature of having an embedded mixed methods research design. This study, therefore, set out to assess the quality of reflection of elementary science teachers, and to investigate the roles of guided reflective practices through critical incidents analysis in conjunction with their colleagues in the changes in the quality of reflection that teachers engaged in, their views of the context of teaching, and subsequently their instructional decisions.

In line with the aim of the study, the following research questions emerge:

1. What is the quality of reflection that elementary science teachers engage in?
 - a) What do elementary science teachers focus on while reflecting on critical incidents (breadth)?
 - b) What is the level of reflection of elementary science teachers while reflecting on critical incidents (depth)?
 - c) What is the language that elementary science teachers use while reflecting on critical incidents (form of reflective dialogue)?
 - d) Which emotions do elementary science teachers identify while reflecting on critical incidents? (affectivity of reflection)?
2. How does the quality of reflection of elementary science teachers on critical incidents change throughout the guided reflective practices?
 - a) How does the focus of elementary science teachers' reflections change throughout the guided reflective process change (breadth)?
 - b) How does the level of elementary science teachers' reflections change throughout the guided reflective process (depth)?
 - c) How does the language used in elementary science teachers' reflections change throughout the guided reflective process (form of reflective dialogue)?
 - d) How do emotions of elementary science teachers change throughout the guided reflective process (affectivity of reflection)?
3. How do elementary science teachers describe their experiences about engaging in the guided reflective practices through critical incident analysis?

1.4. Significance of the Study

There are several important areas where this study makes an original contribution to the literature of reflective practices in the teaching profession. First and foremost, this study aims to contribute to the growing area of research on teacher reflection by revisiting the criteria for identifying the quality of teachers' reflections to develop a holistic framework through a valid and reliable way based on both theoretical and practical knowledge. Adopting reflection at the heart of the understanding of teacher professional development created an emerging need for ways of its assessment. Amid the explosion of interest in exploring how the quality of teacher reflection is assessed (e.g. Loughran, 2002; Sparks-Langer, 1992; Liston & Zeichner, 1990; Tabachnick & Zeichner, 1991), a widely accepted method for identifying and assessing its quality does not exist yet due to personal nature of reflection and the complexity and unpredictability of teaching practices (Thorsen & DeVore, 2013). However, given the consensus of recent studies about reflection is multifaceted with socially situated nature (e.g. Macdonald & Tinning, 2003; Malthouse, Watts & Roffey-Barentsen, 2015; Roffey-Barentsen & Malthouse, 2013), it is hardly surprising that reflection can be viewed as a process of internal dialogue facilitated by thinking or writing and reflection can be promoted through an external dialogue together with others (Clarke, 2004).

In line with the understanding of teacher reflection a social practice through a deliberative thinking process that guides the future decisions and actions as a result of explicit examination of past and/or present teaching experiences within a professional community environment, this study provides an important opportunity to review diverse theoretical underpinnings to conceptualize a new, transferable, customizable and a broader framework to assess teacher reflection as a contextualized practice through adopting an eclectic model including four major components: (1) what a teacher reflects about (*breadth*) (Laboskey, 1994), (2) how a teacher reflects (*depth*), (Luttenberg & Bergen, 2008; Taggart & Wilson, 2005), (3) how a teacher uses language to reflect (*form of reflective dialogue*) (Lane, et al., 2014) and (4) which affective concern(s) a teacher has while reflection on a specific teaching experience (*affectivity of reflection*) (Dewey, 1933; Zembylas, 2014). Ultimately and importantly, based on this holistic framework, a new instrument and its coding scheme is developed and validated through this empirical study.

In relation to assess the quality of teacher reflection aligned with the view of reflection as a socially situated practice, this study highlights that through the existing instruments, which mostly have a rating-based format, teachers are unable to reflect the complexity of teaching to elicit the underlying their tacit assumptions and beliefs since the instrument are more isolated from the context of the real classroom settings (Murphy & Ermeling, 2016). To overcome this deficiency and as an alternative approach to rating-based instruments, text-based instruments including short stories are recommended, in which a real classroom context is provided to situate teachers' reflections by using open-ended questions to facilitate the critical analysis and interpretation of the represented teaching practices (Stecher, et al, 2006). Although using text-based instruments is a more meaningful and productive way to find out related evidence for the quality of reflection, very little is known about how they are useful for both facilitating reflection and assessing its quality. Consequently, as one of the common text-based instruments, a vignette-based instrument is used in which the authentic teaching contexts with complexity including different aspects of teaching are involved. Hence, this study provides an exciting opportunity to advance our knowledge of how to assess the quality of teacher reflection through a vignette-based instrument.

Considering the importance of using augmented vignettes to assess teachers' reflection quality, a corresponding coding scheme is developed to analyze both verbal and written reflections in this study. This study systematically reviews the data obtained from the vignette-based instrument with the use of its coding scheme aiming to provide insight into their reflections as a more holistic view. Overall, this study is significant since it concerns a teacher's reflections from multiple perspectives, developing an initial theoretical framework with research based implications for the use of vignettes well-suited to serve for not only promoting reflections but also assessing the quality of reflection.

Given the potential for empowerment and transformation of teachers through reflective practices, the study also offers all-important insights into revealing effective strategies for practice for illuminating teachers' reflection in actions. It proposes structured and guided reflective practices that are expected to have practical applications for teachers in their teaching actions. Two requirements are given priority to reflective practices. Needless to say, active participation of teachers is required to

engage in reflective practices (Moon, 2004; Procee, 2006; Schön, 1983). As another requirement, it is a widely held view that reflection practices are facilitated through inner and outer dialogues (Benammar, 2004; Dewey, 1933; Leijen, et al., 2012; Procee, 2006). Both types of dialogue help teachers to share and learn from experiences and ideas from their colleagues' views, which leads to interpret, develop and change their own perspectives further. The potential methods for developing professional perspectives have been found to be the guided reflective practices (Husu et al, 2008; Leijen, et al., 2009; Sööt & Leijen, 2012). In this study reflection is framed as a social practice in which all the participants are involved in using and making explicit their reflections about their teaching practices through combining both internal and external reflective dialogues. Within the face to face meetings held in this study, the teachers are each responsible for personal reflection and committed to actively seeking new or creative perspectives within the group. Such an emphasis on teacher reflection has the overarching aim of helping to understand how reflection can be enhanced when a teacher engages through reflective dialogue with colleagues. This study implies that reflective practices can be initiated and further developed through exchanging ideas and perspectives among teachers in a social environment. From this starting point and perspective, discussions between teachers offer tools needed for reflection. By using the guided reflection practices, teachers' interpretations can be used in ways that deeper reflection is encouraged and, consequently, this provides tools for their professional development. Thus, this study might be the first study to undertake an investigation of the role of guided reflective practices including critical incidents analysis and collaborative reflective dialogues on teachers' instructional decisions and actions.

Still, the previous research on guided reflective practices has been mostly restricted to pre-service teachers. This indicates a need to understand its impacts on in-service teachers. Then, this study introduces the potential for the use of the guided reflective practices to support the development of teachers' professional practices. In contrast the previous research studies, rather than pre-service teachers, in-service teachers formed the central focus of this study mainly due to the perception that a teacher must develop a body of classroom experiences before being able to reflect upon them. In that sense, one can claim that the reflections of a pre-service teacher are therefore different in quality from those of a highly skilled and experienced teacher. The

significance of equipping in-service teachers with the conceptual tools with which they can critically reflect upon their professional experiences is that they can transfer their learning from one situation to another, related situation and thus lead to better student learning outcomes. However, in-service teachers generally do not know how to engage in reflective practices. We cannot expect from teachers who do not have reflective consciousness engage in productive reflection because it requires far more than telling teachers to reflect and then simply hoping for the best. To become more conscious about instructional decisions and actions, teachers need to learn about how to promote reflective practices explicitly, directly, thoughtfully and patiently. This will make them consciously articulate and examine their repertoire of teaching experiences. Moreover, a benefit of being a reflective practitioner is that it frees teachers from the routines of the automatic teacher behaviors. Unexpected problems tend to create a greater sense of urgency than do expected problems, even if they are not important. Becoming a reflective teacher allows them to improve their own teaching practices by becoming more thoughtful and competent. Their viewpoints and actions can become coherent, which increases credibility of teachers with their students and themselves as well. When teachers reflect, the process contains some systematic analysis of the problem, event, or issue with a recursive character in which the role of the researcher in this study is to serve as another pair of eyes, assisting teachers in looking critically at their teaching practices. Also, not all teachers have the opportunity to work with a researcher. All in all, the results of this study are expected to be useful for teachers, researchers and teacher educators who wish to derive greater benefit from various reflective tools and practices used in this study.

It is also worth noting that all teachers participating in this study decide what to reflect on within a supportive environment. This is important since asking teachers what part of their practices they wish to improve helps to increase their motivation for enhancing reflective practices. An important assumption is that altering teaching practices requires internal motives rather than external (Willkie, 2019). Reflection reverses the natural tendency of top-down control, which Fullan (2006) believes does not bring about lasting change. Upon critical examination of teaching decisions and actions, teachers are enabled to notice a discrepancy between their perceptions and teaching practices. The study seeks to demonstrate that teachers are enabled to alter their practices if they see a contradiction between their perceptions and practices. In that

sense, this study has immediate applications for teachers who desire to change their classroom experiences. That is why the results of this study can generate subsequent further research, encouraging the process of the guided reflective practices among teachers in different subject areas.

1.5. Definition of the Terms

Throughout this paper, the following definitions of the key terms are taken into considerations:

Teacher reflection / reflective practice is operationally defined as a deliberative thinking process that guides the future decisions and actions as a result of critical examinations of theoretical knowledge, past and present teaching experiences, problematic issues to be resolved and emotions including self-analysis with a sense of a commitment to take an action.

Critical incident is any unplanned and unanticipated event that occurs during class, outside class or during a teacher's career but is "*vividly remembered*" (Brookfield, 1995, p. 84) and that serves to "*trigger insights about some aspect of teaching and learning*" (Richards & Farrell, 2010, p.13).

Critical incidents analysis is outlined in this research is grounded in Tripp's (1993) notion of reflecting critical incidents analysis and basically, there are two main phases of reflecting on teachers' specific experiences rather than general ones. As an initial phase, teachers describe the incidents (i.e. the "what" aspect), and then move to another phase by explaining why this incident is critical to them (i.e. the "why" aspect).

Guided reflective practices involve systematic and rigorous ways of thinking that teachers can encourage deeper reflection and, consequently, provides tools for their professional developments and interaction with colleagues through spoken and written reflections.

Reflective dialogue occurs through different parties having input into its direction (Bullough & Gitlin, 1991), that is grounded in critical, questioning orientation, and a deep commitment to the discovery (Mezirow, 2000). While a teacher can listen to her own voice and engage in a form of internal dialogue or called as "*self-dialogue*", the external dialogue can be through collegial discussions (Hussein, 2006). Reflective

dialogue is essentially the tentative construction of meaning for particular teaching contexts that are not at all straightforward to interpret. In this study, teachers are thus deliberately engaging in dialogue with self or other professional to actively revisit their understandings and, as a consequence, they can generate new professional insights.

Quality of teacher reflection operationally is comprised of identifying what teachers reflect upon (content); how they reflect on their teaching (nature); how they feel about their teaching (emotions); and how they use language to reflect (dialogue). These dimensions merely form the basis of the quality of reflection, as it is framed as a situated practice. However, one can recognize that reflection is an evolving concept, and this categorization is flexible.

Vignette is operationally defined as incomplete short stories that are written to reflect, in a less complex way, real classroom situations in order to encourage discussions and potential solutions to problems where multiple solutions are possible depending on how teachers frame the situation.

In-service teacher is the term designating teachers for the ones who work in their own classrooms in schools where they have some security of tenure, and who thereby have an accepted position as a member of both the staff of the school and of the profession itself (Bennett & Carré, 1993).

CHAPTER 2

LITERATURE REVIEW

“Cannot teach clearly unless I recognize my own ignorance, unless I identify what I don’t know, what I have not mastered.”

Paulo Freire

This chapter provides a short overview of various definitions of teacher reflection and then proceeds to several empirical research findings on the tasks on which reflection of teachers are assessed, the format used to measure those tasks, and the number of dimensions of teachers’ reflections that are measured. Then, it gives a brief synopsis of the relevant literature about the issues that teachers have with reflective practices. This review of literature initiates by discussing some of the theories and issues that have contributed to a development of interest in reflective practices within teacher professional growth and development.

2.1. A Review of Definition of Teacher Reflection

Before further analyzing the concept of teacher reflection, as the first thing, it is vital to establish a foundation for understanding of the nature of teacher reflection. One who seeks to understand reflection are encountered a confusing diversity in the literature, which creates difficulties in understanding the concept. For instance, the word of thinking that is predominantly used to describe reflection are either synonymous with reflection or it is apparently used in connection with reflection. However, in any analysis, it is essential to differentiate the terms reflection and thinking. Then, a close examination brings to light that the merge of the term of thinking used to describe reflection has a narrow conceptualization, which makes it difficult to capture the complexity of reflection and its multi-faceted nature. Thus, it is an urgent need to have an all- encompassing definition, which includes reference to many aspects of

reflection: focus; process, individual and collaborative; emotions and experience; context; and outcomes. In order to have a more comprehensive understanding as the way of how I frame the concept of reflection is a situated practice, whereas reflection with the connection of thinking is not used in this dissertation study.

Teacher reflection has been discussed historically and is based on John Dewey's understanding of reflective thinking. According to Dewey (1933), the notion of teacher's reflection is associated with the examination of an idea, a problem or an experience related to teaching profession through a systematic and rigorous way in line with three distinctive dispositions of being open minded, wholeheartedness and responsible. Dewey operationalizes open mindedness as a reflective attribute with a desire to listen to more than one side of an issue so that a reflective teacher can give attention to possible alternative views. Wholehearted implies that reflective teachers can overcome fears and uncertainties to continuously review their teaching practice. Responsibility refers to careful consideration of the consequences to which an action leads.

While Dewey is well-known for identifying the essence of reflection; in the beginning of 20th Century, Donald A. Schön has been another prominent scholar as he provided detailed descriptions of the process of reflection teachers undergo. Dewey (1933) distinguished routine action following "*a habit, tradition and authority*" without any thinking from reflective action referring to the action with "*active, persistent and careful consideration*" (p.17). Schön (1983) viewed the action in terms of three different time references in which reflection takes place, categorized as "*reflection on action*", "*reflection in action*", "*reflection for action*". While "*reflection on action*" for a teacher is considered as a reflection occurring about the lesson before and after the lesson takes place, "*reflection in action*" refers to the teacher reflection that occurs during the lesson. "*Reflection for action*" has a strong connection with the other types of reflective actions and is basically used for the reflection about future actions with the intention of improving or changing a teaching practice. All in all, teacher reflection has been considered as a cyclical and recursive problem solving process (Dewey, 1933), which increase awareness of teachers' thinking, feelings, beliefs and assumptions (Schön, 1983) in order to develop an analytic viewpoint of their experiences and to transform professional knowledge into their experiences (Zeichner & Liston, 2013). Considering these essential elements, reflection can be enhanced

through professional development programs especially for teachers (Kayapınar, 2016). With the promotion of reflection through professional development programs, the conceptualization of teacher reflection has widened and differentiated, especially based on three dimensions: (1) specific characteristics of a reflective teacher (i.e. open mindedness, wholeheartedness and responsible); (2) the processes in which teachers engage for reflection (i.e. critical analysis of classroom situations, searching for alternative viewpoints for problem solving); and (3) various modes of applying reflection (i.e. technical reflection, contextual reflection and critical reflection).

Zeichner and Liston (2013) have been also influential researchers, who emphasized the moral and ethical dimensions for a reflective action. They built upon Dewey's work by arguing the main attributes of various four reflective teaching traditions. These are the academic (i.e. subject matter), social efficiency (i.e. student thinking and understanding), developmentalist (i.e. student needs and interests), and social reconstructionist (i.e. social contexts of teaching) traditions. They highlighted that a reflective teacher should take into account all of the elements related to these four traditions. For instance, a reflective teacher needs to question the goals, means and contexts of teaching, s/he should be concerned with the wider historic, cultural and political values and beliefs that guided their teaching practices and s/he also needs to be democratic and self-critical with such a sense of being committed to teaching all students fairly. For the purpose of this study, building primarily upon research of Dewey, Schön and Zeichner and Liston, the common understanding of teacher reflection is a deliberative and cooperative process through which teachers ponder the impact of their decisions on their teaching actions for better and effective outcomes.

So far, the concept of reflection in teaching has been introduced in a myriad of ways, yet it is worth noting that there is still a lack of a clear understanding of reflection (Rodgers, 2002). As a matter of fact, Sparks-Langer and Colton (1991) argue that it is easier to define what reflection does not entail rather than what it entails. They assume that when a teacher does the same teaching by using the same thing year after year in teaching, the teacher does the opposite of reflection, which is referred to as routine action (Dewey, 1933). With the emphasis on the relation between reflection and changing in teaching practices after gaining experiences, the concept of reflection is considered as a catalyst for change according to Dewey (1933). Teachers mostly have a tendency to reflect on previous problems or failures related to aspects of teaching

since they have a desire to fix those problems to achieve more certainty and agreement for the future experiences (Dewey, 1933). From that perspective, as a concept, reflective action enables teachers to be more critical of current teaching practices through learning from past failures or problems. In essence, while routine action can be associated with responses of denial and avoidance, reflective action can reinforce a greater willingness to consider alternatives, stimulating a culture of transformation (Schön, 1987).

In order to understand the relationship between the notion of reflection and experience, Schön (1987) emphasized even further that reflection is more likely to occur in the case of being “*surprised, pleased, promising or unwanted*” (p. 6). In addition to learning from failures or problematic situations, through the practices of reflection teachers can learn to appreciate the successful aspects of their teaching as long as they challenge and examine their successes (Jay & Johnson, 2002).

Both failures and successes create the repertoire of teaching, in which teachers build up a collection of beliefs, ideas, experiences and attitudes that allow them to enact different ways of framing a situation (Calderhead, 1989). From this perspective, it is important to keep in mind that reflection is done basically when a teacher simply frames a problem or an unexpected situation with a sense of what might make for the good (Valli, 1997; Zeichner, 1996).

With respect to this study, teacher reflection is operationally defined as a deliberative thinking process that guides the future decisions and actions as a result of critical examinations of theoretical knowledge, past and present teaching experiences, problematic issues to be resolved and emotions including self-analysis with a sense of a commitment to take an action.

2.2. Reflective Practices for Professional Growth

As crucial for all other professionals, teachers also need to improve professionally throughout their career. Learning through experience is considered as an essential to this progress (Eraut, 1994), in which teachers can enhance their practices mainly by reflecting on their teaching and discussing teaching issues with their colleagues (MacDougall & Drummond, 2005).

The role of reflection in teachers' professional development is often written and spoken about. These ideas are associated with the concept of reflection as a social practice (Zeichner & Liston, 2013). It is widely acknowledged that reflection is essential for in-depth understanding of teaching and for advancing teachers' professional growth. Reflection actually leads to deeper understanding of the extent to which it focuses implicit beliefs and values that are based on teachers' actions (Eraut, 1994). Sharing experiences and ideas with colleagues is considered crucial for fostering the quality of reflection (Hatton & Smith, 1995). Meeting with colleagues is a popular way of exchanging experiences and ideas (Thijs & Van den Berg, 2002). Such professional meetings allow teachers to talk about and improve their teaching (Tigelaar, et al., 2008). In these meetings, teachers review their teaching experiences with a view to improving or gaining insight into their teaching practice, in which they equip them with conversation skills, as another way of their professional development (Meijer, de Graaf & Meirink, 2011).

Several studies have examined using reflection for teacher professional development and different forms for facilitating teachers' change and growth (Admiraal, Lockhorst, & Van der Pol, 2012; Horn & Little, 2010). In supporting teachers to engage in the process of reflection, a number of conditions are encountered. The realization of professional development through reflection is mainly related to providing time and opportunities to practice, dialogue, reflect, support and challenge each teacher who participated in the meetings (Körkkö, Kyrö-Ämmälä & Turunen, 2016). Teachers rarely have opportunities to meet with their colleagues for reflection (MacDougall & Drummond, 2005). Little is known about how professional meetings stimulate teachers to reflect. That is why it seems useful to examine the quality of teacher reflection during the meetings with colleagues.

As implied, the existing research has been reported the meaning of reflection from the perspective of teacher educators, researchers and theorists. However, the research efforts on revealing teachers' understandings of reflection experiences has been considered as limited. Given the significance of clarifying the concept of reflection in teachers' professional development, and an interest in listening to what teachers illuminate the role reflective practices play for themselves and their teaching actions led to examine the voices of teachers to be heard regarding the reflective practices in which they already engage.

2.3. Framing Reflection as a Social Practice

Teaching is considered as a complex profession (Tsangaridou & Siedentop, 1995) since teachers have to make countless and complex decisions every day in an effort to facilitate better learning outcomes (Calderhead, 1987), and they are also worried about the moral and political context of teaching (Zeichner, 1987). There is a common agreement that teachers cannot be prepared for every situation they may face in their professional lives before they start to work (Cutforth & Hellison, 1992). The curiosity to know how to deal with the challenges presented in the daily teaching process leads to look for strategies in order to figure out how to perform better teaching practices. With a profession as challenging as teaching, Throsen and DeVore (2013) suggest that teachers need to become thoughtful decision-makers and to cultivate reflection in order to deal with complicated issues effectively. The one who is able to learn from his or her teaching experiences within a professional community can be called as an effective teacher according to Shulman and Shulman (2009). Accordingly, there is growing consensus that effective teaching practices are associated with teachers' reflections on their teaching experiences (Taggart & Wilson, 2005). With reference to a famous management consultant and author, a well-known quote of Peter F. Drucker is considered as very helpful to explain the relationships between reflection and teaching practices by stating that *"Follow effective action with quiet reflection, from the quiet reflection will come even more effective action."* This implies that engaging in meaningful reflection can be a powerful approach to maximize the effectiveness of teaching practices (LaBoskey, 1994).

Engaging in reflective practices is considered as a critical component for developing self-understanding for the teaching profession (Pollard, et al., 2008). Through reflective practices, teachers can carry out systematic inquiry into their thinking and actions so that they can understand themselves, their practices and the impacts of their actions on their learners (Bousted, 2011). Teachers make decisions about their actions based on their own sense of teaching and learning processes, which Kelly (1955) referred to as *"personal constructs"*. Reflective practices provide the cornerstone for raising self-awareness and for adapting their personal construct for better outcomes of their teaching actions (Zwozdiak-Myers, 2018). All in all, this notion of being an effective teacher is linked to two main aspects, (1) the ability to reflect in order to learn

new things from teaching experiences, and (2) the ability to act as a member of a professional community (Mathew, Mathew & Peechattu, 2017).

Given reflection is considered as an essential element for the professional development of teachers (Throsen & DeVore, 2013), it is not inevitable that numerous strategies for fostering teacher reflection have been stressed, including different forms of reflective tasks such as journal writing (Walker, 2013), autobiographies (Rodgers, 2002), action research (Zeichner & Liston, 1995), video analysis (Griffin, 2003) and critical incidents analysis (Farrell, 2013). While a wide variety of approaches have been employed to foster reflection among teachers, approaches including written and spoken reflections are the ones providing the clearest evidence of reflection (Hatton & Smith, 1995). However, as Woodward (1998) points out, many written reflections turn out to be *“far from reflection and indeed (were) merely describing an event or activity”* (p. 417). This is because some type of support or guidance is required for teachers to engage in reflective practices because critical examination of teachers’ own knowledge, beliefs, and assumptions regarding the teaching is not an easy attempt (Schön, 1983).

Almost every paper that has been written on teacher reflection includes a section relating to that when teachers are asked to reflect in isolation without support structures, they primarily engage in low levels of reflection (Delandshere & Arens, 2003). According to Copeland, Birmingham, La Cruz and Lewin (1993), teachers generally feel more pressure to meet national standards of student performance and have less time for undertaking reflective practices (Wildman & Niles, 1987). Thus, different methods can be used to facilitate reflection among teachers.

There are few studies addressing particularly various ways of promoting teachers’ reflective practices. For instance, Tok and Dolapcioglu (2013) carried out a research study for the purpose of exploring common reflective practices among Turkish primary school teachers with the sample of 328 primary school teachers working in 30 primary education institutions in the province of Hatay. The results of the study revealed that teachers generally implement the following reflective practices: providing learner-centered instruction, creating a reflective classroom climate, valuing criticism, self-appraising, making decisions for the future, solving problems, and being open to professional development. However, observation results indicated that

teachers generally fail to implement the reflective practices of praising students who defend their views freely, facilitating students to communicate their criticism regarding instructional processes and teacher attitudes in oral or written form, identifying problems that emerge in the class, and keeping a daily journal to observe their own professional development and identify shortcomings.

Another study conducted by Gün (2011) focused on improvement of the quality of teachers' reflective practices by providing training to participants on reflection. The participants are provided recordings of their classroom teaching to promote the quality of their reflection. The study suggested that recorded videos are valuable to nurture reflective thinking; moreover, when given the opportunity to discuss the reflections on teaching, teachers could identify the problems and suggest alternative solutions in a collaborative group atmosphere.

Correspondingly, Oruç (2000) aimed to investigate the effects of a reflective teacher training program on teachers' perception of classroom environment and on teachers' attitude to teaching profession with 10 high school teachers. As an experimental design is used, teachers in the experimental group are given a 9-week Reflective Teacher Training Program. The results revealed that the training program contributed positively to teachers' perceptions of their classroom environment and to teachers' attitude toward the teaching profession.

A recent study of Burhan-Horasanlı and Oraçtepe (2016) involved nine English language teachers engaged in reflective practice oriented online discussions through which teachers collaboratively reflect on their own and colleagues' beliefs and practices within an online community of practice. Detailed examination of teachers' reflective discussion entries led to identify the teachers' strengths and weaknesses and then they gained insights into their future practices through sharing each other's teaching experiences.

Taken together, what is clear based on the evidence provided in these studies is that reflective dialogue is one of the promising mechanisms that bring teachers together to discuss, assess, and improve their teaching practices (Darling-Hammond et al. 2009). Reflective dialogue among teachers can be enhanced either orally in face-to-face meetings (Bergström & Granberg, 2007), or reflective journals can support

written dialogue (Clarke, 2004). In that sense, reflection can be viewed as a process of internal dialogue facilitated by thinking or writing and reflection can be promoted through an external dialogue together with others (Clarke, 2004).

2.4. Promoting Teacher Reflection: Guided Reflective Practices

As presented, there is a large volume of published studies describing the significance of reflection on fostering teachers' professional development (Admiraal, Lockhorst, & Van der Pol, 2012; Black & Plowright, 2010; Horn & Little, 2010). Along with this growth in reflection, however, there have been debates centered on the barriers to teacher reflections, including time constraints, fear of being judged (Bishop, et al., 2010), lack of knowledge, skills and experiences about what and how reflection occurs (Calderhead, 1989), certain personal characteristics of teachers (Hatton & Smith, 1995), existing characteristics of the teaching profession and the school culture that undermines reflective behavior (Brookfield, 1995; Hogarth, 2001; Laboskey, 1994). That is to say, teachers are more likely to misinterpret what reflection actually means and what they need to do while reflecting (El-Dib, 2007; Lee, 2005). In this case, teachers generally try to rationalize the way they teach and justify what they do rather than they examine their beliefs and understandings about teaching critically, which have a strong and negative influence on their classroom decisions (Loughran, 2002; Mena, García, & Tillema, 2011).

As noted by many scholars, these barriers mostly stem from the fact that reflection does not occur naturally (Etscheidt, Curran, & Sawyer, 2012; Husu, Toom, & Patrikainen, 2008). Teachers need support for connecting their experiences to theoretical professional knowledge and challenging their beliefs and assumptions (Williams & Grudnoff, 2011). The ability to reflect is generally connected with the higher order cognitive processes of self-regulation and metacognition (Paris & Winograd, 2003). It has been acknowledged that not all teachers are disposed to reflect, nor are they innately able to effectively reflect (Kreber & Castleden 2009). Teachers themselves need a scaffolding to develop their reflective capacity. It is therefore important that reflection should be taught deliberately and explicitly (Russell, 2005) in order to "*move beyond its uncritical calibration*" (Zeichner, 1996, p. 207). Thus, it has been suggested that not only these barriers can be mitigated but also the content and processes of reflection can be improved through creating a

supportive environment for teachers in the process of reflection with a systematic set of procedures to guide their reflection (Russell, 2005; Shoffner, 2011; Ward & McCotter, 2004; Zeichner, 1996).

A general theoretical overview about how different researchers have studied guided reflection processes to foster changes in teachers' professional actions are explored to provide context for this study. Without any controversy, teacher reflection has been considered as a deliberative process of self-examination and self-evaluation in order to improve teaching practices (Zeichner & Liston, 1991).

It has commonly acknowledged that the key aspects of engaging in reflective practices are listed as follows: active involvement (Moon, 2004; Procee, 2006) and interaction with others (Benammar, 2004; Leijen, et al., 2012). Several attempts have been made to discuss the impacts of guided reflective practices on the quality of reflection and the development of teachers' professional learning. A study by Nolan (2008) investigated how guided reflection processes had an impact on pre-service teachers' professional identity. The evidence from this study demonstrated that when participants are actively engaged in processes that guided them in their reflections, they developed a better understanding of their beliefs, values and experiences which impacted on their teaching practices and they are encouraged for deeper reflection and challenged to examine their presumptions, beliefs, values and experiences have shaped their teaching practices.

In another investigation of the guided reflection processes supporting the increase in pre-service teachers' reflections quality and the development of their professional knowledge, Husu, Toom and Patrikainen (2006) reported that pre-service teachers moved beyond immediate concerns of their teaching practices towards long-term inquiries of their professions with the aid of reflective tools including reflective discussions and critical incident analysis.

Our consideration of how reflection is best guided is informed by these studies that provided specific suggestions for scaffolding the development of reflective practices. In that sense, three potential methods for enabling teachers to (1) engage in reflective practices actively and (2) share and learn from their teaching experiences through interaction with others have been found to be critical incident analysis, reflective

discussions within a collaborative professional environment and reflective journal through guided by an external (Husu et al, 2008; Leijen, et al., 2009; Sööt & Leijen, 2012). Still, since the previous research on guided reflection procedures has been mostly restricted to pre-service teachers, indicates a need to understand its impacts on teachers. Moreover, this study introduces the potential for the use of the guided reflection process to support the development of teachers' professional practices.

2.4.1. Critical incidents analysis. The concept of a critical incident is used by several authors and is defined in various ways (Brookfield, 1990; Richards & Farrell, 2010; Thiel, 1999). Although a critical incident is defined by different scholars in different ways, the term of critical incident is commonly referred to as an event or a situation that means a significant turning point or change in the life of a person, an institution or some social phenomenon. These kinds of incidents seem to be usual rather than critical, but they are interpreted as being critical for the purpose of analysis (Tripp, 1994).

This concept of critical incidents analysis is central within the notion of narrative reflection and it has been treated thoroughly in previous research studies, although there has been little discussion about reflection through critical incidents analysis so far (e.g. Bell, 2002; Farrell, 2015; Finch, 2010). Although little is known about reflection through critical incidents analysis, in the review of the recent arguments two important points have emerged.

Firstly, for reflection through critical incidents analysis to be really beneficial to teachers, it should go beyond just simply telling general situations about what happened in their teaching world. That is to say, it should feature description of specific classroom events or situations that teachers deem critical for their professional development. All incidents that take place in the classroom may not be critical. A particular event becomes critical incident depending on how it is interpreted, as in a generally accepted definition of a critical incident: “*any unplanned and unanticipated event that occurs during class, outside class or during a teacher's career but is “vividly remembered”*” (Brookfield, 1990, p. 84). That said, according to Richards and Farrell (2005), there are certain things to take into considerations when an incident is viewed as critical. It is of the utmost importance that incidents only really become critical when they are subject to such productive reflection in a structure way that these

incidents are analyzed critically by teachers and eventually new understandings of teachers' teaching practices can be uncovered, which is one of my ultimate goals of this research study. This notion of critical incidents analysis is grounded by Tripp and there are two main phases. As an initial phase, the incidents are described (i.e. the "what" aspect), and as a second phase teachers explain why these incidents are critical to them (i.e. the "why" aspect) (Tripp, 1993). In addition, using critical incidents guide and direct teachers' reflections on their teaching experiences and the emotions that associate with the critical incidents (Bekdemir, 2010; Vandercleyen, et al., 2014). That is to say, critical incidents are usually accompanied by emotions. This is not surprising since it is evident that teachers are affected by their emotions so that their understanding of how the lesson is progressing in the classroom are triggered by emotions. In relation to teachers' specific emotions, it is essential to seek teachers' emotions in relation to critical incidents that they identify. In this study, another phase is added, in which teachers are asked to identify their emotions in relation to the specific incidents (i.e. the "how" aspect).

Reflective practices through analyzing critical incidents are beneficial for teachers' professional developments if they examine the experience of the incidents rather than only describing them (Calandra et al., 2009; Griffin, 2003). According to Tripp (1993), a critical incident in teaching is a typical event in the classroom in which teachers encounter a dilemma or a problem situation to deal with. The use of critical incidents as a focus of and a tool for reflective practices is based on the idea that it is unreasonable and impossible to reflect on everything that happens in the classroom, and moreover it is more plausible to choose a specific focus. When particular incidents are chosen by teachers and are significant for them, it is assumed that even little incidents include the basic elements of teachers' personal ways of thinking and acting in a pedagogical context (Bruster & Peterson, 2013). If teachers reflect upon the same incidents several times, it is possible to understand their positions and meanings in a wider perspective, which enables them to develop their professional views (Thuynsma, 2001).

The value of critical incidents analysis with different forms on the promotion of teachers' reflective practices has been proved. For instance, reflective journal writings are used to analyze critical incidents foster teachers to improve their reflective thinking (Griffin, 2003). Also, analyzing critical incidents through videotaped lessons promote

teachers' deeper reflections (Calandra et al. 2009). All contributions reviewed have in common that promoting reflection by the means of critical incidents analysis has been considered as: (a) a process of teachers' reflection from their practices, where teachers are confronted with their daily work; and (b) that could be assessed using dimensions of teachers' reflection. In this study, reflective journals and video footage analysis are used as tools for analyzing critical incidents that teachers identify, which have three particular things: (1) the teacher's willingness to examine his or her own practice and develop professionally; (2) the significance of collegial reflection; (3) the time period needed to see and reflect on things from different perspectives and in a wider framework.

2.4.2. Reflective journals. By nature, reflection needs a certain amount of self-discipline (Shulman & Shulman, 2009). While reflecting, teachers require some time to sit back and ponder the events and situations which had occurred during their teaching practices. In that sense, writing is one of the effective ways to reflect ideas, thoughts and feelings in various contexts (Gilmore, 1996). Likewise, the basic value of writing is inherent in any process of reflection (Leigh, 2016) in a way that it stimulates cognitive process and self-consciousness (Johns, 2013).

Adaptable in form and purpose, reflection through a piece of writing has been a long history and a strong set of contemporary advocates (i.e. Hatton & Smith, 1994; Fund, et al., 2002; Lane, et al., 2014). This view is also supported by Vygotsky (1956) who points out that written speech is a self-reviewing structure of thought. Luria and Yudovich (1959) take the discussion of the importance of writing into a new level by examining the role of written speech in facilitating the development of inner speech, referred to as "*reflective judgment*" by Reiman (1999, p.599). In the same vein, Koottkamp (2015) described writing as an active, engaging and personal process, through which teachers can move back and forth among past, present and future to generate different perspectives on the same events or incidents. Put in different words, writing can be viewed as a powerful mean for reflection through different lenses: as a form of self-expression, as a form of self-produced feedback for the evolution of ideas, and as a form of both language process and as a learning mode (Boud, 2001; Moon, 2004).

Although a concise definition of a reflective journal is not consistent in the literature (Farrell, 1999; Ferraro, 1999; Gilmore, 2001; Hatton & Smith, 1996) and a variety of definitions of the term have been suggested, this paper will use the definition suggested by Richards & Lockhart (1994) who saw it as “*a teacher’s written response to a teaching event that helps trigger insight about teaching*” (p. 7). Along with this definition, this study used reflective journal writings in line with two purposes: as an aid for teachers to reflect purposefully and as a data collection tool to acquire evidence of the nature of changes in teachers’ reflection.

By drawing on the concept of writing, much of the current literature on promoting reflection pays particular attention to journal writing as an important tool particularly in the field of teaching profession (Carter & Francis, 2000; Freidus, 1998; Yost, Sentner & Forlenza-Bailey, 2000). So far, the numerous research supports the value and potential of written reflections. According to Woodward (1998), among forms of reflection, written reflections are the most effective way to identify the evidence of reflection. In writing journals regularly, teachers are enabled to notice alternative perspectives and generate new ideas about future actions for specific experiences (Farrell, 1999). In the same vein, Lee (2008) argues that reflective journals can be used as a self-assessment tool for teachers to question their pedagogical decisions and approaches, which creates an environment to improve their teaching practices.

2.5. Assessment of the Quality of Teacher Reflection

Over the past decades, reflection has been fast becoming a key instrument in teachers’ professional development (Pollard, et al., 2008). Adopting reflection at the heart of the understanding of teacher professional development creates an emerging need for ways of its assessment. What we know about reflection is largely based upon empirical studies that investigate how reflection plays a critical role in changing teachers’ professional knowledge, skills and dispositions (Lee, 2005). Correspondingly, reflective practices can make significant contributions in the evolution of teachers’ ideas of what should happen in class, and about alternative means of achieving teaching goals, through examining past experiences critically. This shows the importance of teacher reflection in the development of professional knowledge and expertise (Davis & Wagett, 2006). Thus, there is a large volume of published studies describing how to assess teacher reflection (i.e. Loughran, 2002; Smyth, 1992; Sparks-

Langer, 1992; Zeichner & Liston, 1990; Zeichner & Tabachnick, 1991). Although the existing frameworks are found useful for establishing the guiding essentials for assessing teacher reflection, one criticism of much of the literature on reflection is that these frameworks do not provide a systematic and deliberate approach to assessing reflection of teachers (Orland-Barak, 2005). A likely explanation for this inconsistency may be due to that there has been little agreement on what teacher reflection entails.

Other than that, all the previously mentioned pre-existing frameworks for assessing the quality of teacher reflection have been mostly the prepackaged and rigid categorical frameworks (i.e. Hatton & Smith, 1993; Kember, et al., 2004; Sparks-Langer et al., 1990; Taggart & Willson, 2004; Van Manen, 1990). A considerable amount of literature has been published on using these frameworks for assessing teachers' reflections (Bain, Ballantyne, Packer, & Mills, 1999; Fund, Court, & Kramarski, 2002; Lee, 2005; Luttenberg & Bergen, 2008; Rodgers, 2002; Ward & McCotter, 2004; Yesilbursa, 2011), which are concerned with mainly two dimensions. While a variety of terms of these dimensions have been suggested, this paper uses the terms first suggested by Luttenberg and Bergen (2008) who saw them as "*breadth*" and "*depth*" of reflection. The breadth of reflection formed the central focus of several previous studies (e.g. Dinkelman, 2000; Harrington, Quinn-Leering, & Hodson, 1996; Lee, 2005; Russell, 2005) in which it is conclusively linked with the content of reflection and ranges from general teaching issues to the social and cultural context of teaching. Depth of reflection is generally indicated by the nature of reflection when reflection is encapsulated as a developmental process (Luttenberg & Bergen, 2008). As regards the depth of reflection, much of the current literature on assessing teacher reflection (e.g. Bain, Ballantyne, Packer, & Mills, 1999; Jay & Johnson, 2002; Hatton & Smith, 1995; Husu, Toom, & Patrikainen, 2008) pays particular attention to the level of reflection. That is to say, the breadth of reflection concerns the same type of reflection with a different content, the depth of reflection is construed as the same content viewed from a different level of reflection (Davis, 2006; Fund et al., 2002; Lane et al., 2014; Luttenberg & Bergen, 2008; Moon, 2004; Ward & McCotter, 2004).

However, this understanding of teacher reflection with these two dimensions has recently been challenged by few arguing that reflection as a socially situated practice (Rovegno, 2006). In fact, it is acknowledged that all teachers are reflective in some sense (El-Dib, 2007; Pedro, 2005) and their reflections are influenced by the context

(Boud, 2010). Given the consensus of recent studies about reflection is multifaceted with socially situated nature (Macdonald & Tinning, 2003; Malthouse, 2012; Malthouse and Roffey-Barentsen, 2013; Malthouse, Roffey-Barentsen and Watts, 2013), it is hardly surprising that identifying and assessing teacher reflection through a standard tool or strategy has continued to raise questions for scholars (Rossi & Thorsen, 2019). As Ixer (1999) discusses the challenges for assessing reflection: “We do not know enough about reflection or how its intricate and complex cognitive processes can enhance learning to be able to assess it fairly” (p. 522). Amid the explosion of interest in exploring how teacher reflection is assessed (Williams & Grudnoff, 2011), a widely accepted method for identifying and assessing teacher reflection does not exist yet due to personal nature of reflection (Thorsen & DeVore, 2013.), and the complexity and unpredictability of teaching practices (Campbell, 2006). In addressing these issues, Valli (1997) suggests that the different approaches should be used in combination with one another so that each balances the others’ deficits. But relying on only previous understandings alone will not create new insights. In this regard, to avoid the inherent limitations in each approach, this study seeks to remedy these problems by analyzing the existing literature of assessing teacher reflection and developing a holistic framework to address different dimensions of reflection. This following section outlines our proposal for a model that takes account of different theoretical approaches to assess teacher reflection.

2.5.1. Towards a holistic framework for assessing teacher reflection. This paper provides an important opportunity to review diverse theoretical underpinnings to conceptualize a new, transferable and customizable framework for assessing teacher reflection. This paper attempts to utilize a holistic and multidimensional approach, integrating four aspects: (1) what a teacher reflects about (*breadth*), (2) how a teacher reflects (*depth*), (3) how a teacher uses language to reflect (*form of reflective dialogue*) and (4) which affective concern(s) a teacher has while reflection on a specific teaching experience (*affectivity of reflection*). The framework for assessing teacher reflection is developed through outlining existing frameworks along with transformative and social/cognitive theories (Dewey, 1933, Laboskey, 1994; Lane, et al., 2014; Luttenberg & Bergen, 2008; Taggart & Wilson, 2005; Zembylas, 2014).

a. Depth of Teacher Reflection. It has commonly been assumed that there is a type of evolution that is desired as one gains experience in reflection, starting at a basic

level and ultimately progressing to a higher level that usually incorporates critical reflection. As a well-known example, Van Manen (1977) categorized teacher reflection into three levels, ranging from practical/technical as a lower level to moral/ethical a higher level. However, such understanding regarding hierarchical structures of the ability to reflect has been challenged by the recent study of Thorsen and DeVore, 2013.

One problem with this conceptualization is that it implies hierarchical levels or categories that mainly tend to overlook the fact of the complexities and comprehensive issues in teaching practices (Kuhn, 2008). In that sense, recent research has suggested that categories or levels of teacher reflection are consequential rather than hierarchical, each of which is equally important and has different focus (Lee, 2005). These insights began to be supported empirically by Laboskey (1994) in her major longitudinal investigation into teacher reflection, who referred to the categories of reflection as the content of reflection rather than levels. This also goes beyond further research carried out by Luttenberg & Bergen (2008), who attempted to draw a fine distinction between the content of reflection and categories of reflection. The findings of their study corroborate the ideas of the fact that teacher reflection encompasses both content and categories of reflection, yet there still a connection exists among them.

A further definition is given by Luttenberg and Bergen (2008), who are apparently the first to use the term of broad and deep reflection. They describe breadth along with the content of reflection and depth as the categories of reflection. That is to say, the breadth of reflection concerns the same type of reflection with different focus or content; whereas the depth of reflection describes the same content varied degrees in different categories. The perspective in the current discourse on teacher reflection with regard to broad and deep dimensions have been well captured in Kremer-Hayon's (1990) argument that a reflection profile of a teacher can be yielded by looking at reflection level (the nature of reflection) within a content knowledge (subject-matter/pedagogical content/curriculum).

Further, it is equally difficult to know how we differentiate the content of a teacher's thoughts and the evidence for reflection (Rossi & Thorsen, 2019). Thus, in-depth descriptions of types of behaviors within the depth of reflection and the aspects of teaching within breadth of reflection should be provided for reliable assessment

outcomes (Sumsion & Fleet, 1996). As a result of our systematic literature review of reflection, most typically three categories are identified in relation to the depth of reflection. Technical, conceptual and critical reflection are often used as broad terms (Luttenberg & Bergen, 2008). Furthermore, a considerable amount of literature has been published on the differences between reflective actions and routine actions based on the ground established by Dewey (1933). These four categories for assessing depth of teacher reflection provide the conceptual framework in this article: (1) routine, (2) technical reflection, (3) conceptual reflection, and (4) critical reflection. The features of each category are identified as follows:

- **Routine:** Routine action without thinking based on prejudice, reacting automatically without consideration of alternative responses.
- **Technical reflection:** Teacher competency towards meeting outcomes; focus on behavior/content/skill; use simple and theoretical description; adjust teaching practices only to current situation without developing a long-term plan. Thinking at a low level of reflection involves technical, habitual, subjective, rigid thoughts, feelings, and/or views.
- **Contextual reflection:** Look at alternative practices; content related to content and student needs; engage in constructive criticism of our own teaching. The higher a persons' reflective thinking develops the more he/she starts to realize the subjectivity of knowledge, the relativity of truth, the multiplicity of sources of knowledge and the importance of context in determining meaning.
- **Critical reflection:** Address moral, ethical, socio political issues, self-understanding; recognize assumptions and premises underlying beliefs. The highest level of reflection involves questioning one's own assumptions and beliefs, the impact of societal and cultural values over educational practices, and the moral/ethical considerations behind these practices.

Various frameworks for assessing reflection within the field of teaching profession exist to nurture both depth (level) and breadth (content) in reflection; some exist as step-by-step procedures (Freese, 1999; Loughran, 2002), and others exist as typologies geared to assist teachers in coping with difficult aspects of their practice (Bain, Ballantyne, Packer, & Mills, 1999; Rodgers, 2002). Despite tandem goals of breadth

and depth in teacher reflection, it is assumed that the broad of reflection is inextricably intertwined with the depth of reflection (Hallman & Adam, 2013). This, to us, is a starting place for our inquiry, for we assert that the concept of teacher reflection is considered as multi-faced and interdimensional structure and we first described the assessment of teacher reflection within the depth of reflection and now move toward articulating the assessment of teacher reflection based on the breadth of reflection.

b. Breadth of Teacher Reflection. Another dimension of teacher reflection within the context of this study is the content that teachers specify for reflection, which is called breadth of reflection in this study. Returning briefly to the issue of the fact the reflective practices are situated (Ovens & Tinning, 2009), it is also worth noting that reflection can be identified as an evaluation of the consequences of actions (Ward & McCotter, 2004). It can thus be suggested that this corresponds to an individual teacher's thinking and actions that are associated with the practical situation which the individual goes through. That is to say, different issues are considered by different individual teachers even if they have some experiences in the same context. This view is supported by Luttenberg and Bergen (2008) who argue that since teachers screens the same situation using their own filter, not surprisingly, the differences in the breadth in reflection exist.

According to Laboskey (1994), the breadth in reflection can be either practical or theoretical or both. Putting into different words, in the consideration of a practical issue, it is required to examine and analyze theoretical perspectives. In an opposite way, in the evaluation of a theoretical principle, the implications for practice are discovered. This view is supported by Elliott (2005) who writes that: "*Practical deliberation integrates empirical with theoretical/ philosophical inquiry*" (p. 163). Yet, some authors challenge the widely held view that this discrepancy could be attributed to a false dilemma (Shulman & Shulman, 2009).

The focus of consideration can still vary within this framework according to Roberts (2012) and may include such categories as those Richert (1992) uses in her study: teacher, student, context, content, general pedagogy, content specific pedagogy, and personal. Similarly, Bain, Ballantyne, Packer, & Mills, (1999) identified four key foci of reflection: focus on teaching, focus on self, focus on professional issues and focus on students or class.

Irrespective of various categorization, a reasonable approach developed by Fund, et al. (2002) to tackle this issue, in which the breadth dimension of teacher reflection is categorized into three components (subject matter-content, didactic content and personal content). Given all the studies reviewed so far, the various breadth of teacher reflection differs according to teachers' understandings, beliefs, attitudes and dispositions in relation to teaching and learning (Mezirow, 1991; Kember, et al., 1999). It is important to bear in mind, regardless of focus, each act of reflection might well include practical/technical, social/political, and moral/ethical arguments and outcomes, which we call as depth in reflection. However, an arguable limitation of this categorization offered by Fund, et al. (2002) is that it ignores the issues of social continuity, change and ethical justification as Zeichner (1993) stresses.

Notwithstanding this major limitation of this approach, the study suggests that the breadth in teacher reflection generally falls into three broad categories. The primary category is related to reflections on the issues of teaching and learning, including instruction methods, student's engagement, students' motivations to learn, classroom management, etc. (Lee, 2005). Although this aspect can be described as having a technical orientation due to mostly focusing on the means of delivering instruction as Fund, et al. (2002) refer to didactic content, as another group of content that teacher reflect on, the broader aspects such as ethical principles, social context and cultural diversity also have a strong influence on teacher decision-making (Zeichner, 1994). Furthermore, there is some evidence to suggest that teachers also reflect on themselves including personal teaching styles and professional growth as belonging to personal content (Lane et al., 2014). The focus here is on reflection for self-enlightenment, confronting the self to examine feelings and emotions about teaching, students and the school setting (McCarthy, et al., 1989). It is important to bear in mind that all three aspects regarding the broad of reflection are all connected to the teaching-learning process so as to be difficult to separate (Bain, Ballantyne, Packer, & Mills, 1999), it can thus be assumed that teacher's instructional decisions and judgments are context dependent, eventually it is more likely that such connections exist between teaching practices and purpose and goals of schooling, bears mentioning as a major, valued focus (Alger, 2006).

c. The Form of Reflective Dialogue. In an effort to identify criteria for assessing teacher reflection, another predominant theme emerged from previous

studies is dialogue. Although theoretical perspectives obviously differ, there appears to be a consensus among authors in the fact that the relationship between dialogue and reflection is important (Koppi, Lublin, & Chaloupka, 1997). The role of language in mediating reflective thought is also stressed by Vygotsky (1986) by stating that “*The relation between thought and word is a living process; thought is born through words. A word devoid of thought is a dead thing*” (p. 255). Even, it is somewhat surprising that reflection is rarely defined as a dialogue explicitly although in recent times, dialogue has been at the heart of the understanding of teacher reflection mostly with the influence of social constructivism (Koppi, Lublin, & Chaloupka, 1997). Ironically, these two concepts are tied to deep historical roots by the most prominent educational philosopher John Dewey (1933), yet, whose work is only grounded in the idea of “one’s sense of self”, and “reflecting individually”, and lacked the notion of reflection through dialogue with others. While a teacher can listen to her own voice and engage in a form of internal dialogue or called as “self-dialogue”, the external dialogue can be through collegial discussions and students’ feedback (Hussein, 2006). However, Zeichner and Liston (1996) argue that if only reflection is limited to an internal dialogue with oneself, or if only it is restricted to share with colleagues who adopt a similar approach, there is more likely to occur self-justification of the action rather than critically examination, which does not lead towards deliberative action, which is the ultimate goal of teacher reflection. To better understand the notion of reflection as dialogue, Belenky et al. (1986) highlights the importance of “real talk” among parties to engage in reflection, and suggests the use of “reflective apprenticeship”, which refers to the direct access of one party to the practice performance of the other. Bullough and Gitlin (1991) draw our attention to a productive reflective dialogue occurring through different parties having input into its direction. Along with this understanding, what is clear is that teacher reflection can be considered as a productive dialogue through either an internal dialogue with one’s own self or an external dialogue with other people, that is grounded in critical, questioning orientation, and a deep commitment to the discovery (Mezirow, 2000).

However, traditionally it has been argued that it is essential to assess whether a piece of writing displays any evidence of reflection or it is merely description of an event for several reasons. Numerous studies have reported analyses of written reports is essential so that truly reflective writing can be encouraged, assessed and responded to

(Fund et al., 2002). So far, most of the studies in the field of assessing reflective writings have only focused on either breadth (content) of reflection (Power, et al., 2002) or the depth (nature) of reflection (Ward & McCotter, 2004) or nurtured both of them (Lee, 2005; Luthenberg & Bergen, 2008). However, few scholars have attempted to investigate the form of writing as another significant dimension of reflection based on the understanding of reflection as dialogue (Fund, et al., 2002; Hallman & Adam, 2013). Fund, et al. (2002) offer a framework for the assessment of reflective writings, which is based loosely on the taxonomy developed by Hatton and Smith (1995). Fund, et al. (2002) hold the view that the form of writing is a significant dimension of reflective writings. This usually includes a combination of writing style and genres, which relates specifically to the ideas expressed in the writing. Hatton & Smith (1995) have warned that if reflective writings are assessed based on the criteria that suggest particular vocabulary or constructions of text, it is more likely that writing classified as reflective is a particular writing genre. On the other hand, in this investigation, reflective writings of teachers are evaluated regarding the four categories under the dimension of the form of writing. The higher level categories are called “linking and critical bridging” and the lower level categories are called “*description and personal opinion*” (p. 490-491). This hierarchical structure suggests that reflections at the higher levels “*extend beyond the immediate situation*” (p. 491). In this view, although the authors claim that this classification is under the form of writing dimension, they refer to it as the “*level of coordination between different ideas*” (p. 488). This issue posed a particular problem in the study conducted by Bain, Ballantyne, Packer, & Mills (1999). The authors argued that changes in using various vocabulary or the structure of writing does not represent the real changes in producing more reflective work. On the other hand, Margolis (2002) put forth the premise of the significance of using various forms of writing on promoting reflection.

Given that all the previously mentioned influential research about reflective as dialogue, there is consistent evidence that the categories for the analysis of reflective writings varies widely, ranging from simple description in which little if any reflection is evident, to highly sophisticated reflective dialogue in which several perspectives are explored (i.e. Hatton & Smith, 1995; Fund, et al., 2002; Bain, Ballantyne, Packer, & Mills, 1999; Lane, et al., 2014). Although these frameworks are concerned with quality of reflective writing based on not only the form of writing but also other dimensions,

they still served as the foundation for the development of the understanding about the differences among reflective dialogue and descriptive dialogue. A well-known framework to assess teachers' reflective writings is developed by Hatton and Smith (1994), which helped lay the foundation on the uniqueness of writing for promoting reflective dialogues within the field of teaching. A significant contribution of this framework appears in their experimental research for evidence of reflection in teachers' written reports about various teaching aspects including curriculum planning, development, implementation, and evaluating. The framework offers a taxonomy including four different kinds of reflection, ranging from non-reflective descriptive writing, through critical reflection. The taxonomy differentiates merely description of events from more sophisticated analysis of teaching. However, the higher categories of reflection (dialogical and critical reflection) are mentioned in our quest for the deep dimension of teacher's reflection, there is no need to cover within this dimension again.

Another framework proposed by Bain, Ballantyne, Packer, & Mills (1999) is developed for the purpose of the assessment of weekly journal entries of teachers, based on the previous research (Richert, 1992; Tann, 1993; Zulfikar & Mujiburrahman, 2018). The framework has five different categories abbreviated as 5R, which run from a low level of Reporting, through Responding, Relating, Reasoning to a high level of Reconstructing. In another study, Bain, Ballantyne, Packer, & Mills (1999) attempt to illustrate the evidence of reflection only based on the notion of demonstration of reasoning, which show that reflective writing is little more than a description of an experience. This framework offers a bimodal categorization in which while reflections classified as demonstrating reasoning include the analysis of events through questioning pre-existing understanding and considering different perspectives, the other reflective writings which do not display any evidence of reasoning are categorized as "*reflective writing as a record of reflective thinking*" (p. 189). In the similar vein, Davis (2006) also proposed a model having two sides in which "*productive reflection*" and "*unproductive reflection*" are distinguished. While she defines "*unproductive reflection as mainly descriptive, without much analysis, and involves listing ideas rather than connecting them logically*" (p. 282), productive reflection can be viewed through analyzing teaching, questioning assumptions and considering alternatives. Regarding assessing teachers' reflection, this paper makes an

attempt to differentiate between reflective dialogue and descriptive dialogue within a piece of writing. Reflective dialogue demonstrates reasoning (Bain, Ballantyne, Packer, & Mills, 1999), linking and critical bridging (Fund, et al., 2002), and descriptive dialogue includes merely description of events without evaluation or sophisticated analysis of events (Lane, et al., 2014).

Also, Lane, et al. (2014) suggested that the descriptive and reflective entries can be further divided into subcategories. Descriptive entries might include a brief evaluative statement, which are different from purely descriptive comments. The reflective responses can be also divided into two categories: those providing evidence of low-level reflection (description, evaluation and justification) and entries that include the imagination of future actions and alternative approaches. This study adopted the four category system in line with the form of dialogue based around the following levels: (1) Purely descriptive responses. (2) Descriptive responses containing an evaluative element. (3) Low level reflective responses (makes a judgement and justifies it). (4) High level reflective responses (explains possible causes and/or imagines future actions).

d. Affectivity of Teacher Reflection. As Piaget (1981) noted, affectivity refers to the experience of feeling and emotion. Dewey (1916) originally propounded the social conditions for learning, emphasizing affectivity as a crucial component for not only learning but also teaching in the classroom. In keeping with Carl Rogers (1959), who believed that personal growth is tied to the evident support of a caring person, Nell Noddings (2012) has advocated the need for caring teachers. Putting into different words, Rogers and Webb (1991) argue for the connection between being a good teacher and being a caring teacher by stating that “*Good teachers care, and good teaching is inextricably linked to specific acts of caring*” (p. 174). However, there has been a common underestimation of the emotional complexity of teaching since teaching is often considered as a rational activity (Schutz, 2014; Schutz & Zembylas, 2009). Over the last decade, only few scholars have been able to draw on research into the significant role of emotions of teachers in their lives, professional developments and identity (e.g. Hargreaves, 2005; Liston & Garrison, 2004; Zembylas, 2014). What is more, previous research has also questioned the impacts of teachers’ emotions on learning outcomes, school climate and the quality of education in general (e.g. Linnenbrink, 2006; Schutz, Pekrun & Phye, 2007; van Veen & Lasky, 2005), and

teachers' emotions have been linked to pedagogical strategies and learning outcomes. For instance, Trigwell (2012) reports that teachers' emotions are connected to the teaching strategies they adopt. According to this study, positive emotions (e.g., pride and motivation) are associated with student-focused teaching approaches and negative emotions (e.g., anxiety and embarrassment) with teacher-centered approaches focused on only transferring of knowledge. Similarly, Postareff and Lindblom-Ylänne (2011) go further and conclude that positive emotions are associated with higher quality teaching, which lead to better outcomes.

Nowadays, it has been accepted that teaching profession has an emotional nature, concentrating on issues of care, social justice and relationships among students and teacher (Mills & Satterthwait, 2000), as Schutz and Zembylas (2009) identify teaching as "an occupation that involves considerable emotional labor" (p. 3). This view has led to a proliferation of studies of exploring the place of teachers' emotions in their reflective practices (Fook, 2010; Holmes, 2010; Zembylas, 2014).

As discussed previously, through writing and reflecting on teaching practices, teachers become more aware of not only patterns of thinking but also their emotions and responses to the specific situations (Holmes, 2010). Although well-known scholars (i.e. Dewey, 1933; Boud Keogh & Walker, 1985; Brookfield, 1995; Mezirow, 1990) call attention to the importance of emotions in the process of reflection and transformative learning, surprisingly enough, the place of teachers' emotions in their reflections have received little attention in the existing literature with a few notable exceptions (e.g. Edwards & Thomas, 2010; Fook, 2010; Zembylas, 2014). Most of the previous research shows a tendency to emphasize teacher reflection as primarily a cognitive activity but the role of teachers' emotions is neglected, which Zembylas (2014) called as "*the reluctance to emotionalize*" (p. 211). From this perspective, there have been criticisms of the understanding of reflective practices as they are considered as objective and emotional detachment (Fook, 2010), and as means for the development of an instrumental and technical set of skills to be used for delivering information (Edwards & Thomas, 2010). A particular issue of interest in these critiques is associated with the significant role of emotions in the context of teaching reflective practices.

Dewey (1933) defined reflection as a rational and cognitive way of thinking and called for the personal attitudes of open mindedness, wholeheartedness and responsibility to be present during reflection. Schön (1983,1987) also acknowledges a place for the affective domain in the presentation of reflection. Seeing reflection as an emotional undertaking, Schön (1983) stressed the place of emotions like “*surprise, puzzlement, or confusion*” (p. 68) in reflective thinking. The complications of teaching that lead to such emotions are also the impetus for teachers to engage in reflection on those emotions, as related to the actions and situations of teaching. In Birmingham's (2004) reconceptualization of reflection, she also connects reflection to the personal elements of teaching, recognizing that “*much of what happens in schools happens in the personal interactions among teachers and students*” (p. 321). Birmingham (2004) presents reflection as a moral process, one that requires the individual to use practical reasoning to determine the best action for specific situations while acknowledging implications of right and wrong. As teaching encompasses “the personal as well as the institutional” (p. 321), so, too, should reflection.

Reflection and the affective domain are closely intertwined, as engagement with reflective practice requires teachers to identify and analyze complex issues that arise in classroom teaching (Spalding, Wilson & Mewborn, 2002), whether relational or managerial. Through reflection, teachers have the opportunity to explore teaching and learning from a personally meaningful perspective (Larrivee, 2000) and generate questions that challenge personal understandings (Liston & Zeichner, 1990). Reflection also allows for the acknowledgment of the interpersonal and intrapersonal dimensions of teaching, providing a space to examine the emotions that naturally emerge when working with others. Given the importance of emotions within the context of reflective practices, this current study further addresses how to assess teachers' writings in regards to how they demonstrate their emotions or feelings for the specified critical incidents.

2.5.2. Instruments used for assessing the quality of teacher reflection. Upon examination of the dimensions of frequently cited frameworks for analyzing reflection, we found that they are in accordance with these guidelines. In essence, different instruments have been applied to assess teacher reflection. Some researchers developed a Likert-type scale of reflection (e.g. Larrivee, 2008) and some have explored coding schemes for assessment of written reflection (e.g. Kember et al.

2008). Also, the models that have been used to assess teacher reflection are various with regards to their complexity. Some researchers used a model that had three to four categories for reflection depth, for instance, non-reflective, reflective and critically reflective used by Kayapınar and Erkus, (2009) or pre-reflection, surface reflection, pedagogical reflection and critical reflection used by Larrivee (2008) whereas other researchers used models composed of six to seven different levels such as attending to feelings, association, integration, validation, appropriation, outcome of reflection by Boud and Walker (1998), and habitual action, thoughtful action, introspection, content reflection, process reflection, content/process reflection, premise reflection by Mezirow (1991).

Obviously, each approach has various criteria created to identify what forms different categories of reflection. Despite the different purposes of studies, they have had the common aim of providing information about reflection and its assessment and they all share similar features. Firstly, measurement instruments should focus on reflection of teachers in a way that it assesses reflection precisely. Then, as previously mentioned, reflection occurs in different categories. Another common characteristic of the instrument for assessing teacher reflection is that while teacher reflection changes from low category including technical and habitual rigid thinking views to highest one with moral and ethical considerations for teaching practices. Finally, it is critical to explain details of the instruments for others' potential use. These specified characteristics are used as guiding principles for the development of a new instrument for assessing teacher reflection.

From our perspectives on teacher reflection, vignette-based measures can be used as a reflective tool to reveal information about not only teachers' reflection on the imaginary and problematic situations but also what they would do in the specified incidents that they have analyzed (Schön, 1987). The vignette is defined as *incomplete short stories that are written to reflect, in a less complex way, real life situations in order to encourage discussions and potential solutions to problems where multiple solutions are possible* (Jeffries & Maeder, 2011). Three criteria are identified for a good vignette from this definition, which are (a) it is a story reflecting a real life situation; (b) it has at least one problem to be solved and there is no one right answer; (c) multiple interpretations can be made in the discussions of solutions.

As another essential attempt to assess written reflection of teachers through a vignette-based instrument, each dimension of reflection should be well-defined operationally. In the current study, the main aim is to develop a new instrument based on the existing frameworks of teacher reflection including its particular components. Although the existing frameworks are considered as satisfactory in line with our purpose of the study, there are several missing elements from the existing frameworks, which make them difficult to use for evaluating teacher reflection. A common shortcoming of these frameworks as tools for evaluation is a lack of attention to how teachers situate their thinking within the context of their practice (Ross, 1989). In that sense, they have disadvantages such as having a lack of aspects of framing and reframing classroom problems (Galvez-Martin, Bowman & Morison, 1998). Although the existing frameworks include general principles about teacher reflection, they lack the method to evaluate both the quality and dimension of the reflection (Hatton & Smith, 1995).

2.5.3. Rationale for the development of a new instrument. As stated in the literature, the process of reflection begins with systematic analysis of issues regarding teaching practices and as a result of this analysis, teachers question their underlying beliefs and assumptions about teaching (Dewey, 1933). These tacit beliefs and assumptions are associated with teachers' understanding about how to teach (Schön, 1937). Throughout the reflection process, teachers challenge these assumptions, and their tacit beliefs become apparent and open to discuss. As a result, they offer alternative solutions and take further actions for better results (Larrivee, 2008).

Ever since the assessment of teachers' reflection became a focus of research, adequate measurement instruments to illustrate the quality and different dimensions of teachers' reflection in a valid way have been examined. A number of assessment instruments for teacher's reflection have been developed, yet most of them with a rating-based format directly ask teachers to answer questions without much context (Murphy & Ermeling, 2016). Although these kinds of instruments to assess teachers' reflection are considered as more objective, easy to administer with low scoring costs, they are more isolated from the real classroom settings since their format might not enable to reflect the complexity of teaching to elicit the underlying tacit assumptions and beliefs related to teaching (Hatton & Smith, 1995). As an approach to rating-based instruments, text-based instruments, in which a real classroom context is provided to situate their responses (Stecher, et al., 2006). By measuring teachers' reflection through analysis

and interpretation of the represented teaching practices, it is more meaningful to find out related evidence for their own reflection (Lee, 2005). Consequently, the stories in various formats could be appropriate for assessing teacher reflection in a way that the authentic teaching context with complexity including different aspects of teaching might be created.

The use of vignettes would help to contextualize the items of such an instrument in a way that teachers can imagine themselves in similar problematic situations. When asked how teachers would act or feel, it may be easier for teachers to answer the questions if they are prompted to imagine themselves in a classroom so that they can envision how they would react.

Vignettes are found very efficient since they could be constructed easily and they reflect real life contexts and problems to stimulate discussion. Given these benefits of using vignettes as a reflective tool, vignettes are decided to be well suited for assessment of teacher reflection and for yielding information about teachers' reflections and their potential actions regarding the classroom incidents provided.

Even though vignettes with multiple choice responses can easily be analyzed statistically, this format has a number of weaknesses: participants tend to reply in a manner that will be socially desirable (Stecher, et al., 2006). Also, as another shortcoming, providing response choices might give clues directing the participants' answers. Jeffries and Maeder (2004) claim that vignettes along with open-ended questions are more effective to provide evidence of higher order thinking such as problem solving and reflective thinking. To analyze the entries created by the respondents, content analysis is also particularly appropriate since I integrate quantitative and qualitative methods in such a way of an empirical and methodologically controlled approach. Thus, the current study depicts the development of a valid and reliable instrument to assess the quality of teachers' reflections. The vignettes are developed by determining typical situations that teachers may come across, and by checking with a varied group of teachers to confirm that the situations would be considered realistic by most teachers. As well, it is much more cost-effective to use a written reflection instrument with an objective coding scheme that does not require the extensive training of raters and checking for inter-reliability. Thus, any vignette-based instrument for teacher's written reflection assessment has

not been encountered in the literature. The vignette-based instrument developed in this study has a focus on the use of science teachers for whom vignettes are appropriate. This paper is the product of an effort to better understand how to assess teachers' reflections. As a part of this journey, this paper analyzes teachers' reflections based on a set of imaginary teaching practices. The specific properties of this instrument are described in more detail below in the method section.

2.5.4. Scheme a scoring coding for categorizing vignette responses. The current study has a focus upon teacher's reflection and the way of assessing it directly. I specifically looked for a method which could be used with teachers' written reflections on vignettes. I felt it desirable that I also develop a useful and content valid scheme as the method of assessing teachers' reflection in line with the proposed model of the study. Coding schemes are widely used in the education field (Cooper & Gargan, 2009), and over time, a number of practical ways for guiding researchers for developing coding scheme have become accessible.

Throughout the development process of a scheme, indicators for observable behaviors representing categories of reflection depth on a vignette are established for experts to score written responses. On the other hand, researchers argue that coding schemes can be limited and subjective (Cooper & Gargan, 2009). For the present study using vignettes, I followed a rigorous process in scheme design to ensure the required content validity to meet the aforementioned concerns, as described in detail in the methodology part of the paper. When written reflections are scored by external evaluators via using a well-designed coding scheme, the qualitative entries can be analyzed within and between predetermined categories of reflection. This approach can reveal an understanding of the data in more depth and further changes can be made in using the vignette-scheme combination for assessing reflections on teaching practices. Given the need to develop a new instrument to measure teachers' reflection, I designed a tool through adopting the following methodology.

2.6. Summary of Literature Review

In sum, a review of literature above demonstrates that reflective practices play a promising role in the professional development of teachers. The previous studies help to clarify that teachers also need to be adequately prepared to reflect upon and

articulate a wide variety of teaching considerations since the teaching profession certainly has the nature of dealing with dilemmas and the uncertainties associated with such dilemmas.

This section provides a brief overview of literature on the promotion of reflective practices in teaching as in the displayed in the following Figure 2.1. Then, the next section moves on to describe and discuss the methods used in this investigation in greater detail.

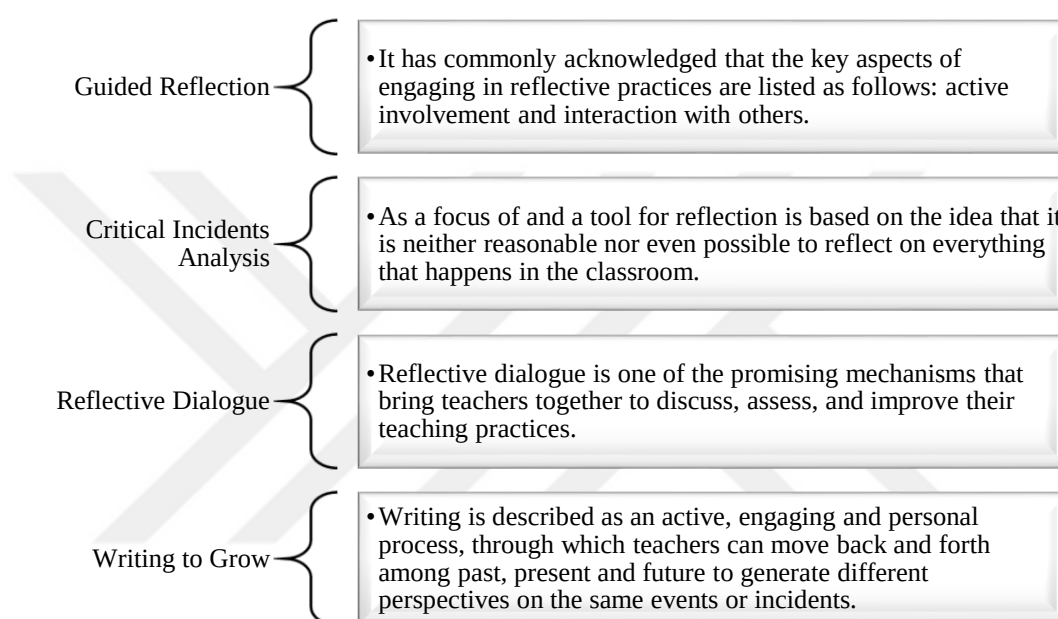


Figure 2. 1. A Summary of the Essentials for Promoting Reflective Practices of Teachers

CHAPTER 3

METHOD

“Without reflection, we go blindly on our way, creating more unintended consequences, and failing to achieve anything useful.”

Margaret J. Wheatley

This chapter gives an account of how the present research is carried out, indicating the research design, sampling process, data collection tools and procedures, data analysis process, trustworthiness in the research, limitations of the study and the researcher roles in the study.

3.1. Overall Design of the Study

This research study aims at investigating the quality of reflections of science teachers working in elementary public schools, and the roles of guided reflective practices through critical incidents in the changes in the quality of reflections that teachers engaged in, their views of the context of teaching, and subsequently their instructional decisions. To address this primary purpose, it is decided that the most appropriate design to adopt for this study is to use an embedded mixed methods design, in which *“one data set provides a supportive, secondary role in a study based primarily on the other data type”* (Creswell & Plano Clark, 2010, p. 67), with the development purposes (Greene, Caracelli & Graham, 1989). It is now necessary to give insight into the thought processes behind conducting an embedded mixed methods design with development purposes. The most noticeable feature of this embedded mixed methods design with development purposes is the sequential timing of the implementation in two different research designs, in which a multiple case study as a qualitative component is embedded within a survey study as a quantitative design in this current research. In the first place, the data from both studies are collected and analyzed

independently since the survey method is implemented first, and the results are used to help reach out the study group of multiple case study as a result of the school visits. In the second place, the data gathered in the survey study primarily has a development intent that seeks to develop reliable process for identifying and assessing the nature of reflection. Thus, the survey study is used to help inform the design of the multiple case study regarding analysis of data gathered in line with the preliminary teacher reflection assessment framework with four dimensions based on the situated nature of reflection (See Figure 3.1).

The survey study aims to investigate the quality of elementary science teachers' reflections on critical incidents related to science teaching. Specifically, this survey research with long lasting data collection required me as a researcher to revisit elementary science teachers at proper intervals to collect data since samples needed extra time to reflect on the vignettes through three open ended questions of the Vignette-Based Assessment of the Quality of Teacher Reflection Instrument (VBAQTRI).

The primary purpose of this embedded multiple case study is to explore the role of the guided reflective practices including analysis of the incidents that they deemed critical with interaction with each other in teachers' reflection and their teaching practices. To fulfil this purpose, I decided to study multiple cases of teachers to understand the differences and the similarities between the cases (Stake, 1995) through analyzing the data both within each situation and across situations (Yin, 2003). This study allows a wider discovering of the enhancement of the quality of teacher reflection through guided reflective practices within the social context in which teachers are situated. In that sense, the evidence generated from this multiple case study is strong and reliable (Yin, 2003) since the suggestions are more intensely grounded in different empirical evidence obtained from different teachers. In line with the aim of the study, the following research questions emerge:

1. What is the quality of reflection that elementary science teachers engage in?
 - a. What do elementary science teachers focus on while reflecting on critical incidents (breadth)?
 - b. What is the level of reflection of elementary science teachers while reflecting on critical incidents (depth)?

- c. What is the language that elementary science teachers use while reflecting on critical incidents (form of reflective dialogue)?
 - d. Which emotions do elementary science teachers identify while reflecting on critical incidents? (affectivity of reflection)?
- 2. How does the quality of reflection of elementary science teachers on critical incidents change throughout the guided reflective practices?
 - a. How does the focus of elementary science teachers' reflections change throughout the guided reflective process change (breadth)?
 - b. How does the level of elementary science teachers' reflections change throughout the guided reflective process (depth)?
 - c. How does the language used in elementary science teachers' reflections change throughout the guided reflective process (form of reflective dialogue)?
 - d. How do emotions of elementary science teachers change throughout the guided reflective process (affectivity of reflection)?
- 3. How do elementary science teachers describe their experiences about engaging in the guided reflective practices through critical incident analysis?

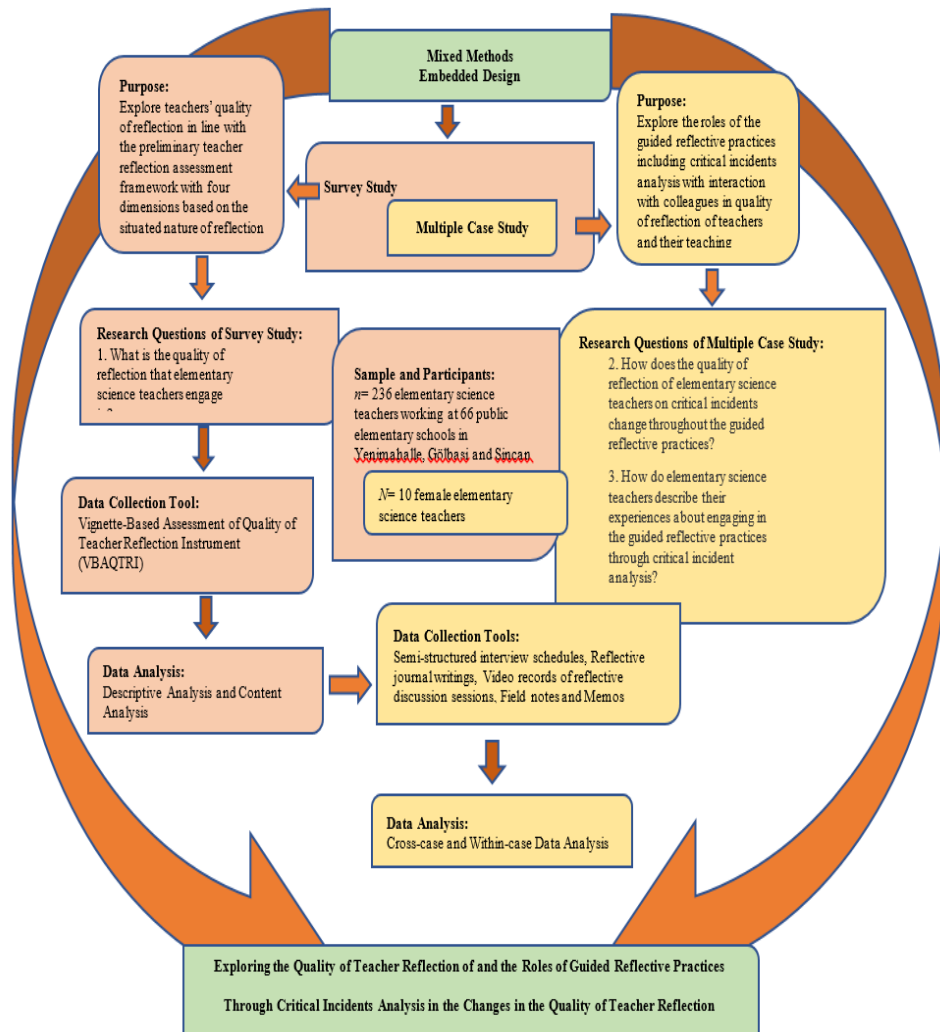


Figure 3. 1. Flow of the Present Study Along with Research Design and Questions

3.2. Sampling Process of the Study

This section gives an account of the sampling process that is carried out in this study. The sampling process includes the sample for the survey study and the participants for the multiple case study with the description of their characteristics.

With reference to the current study, the target population constitutes all science teachers working in public elementary schools in Ankara. It is worth considering that accessible population is limited to elementary science teachers working in public schools in the central districts of Ankara. Although schools at the central districts are selected considering the convenience of transportation and the willingness of schools/teachers to participate in the study, efforts are made to represent different school contexts and teacher characteristics in this sample. As the whole accessible population would not be reached due to lack of adequate time the sample is selected from this population following the steps described in Figure 3.2.

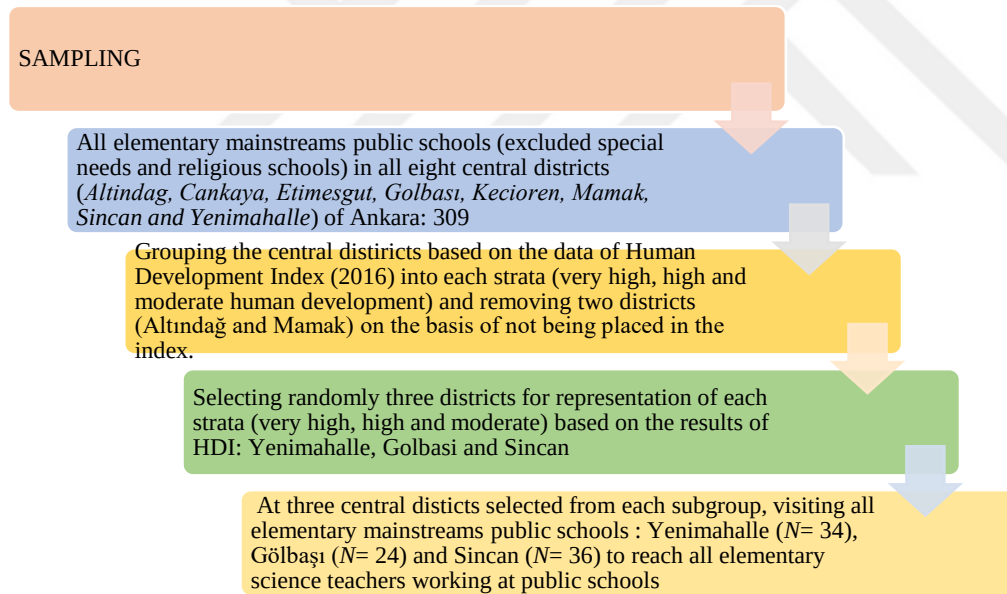


Figure 3. 2. Steps of the Sampling Process

Sampling process of the study involves two stages. As a first step, stratified sampling method is used, in which central districts of Ankara is stratified into three strata (very high, high and moderate) by means of socio-economic and cultural characteristics in order to obtain a representative sample within the given context. To identify each stratum, the Human Development Index (HDI) conducted by Human Development Foundation (INGEV) (2016) is used. According to HDI, Cankaya, Yenimahalle and

Kecioren are among the districts with very high human development in Ankara; Gölbaşı and Etimesgut are marked as high human development districts in Ankara; Sincan is the only center district reported as moderate human development district in Ankara. The investigation included 150 districts from Turkey's 30 metropolitan provinces. The main index had social and economic variables at the district level, such as governance, social inclusion, income levels, education, health, social life and transportation. For this study, in order to reach elementary science teachers in different socio-economic districts and to reflect different views and experiences of teachers, Yenimahalle, Gölbaşı and Sincan is randomly selected for representation of each stratum (very high, high and moderate) based on the results of HDI.

This sample constituted the main data set for the further investigation in order to address the first main research question. The public elementary schools located in these three districts are represented as clusters in these three districts. There are 90 regular public elementary schools in the four central districts of Ankara. Among those districts, Etimesgut is selected for the pilot study. All 66 public schools in the remaining three districts (73.3%) are included in the survey study. Of the schools visited, the most is located in Sincan (54.5%, $n = 159$), followed by the schools in Yenimahalle (13.2%, $n = 62$) and Gölbaşı (15.2%, $n = 15$) as seen in the following Figure 3.3.

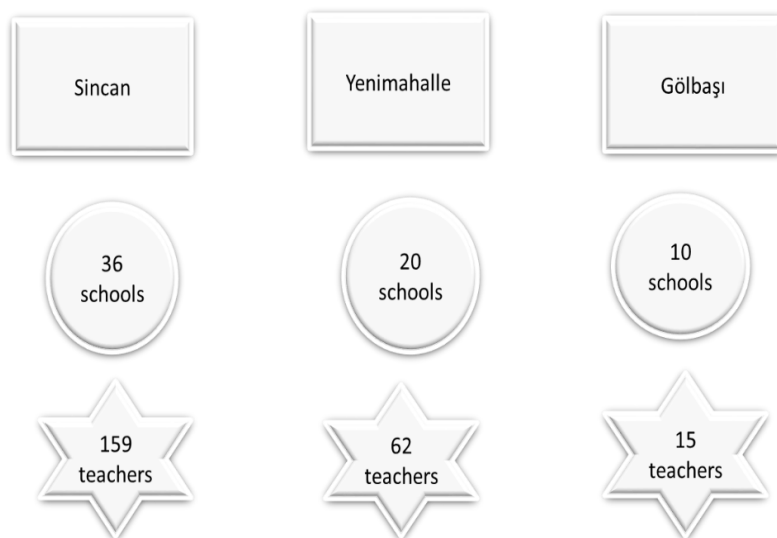


Figure 3. 3. A Representation for the Sampling of the Survey Study

As the second step, cluster random sampling method is used for the selection of the sample, in which each elementary public school in the central districts of Ankara, where science teachers work, constitutes a cluster. Using this method, more than 400 elementary science teachers are reached for data collection vis-a-vis; however, more than half of them ($n = 253$) volunteered to participate in the study while others accounted lack of time or provided incomplete responses in the instrument. After cleaning and removing the instruments that are incomplete or included incomplete responses to the vignettes, the sample of the study comprised of 236 elementary science teachers working at public schools in the randomly selected three strata (Yenimahalle, Gölbaşı and Sincan). Overall, among 66 different schools in Ankara, the sample of the survey study ($n = 236$) are recruited from three central districts in Ankara, covering urban and suburban schools.

Consistent with the general feature of the population of science teachers in Ankara, two third (74.6%, $n = 176$) of the participants are female. The sample involved teachers with various educational degrees. The majority of the participants ($n = 196$, 83.1%) graduated from the Education Faculty and there are also teachers with M.S. degrees ($n = 18$, 7.6%). More than half of the participants ($n = 146$, 61.9%) obtained their educational degrees in science education. The length of the experience in teaching is about 15.83 years ($SD = 7.91$), ranging from 1 year to 39 years.

Table 3.1 summarizes the frequencies and percentages of how often elementary science teachers use the specified tools to facilitate their reflective practices. As seen in the following table, the participant teachers claimed that although over half of them generally used cooperation with colleague ($n = 209$, 88.6%), colleague discussion ($n = 203$, 86.5%), and class observation ($n = 161$, 68.2%), only less than half of the teachers generally got feedback from their colleagues ($n = 83$, 35.2%).

Table 3. 1

Descriptive Statistics of Using the Tools to Facilitate Reflective Practices (n = 236)

Frequency of Use	Never		Rare		Usually		Always	
Reflective Tools	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Class observation	73	30.9	2	0.8	77	32.6	84	35.6
Colleague discussion	10	4.2	23	9.7	116	49.2	87	36.9
Cooperation with colleague	12	5.1	15	6.4	108	45.8	101	42.8
Colleague feedback	105	44.5	48	20.3	63	26.7	20	8.5

22 volunteers emerged, and they are informally interviewed to understand their feasibility and fit for the embedded multiple case study. Among the volunteers, 12 teachers are excluded from the cases due to lack of allocating time for this long-term study, pregnancy, unwillingness to participate weekly meetings and new school transfer and retirement. Overall, the participants of the study consisted of 10 female science teachers working at different public elementary schools located in the central districts of Ankara. In other words, 10 teachers are recruited by using criterion sampling method on the basis of the idea developed by Dewey (1933) as the reflective action requires three main attributes: (1) open mindedness, (2) responsibility and (3) wholeheartedness. The teachers who wanted to become a part of the study, I carried out face-to-face informal interviews with the teachers to reach out the ones who have three reflective attributes that Dewey call readiness to engage in reflection (1933). In the interviews, three questions are asked related to three reflective dispositions (open mindedness, responsibility and wholeheartedness): (1) Do you actively seek student input into how and what you teach? How do you do that?; (2) What is the impact of what you do on yourselves, your students and the community in which you teach?; and (3) What do you do when your students do not understand the content that you teach? Thus, as a researcher I am looking for the teachers who had willingness to listen to different views of thinking (open mindedness); the teachers who had careful

consideration of the consequences of their actions (responsibility); and the teachers who had willing to learn something new within various situations (wholeheartedness). As Table 3.2 displays the participants in this study, regarding their demographic information, they reflected the diversity of having different teaching experiences ranging from 4 years to 26 years and of working in a variety of schools in different neighborhoods where students had different socio economic status as well as grade levels, from 4th grade to 8th grade. Ten female science teachers are akin to each other regarding their educational background. All had a B.S. degree and two of them have a M.S. degree in an area related to science education. Based on the teacher reports, the majority of the children in these classrooms are from either low or middle-income families. The class sizes ranged from 22 to 45 students.

Table 3. 2

Demographic Information of Participants of the Multiple Case Study (N = 10)

Participant	Education	Context	Class size	Grade	Experience
Aysel	Master	Average	22	7 th & 8 th	11 years
Banu	Bachelor	Low	26	7 th	15 years
Esra	Bachelor	Average	35	5 th to 8 th	20 years
Filiz	Bachelor	Low	24	6 th & 8 th	15 years
Gaye	Bachelor	Average	30	5 th to 8 th	26 years
Hale	Master	Average	30	5 th to 8 th	13 years
Mine	Bachelor	Low	45	7 th & 8 th	9 years
Sevda	Bachelor	Average	27	6 th & 8 th	11 years
Sibel	Master	Low	28	5 th to 7 th	10 years
Zeynep	Bachelor	Low	23	6 th & 8 th	4 years

*Note. Participants are occasionally presented with the use of a pseudonym for each.

**Note. Average class size is presented.

***Note. Context refers to social economic status of the schools.

3.3. Data Collection Tools

A vignette-based instrument, which is called as Vignette-Based Assessment of the Quality of Teacher Reflection Instrument (VBAQTRI) and its coding scheme described here is used to analyze the quality of teacher reflections under the four-dimension model of teacher reflection (breadth, depth, dialogue and affectivity) within

the survey study. For this purpose, VBAQTRI and a coding scheme including a set of descriptors are described in the following sections. Then, semi-structured individual interviews, reflective journal writings and video recordings of reflective discussions, field notes and my memos are primary data collection tools for the embedded multiple case study. This forthcoming sections provide a brief overview of data collection tools for the survey and the multiple case study.

3.3.1. VBAQTRI for assessing the quality of teacher reflection. For the survey study, VBAQTRI is developed and utilized in order to assess the quality of teacher reflection. This instrument is a general set of vignettes depicting classroom situations and the questions promoting teachers' reflections in the process of solving dilemmas that they might come across in their professional lives. Jeffries and Maeder (2011) claimed that vignettes with open-ended answer formats are more useful to provide evidence of higher-order thinking skills such as problem-solving and reflective thinking. thus, each vignette is followed as three specific open-ended questions prompting teachers to choose and defend a position during reflecting (described as considerations, feelings, thoughts, suggestions and actions to be taken) including (1) the issues or problems raised in the vignette, (2) the actions could be taken to solve the problems and (3) their emotions in relation to the issues or problems encountered. These open-ended questions, designed to maximize the depth and breadth of the teachers' reflections, are repeated in each vignette.

The instrument consists of eight vignettes that represent a variety of different problematic situations of varying conditions under six different themes in the field of science teaching and learning: (1) pedagogical content knowledge; (2) classroom management; (3) inclusive education; (4) student engagement and motivation; (5) assessment and evaluation; (6) attending to school / drop out.

The vignette and coding scheme development process herein is described in detail in the following sections. prior to commencing the study, the first phase focuses on developing VBAQTRI to assess the quality of teacher reflection. On completion of developing the instrument, the second phase involves launching a trial test of the instrument and data collection process as well. Following this, the third phase evaluates reliability and validity of the instrument through scorer ratings of participant responses gathered in the pilot study. Then, the fourth phase embraces the analysis of

written responses and as a result of the data analysis process, some indicators are involved in the corresponding coding scheme. The final phase further assesses content validity through a comparison of the coder ratings and the corresponding participant responses in the final construction of the instrument and the coding scheme.

Phase 1: Development of VBAQTRI. Bearing all the previously mentioned information in mind, a vignette-based instrument is developed specifically for this study. In an attempt to construct realistic and relevant vignettes to foster teachers to reflect their opinions, three procedures identified by Campbell (1996) are followed. Prior to commencing the study, the topics of each vignette are derived from three main sources: (1) the literature in the field of teaching, (2) teacher competency areas predetermined by the Ministry of National Education (MNE, 2016), and (3) my teaching experiences as a science teacher. After preliminary vignettes are designed based these three main sources, I conducted several brainstorming sessions with a small group of volunteer science teachers ($n = 5$), who had professional experiences from their teaching practices. Following this, a panel of four experts in the field of teaching is asked to examine the vignettes with regards to the clarity of the wording, appropriateness for elementary science teachers and if there are any vignettes that are unrealistic or unusual situations. The experts also evaluated the content and face validity of each vignette and made some wording suggestions for improvement. After revisions of vignettes based on the expert opinions, I carried out cognitive interviews with two volunteer science teachers. Based on these interviews, required revisions and changes are made, which are incorporated into the final version of the instrument including eight vignettes with three open-ended questions.

Phase 2: Piloting VBAQTRI. Prior to employing the VBAQTRI, ethical clearance is obtained from the Middle East Technical University Human Subjects Ethics Committee (See Appendix). For the pilot study, data are gathered from 24 elementary public schools in the district of Etimesgut in Ankara in the fall semester of 2017. The vignette-based instrument is tested and piloted with elementary science teachers ($n = 81$) to ensure that the vignettes are clear and authentic as intended. Participants are visited personally in their schools where they work. After consent, participants are shown a description of the study, of which they are invited to read each vignette and to respond to the following questions. Upon completion of the instrument

participants are asked to judge the vignettes as useful and realistic, respectively. Based on the pilot test, completion of the survey generally took about 20-25 minutes.

After the pilot study, regarding the general information part including the items for the frequency of the use of the remaining tools for facilitating reflective practices, most of the teachers mentioned that some tools for the enhancing their reflective practices, which are predetermined from the literature review, are not understood clearly or hardly understood because only their terminological names (i.e. critical incident analysis, video analysis, reflective journals, action research, and feedback from students) are used in this part. To make it more clear and understandable for the participants, an elaborative and complete sentence for each tool is enclosed in parentheses in addition to use of the terminology for each tool at the last version of the instrument (e.g. instead of using only “critical incident analysis”, “I analyze any unplanned/unanticipated event that occurs during or outside my classes (Critical Incident Analysis)”). Figure 3.4 illustrates an overview of the steps followed for the construction of the instrument and ensuring its validity and reliability.

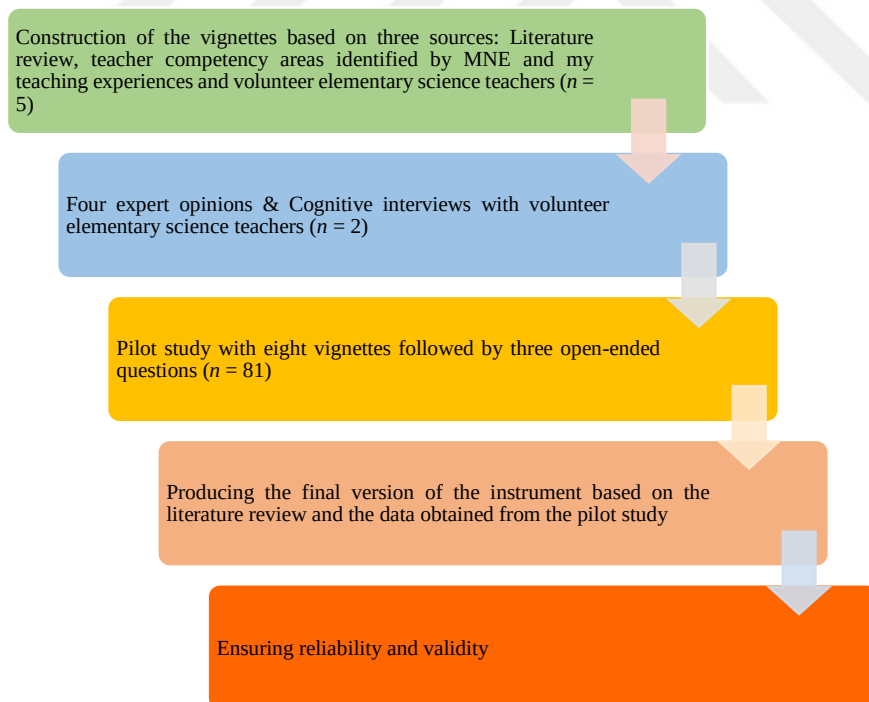


Figure 3. 4. Steps for the Construction of the Instrument and Ensuring Its Validity & Reliability

Phase 3. Ensuring Validity and Reliability of VBAQTRI. The validity and reliability of the instrument is outlined in this phase. The following miscellaneous procedures to enhance the validity and reliability of the instrument with its coding scheme and the data are used in this study. To be more specific, the instrument is validated within the content, face and internal validity; and the researcher's position, audit trial and inter-coder reliability are used to ensure the reliability of the data and findings.

The content validity of an instrument involves identifying whether related content is adequately and effectively composed by the instrument (Rusticus & Lovato, 2014). For the content validity of the instrument, each vignette is created based on science teachers' teaching experiences in the real classrooms and it is also identified in line with the classroom issues repeatedly emerging in the related literature. As a second measure to construct the content validity of the instrument, four education professors from different areas including curriculum and instruction ($n = 3$), and science education ($n = 1$) are consulted for expert opinions, and requested to review each vignette and the following three open-ended questions in relation to teacher competency areas predetermined by the Ministry of National Education (MNE, 2016). These are elaborated in the previous section of developing vignettes. They are invited to investigate the correspondence of each vignette and its following open-ended questions to reveal teachers' reflection comprehensively and precisely. They also analyzed the instrument based on the criteria of accuracy of the information presented. As a result, although the experts reported that eight vignettes with three open-ended questions are appropriate and relevant to assess the reflections of science teachers, they had given useful feedback on open-ended questions and suggested the description of the issue(s) or the problem(s) arisen in each vignette in the eye of each participant including their positive and negative aspects, which enabled them to analyze and discuss the issues in detail. Also, they requested for further clarification of some vignettes. For instance, two vignettes (related to meeting diverse learning needs and the incident related to the laboratory security) did not cover the detailed information about how the teacher in the vignette behaved, which is considered as an essential component for revealing teachers' reflections more concise and inclusive.

For the face validity of the instrument, the expert opinions are also collected in terms of the clarity of the words and phrases, their grammars, structures, organization and

appropriateness for each vignette. Based on the experts' feedback, some complex sentences are reworded in order to make the vignettes clearer and more realistic. After required changes are made based on the expert judgments in wording and content of the vignettes and as well as questions, it is reported that the instrument is appropriate and the language is understandable.

Moreover, for the instrument to be valid, two cognitive interviews with two volunteer science teachers are carried out whether each vignette is understood by participants correctly to respond. Besides, what the problems participants faced while filling the instrument and how much time they needed to complete it is checked throughout the process. These interviews provide guidelines for how to carry out the instrument in a way that structured time and procedure for their responses on each vignette is specified to assure comprehensive and accurate reflection. Before employing the instrument, the evidence for timing, wording, appropriateness, and understandability of the instrument is also detected as a result of the cognitive interviews.

Phase 4: Development of a Coding Scheme. The data gathered from the teachers in the pilot study are also used to develop a coding scheme for assessing the quality of their written reflections. VBAQTRI locates a teacher's quality of reflection with a corresponding coding scheme on four dimensions of teacher reflection: depth of reflection, breadth of reflection, form of reflective dialogue and affectivity of reflection, which measure the evidence and quality of teacher reflection. In this study, I completed several steps for the developing a corresponding coding scheme. As a first step, this coding scheme is designed through reviewing the related literature and expert opinions to reach a consensus about the dimensions of reflection in the context of teaching and sub dimensions and indicators for each one. These indicators are used for preliminary analysis of the quality of reflections in the pilot study, yet pilot study needed to be conducted to determine the final version of the coding scheme that is associated with each the instrument and the notion of reflection situated in this study.

For further validation of the coding scheme, I followed the following steps. After I gathered the data from the pilot study, I recruited an external coder, who has experiences in science teaching with a PhD degree. Once I coded all entries, the written responses to each vignette are recorded in an online document and assembled into coding packets, consisting of the coding scheme and the response set. The external

coder is then asked in what way she used the scheme when coding the responses to each vignette, and whether she judged the indicators and descriptions of the scheme as valid and applicable for each vignette to assess the quality of teacher's reflections under four dimensions. After coding, each of the two coders then cross-checked the codes applied by the other. Discrepancies in coding are resolved by several discussions. As a result of the data analysis, the collected descriptions for each entry are sorted into the four main dimensions and sub-dimensions for the development of a coding scheme to assess the quality of teachers' written reflections. Since the descriptors in the literature and the expert judgment of three education professors are used in line with the four dimensions of teacher reflection defined, the coding scheme of analyzing teacher reflection is a synthesis of the conceptualization of teacher reflection with collected data from the responses to the open-ended questions of the vignettes used in the instrument.

The final draft of the coding scheme places the form of dialogue along the top and the bottom to serve as anchors for evaluating the overall placement of a teacher's reflection in accordance to the language used in a piece of writing. The labels of the continuum are shown horizontally beginning with descriptive dialogue involving merely description of events and continuing to reflective dialogue including justification based on the analysis of events. In the left margin, the coding scheme shows the other three dimensions, named as the depth of reflection, the breadth of reflection and affective dimensions of reflection. Each vignette entry is coded firstly according to the breadth (content) of reflection. Where an entry dealt with more than one content, it is divided into segments accordingly. Then, I determine the appropriate category of reflection within the domain of depth of reflection. It is important to note that all listed indicators are developmental and assume that the less sophisticated indicators are also present when more sophisticated characteristics are evident within this domain, in which each segment is rated on a continuum four-point scale. Once the depth of reflection is rated for a segment, I choose an appropriate sub-dimension through a four-modal form of dialogue to label this entry from purely descriptive dialogue to reflective dialogue. In the follow-up phase of the analysis of the written segments, I code each segment for the use of specific emotion terms, including not only positive and negative emotions, but also emotional surprises and neutral emotions.

To ensure the validity and reliability of the coding scheme, Miles (1990) provides a guide to verify content validity from a different angle to determine qualitatively whether the participant responses cover the full range of the components of the teacher reflection model and the indicators identified in the scoring scheme and whether any content falls outside the components of the scheme. To accomplish this, the written reflections are sorted by average scorer rating, rounded to the nearest integer in the rubric range of “1” to “4” within the domain of depth of reflection and “1” to “4” within the domain of form of dialogue. This allows an examination of how written responses related quantitatively to teacher reflection under these two domains in the scoring scheme. For the other two domains, content analysis is conducted to identify main themes and sub-themes. A careful reading of the participant responses further establishes content validity in that the participant responses are clearly within range of both the teacher's reflection components and the scheme. With regard to the all domains, the participants are able to articulate responses, which cover but do not appear to exceed the full range of the scheme categories. An examination of the responses within and between categories support the manner in which the scheme differentiated between sub-categories. Therefore, no substantive revisions are made to coding scheme content. Also, the categories and their descriptions are determined on the bases of approaches and models of teacher reflection in the literature reviewed, which also represents the validity of the coding scheme.

Mainly, internal validity deals with the degree to which the researcher measures what is supposed to be measured (Merriam, 1998). As Miles and Huberman (1994) suggested, two kinds of triangulation are chosen regarding ensuring the internal validity of the instrument, which are triangulation by me as a researcher and triangulation by theory. In the former triangulation procedure, the data are analyzed by two different coders and the percentage agreement across the coder, referring to inter-coder reliability, is measured to verify the instrument and its coding scheme. In this process, I instructed an external coder in the use of the coding scheme to analyze the data. After I performed coding to the entire data set including 1,944 reflective units, six individual responses for each vignette corresponding to 486 (25% of the entire data set) reflective units, which is acceptable to ensure representativeness of the entire data (O'Connor & Joffe, 2020) is selected randomly and coded by the external coder in the field of science teaching to ensure the inter-coder reliability. After conducting separate

analyses, the results are compared and each category and subcategory under each of four dimensions is more sharply identified until agreement of over 80% is achieved (Miles & Huberman, 1994). Overall, the inter-coder-reliability across the two coders for each dimension is calculated as exceeding 80% (80% for breadth in reflection, 85% for depth in reflection, 98% regarding the affectivity of reflection and 90% for the form of reflective dialogue).

Also, for the inter-coder reliability between each coder, additional analysis is conducted using the SPSS 25.0 Package Program, through which the first set of analyses for the dimensions of the depth in reflection and the form of dialogue examined the correlation among scores derived from two independent scorers on each vignette (Bardhoshi & Erford, 2017). Before the main analyses, the data that included responses from 81 elementary science teachers under the two dimensions of teachers' written reflections (*depth in reflection and form of reflective dialogue*) are inspected for the assumption of normality. The Kolmogorov-Smirnov and Shapiro-Wilk tests reveals statistically non-significant results, which displays the normality of the data, given the dimension of the depth in reflection the tests yield statistically significant results for each vignette in the instrument in the present study, suggesting violation of assumption of normality (Pallant, 2007). Furthermore, as another suggested statistical method for checking the normality of data (Tabachnick & Fidell, 2013), the values of Skewness and Kurtosis are calculated under the dimension of the depth in reflection. The skewness coefficient ranges from -0.238 to 2.329 and the kurtosis coefficient ranged from -0.957 to 6.997. Kline (2011) suggests that the value of Skewness and Kurtosis should not be greater than 3 and less than 10. Based on this recommendation the values of the Skewness and Kurtosis of all the vignette scores in this study are within the acceptable range of < 3 and < 10 respectively, which is satisfactory for further analysis.

As discussed previously, there are two scores for each participant response set (one vignette with three open ended questions) on each vignette. Given these two dimensions, data arising from the pilot study are summarized in Table 3.3 and Table 3.4, which displays the descriptive statistics results. For the dimension of the depth in reflection, inter-scorer reliability analysis through Cronbach's alpha coefficients for scorer 1 and 2 for each vignette is measured as moderate to high reliability: vignette 1

($\alpha = 0.81$), vignette 2 ($\alpha = 0.72$), vignette 3 ($\alpha = 0.70$), vignette 4 ($\alpha = 0.73$), vignette 5 ($\alpha = 0.80$), and vignettes 6 ($\alpha = 0.71$), vignette 7 ($\alpha = 0.85$) and 8 ($\alpha = 0.82$).

Table 3. 3

Scorer Descriptive Statistics and Interrater Reliabilities for Depth of Reflection in the Pilot Study
($n = 81$)

Vignette	Scorer 1		Scorer 2		α
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Vignette on Group Working	1.61	0.67	2.28	0.51	0.81
Vignette on Laboratory Security	1.04	0.20	1.55	0.43	0.72
Vignette on School Attendance	1.05	0.22	1.60	0.46	0.70
Vignette on Diversity in Students	1.41	0.50	2.26	0.86	0.73
Vignette on International Students	1.49	0.47	1.82	0.54	0.80
Vignette on Alternative Assessment	1.05	0.22	1.53	0.42	0.71
Vignette on Students' Disruptive Behaviors	1.10	0.30	1.35	0.36	0.85
Vignette on Assignment Evaluation	1.96	0.19	2.15	0.43	0.82

For the dimension of the form of dialogue, inter-scorer reliability analysis through Cronbach's alpha coefficients for scorer 1 and 2 for each vignette is measured as high reliability: vignette 1 ($\alpha = 0.99$), vignette 2 ($\alpha = 0.84$), vignette 3 ($\alpha = 0.81$), vignette 4 ($\alpha = 0.86$), vignette 5 ($\alpha = 0.78$), and vignettes 6 ($\alpha = 0.82$), vignette 7 ($\alpha = 0.86$) and 8 ($\alpha = 0.98$). According to Nunnally (1978), these results indicate that the VBAQTRI is reliable.

Table 3. 4

Scorer Descriptive Statistics and Interrater Reliabilities for Form of Reflective Dialogue in the Pilot Study (n = 81)

Vignette	Scorer 1		Scorer 2		α
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Vignette on Group Working	2.92	0.83	2.94	0.54	0.99
Vignette on Laboratory Security	2.14	0.40	2.30	0.26	0.84
Vignette on School Attendance	2.01	0.11	2.33	0.27	0.81
Vignette on Diversity in Students	2.39	0.49	2.53	0.62	0.86
Vignette on International Students	2.05	0.21	2.36	0.40	0.78
Vignette on Alternative Assessment	2.10	0.32	2.29	0.24	0.82
Vignette on Students' Disruptive Behaviors	2.09	0.32	2.23	0.37	0.86
Vignette on Assignment Evaluation	2.94	0.35	2.97	0.36	0.98

Given each dimension, mean differences testing indicates no significant differences between part response scores and the overall score, $t(80) = 0.449$, $p = 0.59$ (for the dimension of depth in reflection) and $t(80) = 0.289$, $p = 0.78$ (for the dimension of the form of reflective dialogue). As a result of these findings and the high internal consistency reported previously, one mean rating is calculated for each vignette under each dimension. For the depth in reflection, the consequential mean teacher reflection for the 81 science teachers is 1.58 ($SD = 0.16$). There are no significant differences between vignettes, $F(7,77) = 0.45$, $p = 0.70$ and between scorers, $F(2,78) = 1.082$, $p = 0.34$. For the form of dialogue, the consequential mean teacher reflection for the 81 science teachers are 2.42 ($SD = 0.18$). There are no significant differences between vignettes, $F(7,77) = 0.39$, $p = 0.42$ and between scorers, $F(2,78) = 1.927$, $p = 0.21$. Together these results provide important insights into validating the VBAQTRI and its coding scheme.

As another strategy, theoretical triangulation is used to enhance the internal validity of the instrument and its coding scheme. Triangulation by theory is more commonly known as using various theories that existed in the related literature in the interpretation of the phenomenon under the investigation (Miles & Huberman, 1994). In that sense, a four-dimensional approach for coding and analysis of written teachers' reflections is adopted in this study based on those employed in previous research (Dewey, 1933; Laboskey, 1994; Lane, et al., 2014) and are refined in order to best represent the present data.

Finally, the development process of the vignette-based instrument and its coding scheme is explained in detail to enable future researchers to evaluate our process in establishing the preliminary reliability and validity of the vignettes and the scheme.

3.3.2. Data collection procedures in the survey study. After development and trial of VBAQTRI and its corresponding coding scheme, teachers are reached out through school visits and social media (Facebook) to collect the main data of the survey study. Participant teachers are informed about the details of the nature and purpose of the study; a statement that participation in the study is voluntary; and any other information that seems necessary for an informed decision to be taken by the sample. After consent, teachers are shown a description of the study, of which they are invited to read each vignette and to respond to the following three open-ended questions. Upon completion of the instrument participants are asked about whether they are volunteered to participate in the further study. The completion of the survey generally takes about 20-25 minutes.

3.3.3. Data collection tools in the multiple case study. In the multiple case study, main data sources consist of semi-structured interviews, reflective discussions and reflective journal writings. The covert interpretations of participants and their understanding and assumptions of teaching and learning are captured through the transcription and analysis of interviews, and the examination of their reflective journal writings. In-depth semi-structured interviews with participants are carried out to obtain their understanding and experiences of the guided reflective process. Also, after their teaching practices, I conducted additional one-to-one interviews in order to identify the critical incidents that occurred. Reflection journals' writings are used as the means for allowing participants to spend time individually reviewing their teaching practices

and the incidents they deemed to be critical before discussion sessions. Also, reflective journal writings are the main sources of validating teachers' input and their changes in their reflections. Reflective discussions also give me an insider perspective of the phenomena under study. Field notes are the secondary sources for recording the thoughts and decisions of teachers in their teaching contexts and for providing raw data for the guided reflective practice sessions. Memos are used as another secondary source of the study, including the records of my thinking processes, reactions, feelings, impressions, reasons for decisions, and the ideas that might later prove significant during all tasks in the conduct of this research (Glaser, 1978).

a. *Semi-Structured Interviews.* Semi-structured interviews are the primary data collection tools to recognize the teachers' voices and experiences regarding the guided reflective process to address the research questions of the embedded multiple case study (Marshall & Rossman, 2014).

Essentially, I generated three interview protocols with open-ended questions. The first protocol is designed for exploring the teachers' personal perceptions, values and beliefs about science teaching. In order to elicit an account of what teachers actually do in their classrooms rather than an idealized point of view, I asked the participant teachers to elaborate their perspectives through telling stories of their own experiences. Also, I asked further questions to obtain a rationale for the teachers' teaching practices in order to infer their personal beliefs and values about science teaching and learning.

The second protocol is used to collect data on the teachers' reflections on the video recorded teaching incidents they deemed to be critical. This interview took place following each of video recorded lessons of participant teachers. During this process, I asked the participant teacher to analyze and comment about what is going on, what are the reasons for the things that s/he is doing in the lesson, and about any thoughts that might be going through his/her mind as s/he is teaching. The basic questions are "What happened?", "Why?" and "What are you thinking?" Also, several reflective questions that are related to the specific events in each videotaped lesson that I noticed while observing are asked, such as "What are essential strengths of the lesson?", "What, if anything, would you change about the lesson?", "What, if any, unanticipated learning outcomes resulted from the lesson?". The teachers have a certain amount of autonomy in determining the content and direction of this one-to-one interview.

The third interview protocol is used to recognize the teachers' voices and experiences about the guided reflective practices through critical incidents analysis. I carried out both one-on-one interviews and a focus group interview in the last meeting to collect data on the lived experiences of elementary science teachers about guided reflective practices that used in their professional works.

Selected participants are informed to set up an interview and before the interview, they are instructed to sign a consent form. The protocols for each one-to-one interview are shown in Appendix E. One-on-one interviews are conducted in the location that participants choose. Participants are interviewed mostly in a private room in their own school where they feel comfortable to share their experiences and feelings. Individual interviews take around one hour for about ten questions. Each semi-structured interview protocol is provided to each teacher at the beginning of each interview. This allows the teachers to think through their responses to the questions and to clarify their thoughts. As fitting with qualitative research, the semi-structured interview protocols provide a framework of open-ended questions that leave room for unanticipated topics. I carried out the conversational style in order to maintain the flow of the conversation naturally while allowing the participant to speak freely as much as possible. The questions in the semi-structured interviews are formulated as an indirect prompt with a polite manner. At the beginning of each interview, I asked the participants if they had any questions or concerns about the interview and they are answered to avoid confusion. All the interviews are tape recorded with the permission of the participants. Each interview is approximately 40-90 minutes in length.

b. Video Records of Reflective Discussions. Reflective discussions mostly focus on the critical incidents that participant teachers choose from among other critical incidents in the videotaped lesson. The aim here is to revisit the incident, consider its meanings for the teacher and explore the possibilities for changing their actions. These discussions are repeated several times based on the idea that teachers are enabled to produce a deeper understanding of their thinking and actions. I maintained these discussions. I am the moderator allowing the participants to dynamically interact with each other in answering the reflective questions (Creswell & Poth, 2016). All discussion sessions are video recorded with the approval of the participants.

Before interviewing participants, the interview protocol including open-ended questions are reviewed by three faculty professors to examine each question to reveal teachers' experiences and feelings about the reflective practices in terms of the clarity of the words and phrases, their grammars, structures, organization and appropriateness. Also, a pilot study for the interview protocol is conducted to determine their appropriateness. For the pilot study, two science teachers are interviewed, both of whom agreed to participate. Their responses validate that the interview protocol is in line with the purpose of the study, and the information gathered is used to identify the feasibility and applicability of the protocol. No additional adjustments are required of the questions as a result of the pilot study. Both individual and focus group interviews with the ten science teachers are transcribed verbatim. Also, during the interviews, I attempted to bracket through the use of a research journal to decrease the impacts of any bias, values and experiences regarding the research process and the phenomena under the study (Lincoln & Guba, 1990). I took these field notes during the interviews to be used in the analysis of the data.

c. Reflective Journal Writings. All of the participants in the study are required to write a weekly reflective journal as a part of their practices for the duration of the investigation. The purpose of the journals is to stimulate recall for personal and informal reflective practice in their teaching. Although a teaching practice booklet is developed, which lists suggestions for the reflective journal offer to the participants, the format and content of the journals is left to their personal discretion. In these journals, they record their reflections on curriculum matters, class activities, social and personal matters that are significant to them on their teaching practice (See Appendix D).

d. Field Notes and Memos. Field notes are gained throughout the present study in line with the two main purposes. The first one is to gain the understanding of the milieu in which the participants are involved. For this purpose, I kept detailed field notes before, during and after participants' actual teaching performances. The majority of the field notes is used to keep important contextual and personal background information in mind, which helps me to develop clearer ideas for each participant's reflective journey. They are also used to prepare specific interview questions following each observation, particularly for the further discussions on the critical incidents that teachers identified and other relevant events. Another purpose is related to obtain

detailed information about how teachers are engaged in the guided reflective practices. Field notes are arranged at the convenience of the participant teachers' schedule. Detailed field notes and audio recordings are kept to ensure accurate data collected (See Appendix F). The data are also shared with the participants to verify its accuracy and relative trustworthiness.

Furthermore, I kept a research journal as a tool of producing memos for three purposes. In this study, memos work alongside as a secondary sources of data in such a way that the data gathered through semi-structured interview protocols and the video recordings of the reflective discussions, and the field note data are incorporated into the memos to provide supportive documentation for the study. Another important contribution of producing memos is that memos in the researcher journal included the records of the researcher's thinking processes, reactions, feelings and impressions from the beginning during all tasks in the conduct of this research to be aware of own prejudgments and assumptions influencing the credibility of the study. Last but not least, as another function of the memos, I recorded how decisions are made and conclusions reached in the research process, and the ideas that might later prove significant, which initiates and maintain my productivity in the study.

3.3.4. Data collection procedures in the multiple case study. Several instruments are exploited to collect the data for the embedded multiple case study. For this study, the data collection procedure lasted for four months through the 2018-2019 Spring Education Term. After selected the participants of the study, they agreed to attended eight-week reflective discussion meetings within a collaborative environment, where various reflective tools are used including all different approaches (i.e. written reflection, verbal reflection, and mental self-reflection) (Cowan & Westwood, 2006) such as reflective journals, critical incidents analysis and self and peer analysis of real classroom video footages. These practices are carried out in the name of "Guided Reflective Practices"

The main purpose of these meetings is two-fold: (1) to enable participants to evaluate their decisions about what and how to teach and to feel responsibility for those decisions and (2) to have multiple and wider perspectives in order to find alternative ways of reacting and responding to everyday classroom situations/issues/problems for better outcomes.

The meetings are held twice a month and took almost 3-4 hours. Before the meetings, participant teachers are interviewed to elicit information about their backgrounds and their pre-existing beliefs on science teaching. Each interview is arranged for one hour in length and took place at locations of the participants' choice. The interviews are audio-taped and later transcribed. The procedure of guided reflection is developed mainly the idea of repeated reflective discussions arise on the basis of teaching experiences of participant teachers. The procedure began with the videotaping of a particular lesson. Thus, I visited the schools where the participant teachers taught to video-record their teaching sessions. I recorded at least two 45-minute teaching sessions of each participant teacher. Two cameras situated at the very back of the classroom to clearly capture the voice and image of both the teachers and the students with nearly the whole classroom surroundings. I also stayed in the classroom taking some field notes in order to identify some critical incidents. On the next time of the observation, when the participant teacher is available for attending a post-conference for discussing the lesson. To prevent the teacher from forgetting the details of the lesson the interview is done within two days. The goal of the interview is to allow the teacher to bring to mind the actual classroom situation as clearly as possible and to verbalize the thought processes in connection with the actions in the classroom. The teacher described classroom events and most importantly, gave reasons for the actions taken. In this phase, the most important questions are what, how and why.

In the next phase, reflective discussions are carried out. The focus of the reflective discussion is the critical incident that the teacher has chosen from among other incidents in the videotaped lesson. The criticality of the incident is defined according to a framework of professional development and is based on the teacher's conscious intentions (Tripp, 1994). Compared with the previous interview, the aim here is to revisit the incident, consider its meanings in a wider context, and explore the possibilities for changing the teacher's actions. Reflective discussions are repeated eight times, twice in a month during the period, on the assumption that they produced a deeper understanding of the teacher's thinking and actions. In this study, the usefulness and importance of reflection when conducted in interaction with colleagues is stressed during the discussion sessions. The sessions are based on the learning process of the teachers in exercises of reflection about their teaching practice. The participants carried out exercises of reflection on those experiences and drew both

practical lessons and insights about the concepts and methods of reflective practice they apply. The eight sessions of three to four hours are arranged to introduce some reflective and reframing methods as a resource for carrying out those exercises.

A “Critical Incident Protocol” is used as a main tool to facilitate reflection of participant teachers. The protocol is developed based on David Tripp’s (1994) four steps: (a) describe and explain an incident; (b) find a general meaning and classification for the incident; (c) take a position regarding the general meaning; and (d) describe actions to be taken. A two-part Critical Incident protocol is constructed using these components: a description of an incident that ‘amused or annoyed’ (Tripp, 1994, p. 20), is ‘typical or atypical’ (Tripp, 1994, p. 36), is an ‘aha or ouch’ or a ‘felt difficulty’ (LaBoskey, 1994, p. 25.); and, the meaning of the incident written as a detailed reflection and analysis of the incident. The description requires rich and concrete detail; the meaning required teachers to find the generalizable aspect of the incident, link it to theoretical information, elucidate their position regarding the general meaning, and select potential future actions pertaining to this meaning. It is the second half, the meaning, which makes an incident ‘critical’ (Tripp, 1994). The intent of the tool is to focus on the meaning of the incidents rather than on the experience of them. An “*emotions*” component is added to facilitate the understanding that emotions and what comes to our attention (an “incident”) are inherently connected (Brockbank & McGill, 1998). Second, the use of ‘I’, requires when describing the perspective of each person taking role in the incident, enriches explanations and deepens and broadens understanding of the perspectives of others. Next, the Classification component is placed before the General Meaning component to provide a single focus for discussion while demonstrating that one incident relates to many aspects of teaching/learning. Finally, teachers are enabled to connect their daily classroom practices to the theory that are addressed in their incidents.

Through the guided reflective process, participant teachers are previously provided with a guiding sheet to outline various teaching aspects to ease the self-analysis procedure. All the sessions are also video-taped. In addition, the teachers kept reflective journals in order to write down their teaching experiences and to self-reflect about what happened and how they feel about each incident. All participant teachers are also supplied with brief notes mentioning how to write and what to include in a reflective journal on the first meeting held before the session started.

This whole process is held under the name of guided reflective practices. As a researcher, I have two main roles in this process. The first role is to provide guidance for all participants to reflect their teaching practices during the meetings. I mostly asked what, why, and how questions to elicit their reflections (i.e. What do you believe this happened? Why do you think about it? and How do you feel about it?). All participants are previously provided with a guiding sheet to outline various teaching aspects to ease the reflective practices and my second role as a researcher is to create a friendly space that allowed the participants to share their experiences and feelings without making any prejudice and judgment. With the permission of the participants all meetings are video-taped. Also, the participants kept a reflective journal in order to write down their teaching experiences and to self-reflect about what happened and how they felt about them. They are also supplied with brief notes mentioning how to write and what to include in a reflective journal on the first meeting held before the session started.

3.4. Data Analysis Process

Data analysis is defined as a process of bringing order and structure, making sense of the data (Marshall, & Rossman, 2014). This section gives detailed information of the analysis of data classified as belonging to quantitative or qualitative categories within the context of the mixed method study.

3.4.1. Quantitative data analysis process. This part is concerned with the quantitative data obtained under two dimensions of “*depth in reflection*” and “*form of dialogue*”. As discussed in the section dealing with the validation process of the vignette-based instrument, the unit of analysis is used in this study, in which each vignette entry is referred to as a “*reflective unit*” (Galves-Martin et al., 1998), and each reflective unit is assigned in terms of different categories and sub-categories specified in the coding scheme. A reflective unit can be defined as “*a single idea or thought about a particular event or situation*”, and there is no specified length for this unit. It is important to bear in mind that the unit of analysis could be the sentence, or any part of a sentence presenting a different idea from the other parts.

The number of the sample of the main study is 236 elementary science teachers, therefore, the total number of individual responses is 5.664 ((236 x 8 vignettes)

response sets x 3 open-ended questions = 5664 individual responses). As previously mentioned, regarding the responses to the questions, at the first place, each unit of analysis is assigned a category of the depth in reflection and a category of the form of dialogue specified in the coding scheme. Each participant is given one total score for each vignette on the four scales and transitions between consecutive levels indicating routine (1.00), transition, technical (2.00), transition, contextual (3.00), transition and critical reflection (4.00) regarding the domain of the depth of reflection, and four scales indicating purely descriptive dialogue (1.00), descriptive dialogue with evaluation (2.00), lowly reflective dialogue (3.00) and highly reflective dialogue (4.00) according to the form of dialogue. Regarding the form of dialogue, while analyzing the data set, the reflective units are scanned for particular words and phrases that might indicate reflective rather than purely descriptive responses. For instance, in the cases of the specific words such as “because”, “as” or “by” used, the code of lowly reflective dialogue is used due to the evidence of a justification. Likewise, in the cases of the words “could have” “would have”, “should have”, “might have” and “perhaps” used, the code of highly reflective dialogue is used due to the evidence of an imagining of future actions. Each participant is also given an average score representing overall placement of a teacher’s reflection under these two dimensions. Therefore, each of the response sets received 4 ratings for the depth in the reflection and 4 ratings for the form of dialogue. Exemplary sentences from reflective units obtained in the pilot study under these two dimensions are coded and scored as follows:

Routine; Purely Descriptive Dialogue: *“It would be another issue that not all students want to engage in that kind of activity”.*

Technical Reflection; Lowly Reflective Dialogue: *“With these crowded classroom sizes, it would not be feasible to implement group works.”*

Technical Reflection; Descriptive Dialogue with Evaluation: *“In that case, even students who are not interested in the group work can get higher points based on the product of the group.”*

Technical Reflection; Highly Reflective Dialogue: *“If this had been my classroom, I would have been carrying out the activities based on individual performance rather than group work.”*

The depth of reflection score is calculated as 1.8, which means that this teacher is positioned in the transition between Routine-Technical. The form of reflective

dialogue for the teacher is calculated as 2.6, which is categorized as the transition between Descriptive- Lowly Reflective Dialogue.

For ensuring inter-coder reliability of the data in the main study, an external coder is instructed in the use of the coding scheme to analyze the data. After I performed coding to the entire data set including 5.664 reflective units, 59 individual responses for each vignette corresponding to 1.416 (25% of the entire data set) reflective units, which is acceptable to ensure representativeness of the entire data (O'Connor & Joffe, 2020) is selected randomly and coded by the external coder in the field of science teaching to ensure the inter-coder reliability. After conducting separate analyses, the results are compared and each category and subcategory under each of four dimensions is more sharply identified until agreement of over 80% is achieved (Miles & Huberman, 1994). A full list of identified themes is available from the coders. Agreement between the coders on themes discussed in each reflective unit is high (82% for depth in reflection and 88% for the form of dialogue).

Also, for the inter-scorer reliability between each scorer, additional analysis is conducted using the SPSS 25.0 Package Program. In this analysis, the first set of analyses for the dimensions of the depth in reflection and the form of dialogue are examined and the correlation among scores is derived from two independent scorers on each vignette (Bardhoshi & Erford, 2017). Before the main analyses, the data that include responses from 236 elementary science teachers under the two dimensions of teachers' written reflections (depth in reflection & form of dialogue) are inspected for the assumption of normality. The Kolmogorov-Smirnov and Shapiro-Wilk tests reveal statistically non-significant results, which displays the normality of the data, given the dimension of the depth in reflection the tests yield statistically significant results for each vignette in the instrument in the present study, suggesting violation of assumption of normality (Pallant, 2007). Furthermore, as another suggested statistical method for checking the normality of data (Tabachnick & Fidell, 2013), the values of Skewness and Kurtosis are calculated under the dimension of the depth in reflection. The skewness coefficient ranges from -0.354 to 3.742 and the kurtosis coefficient ranged from -0.862 to 7.137. Kline (2011) suggests that the value of Skewness and Kurtosis should not be greater than 3 and less than 10. Based on this recommendation the values of the Skewness and Kurtosis of all the vignette scores in this study are within the

acceptable range of < 3 and < 10 respectively, which is satisfactory for further analysis.

As discussed previously, there are two scores for each participant response set (one vignette with three open ended questions) on each vignette. Given these two dimensions, data arising from the main study are summarized in Table 3.5 and Table 3.6, which display the descriptive statistics results. For the dimension of the depth in reflection, inter-scorer reliability analysis through Cronbach's alpha coefficients for scorer 1 and 2 for each vignette is measured as moderate to high reliability: vignette 1 ($\alpha = 0.87$), vignette 2 ($\alpha = 0.81$), vignette 3 ($\alpha = 0.83$), vignette 4 ($\alpha = 0.86$), vignette 5 ($\alpha = 0.84$), and vignettes 6 ($\alpha = 0.81$), vignette 7 ($\alpha = 0.89$) and 8 ($\alpha = 0.88$).



Table 3. 5

*Scorer Descriptive Statistics and Interrater Reliabilities for Depth of Reflection in the Main Study
(n = 236)*

<i>Vignettes</i>	<i>Scorer 1</i>		<i>Scorer 2</i>		α
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Vignette on Group Working	2.94	0.83	2.88	0.54	0.96
Vignette on Laboratory Security	2.55	0.40	2.38	0.26	0.82
Vignette on School Attendance	2.83	0.11	2.63	0.27	0.81
Vignette on Diversity in Students	2.91	0.49	2.71	0.62	0.81
Vignette on International Students	2.87	0.21	2.54	0.40	0.82
Vignette on Alternative Assessment	2.90	0.32	2.69	0.24	0.84
Vignette on Students' Disruptive Behaviors	2.41	0.32	2.26	0.37	0.88
Vignette on Assignment Evaluation	3.07	0.35	2.94	0.36	0.95

For the dimension of the form of dialogue, inter-scorer reliability analysis through Cronbach's alpha coefficients for scorer 1 and 2 for each vignette is measured as high reliability: vignette 1 ($\alpha = 0.96$), vignette 2 ($\alpha = 0.82$), vignette 3 ($\alpha = 0.81$), vignette 4 ($\alpha = 0.81$), vignette 5 ($\alpha = 0.82$), and vignettes 6 ($\alpha = 0.84$), vignette 7 ($\alpha = 0.88$) and 8 ($\alpha = 0.95$).

Table 3. 6

Scorer Descriptive Statistics and Interrater Reliabilities for Form of Reflective Dialogue in the Main Study (n = 236)

<i>Vignettes</i>	<i>Scorer 1</i>		<i>Scorer 2</i>		<i>α</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Vignette on Group Working	1.93	0.25	1.87	0.51	0.87
Vignette on Laboratory Security	1.45	0.27	1.38	0.43	0.81
Vignette on School Attendance	1.35	0.23	1.29	0.46	0.83
Vignette on Diversity in Students	1.83	0.36	1.79	0.86	0.86
Vignette on International Students	1.50	0.37	1.54	0.54	0.84
Vignette on Alternative Assessment	1.49	0.21	1.52	0.42	0.81
Vignette on Students' Disruptive Behaviors	1.51	0.33	1.45	0.36	0.89
Vignette on Assignment Evaluation	2.22	0.39	2.02	0.43	0.88

Given each dimension, mean differences testing indicate no significant differences between part response scores and the overall score, $t(235) = 0.408$, $p = 0.51$ (for the dimension of depth in reflection) and $t(235) = 0.139$, $p = 0.84$ (for the dimension of the form of dialogue). As a result of these findings and the high internal consistency reported previously, one mean rating is calculated for each vignette under each dimension. For the depth in reflection, the consequential mean teacher reflection for the 236 science teachers are 1.66 ($SD = 0.16$). There are no significant differences between vignettes, $F(7,232) = 0.45$, $p = 0.70$ and between scorers, $F(2,233) = 1.082$, $p = 0.34$. For the form of dialogue, the consequential mean teacher reflection for the 236 science teachers are 2.72 ($SD = 0.12$). There are no significant differences between vignettes, $F(7,232) = 0.47$, $p = 0.24$ and between scorers, $F(2,233) = 1.718$, $p = 0.31$. The reliability measure between the two coders is ensured.

3.4.2. Qualitative data analysis process. In relation to the assessment of a teacher's reflection in line with the breadth in reflection and the affective domains of reflection, an iterative data analysis process is utilized, in which I performed the systematic repetition of a sequence of coding and grouping the references to construct a set of tentative categories and themes before the final decision. This process provides a deep understanding of the data and enhances the credibility and reliability of the data analysis process (Marshall & Rossman, 2014). Then, the recurrent categories and themes throughout the dataset are reviewed and adjusted accordingly, which mostly emerge inductively in the raw data (Thomas, 2006). Still, the themes and categories are also specified based on not only actual expressions, words and phrases that participants used in their responses but also previous discussions emerged in the literature review. While additional coding is performed on each vignette entry for the identifying the categories and subcategories within the breadth of reflection, the content of every reflective unit in the written responses is identified and allocated it to a specific focus theme or category of the coding scheme. The five themes identified in the reflective units obtained from the pilot study are set out as follows: focus on self, focus on students, focus on instruction, focus on context and focus on evaluation. Regarding the theme of "focus on self", there is a personal focus, on which teachers describe some personal insight about themselves and their roles in the teaching. For the theme of "focus on students", teachers relate the identified issues or problems to students and made connections of their decisions or actions to positive or negative impacts on the students. Also, teachers link a specific issue explicitly to how the instructional processes are carried out under the theme of "focus on instruction". Another recurrent theme in the instrument is related to the "focus on context", under which a variety of perspectives are expressed about mostly the underlying reasons of the issues or problems and some conclusions are drawn based on the contextual factors such as class size, time management, etc. The final theme, referred as "focus on evaluation", come up mainly in discussions of assessment and measurement of students' learning.

If I turn to the data analysis under the affective domains of reflection, any references concerning how participants feel about the issues on each vignette in the instrument are coded. A range of responses is elicited in response to the question: "*how do you feel about the issue(s) specified in this incident?*". Given emotion-laden language

within the reflective units, five categories are emerged as they are presented in the results section: positive emotions, negative emotions, surprising emotions, and neutral emotions. While some specific emotion terms within the reflective units is explicitly stated such as, *“I feel overwhelmed because I am not sure how to teach such a wide diverse population of students”*, I also coded some reflective units based on the use of emotionally-laden language within the context of the vignette such as *“I would care about those students because they are vulnerable and they need time and support to feel belongingness in my class”*. On completion of the coding under two dimensions of breadth in reflection and affectivity of reflection, a cross check is conducted for reliability across two coders, which are calculated as 84% for breadth in reflection and 93% for affectivity of reflection.

In the process of data analysis within the context of the qualitative part of the study, as a general principle, I analyzed the data both within and across each case for commonalities and differences in each piece of data collected (Stake, 1995). After analysis of each set of data collection is addressed individually in this study, the data are triangulated through different data sources including interviews, reflective journal writings and reflective discussions (Yin, 2013). Thus, the data from each method of collection provide assurance that important themes generated, given meaning and interpreted correctly both within the individual case and across all ten cases (Stake, 1995).

Specifically, categorical aggregation and direct interpretation are carried out in order to generate themes as Creswell (2013) suggested. In this stage, NVivo 12.0 computer assisted software is used to assist in the data analysis, in which repeated words and phrases are grouped and analyzed for deeper understanding, assisted in identifying relevant big picture themes which guides more individual analysis. I then continued to use the computer generated results as well as the transcribed documents themselves to search for meaning. This is followed by a reiterative cycle of coding until a final set of codes within main themes is identified to be used across the cohort.

The cycle of data analysis of the initial case begins with the first participant's and connected her interviews with reflective journal writings, and the review of reflective discussions that she engaged in. The initial themes for coding emerge in line with the research questions. The detailed descriptions of each case is summarized by using the

word tables and charts not only to fully capture the uniqueness of the individual case but also to understand the nature of changes in different dimensions of reflection, which then is used for the cross case analysis (Yin, 2013). After initial analysis of the first participant, the next participant is analyzed and the analysis continues across each individual case.

Since this study is exploratory and interpretative in nature, explanation building about the cases through data is utilized (Yin, 2013). In order to explain the phenomenon of the guided reflective process, I drew conclusions about how and why the changes in the quality of teachers' reflections happened based on the various forms of data collected throughout the research (Yin, 2013). After conducting within case analysis, the data are then compared to the analysis of the other cases for cross-case analysis for the purpose of presenting evidence to allow for greater interpretation (Yin, 2013).

Data saturation of the identified themes occurs early in the coding process, indicating that the list of themes is representative of the context of the qualitative data in relation to the research questions emerged in this study. It should be taken into considerations that the charts including the descriptive statistics of the themes emerged are designed to illustrate the findings and to reveal patterns and themes.

3.5. Trustworthiness of the Study

As the concerns related to ensuring validity of the quantitative data are discussed in the previous section, in this section, the four standards of establishing trustworthiness of the research are outlined to verify the credibility, transferability, dependability and confirmability. The following table illustrates how the current study met these standards for increasing trustworthiness.

Table 3. 1 Standards for Research Trustworthiness

Question	Key components
Is the study credible?	Is prolonged engagement adequate? Is persistent observation adequate? Is triangulation adequate? Is peer debriefing adequate? Is negative case analysis adequate? Are member checks adequate?
Is the study transferable?	Is thick description adequate to make transferability of the study likely?
Is the study dependable?	Is an adequate audit trail maintained? Are data collection and analysis procedures adequate? Has the researcher been careless or made mistakes in conceptualizing the study, sampling people and events, collecting the data, interpreting the findings, or reporting results?
Is the study confirmable?	Is an adequate audit trail maintained? How adequate are the findings? How well are they supported by people and events that are independent of the inquirer?

The related issues of credibility, transferability, and dependability and confirmability are further discussed below.

3.5.1. Credibility. In order to ensure the credibility of collecting and presenting data within the context of the multiple case study: prolonged and persistent engagement, triangulation, peer debriefing, member checking, negative case analysis and reflexivity are followed to minimize the research bias.

a. Prolonged and Persistent Engagement. This strategy is used to establish the credibility of the research, in ways of spending enough time in the field, showing enough effort to understand what goes on, letting participants know about the research and using key informants (Yin, 2013). This current investigation is carried out for approximately 16 weeks. During this research period, I spent enough time to provide the data to reach out interesting and significant findings. Also, multiple data instruments are used to reveal participants' experiences and views related to the guided

reflective process so that I showed enough effort in the field to understand the topic being studied. At the beginning of the study, the participants are informed about the research, who are selected based on the criteria of being key informants. Persistent engagement is also used throughout the duration of the study, which refers to staying in the field, keeping the goals of the study in mind and collecting data in detail (Yin, 2013). I participated in the reflective discussion sessions, observed their teaching practices, visited the schools that participants are working at and interviewed them on a regular basis. Therefore, it is possible to share experiences in the same atmosphere and to observe day-long activities of the participants. In addition, several in-depth informal interviews with the teachers and interaction within the settings are possible during the research period. Also, prompts and alternative questions are used to ask details and to get more about the experiences, beliefs and views of the participants.

b. Triangulation. The triangulation effort is adequate for this study since I collected, compared and analyzed multiple sources of the data through using multiple methods of data (interviews, reflective discussions, and reflective journal writings) in an effort to inquiry multiple perspectives are used to validate the various findings. Although different methods of data are used for different purposes, they are mutually complementary to compile rich data. For instance, when participants never thought about the issues, they came across during the reflective discussion sessions or when they are not prepared to answer certain issues during the interviews, they could take as much time as they needed to explain themselves, when they wrote their reflective journals.

c. Peer Debriefing. As another strategy that helps to establish the truth claims of qualitative research, a colleague as a critical friend is included as peer debriefing (Paton, 1990). One of my colleagues who has a PhD degree of science education is involved in data analysis from the beginning of the process including finding appropriate categories to develop the coding system and counting the frequencies of participants' thought in order to verify the findings. My supervisor also read and edit this research paper from draft to the final product. She suggested some ideas that help me to strengthen the value of the conclusions, and to enrich understanding of the research. Through discussing with these colleagues, a balance between subjectivity and objectivity is kept.

d. Member-Checks. Throughout the study member-checks are used, where the participants read the interview transcripts to verify the information they are given. The views of the teachers are extracted from the interviews, reflective discussions and the reflective journals without alteration except in changing grammatical structures to reflect as far as possible what the participants want to say.

e. Negative Case Analysis. Since the major aim of this study is to give voice to participants in order to understand the concept of reflection in teaching, looking at contradictory pieces, differences, outliers or extremes of data from participants in the study as known as negative case analysis, is another way to provide well-elaborated descriptions of the teachers' views. I maintained an unbiased point of view and made efforts to consider all points of view.

f. Reflexivity. Given my deep immersion in the research context regarding my roles in gathering and interpreting evidence from the subjects, engaging in reflexivity is of fundamental importance for promoting rigor in the study. In order to reduce the possible impacts of my presence and personal biases on the choices of theoretical position, methodological approach and interpretive rational, particularly while conducting qualitative research, it is critical to be aware of my role as a researcher within a highly familiar context for a long time. Given that reflexivity means interpreting one's own interpretations (Clegg & Hardy, 1996), the following three strategies facilitate the process of reflexivity: (1) keeping a research diary noting down thoughts and feelings about the research process; (2) keeping fieldwork notes observations, interactions, incidents, conversations, emotions and responses; and (3) discussing and evaluating responses to the research subject, participants and process with a fellow researcher.

3.5.2. Transferability. I maintained a detailed log, field notes, my memos, audit trail, and used audio and video recordings to ensure that a "thick" description is collected (Stake, 1995). In order to allow the results of this research to be transferred to other schools or districts, the study uses thorough descriptions of the data collection and analysis procedures. The total replication of the study is not needed to allow for transferring of knowledge; however, the methodology and procedures are detailed if replication is desired. As identified earlier, the criteria for selection of the participants are explained in detail for transferability. This final report includes participant sampling limitations and the procedures used in this research. Any aspect of this multiple case study could be used to examine or assess the nature of teachers' reflection as a result of the use of the guided reflective process.

3.5.3. Dependability. An audit trail is kept until the completion of the study, which includes notes detailing when, why, and how decisions are made regarding the direction, organization, and formation of the study and detailed information about all procedures, data collection, and data analysis methods (Donald et al., 2006). I also kept a journal including all notes, questions, and correspondence with participants and the links between the proposed research questions, the data collected, and the conclusions drawn. An independent auditor, who recently completed her case study dissertation from the same department, is consulted about how the study is conducted; including what is done, when, and why. I used the audit trail, independent auditor field notes, my memos, member checks, and audio recordings to ensure that the methods, descriptions, and results are as accurate as possible.

3.5.4. Confirmability. Although limited by sample size and demographics, the results of the research are confirmable with the use of three methods including member checks, field notes, and a detailed audit trail to verify recorded data and findings. The audit trail accounts for all of the dates and times of when I met with the participants of the study. In addition, it outlines the decisions, logic, and rationale that I used to guide the directions and the efforts of the study. At the end of the study, the preliminary findings and the majority of the data are shared and verified by the participants.

3.6. Limitations and Delimitations of the Study

The limitations and delimitations of this study warrant mention in order to take into consideration while interpreting the findings of the study within the context of two parts of the study.

3.6.1. Limitations and delimitations of the survey study. This section is concerned with several limitations and delimitations placed in the survey study.

This study proposes an in-depth examination of the quality of elementary science teachers' reflection through the Vignette-Based Assessment of the Quality of Teacher Reflection Instrument (VBAQTRI), in which they are asked to write their opinions and feelings independently without external prompting. At first glance, this study is delimited to the participants' ability to reflect through writing.

Another potential limitation is that driven by social desirability, teachers could provide inaccurate information about what they would do in the cases of the specified critical incidents or how they would feel about them through the self-report instrument. However, according to Alwin (2007), information provided through the use of open-ended question formats is more likely to have systematically higher levels of reporting accuracy than the questions with closed-form. To overcome this limitation, I attempted to build rapport with the participants and ensured the confidentiality and anonymity during the data collection process to reduce the effect of social desirability in the scope of this study. Also, I gave privacy to the participant teachers while they are responding to the questions. Given the lack of my social contact with the participants, they felt more comfortable while giving socially unacceptable or more true responses to the questions while taking the instrument (Wallace, Cesar & Hedberg, 2018).

Furthermore, the study is also delimited to the responses of participants to the eight imaginary situations occurring in the science classrooms described in the vignettes. Still, having open-ended questions yields more detailed information about how participants perceive the problematic issues established in each vignette, which is constructed to present a descriptive summary that resembles the real situations and it is expected to notice the presence of variation of responses some level due to the

various interpretations of the participants about each vignette based on their own beliefs, assumptions and professional experiences.

Finally, the data generated by the study had interpretive value only if the operational definition of teachers' reflection articulated for this study is accepted. Since a consensus understanding of teacher reflection has not yet been reached, this may be difficult for some readers to conceptualize the phenomena under the investigation as conceptualizing in this study.

3.6.2. Limitations and delimitations of the multiple case study. With this multiple case study regarding the guided reflective process, several limitations and delimitations need to be acknowledged while interpreting the results of the study.

One arguable issue needs to be noted regarding the timing of the present study. Since the nationwide high school entrance exam occurs at the end of the Spring term, the participants are more occupied with covering all the topics in the curriculum. Thus, the current study only examines teachers' reflections that are mostly oriented to promote the development of content specific and general teaching practices. Due to the national examinations, teacher may have been more concerned with content specific issues, in which the national exam is considered as a validity threat of case study.

Regarding the timing issues, there are some cases in which participants left their weekly reflections to the last minute due to other immediate and overloaded classroom issues, which might limit their ability to recall exactly what they taught and what is occurring during their teaching performances. However, the reflective discussions and critical incidents analysis allow the teacher to bring to mind the actual classroom situation as clearly as possible and to verbalize the thought processes in connection with the actions in the classroom.

3.7. Situating the Researcher in the Study

Before proceeding to display the findings of the study, it is critical to move on to discuss how I am situated in this mixed methods study. Given the philosophical distinctions between qualitative and quantitative research (Smith, 1983), it is not surprising that my role is fundamentally different in qualitative and quantitative

research (Sciarra, 1999). This final section of this chapter addresses my stance on the research, the relation between me and the researched and the shifts in my positions regarding the long lasting survey study and the multiple case study as two parts of this research.

My educational background includes four years of an undergraduate study in a science education department and nine years of a graduate study in a curriculum and instruction department, during which my research has mainly focused on teacher education and teacher professional development. One of my main motivations for seeking an academic position is my strong interest in teaching. Because I consider myself as a scholar inside and outside of the classroom, my research informs my teaching and my teaching informs my research. That is why I started my career as a science teacher in a village school. Based on my professional and personal experiences in the field of teaching profession and my educational background, I came up with the research questions and believed in the need for this study as noted by the prominent social scientist Mills (1959) that "*the most admirable thinkers within the scholarly community you have chosen to join do not split their work from their lives*" (p. 195).

However, while my appreciation of the advantages of reflection has grown gradually over the time, the opportunity to practice reflection has not. Similar to a teacher who usually finds it difficult to carve out reflection time, I also have found it practically difficult. For this reason, I chose to focus on the ways of promoting reflective practices of teachers. Consequently, this study provides an especially opportune time to guide such teachers in the process shape their development even if they had long-term experience of the various school settings. Of course, what I have said here may not be accepted, but researchers generally tend to explore problems of their own formulation rather than those of teachers, which is my starting point of using critical incidents that teachers chose to focus on. Moreover, as a researcher, I do not offer any suggestions on how to improve teachers' own practices, and the relationship between me and the teachers is mutual and equal. In addition to this, the reflective practice process presented in this study requires the partnership of teachers who hold each other accountable. Researchers generally have difficulties in fully understanding the pressures of the school culture due to the fact that they do not work in a similar working environment. With my previous teaching experiences as a former science teacher, I serve as a colleague and a facilitator of reflective practices to elementary science

teachers in the study. As a bonus, writing this dissertation evolved into an opportunity to be reflective about my own personal and professional experiences.

Additionally, this study sketches my understanding of the necessity of reflective practices for professional growth on the basis of carrying out educational research integrated with the work of teachers in schools, in the form of the teacher as reflective practitioners. My role is shifted in such a way that I started as an outsider in the survey study, and then became an actor through the close interaction with participants of the multiple case study, which enables me gain access to their meaning-making worlds. This helps me to have a deeper understanding of the critical incidents that they identified throughout the study, which leads to establish a good relationship with them. Once again, I needed to spend a considerable time in the field building up such relationships with them. However, it is also essential to maintain the boundary between me and participants and to be at a neutral stance in the analysis of the data (Patton, 1990). It is crucial to take a step back from the data and negotiated constantly the issues closeness and intimacy, which might have serious consequences on truthfulness of findings of qualitative research.

CHAPTER 4

RESULTS

This chapter presents and describes the results in a systematic and detailed way to address three research questions of this study under four main sections.

4.1. The Quality of Teacher Reflection

This section addresses the analysis results according to each category and sub-category under the four dimensions (depth of reflection, breadth of reflection, form of reflective dialogue and affectivity of reflection) of elementary science teachers' written reflections about specified eight critical incidents obtained through the Vignette-Based Assessment of the Quality of Teacher Reflection Instrument (VBAQTRI).

4.1.1. Depth of Reflection. As noted previously, the coding scheme of analyzing the quality of teacher reflection regarding the depth of reflection specifies four levels and transitions between consecutive levels. Each unit of analysis is assigned a level of reflection specified in the coding scheme. Table 4.1 displays the basic descriptive statistics of the main study regarding the level of reflection of elementary science teachers for eight different vignettes. Given the means scores on eight vignettes regarding the dimension of the breadth in reflection, vignette 1 ($M = 1.93$, $SD = 0.25$), vignette 4 ($M = 1.83$, $SD = 0.36$) and vignette 8 ($M = 2.22$, $SD = 0.39$) are at high range, vignette 2 ($M = 1.45$, $SD = 0.27$), vignette 3 ($M = 1.35$, $SD = 0.23$), vignette 5 ($M = 1.50$, $SD = 0.37$), vignette 6 ($M = 1.49$, $SD = 0.21$) and vignette 7 ($M = 1.51$, $SD = 0.33$) are close to the low range. The total mean score of the sample regarding the dimension of the breadth in reflection is 1.66 ($SD = 0.16$). Given standard deviations for each vignette, the mean values of the vignettes under the dimension of the breadth in reflection are not dispersed largely.

Table 4. 1 Descriptive Statistics of Breadth & Depth by Vignette (n = 236)

Vignette Theme	<i>M</i>	<i>SD</i>
Vignette on Group Working	1.93	0.25
Vignette on Laboratory Security	1.45	0.27
Vignette on School Attendance	1.35	0.23
Vignette on Diversity in Students	1.83	0.36
Vignette on International Students	1.50	0.37
Vignette on Alternative Assessment	1.49	0.21
Vignette on Students' Disruptive Behaviors	1.51	0.33
Vignette on Assignment Evaluation	2.22	0.39

This table is quite revealing in three ways. First, it is apparent from the table that only the written reflections on three vignettes (Vignette 2, 3 & 6) are rated as routine. Then, a large part of written reflections on four vignettes (Vignette 1, 4, 5 & 7) are interpreted as the transitional phase between routine and technical. From this data, the reflective writings on the last vignette are found almost least of all in the data and interpreted as technical reflection.

For Vignette 1 ($n = 108$, 45.8%), Vignette 2 ($n = 184$, 78.0%), Vignette 3 ($n = 165$, 69.9%), Vignette 5 ($n = 105$, 44.5%), Vignette 6 ($n = 195$, 82.6%) and Vignette 7 ($n = 143$, 60.6%), vast majority of the teachers are at the transition level from routine to technical where their reflections mostly tend to contain problems with students' behaviors and lack of students' engagement. These reflective writings generally focused on blaming others and have focus on school context and concerns on lack of resources and time with crowded classroom size. The following example in vignette 1 illustrates these low-category of reflections:

With these crowded classroom sizes, it would not be feasible to implement group works. It would be another issue that not all students want to engage in that kind of activity. The lesson is too short to finish their group work. In that case, even students who are not interested in the group work can get higher points based on the product of the group. If this had been my classroom, I would have been carrying out the activities based on individual performance rather than group work.

Although there are not any reflective responses, relatively consistent with the critical category (See Table 4.1), for Vignette 4 ($n = 95$, 40.3%) and Vignette 8 ($n = 135$, 57.2%) most of teachers' reflections are categorized as transmission among technical and contextual categories. Most typically, these reflections have concerns about instructional process, lack of lesson preparations and fair evaluation of students' performance as seen in this exemplar:

If the teacher does not explain what they expect from students for an assignment, it is expected some students misunderstand the assignment. It is not good to give a minus point for these students. The teacher should have given another chance for students to revise their homework.



4.1.2. Breadth of Reflection. I identified 3.776 reflective units to 23 themes discussed within the written reflections of 236 elementary science teachers. Themes cover a broad range of categories regarding the teaching profession, including five categories identified in the pilot study. The categories are tracked by the number of reflective units in which the category is discussed (“*mention*”) as well as the total number of reflective units to the category in all individual responses (“*weight*”), as categories could be discussed multiple times within a single individual response. Table 4.2 illustrates the distribution of the categories for the eight vignettes under the dimension of the breadth in reflection, and the pie chart below presents the weight placed on each category according to the total number of reflective units to that category. As seen in the following chart, while elementary science teachers focus mostly on instruction (28%) and on teacher (24%), they have less concerns about evaluation (12%).

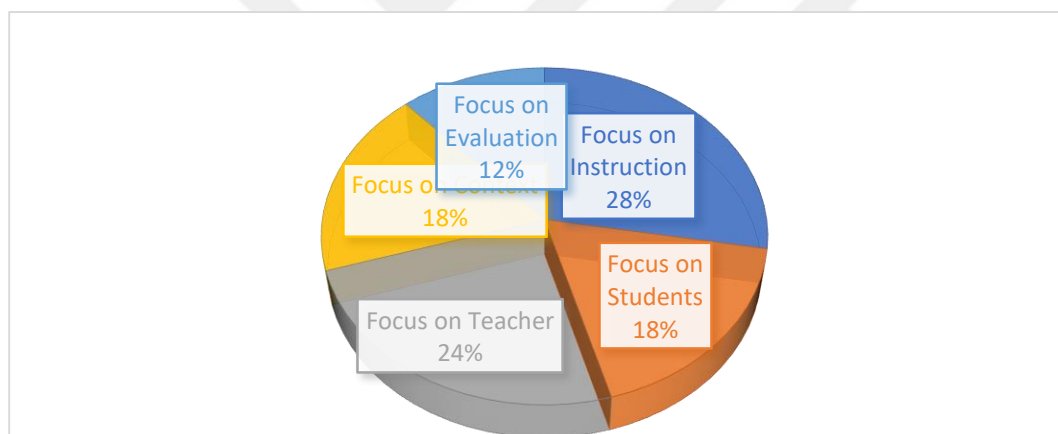


Figure 4. 1. Five Categories Under the Dimension of Breadth in Reflection by Weight (n = 236)

**Total of 3.776 reflective units (weight)*

Table 4. 2 |
Descriptive Statistics of the Breadth in Reflection by Mention ($n = 236$)

Vignette	Breadth in Reflection	f	%
Vignette on Group Working	Focus on self (i.e. authority, role expectation)	453	63.9
	Focus on students (i.e. students' needs, relationship with students, students' roles and responsibilities)	568	80.2
	Focus on instruction (i.e. lesson preparation, student engagement, feedback)	271	38.3
	Focus on context (i.e. resources, time issues, crowded classroom size)	705	99.6
	Focus on evaluation (i.e. fairness, student differences)	649	91.7
Vignette on Laboratory Security	Focus on self (i.e. authority, role expectation)	689	97.3
	Focus on students (i.e. students' needs, relationship with students, students' roles)	151	21.3
	Focus on instruction (i.e. lesson preparation, classroom management, safety procedures)	707	99.9
	Focus on self (i.e. authority, role expectation, responsibility)	542	76.5
	Focus on students (i.e. relationship with students and parents)	403	56.9
Vignette on School Attendance	Focus on context (i.e. culture, socio-economic status, gender role)	657	92.8
	Focus on self (i.e. caring profile, authority)	232	33.2
	Focus on students (i.e. relationship with students, respects for others)	104	14.7
	Focus on context (i.e. resources, time issues, crowded classroom size)	576	81.4
	Focus on instruction (i.e. overloaded curriculum)	481	67.9
Vignette on Diversity in Students	Focus on self (i.e. teachers' profile such as caring, authority)	312	44.1
	Focus on instruction (i.e. lesson preparation, multicultural education)	513	72.5
	Focus on students (i.e. students' needs, relationship with students, students' differences)	368	51.9
	Focus on context (i.e. language problems, administrative problems)	702	99.2

Vignette	Breadth in Reflection	<i>f</i>	%
Vignette on Alternative Assessment	Focus on self (i.e. self-improvement, authority, role expectation)	416	58.8
	Focus on instruction (i.e. lesson preparation)	695	98.2
	Focus on evaluation (i.e. assessment methods, fairness, student differences)	647	91.4
Vignette on Students' Disruptive Behaviors	Focus on self (i.e. role expectation, authority)	517	73.0
	Focus on students (i.e. relationship with students, students' needs)	634	89.5
	Focus on instruction (i.e. lesson preparation, classroom management)	671	94.8
Vignette on Assignment Evaluation	Focus on self (i.e. authority, role expectation)	691	97.6
	Focus on students (i.e. students' needs and differences)	369	52.1
	Focus on instruction (i.e. guiding students, classroom management)	706	99.7
	Focus on evaluation (i.e. assessment methods, fairness)	408	87.6

* Total of 708 reflective units for each vignette

** Total of 1,888 individual response (included any mention in any response)

***Table ranks according to the number of reflective units discussing identified the category within each vignette

Across all vignettes, for Vignette 1 (*Vignette on Group Working*), nearly all reflective units are coded under the categories of focus on context and focus on evaluation. For Vignette 2 (*Vignette on Laboratory Security*), the categories of focus on self and focus on instruction are four times higher than the last category of focus on students. While for Vignette 3 (*Vignette on School Attendance*), Vignette 4 (*Vignette on Diversity in Students*) and Vignette 5 (*Vignette on International Students*), the most frequent category is identified as focus on context, for Vignette 6 (*Vignette on Alternative Assessment*), focus on instruction and focus on evaluation are most frequently coded. For Vignette 7 (*Vignette on Students' Disruptive Behaviors*), all three categories of focus on self, focus on students and focus on instruction are emerged by more than half of the reflective units, among which the most frequent coded category is focus on instruction. In the final vignette (*Vignette on Assignment Evaluation*), the categories of focus on instruction and focus on self are most frequently coded compared to the other categories emerged in the reflective units.

The following figure depicts the averages graphically, on which the findings with regard to the depth and the breadth of teachers' reflective responses are provided. An examination of their reflections within and between these two categories also displays how the rubric is categorized in a way that each category has clear descriptive representations of teachers' actions and opinions. Even though each category consists of several subcategories, overall analysis of reflective responses using the scoring rubric revealed that the vast majority of elementary science teachers' reflections is categorized as either routine or technical or they are placed at the transition phase between routine and technical ($M = 1.66$, $SD = 0.16$).

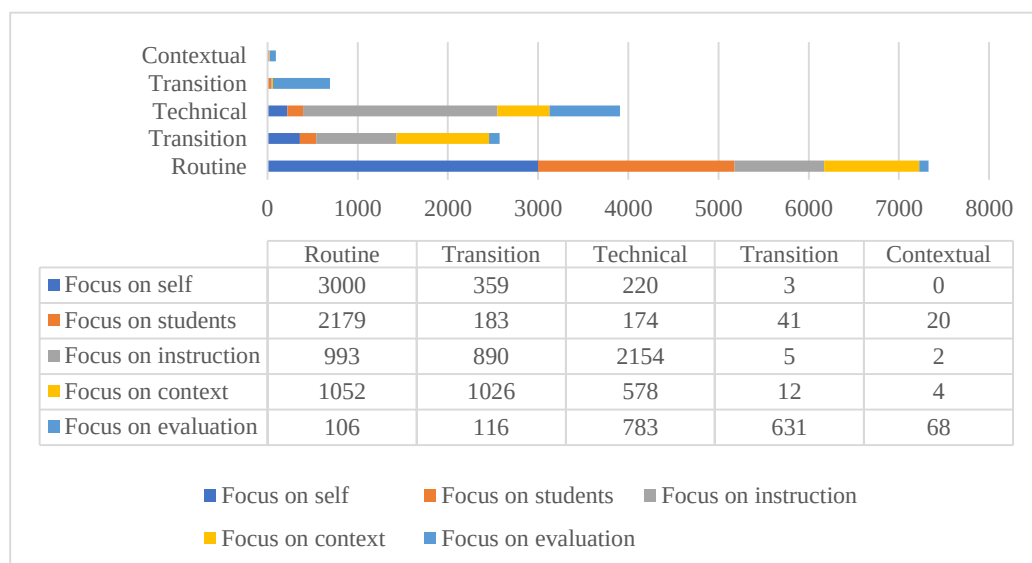


Figure 4. 2. Data Summary in Relation to Breadth & Depth of Teacher Reflection ($n = 236$)

As can be seen from the bar chart above, the subcategories of the depth in reflection obtain overall and in the five foci (*focus on self*, *focus on students*, *focus on instruction*, *focus on context* and *focus on evaluation*) under the dimension of the breadth in reflection. Means of the depth of reflection for each focus are 1.03, 1.08, 2.08, 1.59 and 2.64 respectively, indicating the greatest extents of reflection in the focus on instruction and focus on evaluation. No evidence of critical reflection is found.

Taken together, these results suggest that the patterns are found among five foci under the dimension of the breadth in reflection and their nature of reflection when data from this above table can be compared with the data in Figure 4.2. It is clear from the analysis that certain teachers are placing a greater emphasis of their reflections on the contextualizing their experiences and evaluation aspects of teaching, whilst others place a greater emphasis on themselves, students and pedagogical aspects of teaching. The following table indicates that on average across all categories under the breadth in reflection, Routine (R) comprises the most lines in the categories of focus on self, focus on students and focus on context and ranges from 12.9% to 82.8% of in the reflective units respectively. These categories are followed by focus on instruction rated as either Technical (T) ranging from 8.5% to 52.4% or lower. On the other hand, focus on evaluation has an even smaller number of lines devoted to either Technical (T) or higher ranging from 4.9% to 32.2% respectively. The final category of Contextual (C) has

very small proportions of the reflective units devoted to the only focus on evaluation and focus on students, ranging from 0% to 3% of reflective units across all vignettes. It is apparent from these results that, majority of the reflective units under these three categories did not articulate beyond mere description of events with some evaluative remarks but did not give reasons, justifications or rationale for their entries of each vignette. Therefore, the data show very little evidence of reflection beyond the contextual category.



Table 4. 3
Descriptive Statistics of Breadth & Depth of Teacher Reflection (n = 236)

Vignette	Breadth of Reflection	Depth of Reflection									
		R		R-T		T		C-T		C	
		f	%	f	%	f	%	f	%	f	%
Vignette on Group Working	Focus on self (i.e. authority, role expectation)	324	71.5	102	22.5	27	16	-	-	-	-
	Focus on students (i.e. students' needs, relationship with students, students' roles and responsibilities)	413	72.7	87	15.3	57	10	11	1.9	-	-
	Focus on instruction (i.e. lesson preparation, student engagement, feedback)	51	18.8	78	28.8	142	52.4	-	-	-	-
Vignette on Laboratory Security	Focus on context (i.e. resources, time issues, crowded classroom size)	584	82.8	61	8.7	63	8.5	-	-	-	-
	Focus on evaluation (i.e. fairness, student differences)	86	13.3	221	34	209	32.2	84	12.9	49	7.6
	Focus on self (i.e. authority, role expectation)	491	71.3	125	18.1	73	10.6	-	-	-	-
Vignette on School Attendance	Focus on students (i.e. students' needs, relationship with students, students' roles)	62	41.1	39	25.8	37	24.5	5	3.3	8	5.3

Table 4.3 continued

Vignette	Breadth of Reflection	Depth of Reflection										Total
		R		R-T		T		C-T		C		
		f	%	f	%	f	%	f	%	f	%	
Vignette on Diversity in Students	Focus on self (i.e. authority, role expectation)	271	50	178	32.8	93	17.2	-	-	-	-	542
	Focus on students (i.e. relationship with students)	163	40.4	78	19.4	79	19.6	38	9.4	45	11.2	403
	Focus on context (i.e. culture, socio-economic status, gender role)	262	39.9	264	40.2	131	19.9	-	-	-	-	657
	Focus on self (i.e. caring profile, authority)	116	50	77	33.2	39	16.8	-	-	-	-	232
Vignette on International Students	Focus on students (i.e. relationship with students, respects for others)	40	38.5	22	21.2	24	23.1	11	10.6	7	6.7	104
	Focus on context (i.e. resources, time issues, crowded classroom size)	192	33.3	188	32.6	94	16.3	102	17.7	-	-	576
	Focus on instruction (i.e. overloaded curriculum)	118	24.5	116	24.1	247	51.4	-	-	-	-	481
	Focus on self (i.e. teachers profile such as caring, authority)	156	50	107	34.3	49	15.7	-	-	-	-	312
Vignette on Alternative Assessment	Focus on instruction (i.e. lesson preparation, multicultural education)	66	12.9	62	12.1	257	50.1	-	-	-	-	513
	Focus on students (i.e. students' needs, relationship with students, students' differences)	144	39.1	105	28.5	109	29.6	64	17.4	74	20.1	368
Vignette on Students' Disruptive Behaviors	Focus on self (i.e. self-improvement, authority, role expectation)	208	50	138	33.2	70	16.8	-	-	-	-	416
	Focus on instruction (i.e. lesson preparation)	170	24.5	178	25.6	347	49.9	-	-	-	-	695
	Focus on evaluation (i.e. assessment methods, fairness, student differences)	104	16.1	97	14.9	183	28.3	181	27.9	83	12.8	647

Table 4.3 continued

Vignette	Breadth of Reflection	Depth of Reflection										Total
		R		R-T		T		C-T		C		
		f	%	f	%	f	%	f	%	f	%	
Vignette on Assignment Evaluation	Focus on self (i.e. authority, role expectation)	347	50.2	232	33.6	112	16.2	-	-	-	-	691
	Focus on students (i.e. students' needs and differences)	124	33.6	98	26.6	95	25.7	19	5.2	33	8.9	369
	Focus on instruction (i.e. guiding students, classroom management)	171	24.2	187	26.5	348	49.3	-	-	-	-	706
	Focus on evaluation (i.e. assessment methods, fairness)	77	18.9	74	18.1	111	27.2	126	30.8	20	4.9	408

* 5,664 individual responses and 708 reflective units for each vignette

4.1.3. Form of Reflective Dialogue. The majority of elementary science teachers ($n = 152$, 64,41%) reaches either purely descriptive or descriptive reflective, 25% of them ($n = 59$) are placed at low reflective dialogue and only 25 teachers (10.5%) reaches high reflective dialogue.

For the form of reflective dialogue, the consequential mean teacher reflection for the 236 elementary science teachers are 2.72 ($SD = 0.38$). As seen Table 4.4 below, the majority of teachers' written reflections contains evidence of purely descriptive without much analysis, descriptive dialogue with some evaluative elements and low reflective dialogue with some justification. However, there is very little evidence of reflection that might be properly considered to be high reflective dialogue.

Table 4. 4

Descriptive Statistics of Form of Dialogue by Vignette ($n = 236$)

Vignette Theme	<i>M</i>	<i>SD</i>
Vignette on Group Working	2.91	0.69
Vignette on Laboratory Security	2.47	0.33
Vignette on School Attendance	2.73	0.19
Vignette on Diversity in Students	2.81	0.56
Vignette on International Students	2.71	0.31
Vignette on Alternative Assessment	2.80	0.28
Vignette on Students' Disruptive Behaviors	2.34	0.35
Vignette on Assignment Evaluation	3.01	0.36

The mean and standard deviation values of each focus area under the dimension of form of dialogue are reported in the following Table 4.5. It becomes apparent that when the reflective writings of elementary science teachers address the themes in relation to Focus of Evaluation and Focus of Context, elementary science teachers reach a higher form of reflective dialogue than those focusing on Self, Students and Instruction.

Table 4. 5

Descriptive Statistics of Each Focus Area (n = 236)

Focus Area	<i>M</i>	<i>SD</i>
Focus on self (i.e. role expectation, authority)	2.73	0.21
Focus on students (i.e. relationship with students, students' needs and motivation)	2.71	0.35
Focus on instruction (i.e. i.e. lesson preparation, classroom management, discipline)	2.75	0.38
Focus on context (i.e. resources, time issues, crowded classroom size)	2.82	0.57
Focus on evaluation (i.e. fairness, ethical behavior, assessment methods)	2.91	0.69

As shown in Figure 4.3, while comparing the weight of each focus area, it can be revealed that although the teachers focusing on Context and Evaluation are not more prevalent than those focusing on Self, Students and Instruction, they have a higher reflective form of dialogue, which requires to provide some degree of reasoned justification or explanation on what had been described.

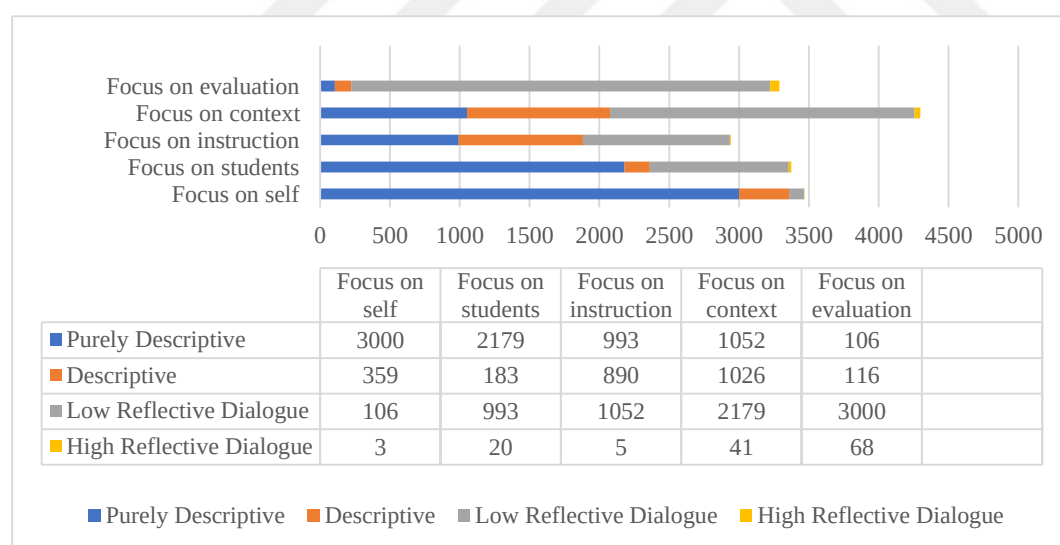


Figure 4. 3. Data Summary in Relation to Focus of Teacher Reflection and Form of Dialogue (n = 236)

4.1.4. The Affectivity of Teacher Reflection. 34 different emotion words are identified, among which are used 1,991 times total across the 1,888 reflective units. The emotion words are mainly categorized into four main themes on the basis of emotional valence (positive, negative surprising and neutral). Then, there are some words showing emotional surprises, which are distinguished from the other types of emotions. Thus, all emotion words in the reflective units for each specified critical incident are coded under the four main themes: positive emotions, negative emotions, neutral emotions and surprising emotions as illustrated in the figure below. The figure 4.4 provides a visualization of the frequency of different emotions on the basis of the words that are most frequently mentioned.

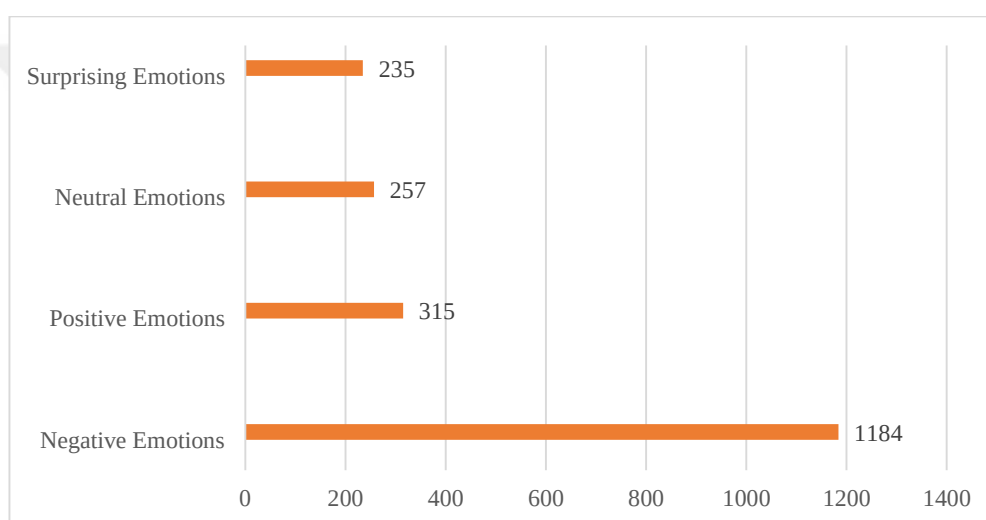


Figure 4. 4. Data Summary Relation to Emotions by Mention (n = 236)

Overall, the emotion words that are most frequently used are: tired (162), concerned (132), angry (110), frustrated (108), stressed (95), worried (79), neutral (78), caring (75) and surprised (75) as displayed in the following Figure 4.5.



Figure 4. 5. Word-Cloud of All Emotion-Laden Language ($n = 236$).

Of the specific emotion words coded (e.g., tired, caring, neutral and surprised), approximately two times as many are negative, with 15 unique negative emotion words used compare to 10 various positive emotion words. The most prevalent negative emotion word used is tired, followed by concerned, angry, frustrated, stressed and worried. The most common positive emotion is caring, followed by feelings of understanding, patient and sympathy. In relation to feelings of surprise, surprise is described negatively, among which are frequently connected their emotions to specific situations or contexts such as lack of resources, crowded classrooms and overloaded curriculum. Overall, elementary science teachers connect their discussions of emotions to specific situations or contexts predominantly interactions with students, evaluation of students' learnings, managing the classroom, organization of the lesson, etc. Of these, the only context in which teachers used more instances of positive emotion terms than negative is in the context of reflecting on their concerns about students. However, these teachers thus report experiencing a variety of negative emotions with increased enthusiasm for the disciplinary issues. The greater frequency of especially fear and anxiety are used particularly in relation to lesson preparations to express their emotions. Also, the teachers emphasize surprising emotions either when there is a discrepancy between their expectations and how the situation occurred in reality or when they did not know what to do in the similar situations that they could encounter. Although more diverse terms in relation to positive and negative emotions are used, neutral and surprising emotion terms are limited. Final affective response expressed through teachers' reflections varies in relation to neutrality with a matter of degree. Teachers prefer to express their emotions relatively neutral either in the case

that they seem “apathetic” or they do not want to say anything or do anything about the issues. The following tables display the summary of teachers’ emotions expressed for each different vignette that they reflected upon.



Table 4. 6

Data Summary of Relation to Emotions for the Vignette on Group Working ($n = 236$)

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Group Working	Positive	Caring	27	7.2	<i>I care about every student in my class and I would try to work with them as much as I can.</i>
		Sensitive	11	2.9	<i>I feel sensitive to students' different capabilities and I would give more time to finish their products.</i>
		Patient	14	3.7	<i>I would be patient and pay more attention to the inactive students.</i>
	Negative	Calm	54	14.3	<i>I feel calm and give additional time to complete their works.</i>
		Stressed	42	11.2	<i>I feel pretty stressed when they do not finish the activity on time because I will be behind schedule.</i>
		Angry	47	12.5	<i>I would be angry about students' laziness because they do not care about the group activities.</i>

Table 4.6 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Group Working	Negative	Uneasy	31	8.2	<i>It is not easy to help my students to engage in group work in such limited time.</i>
		Uncomfortable	52	13.8	<i>I do not feel comfortable about giving the same score for every student in a group if some students do not do anything.</i>
	Surprising	Alone	45	11.9	<i>I feel alone because other teachers do not want to implement group work in the lessons.</i>
		Unusual	19	5	<i>It is unusual to implement group works in our classrooms because of lack of resources and crowded classrooms.</i>
		Unexpected	35	9.3	<i>It is not expected that some students do not want to engage in the activity and get the points anyway.</i>

The teachers describe a range of emotions in relation to group working. The vignette on group working evokes not only positive and negative emotions but also surprising emotions. Descriptive statistics for all teachers' emotions are presented in Table 4.6. In terms of all types of emotions, on a descriptive level the frequency is highest for calm, followed by uncomfortable, angry, alone and stressed whereas the emotions that are the least referred are sensitive, patient, unusual, caring and uneasy. Table 4.6 reveals that addressing diversity in students' learning is seen as an issue which positive emotions are triggered. Also, remaining emotions are frequently felt as a reaction to students' inadequate behaviors, lack of support from colleagues, unfairness in assessing of students' individual performance and overloaded curriculum within limited time and resource.

Table 4. 7

Data Summary of Relation to Emotions for the Vignette on Laboratory Security (n = 236)

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Laboratory Security	Positive	Glad	16	2.2	<i>I feel glad no one gets injured.</i>
		Confident	6	0.8	<i>I am confident that I secure the chemical materials in the closet and I talk with my students about safety requirements before the class.</i>
	Negative				<i>I feel guilty if some students might get injured.</i>
		Guilty	29	4.0	
		Worried	47	6.5	<i>I am worried whether my students stay safe in that case.</i>
		Upset	52	7.2	<i>I feel upset about the students' misbehaviors and irresponsibility.</i>

Table 4.7 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Laboratory Security	Surprising	Surprised	6	0.8	<i>I feel surprised because this is not only the teacher's fault students also need to be well-behaved in the laboratory.</i>
		Shocked	12	1.7	<i>I feel shocked because I do not know what to do if this accident happens.</i>
		Unexpected	23	3.2	<i>It is unexpected to experience such an accident because how students can access the chemical materials without teacher's permission.</i>

On the whole, teachers describe eight different emotions most of which are considered negative and surprising whereas slightly less of them are classified as positive in relation to the second vignette on school attendance as shown in Table 4.7. In what regards emotions considered negative by these teachers, the most experienced ones are upset, worried and guilty. Positive emotional expressions are also present in the references to the emotions of glad and confident. Within the emotions that are considered under the surprising category, surprised, shocked and unexpected are referred mostly. Safety issues, students and confidence in knowing what to do in the case of similar incidents represent the greatest source of the emotions according to the narratives.



Table 4. 8
Data Summary of Relation to Emotions for the Vignette on School Attendance (n = 236)

Vignette Theme	Emotions	Coded	f	%	Sample Quotation
Vignette on School Attendance	Positive	Sympathy	4	0.6	<i>I feel sympathy and give her the score to pass the exam. This is not the girl's fault.</i>
		Understanding	31	4.3	<i>I try to understand the situation of the student and talk with her parents.</i>
	Negative	Sorry	103	14.3	<i>I feel sorry for this female student because I cannot do anything about her problems in attending the school.</i>
		Concerned	58	8.1	<i>I am concerned that I could not give any extra point to her that she does not deserve.</i>
		Frustrated	79	11	<i>I feel frustrated because even parents do not care about what happens to their children.</i>
	Surprising	Guilty	12	1.7	<i>I feel guilty about the future of this student and try to convince the parents that they let her to attend the school</i>
		Surprised	17	2.4	<i>I feel surprised because this is not my responsibility. This is an administrative problem.</i>

Table 4.8 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on School Attendance	Neutral	Neutral	62	8.6	<i>I do not feel anything and I just give the score that she gets from the exam because this is not my responsibility.</i>

Within the emotions that are expressed by teachers in terms of a teacher's reaction to a girl not attending the school regularly, positive, negative, surprising and neutral emotion categories are identified. On the whole, the teachers express a total of eight different emotions most of which are considered negative. In what regards emotions considered negative, negative emotions related to feeling sorry for the student are mostly expressed whereas the emotion of understanding as a positive emotion are described more moderately. Sympathy and surprised is the least reported by teachers respectively. The female student represents the greatest source of all of the emotions without considering which category they belong to. All teachers in this study confessed that this is not the student's fault. The issue of who is responsible for the student's getting education properly is endured with great frustration, guilty, sorry, surprised, neutral sympathy and understanding. Although, most of them claim that parents have the responsibility of their daughter's education, the teachers mostly react negatively in terms of self-preservation.

Table 4. 9

Data Summary of Relation to Emotions for the Vignette on Students with Diverse Needs (n = 236)

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Diversity in Students	Positive	Patient	23	3.2	<i>I learned that being patient is the key of dealing with diverse students in my class.</i>
		Caring	25	3.5	<i>I care about my students' needs because every student should enjoy being at my class.</i>
	Negative	Nervous	39	5.4	<i>I feel nervous about having enough room for all of them. I need more resources for these students.</i>
Vignette on Diversity in Students	Negative	Tired	105	14.6	<i>I feel tired of dealing with some students needs special education because I don't think I really know what is best for them.</i>

Table 4.9 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Diversity in Students	Negative				It is very difficult as a teacher to find the appropriate level for each student and some activities are little harder for them while there's always a risk that they are not challenging enough.
		Difficult	51	7.1	
	Surprising				It is unusual to expect a teacher to meet all those students' needs in a short time because I have to finish the all units before the semester ends.
		Unusual	42	5.8	

Within the emotions that are expressed by teachers in terms of meeting the needs of students with diverse learning abilities and interests, positive, negative, surprising and neutral emotion categories are identified. On the whole, the teachers express a total of seven different emotions most of which are considered negative. In what regards emotions considered negative, the situation that creates mostly negative emotions is the fact that teachers' lack of confidence in dealing with diversity in students' learning performances. On the other hand, unusual emotion under the category of surprising is described more moderately whereas patient and calming as positive emotions and indecision as a neutral emotion are the least reported by teachers. The analysis of the reflective units collected through the vignette-based instrument for the fourth vignette leads to perceive two main sources of their emotions: teachers' influence made a difference in students' learning and performance and teachers do not feel confident in how to deal with all students' needs. Less teachers reveal that they care about their students and they are mostly concerned with what and how they taught towards each student's success. In fact, when faced with this challenge within the classroom, teachers mostly react negatively in terms of overloaded curriculum and lack of resources to meet diverse needs.

Table 4. 10
Data Summary of Relation to Emotions for the Vignette on International Students (n = 236)

Vignette Theme	Emotions	Coded	f	%	Sample Quotation
Vignette on International Students	Positive	Sympathy	14	1.9	<i>I try to help those students feel better in my class because I cannot imagine what they have been through so far.</i>
		Close	17	2.4	<i>I feel close to those students and build some relationship with them because they are small, and they need my support to make progress in my class.</i>
		Expected	4	0.6	<i>These students expect me to tolerate and support them because they need time to adjust to the changes in their lives not only school.</i>
	Negative	Controlled	8	1.1	<i>I feel controlled because I can spend some additional time with them to keep pace with other students.</i>
		Distracted	49	6.8	<i>I feel distracted because I need to be more focused on the good of the whole classroom not only these two students.</i>
		Stressed	53	7.4	<i>I have a feeling that I have to make a lot of additional adjustments for those students like two or three courses running in parallel in the same classroom, which is totally impossible and makes me stressful.</i>

Table 4.10 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on International Students	Surprising	Concerned	74	10.3	<i>I am concerned about their lack of language because I do not have time to teach language as well.</i>
		Surprised	24	3.3	<i>I am surprised that they still do not know the language.</i>
		Shocked	16	2.2	<i>I am shocked they still do not have their own schools educating through their own native language with native teachers.</i>

Within the emotions that are expressed by teachers in terms of meeting the needs of international students, positive, negative, and surprising emotion categories are identified. On the whole, the teachers express a total of nine different emotions most of which are considered positive although the most frequent emotions are predominantly coded as negative. The situations that create mostly negative emotions (distracted, stressed and concerned) is the fact teachers' negative emotions is dominantly student directed and not self-directed. Those emotions of teachers (e.g. stressed and concerned) are frequently related to international students' performances. Teachers' negative emotions are evoked particularly if international students do not engage in learning because of several reasons which are mostly related to lack of language of students. Still, surprised and shocked emotions under the category of surprising is described more moderately whereas sympathy, closed, expected and controlled as positive emotions are the least reported by teachers. Teachers' interactions with international students seem to be the most powerful in terms of evoking not only negative emotions but also positive and surprising emotions as can be seen in Table 4.10.

Table 4. 11
Data Summary of Relation to Emotions for the Vignette on Alternative Assessment Technique (n = 236)

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Alternative Assessment	Positive	Sensitive	18	2.5	<i>I feel sensitive for the ones who think that peer assessment is not fair.</i>
		Controlled	32	4.5	<i>I can control my class and grade assignments because I know how to assess students' learnings.</i>
	Negative	Tired	57	7.9	<i>I feel tired of grading all the assignments by myself because the class is crowded.</i>
		Angry	36	5.0	<i>I feel angry when they complain about their grades</i>

Table 4.11 continued

<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Surprising	Surprised	28	3.9	<i>I feel surprised because a teacher is responsible of grading not students.</i>
	Controlled	32	4.5	<i>I can control my class and grade assignments because I know how to assess students' learnings.</i>
Neutral				<i>It is expected that students are not generally satisfied with the points they get because they are not fair with the scores that they give their peers.</i>
	Expected	5	0.7	

In what regards emotions expressed when teachers consider the use of alternative assessment technique and issues associated with peer assessment, the most experienced ones belong to the negative emotions with 93 different references, mainly concerning grading as a time-consuming activity for teachers within a crowded classroom. The analysis of Table 4.11 reveals that the peer grading is seen as an issue where emotionally challenging actions of not only teachers but also students trigger not only negative but also positive emotions. Positive emotional expressions are present in the category of controlled described 32 times in the most intense manner whereas expected as a neutral emotion is the least reported by teachers with 5 times. Fairness and massive dissatisfaction of the students represent the greatest source of these emotions. The teachers generally claim that they are responsible for grading assignments not students in terms of the weighing the consequences such as being fair to all students. In fact, when students feel that it is not a fair assessment, they also react negatively, which can be considered one of the pedagogical responsibilities of teachers and this seems to have greater expression in the everyday work of these teachers.

Table 4. 12
Data Summary in Relation to Emotions for the Vignette on Disruptive Behaviors of
Students (n = 236)

<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Positive	Patient	10	1.4	<i>I will ignore her behavior and be patient because I do not take this behavior personally and when I respond her aggressively, other students also see me as inadequate.</i>
	Confident	7	0.9	<i>I have strict rules in my class to make it better. If students disturb me and others, I am confident to make them follow my rules because it is not fair for me or other students who want to learn from me.</i>
	Understanding	23	3.2	<i>I feel that I should be available whenever possible to this student because students at this age needs to be understood.</i>
	Sympathy	11	1.5	<i>I certainly feel that I will be willing to lend a sympathetic ear to listen about her problems.</i>
	Calm	13	1.8	<i>I prefer to remain calm and I do not want to lose my control and I try to cool off even though she is rude to me because I am the adult in that class that needs to be mature, they are just kids.</i>

Table 4.12 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Students' Disruptive Behaviors		Responsible	17	2.4	Some students show this kind of behavior because they want me to be distracted and I am responsible for the administering discipline in the class to prevent them.
		Angry	27	3.8	I need to have a guarded attitude and I will be aggressive towards this student at times that she sabotages my lesson.
		Worried	32	4.5	I am worried about whether this student behaves in other lessons because at this age the moods of these students are unpredictable, and this must be handled in a particular way with the support from administration and other teachers.
		Bored	17	2.4	I generally switch off and do not pay any attention because I am bored, and it is not my job to deal with their personal issues.

The expression of emotions of teachers for misbehaved students is mainly coded as either positive or negative emotions although the teachers mostly mention associations between the unpleasant emotions and the regulation of undisciplined students' behaviors. As displayed in Table 4.12, worried and angry are the most prominent unpleasant emotions teachers commonly experienced associated with classroom discipline issues respectively. In the case of the goals of promoting student learning are disrupted due to lack of disciplined in the classroom, teachers predominantly feel anger. Although their negative emotions are triggered by students' misbehavior, lack of effort, or interference with their goals, some teachers claim that it is not their job to deal with students' personal issues and they ignore the problematic behaviors. Still, teachers who report positive emotions explained that they try to regulate their emotions because they believe they have responsibility for managing the classroom effectively in order to achieve their goals. These teachers mostly report modifying a potentially problematic situation by staying calm and showing understanding towards students.

Table 4. 13
Data Summary of Relation to Emotions for the Vignette on Assessment of Students' Learning (n = 236)

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Assignment Evaluation	Positive	Caring	23	3.2	<i>I care about every student and they deserve to feel valued by teachers because developing a close relationship with each of them helps to deal with this kind of issues.</i>
		Confident	8	1.1	<i>As a result of my previous experience, I feel adequate to cope with any disciplinary issue in my class.</i>
		Close	7	0.9	<i>I feel close to these kinds of students because my daughter sometimes has some misunderstandings about her assignments, and I can easily contact her teacher.</i>
	Negative	Upset	16	2.2	<i>I feel upset because I do not deserve this.</i>
		Frustrated	22	3.1	<i>I still feel frustrated even though this type of things happens every day that students are disrespectful towards me.</i>
		Bored	21	2.9	<i>I feel bored because of the work that takes too much energy and time such as correcting assignments.</i>

Table 4.13 continued

<i>Vignette Theme</i>	<i>Emotions</i>	<i>Coded</i>	<i>f</i>	<i>%</i>	<i>Sample Quotation</i>
Vignette on Assignment Evaluation	Surprising	Unexpected	13	1.8	<i>This is unexpected because the teacher should give another chance for this student to fix her assignment.</i>
		Indecision	8	1.1	<i>I am not sure why a teacher shows this reaction to the little students.</i>
	Neutral	Neutral	14	1.9	<i>I do not feel anything and I do not give minus to the assignments because I do not give any assignment.</i>

The analysis of these results displays that assessing students' assignments is seen as an issue where emotionally challenging actions of the teachers trigger different emotions. As a final vignette on assessing students' learning, the teachers describe nine different emotions which are classified as positive, negative, surprising and neutral. Caring, frustrated and bored are the most referred as shown in Table 4.13. In what regards emotions considered as positive, caring is mentioned 23 times in an intense manner mainly concerning students as the greatest source of this emotions. These teachers reveal that they care about their students and are concerned with giving another chance to the student. As other most frequent emotions described by teachers for this vignette, frustrated is mentioned 22 times and bored is mentioned with 21 times. The emotions of indecision, confident and closeness are infrequent and emotions associated with neutral, unexpected and upset are used moderately. The situation that creates the negative emotions is predominantly related to disruptive behaviors of the student and lack of responsibility of the students. According to narratives, one of the situations identified as giving rise to the feelings under the categories of surprised and neutral is precisely related to weighing the consequences and behaving in the favor of students.

4.2. Understanding the Nature of Changes in the Quality of Teacher Reflection

The current study is mainly aimed to investigate teachers' development of the quality of reflection and their instructional decisions and actions during the guided reflective process through critical incident analysis. This section presents an overview of the nature of changes in the quality of teachers' reflections and highlights the themes that emerge from the interpretative analysis within and across ten different cases of elementary science teachers. In each case study, five subsections are provided as follows:

- the key characteristics associated with teachers
- the nature of the changes in the breadth of reflection
- the nature of the changes in the depth of reflection
- the nature of the changes in the form of reflective dialogue
- the nature of changes in the affectivity of reflection

It is important to gain insights into the characteristics associated with teachers in order to understand their reflections. Autobiographical interviews are gathered for the eliciting the key characteristics which are classified into three areas: (1) personal-social characteristics, (2) understanding of science teaching and learning and (3) school context in which they work.

As described previously, oral and written forms of reflections through participants' interview data, journal writings and video recordings of reflective discussions are reported to examine the nature of changes in the quality of teachers' reflections within the context of this study. The journal entries, discussions and interview data included in this section are translated from Turkish. This section also consists of visual graphics demonstrating the changes in participants' reflection over time.

Finally, the study is concerned with the examination of science teachers' experiences, perceptions and feelings about the guided reflective practices through critical incidents analysis. One-to-one semi structured interviews and a focus group interview in the last meeting, through which participants dynamically interacted with each other and discussed the reflective procedures they attended in order to uncover their feelings and perceptions.

4.2.1. The key characteristics associated with teachers. In this section, ten elementary science teachers are clarified in terms of personal-social characteristics, understanding of science teaching and learning and school context in which they work. For confidentiality, all the teachers are given by pseudonyms.

4.2.1.1. Aysel Teacher as a sculptor. She is married and has two children; a son and a daughter. She comes from a middle-class family. She is 35 years old. From the beginning of her career, she is to become a teacher. She graduated from elementary science education department and have a master degree in science education at the same university. She has been working as a science teacher for almost 11 years. Her motivation for being a science teacher is associated with her being patient with children. She describes herself as a teacher who have a responsibility for shaping the students to prepare them for life after school. According to her, it takes time and energy to guide students to develop basic skills and knowledge about both science education

and life itself. In relation to her capacity of self-expression, she feels comfortable expressing herself both in written and oral mode of communication. That is, she thinks teaching suits her personality. Although she gives importance to active participation of students in the learning process, she claims that due to overloaded mandated curriculum and the concerns of students and their parents for the preparation for high school entrance exam, she prefers to use a teacher-guided approach, in which she generally covers the topics through reading, writing, asking questions and demonstration experiments and activities from online sources via smart board.

It has been almost three years to work at the current school after her maternity leave. The school has more than 400 students, which is located in the district of Etimesgut. Most of the students come from middle-class socioeconomic backgrounds. Among 33 teachers, three of them are working as science teachers. The school is built by Turkish Government's Planned Urbanization and Housing Development (TOKİ) in 2009. The school is a single-shift school in which students attend the class between 09.00 and 15.00. The average class size is 22. The hallways of the school are each dedicated to classes of a single grade. The main hallway leads in one direction to the cafeteria, and in the other, to the science laboratory. The laboratory is spacious and filled with desks, chairs, and several closets for science equipment. However, she does not prefer to use the laboratory in her classes because she mostly prefer the smart board and online simulations of experiments.

4.2.1.2. Banu Teacher as a teacher in control. She is married with a daughter. She is 36 years old and came from a family in which her father is also a teacher. She has been a teacher for almost 15 years and she mostly worked at rural and suburban elementary schools, which are at very low social and economic status. After ten years of teaching in such schools, she moved to the current school in the district of Sincan and has taught there for almost five years. This current school as a dual shift school started from 07.50 - 17.45, in which students attended either in the morning or in the afternoon. It had more than 1000 students and 86 teachers, among which eight worked as science teachers. Each class had approximately 26 students, most of them came from lower socioeconomic areas. Since the school did not have a science laboratory, she designed experimental activities in the regular classrooms. Given the previous

teaching experiences, she gave importance to discipline and authority as an essential component of effective science teaching. She identified her role as the authority in charge, controller, and provider. Consistent with the weight she placed on the power of her authority over students, she usually used lecturing, questioning, demonstration and online resources for science teaching.

4.2.1.3. Esra Teacher as a wizard teacher. She received her Bachelor's degree in Chemistry and had a pedagogical formation certificate to work as a science teacher. She is 42 years old. At the time of this study, it is Esra Teacher's 20th year of teaching. She preferred to teach in the elementary level because she enjoyed being around children. She is married and had a daughter who is a fourth grade student in the same school in which her mother worked. She regarded her previous teacher during her high school years as the most influential motivator for her to become a science teacher. One of the salient features in her teaching is having strong and positive relationships with her students. She had a great sense of humor and her entering classroom routine is different in a way that she greeted her students by telling them how happy she is to have them as her students. This feature is consonant with her emphasis on students' active engagement in their learning process. In this regard, she frequently used discussions about everyday life in her lesson, which enabled students to make more sense of scientific concepts and their applications in daily life practices. Her role of being a guide provided students encountering difficulty with questions designed to elicit rather than direct their learning. Responding to the drive to learn more about science teaching, Esra Teacher articulated that she is eager to attend seminars and workshops to develop professionally and she liked learning new things associated with science teaching and applied them into her classrooms.

Esra Teacher has taught science education for almost 10 years at the current elementary school. The school is located in the district of Sincan and had over 600 students and 36 teachers. There are 19 classrooms, in each there are almost 35 students. Esra Teacher is one of the science teachers among four working in the school. Although there is a science laboratory in the school, Esra Teacher generally conduct experiments in the regular classrooms because she claimed that all teachers needed to cover the topics at the same time and pace, that is why it is difficult to have a rotation

or shift system where all science teachers can use the science laboratory or equipment in the laboratory. The school as a single shift school started at 08.30 and ended at 15.20. Most of the students placed into low or middle socioeconomic categories.

4.2.1.4. Filiz Teacher as a high expectation teacher. She is married with one daughter, who studies sixth grade in the school that she is working at. She is 37 years old and have 15 years of teaching experiences. She stays at the current school for almost five years. Her decision of becoming a teacher is made because she believed that she could make a difference in students' lives. Filiz teacher's lessons regularly feature core concepts in science education and she intends to prepare her students for the national high school entrance exam. She mostly concentrates on developing students' academic success in the science course. According to her, she feels responsible for students' exam performances, which make extra demands on her time. For that reason, she said, there is no time allocated to teaching science through student centered approaches but only direct instruction.

She has been working at the current school for almost five years. The school is located in the district of Sincan, having students with low or middle socioeconomic background. There are nearly 500 students with 32 teachers. There are 16 classrooms with one science laboratory, in each there are almost 24 students. Filiz Teacher does not use the laboratory so often. For her, she implements activities based on the prescribed objectives of the national curriculum to challenge students to achieve.

4.2.1.5. Gaye Teacher as a caring teacher. Gaye Teacher is a fun and outgoing 46-year-old married woman with two children. Although she has no intention of becoming a teacher when she starts to study in the faculty of education, after she has the first teaching experience in her practicum course, she pictures herself as a teacher in the future. After graduation, she starts her teaching career in the rural areas, which extends her point of view on becoming a caring teacher for all students including disadvantaged ones. Her idea of a teacher's role is not only to teach science but also to build personal relationships with her students to contact them even after their graduation. She likes to organize casual meetings with her students at the weekends such as going to the cinema together, having a picnic when the spring comes, etc. Her

idea about teaching seems to reflect her personal belief system. She is not only generally concerned with the students in the class, but also reflects on their differences, with the aim to improve how she taught them. That is the reason, she is eager to attend workshops to learn new and updated things for her professional development.

She has 26 years of teaching experience and she has been working at the current school for almost eight years. The school is located in the district of Etimesgut and had over 1000 students and 76 teachers. There are 36 classrooms, in each there are almost 30 students. The school as a double shift school started at 07.30 and ended at 19.00. Most of the students are placed into low or middle socioeconomic categories. She generally carries out experiments in the laboratory because she believes that students can learn better through experiments even though she usually demonstrates the experiments due to lack of materials and security issues. She asks questions for several purposes. At the beginning of each lesson, she asks questions about assessing students' previous understandings about the content. During the lesson, she encourages students to discuss the topic through asking further questions and at the end of the lesson, she uses questioning techniques for assessing their improvements about the topic.

4.2.1.6. Hale Teacher as an information giver. Hale Teacher is 34-year-old married with one daughter and full of self-confidence. She describes herself as a comfortable person when she expresses herself. That is the main driven factor for her to become a teacher. Because of her strong commitment to the teaching profession, she has a master's degree in science teaching to improve herself. She wants to participate in this study because she thinks that participating in academic research would make her teaching experience more meaningful and learn new things not only about herself but also about science teaching.

She has 13 years of teaching experience and for five years, she has been working at the current school with Esra Teacher. The contextual information about the school is provided in the previous part of Esra Teacher. Although Hale Teacher believes that students are significant to the process of teaching, she considers herself as an information provider and mostly concentrates on developing students' cognitive skills.

4.2.1.7. Mine Teacher as a responsive teacher. Mine Teacher is a 32-year-old married woman with a daughter. She has been working as a science teacher for almost 9 years. She is of the opinion that what she teaches must be relevant to students' daily life experiences. According to her, her teaching is influenced by students' needs. Her lessons seem to be consistent with this claim for students' needs and interests shaped the kind of teaching activities she included in her lessons. Curriculum relevance to students' needs is an area that Mine Teacher reflected on. She believes in grabbing students' attention as well as giving them information in the process of teaching, especially at the beginning of her lessons. She also reflects on her teaching style as structured through which she explains to her students about what is expected and the time constraints for completing tasks by taking into consideration students' learning levels.

She is charged with a science teacher in the current school at the beginning of the semester that the present study carried out. The school is located in the district of Etimesgut, in which students mostly come from families with low socio economic background. The school has more than 1300 students and 65 teachers. Since the school is rather small and 16 classrooms, it is a double shift school, starting at 07:50 and finishing at 19:20. The classroom size is over 40 students, which is considered as the most crowded classroom among the other schools in the region. There is not any science laboratory in the school. That is why Mine Teacher conducts laboratory activities in the regular classrooms. Still, quite evident in her reflections is the fact that she is only concerned with the students' needs and interests rather than delivering the curriculum.

4.2.1.8. Sibel Teacher as an expert teacher. She is married with one daughter. She has at least ten years' classroom experience as a science teacher. She has a master's degree in the field of science education and she has been preparing for her PhD qualifying exam in the same department. For that reason, she considers herself as an expert teacher with theoretical and practical knowledge about curriculum and organization. Her view of her role as a teacher influences her belief that students should be encouraged to engage in the process of learning. That is why she views her teaching role as being that of a facilitator. She tries to apply what she learnt from her

graduate courses into her lessons, which enables her to see the gap between theoretical knowledge and its practice in real classrooms. She claims that she always discusses with her professors about the usefulness of educational research. This is one of the basic reasons for her participating in this current study.

The school that she has been working for over six years is a fairly large public elementary school in Sincan district in a zone that draws from mixed neighborhoods of working-class families. There are more than 1400 students and 100 teachers in the school. As a double shift school, it starts at 07.50 and lasted at 18.20. There are 30 classrooms with nearly 28 students and a science laboratory in which Sibel Teacher often prefers to carry out laboratory activities.

4.2.1.9. *Sevda Teacher as a conscientious teacher.* She is married with two children. She earns a bachelor's degree in a small university in Turkey. She has ten years of teaching experiences with over four years in the present context. She describes herself as a conscientious teacher spending extra time with her students particularly students with special needs. The students in her classes represents a wide range of developmental levels. However, she admits that she does not know how to use a variety of instruction and assessment strategies appropriate to the diverse students.

The school is located in the district of Sincan, having students with low or middle socioeconomic background. The surrounding neighborhood consists of low-income apartments. There are nearly 500 students with 32 teachers. There are 16 classrooms with one science laboratory, in each there are almost 27 students. This one shift school starts at 08.45 and lasted till 15.20.

4.2.1.10. *Zeynep Teacher as a traditional teacher.* She is married with two daughters. She has been working as a science teacher for four years in the present context although she has ten years of teaching experience as a private tutor in a private teaching institution. She generally prefers to use only traditional methods, for example, not putting her students in groups, the chairs are always straight and facing the teacher at the center, and she justifies her way of teaching based on the challenges with using a student centered approach that she highlighted.

The school has more than 1800 students in 40 classrooms and 130 teachers. Although there are 15 science teachers in the school, Zeynep Teacher mentions the difficulties in communicating with her colleagues. That is why she is not happy at work and mostly feel alone. Although there exists a science laboratory, she mostly prefers to conduct laboratory activities in the regular classrooms because it is difficult for her to arrange the schedule with other science teachers.

4.2.2. The nature of the changes in the breadth of reflection. The breadth of the participant teachers' reflection is first analyzed individually. The following sections present the division of reflection categories amongst the participants and further specific aspects of each individual teacher. Analyses of both reflective journal writings and critical incidents analysis occurred during eight reflective discussions within four months are used to determine themes to identify the focus of her reflections within the guided reflective process. Semi-structured interviews for critical incident analysis are also used to triangulate and provide additional data regarding the breadth of the reflection.

4.2.2.1. Aysel Teacher as a sculptor. Whereas her oral and written ten reflections cover all the pertinent issues, the dominant focus of Aysel teachers' reflections is mainly (1) pedagogical issues and (2) her relationships with students throughout the guided reflective process. Figure 4.6 displays the themes that she addressed within her written and oral reflections and the variation of these themes over time and within two modes of reflection. Aysel Teacher has four main categories identified through six written and five oral reflections throughout the guided reflective process.

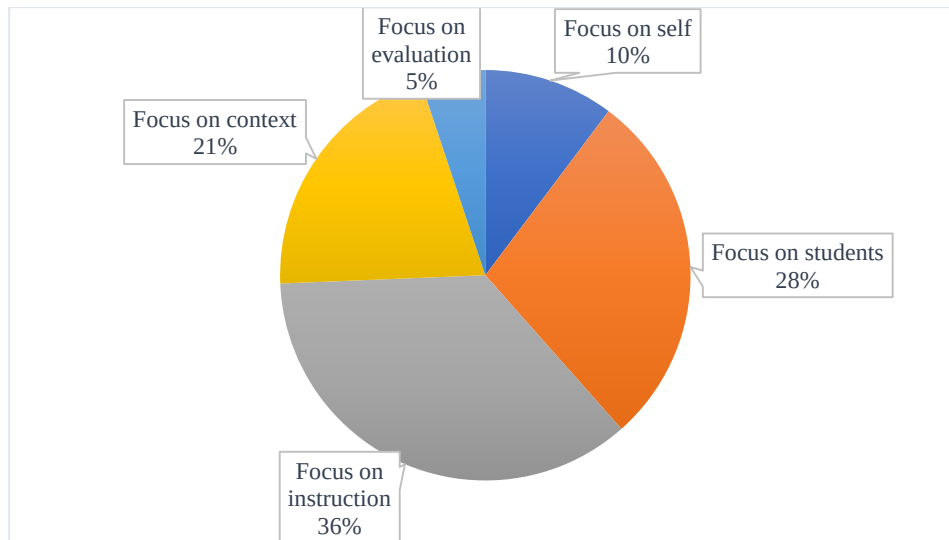


Figure 4. 6. Categories of Aysel Teacher's Focus Through Written & Oral Reflections

The dominant content of Aysel Teacher's reflections is her authority in her classes and feelings about becoming a science teacher in the beginning of the study. In the first week, Aysel Teacher shows complicated emotions about her eagerness to be a science teacher in her reflective journal writing. She is very disappointed lately because most of her students lost their interests in science lessons. She believes that when students do not pay attention to the lesson, she has some disciplinary issues with those students. In the similar vein, during the first reflective discussion, she also expresses her frustration about her students' behaviors, which leads to reducing her motivation for becoming a teacher. She describes some incidents in which she loses control over the class. She mentions that after these years of teaching experiences, she is still shocked by students' disorderly behaviors in her lessons. After the discussion with colleagues in the session, according to Aysel Teacher, she needs to show her students who the authority in her classes is. That is why she thinks that she needs to put effort into changing students' disorderly behaviors because she has a major responsibility for what is going on in the class. In the following weeks, Aysel Teacher continues with addressing concerns about managing students' misbehaviors in her classes. She claims that what she knows to deal with disciplinary issues in the class is old fashioned and does not work anymore because her students have different thinking and behavioral patterns and they are growing in a different and more liberal time of generation. She contemplates the classroom management issue as it relates to the understanding why

students do not listen to her and not change their inappropriate behaviors. Then, in her reflections, Aysel Teacher moves on to building a positive relationship with her students. Particularly, she is more focused on the ways of engaging the students with disorder behaviors into her lessons. The following excerpt illustrates her point of view:

I guess I wasn't really happy last week. There are so many other things, students coming to me complaining about this and that and it was like managing classroom was fundamental for teaching profession even it is more important than teaching subject content and I want my student to take me seriously in the classroom.

Once Aysel Teacher becomes able to accept her responsibility of managing students' misbehaviors, she focuses more on teaching itself rather than disciplinary issues. In the following weeks, her major concerns move on to students' engagement and lesson preparation issues. In order to manage time effectively and to feel more confident, being prepared for the lessons is essential according to her because she mentions that teaching could be full of surprises that she has not experienced before. Another issue that reflects her belief is that the teacher's role is most important in teaching the lesson during which students remain attentive and on-task. That is, in order to increase students' engagement in her lessons, she as a teacher needs to consider how to teach the concepts better. Her written and oral reflections show awareness of the complexity of teaching as well as consideration of teaching methods and activities in order to meet students' needs. Within reflective discussions, she asks for the suggestions to develop new teaching materials to motivate students' interest, which displays her willingness to learn and adopt new teaching approaches with the help of her colleagues. The following reflections nicely summarizes this feature:

I don't know if I'm really even improving my students' understanding of the scientific concepts. There are some students who have private tutoring and they already know what I teach before come to the class. So, I realized that I need to find different ways for encouraging my students to engage in my lessons. I am always conscious of trying to make sure all students involve in the lesson and the hard part is to be prepared all the time to find the appropriate teaching activities in which students are engaged.

Final concern regarding the focus on instruction in her reflections is her awareness about how to overcome unruly classes. In regard to this concern, she focuses on building a more positive and responsive classroom environment. With my suggestions

and more experienced participant teachers, she accepts to establish mutually created ground rules as a strategy that she implements within her own classrooms in order to foster a more responsive classroom environment. Throughout the meetings, she describes how responsive classroom management leads to layers of success to overcome her issues regarding focus on instruction. She describes her feelings about creating ground rules by stating that

I would not think the ground rules work in my classes, but it was a relatively safe space not only for me but also for my students. I realized that students felt more comfortable and at least they were not afraid to truly speak their minds. Because at the very beginning I made it clear that I cared about every student's opinion, and I never judged anybody about what they said unless it was relevant.

The issues regarding Aysel Teacher's focus on evaluation are addressed within two themes: one focusing on the fairness in evaluation and the other on evaluation practices that she performs. She evaluates students' performances in her lessons by using a grade book that one of the students in the class is responsible for. She weights students' performances (assignments, class performance, behaving properly, etc.) in giving plus or minus. However, in her recent reflections, she mentions some incidents that her students want more transparency and equitable practices in grading. According to her students, she mostly relies more on only their performances as a result of a task provided not on the progress of each student in line with their needs. This is considered as one of the main sources of sense of unfairness among students because some students complain about no matter how hard they try; they do not win her affection or meet her expectations. She explains herself by stating that she gives more importance in having the sense of neutrality in her assessment practices. However, other participant teachers do not agree about not being cautious about differentiating in assigning tasks or giving feedback. They suggest that she could differentiate grading practices in line with students' learning differences by referring to some students as "weak" and some students as "strong". They imply that in order to decrease the gaps in weak students' grades, it could be suggested that the weight given could be increased to the more effort and need or some students are given more chances to display their performances when weak students' performances are graded. She also could ask more difficult questions or gave difficult tasks to "*strong*" students while

grading their performances. I warn about labeling students depending on their learning differences, which could inhibit effective learning of students. After a long discussion with her colleagues, Aysel Teacher realizes that within this kind of learning environment that she creates, students become more hostile and resisted her requests, which results in the opposite situation of her decision about building a more positive classroom environment. Then, she decides to implement both equal treatment at some point and equitable practices with mostly disadvantaged students and instead of grading, she decides to do formative assessment rather than a summative one, which enhances fairer assessment, particularly in terms of supporting her students' learnings. Aysel Teacher put it in this way:

My weakness was the grading and lack of time to do formative assessment rather than relying on only summative one because grading individually over 30 students during a class period was really hard to find enough time. The really hardest part about it is justifying, like some students can get a plus and others can get a minus all the time. I realized that it is more important to observe each student's progress from the beginning through the end of the class. Then, each student can improve their learning as time goes on.

4.2.2.2 Banu Teacher as a teacher in control. Observed features in the content of Banu Teacher's six written and six oral reflections are as follows. The dominant components of her reflections related to issues concerning students in terms of their disruptive behaviors, instruction regarding students' engagement in the lessons, school context poorly equipped with facilities and herself regarding being authority in the class as seen in the following Figure 4.7.

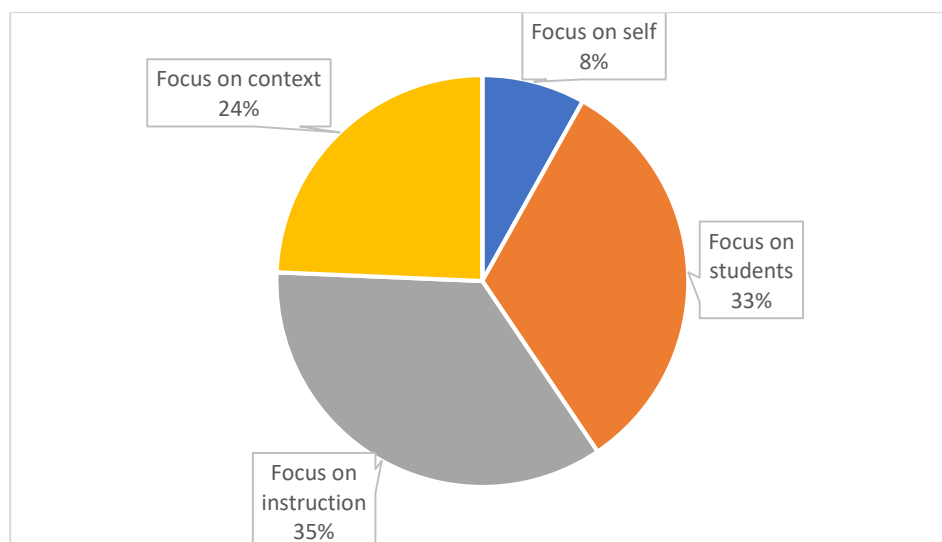


Figure 4. 7. Categories of Banu Teacher's Focus Through Written & Oral Reflections

In Banu Teacher's case, she is disgruntled by students' behaviors. She claims that she needs to establish an environment in which students honor her authority in the class. Her disposition brings a perception about her students and their parents should have an image of her as a knowledgeable person about the scientific concepts and teaching science. She believes that the complexity of being a teacher requires not just academics but surrogate the responsibility of controlling the classroom. She is the most bothered by students' disruptive behaviors among the other participants. When students behave disruptively in her class, she reflects that students do not show respect to her authority and her being teacher in the following entry:

Every day students were doing their best to test me. Two students in my class started to argue with each other about a problem that occurred in the break time. They just pushed my buttons. Then, I said something to embarrass them in front of the class and because their disruptive behaviors affect others learning I sent these two students out to see the administrator because they did not have any respect for me and their classmates.

These comments correspond with her increased concerns regarding her classroom management style to control over the students to ensure her authority. In her journal entries, she mostly reflects on the issues related to instruction along with issues related to herself and students. Regarding these issues, she is concerned about organization and implementation of the lesson including planning and preparations. One noticeable feature of her reflections is that she often refers to her role as a teacher who stands in

front of the class and delivers information. Thus, her reflections include her concerns about her teaching and pedagogy. She believes in question-answer sessions during class to enable students to engage in the lessons. However, she complains that she does not have time to give students further discussions about the topic. She often expresses the reasons for her pedagogical preferences, associated with contextual issues. According to her, this inadequate teaching atmosphere with lack of school facilities and crowded classrooms restricts her to use a student-centered teaching approach in her classes. Although she seems to have confidence in her teaching performances, there is an increase in her concerns regarding instructional skills such as time management and lesson preparations shown in recent written and oral reflections. She summarizes this belief as follows:

I believe that as a teacher, I need to deliver the information. But, I sometimes have difficulties with letting the class go smoothly because of external factors such as crowded classroom, lack of materials and resources. Yesterday, it was not an okay lesson because I could not use group works because some students could not get into activity quickly and we did not have enough time to cover the topic. So, I could not do the activity as I planned.

In her reflections, she questions why she does not feel pleasant after lessons and she expresses that it is mostly related to the deficient in her lesson preparation. According to her, students' understanding is a criterion by which she decided the success of her teaching performance. Also, she often expresses her confidence in the subject matter. She does not feel the need to improve her content knowledge. That is the reason she disregards the issues of curriculum/content. However, in one of the discussion sessions where her video footage is analyzed, one of the other participant teachers realizes that Banu Teacher's instructional strategy causes her to develop some misconceptions about the topic covered. This reflection reinforces her belief on the importance of lesson preparation for preventing the occurrence of unintended outcome as well. With regard to pedagogical issues, reflections on instructional skill and lesson preparation become more frequent while reflections on discipline and classroom management style are decreased. For example, her reflections focus on pedagogical issues related to the whole teaching context rather than considering herself as in the following excerpt:

I believe that my content knowledge is enough. But when I watched my video, I realized that some students were confused about the

topic. One thing I could do was being more prepared the lesson. This could help my students learn better. This is somewhat effective to prevent the occurrence of misconceptions of students.

4.2.2.3. Esra Teacher as a wizard teacher. Esra Teacher is open to being reflective and it is not difficult for her to reflect upon and put her teaching experiences into words to share with other participant teachers and me as well. Regarding what she focuses on while engaging in reflective practices throughout the study, she has reflections with more context specific concerns for their students' learnings and her relationships with them in and out of the classroom. For the most part, although her teaching does not change significantly, her ways of understanding it do and she is aware of addressing the complexities of her classroom. She has three main categories identified through six written and six oral reflections throughout the guided reflective process. Figure 4.8 attempts to summarize the issues and concerns that she has while reflecting.

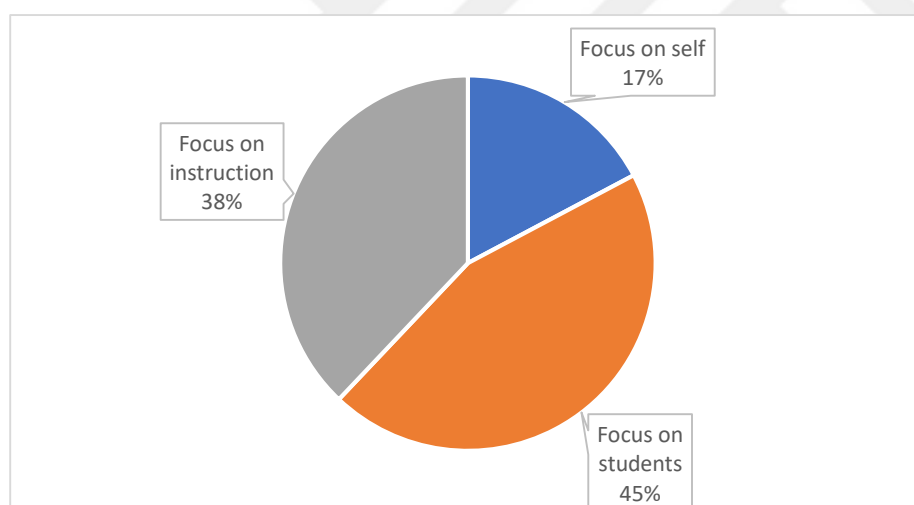


Figure 4. 8. Categories Esra Teacher's Focus Through Written & Oral Reflections

She sees herself as an individual that her students need in their lives. She believes in the idea of getting to know her students and building a relationship with them as the most important duty of a teacher. She is genuinely interested in learning more about her students and all they bring to the classroom environment. Her interactions with her

students demonstrates that she shows them that they are each important and that they have knowledge and unique experiences to share with others.

Although she gives importance to creating a positive learning environment for her students, she remains focused on her students' performance in the classroom. Although she sees her role as a facilitator in helping students when they need to follow directions, she faces many of the dilemmas on implementing the curriculum based on how it is stated. At the beginning of the study, she mostly focuses on the curriculum content along with the behavior and skill levels of her students. She feels satisfied when her students are able to accomplish the objectives of the lesson at the level she expects from them.

The critical topics discussed by the Esra Teacher are of various types and reflect the following circumstances: (a) addressing learning needs and the inclusion of a low-achiever students in the lessons (b) working with special needs learners in large class settings; and (c) addressing unacceptable student behavior or immature or inappropriate reactions. Regarding this, after she engages in reflective practices, she demonstrates some concerns about alternative practices based on her students' knowledge and created meaningful activities that related the content to her students' needs and context. Esra Teacher is aware that she needs to improve herself because students, classroom context and curriculum always evolve and change. She believes this is just a part of being a teacher.

I know it is not possible to do anything the same way for different classrooms in different times. That is why I'm still learning. I'm trying to figure out good things to use later. I am participating in different kinds of workshops and projects where I'm exploring new ways to present material, new ways to try things, different methods in catching students' interests and needs.

This quote is representative of her continually searching for different methods to reach her students. Instead of depending on traditional and usual ways, she attempts various strategies appropriate to her students with diverse learning styles. She demonstrates her sensitivity and caring by listening to her students talk and by being willing to engage in conversations with them. She seems to understand how important it is to allow her students to share as much as possible in the classroom. She understands the

creation of a climate where students feel comfortable. A more explicit example of her focus on students illustrates by the following journal entry:

Yesterday, when we discussed the topic of heat and temperature, one of my students raised his hand so demanding. I let him just talk and I thought he wanted to say something really important about the topic that we discussed. But he talked about a project on getting rid of garbage disposal smell. He had a passion for it and this did not bother me at all. I mean I know a lot of what's being said was totally irrelevant. There were a couple of students in my class that wanted to step up and have a conversation about his project.

Throughout the investigation, she claims that she has qualities that would serve her well in her teaching profession. She describes herself as approachable, patient, and willing to practice. Her perceived weaknesses include that she is sometimes very aggressive with any disciplinary issue. When she is asked to reflect on her development and experiences as an experienced teacher, Emel Teacher responds that she takes satisfaction in increased management abilities and improved interactions with her students after analyzing her teaching experiences with other science teachers. To achieve a more positive learning environment, she starts to remove herself from being the center of attention and to spend more time observing her students and realizing some incidents are different and critical, not usual as they are before. Her written reflections on her realization of analyzing critical incidents also clarify this point:

Basically in this period of time, I constantly make critical decisions because I noticed some incidents are important for me to analyze further. So, every time that I thought that was a critical incident, I had to make a decision on what would be my next move. So, every time I put myself in a position of asking such questions to make right decisions. And I think it is really hard for me to do...

4.2.2.4. Filiz Teacher as a high expectation teacher. Her reflection focus falls into four main categories (self, students, instruction and context) identified through six written and six oral reflections throughout the guided reflective process as seen in the following Figure 4.9.

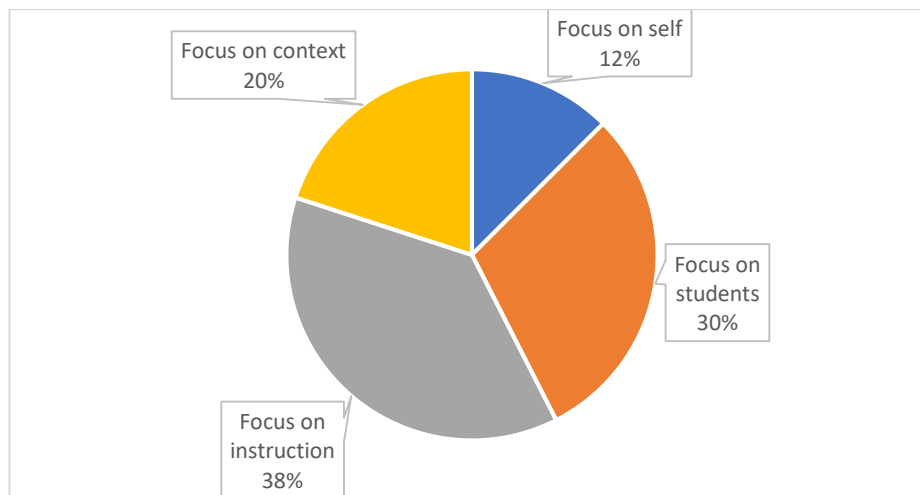


Figure 4. 9. Categories of Filiz Teacher's Focus Through Written & Oral Reflections

She mainly has concerns about (1) facilitation of student learnings; (2) classroom management and student behavior; (3) her role as teacher; and (4) developing an understanding of students. As a science teacher, Filiz Teacher has the task of preparing her students for high school the following year. The students in her class represent a wide range of developmental levels as well as socioeconomic background differences. Some of her students are very hard working and look like they are ready to enter the national entrance exam for high school; others are very not interested in continuing with high school education. Filiz Teacher has concerns that they would be lost without getting a further education. She worries about getting them all prepared for the high school exam not only academically but also emotionally as in the following excerpt:

Actually, my students are pretty diverse. There are some students who have dreams about going to top universities and there are some that don't have any interest in going to high school at all. So, I have to be really careful not to hold them back.... something I have to give extra support that they need, they can be taking tests, they're ready for that emotionally not just academically.

She reflects on how she always gives importance to younger students' need for education to have a reliable position in life. Within her classroom, she tries to plan her instruction that creates a welcoming and inviting learning opportunity for all students regardless of their background and learning levels. Similarly, she reflects that she changes how she sees the purpose of teaching. She is absolutely convinced that her

teaching could impact the social lives of students only if she sees all students as they are capable of learning stated as shown in the following excerpt:

I think I know better now that this is all very good teaching, but when you know that your students really need it, I think I'm really more direct and purposeful about how I can approach them and I am more aware of their differences before even starting. This can change something in their lives in a better way. They are just kids now. But they are our future.

She also reflects on her teaching style as structured with high expectations. She likes her students to feel comfortable in knowing what is expected of them within a given period of time. Within her classroom, she is generally using conventional instructional approaches such as asking questions, solving multiple choice questions, etc. for her students to develop their content specific understanding. She encourages competition between students through some activities. For instance, she expects her students to complete a task within a certain time limit. According to her, this promotes her students to be very engaged. She justifies her use of lecture and worksheets that are also used in other classrooms by stating that:

More than half of the class was spent on the worksheet that I provided. The students were totally engaged in the assignment. I really like the use of worksheets not only to teach science but also to see their performances because we do not have plenty of time to recover their deficiencies. They need to be prepared for the entrance exam.

In order to prepare her students for the academic demands of the national entrance exam for high school, Filiz Teacher thinks about how to reach her students. Inside or outside the classroom, she allows time for informal and daily conversations with her students. For her, in particular, classroom management and student behavior present special challenges. She shares her strategies for managing the classroom effectively.

When I think back to my ways of managing the classroom, I really think I am good at it because I showed true interest in my students. When I ask that first question about what to do first, just knowing who they are is important. I've found that that's the best time for me to do that and to connect with them in that way.

4.2.2.5 Gaye Teacher as a caring teacher. Gaye Teacher mainly has concerns about three main categories (self, students and instruction) identified through six

written and six oral reflections throughout the guided reflective process as seen in the following Figure 4.10.

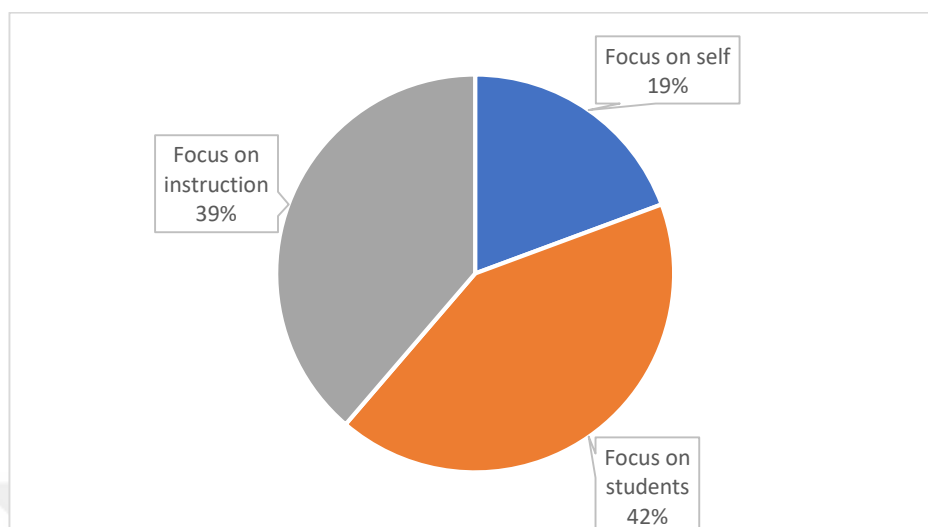


Figure 4. 10. Categories of Gaye Teacher's Focus Through Written & Oral Reflections

It is easy for Gaye Teacher to reflect upon and put her early teaching experiences into words to share with the other participant teachers and me throughout the current investigation. She sees herself as a teacher that her students need in their academic lives. She does not want to be a teacher using the same lesson plans year after year although it is comfortable for her because it is not difficult and as a teacher I do not have to think at all. She has a tendency to take into consideration the needs of students and their differences in the learning process. At the center of her teaching, she considers alternative ways to meet students' needs because lecturing and direct instruction does not work all the time. She finds that she has to do more hands-on activities or laboratory experiments to show they actually do something to learn.

I think all teachers prefer structured and traditional classrooms. But, I prefer to question my decisions like what's best for my students, how do they learn best, and what can I do for them. I need to monitor and direct their own learning. If they're not getting it, I need to figure out another way to teach them.

Within her classroom, Gaye Teacher has concerns about managing students' disruptive behaviors. She claims that whatever she does to fix students' behavior problems is not working. She justifies that she could teach any student who wants to learn. There is a group of students who does not want to learn anything from her.

I knew those students since they were 4th graders. I tried to ignore them. But this made it worse. They thought that they had the power in the class. Lately, I always yelled at them even though this made me feel embarrassed. Now, I feel the pressure to deal with this problem and support for their learning instead of fighting with them.

According to her, misbehaving students also makes other students in the classroom uncomfortable especially when they prevent other students' learnings. According to her, this is not fair for the other students who are hard working to learn something. After she shares her critical incident, she is suggested to communicate with those students' parents. She claims that communication with parents is not always positive, but she tries to be specific when sharing concerns with parents. She thinks that it makes a difference in her students' behaviors in the classroom.

I wrote a note home to their parents to let them be aware of what had happened with them. So I did write them a note explaining what had happened and that it had been hard for me not solving these problems within the classroom. I guess my students got scared when I gave the notes to their parents.

Then, she reports that she is amazed at the response she gets from some of the parents even though she still worries about the rest of them with whom she does not have consistent communication at all.

It was hard for me at first, I just said I have to do this, it is important to have that communication. But, I was surprised when I heard from only over two thirds of the parents. I know that there is a family factor to consider when trying to understand children's behavior.

To solve the classroom management problems, she realizes that building relationships with her students is also extended to reach out to their families. She decides to work hard to do both. As the research term progresses, Gaye Teacher is quite excited about creating a welcoming environment for her students in her classrooms. She lately believes that it is important to develop strong relationships with students because she sees teaching as a relational and interactive process.

I care for every student in my class because I know they hold the future for us. I feel like my students need my love because not every child has a happy family environment. I have a 7th grader student and since he was 2 years old, his father was beating him without any reason. And I did not know his story until he trusted me to tell. I always knew something wrong about him but I did not realize until we said that these kinds of stuff are happening in real life. Now, I

am pretty sure that the most effective way to reach into my little students is that they need to trust me.

4.2.2.6. Hale Teacher as an information giver. Hale Teacher mainly has concerns about three main categories (self, students and instruction) identified through six written and five oral reflections throughout the guided reflective process as seen in the following Figure 4.11.

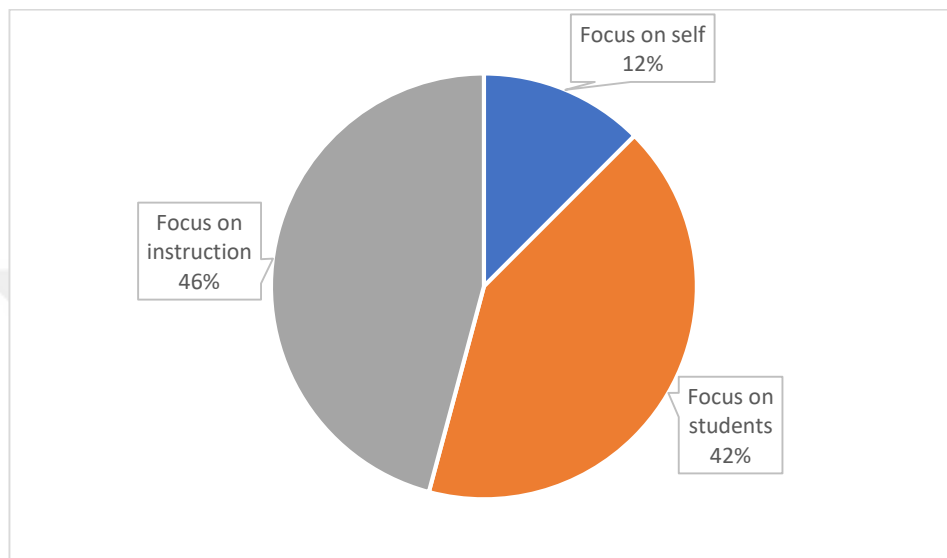


Figure 4. 11. Categories of Hale Teacher's Focus Through Written & Oral Reflections

Hale Teacher has positive attitudes towards discussions on her concerns with other participants specifically interested in the issues. The findings of this study provide insights into issues related to the changes in the focus of reflection illustrated by Hale Teacher. Although she accepts teaching is a multifaceted profession with multiple roles, she mainly sees herself as an information provider in the classroom. When she is first reflected, she mainly focuses on the one of the experimental activities in her classroom in which her students have few opportunities to actively involve and she admits she does a lot of explanation and her students are only listening to her due to her responsibility for covering the whole curriculum in the limited period of time:

What my first responsibility is to do is to finish all the topics in the curriculum. So it takes time to do it and it is difficult to finish all the topics when I implement various activities in my lessons. Most of the time I do talking and my students are just listening to me.

Hale Teacher acknowledges that she identifies students' misbehaviors as a challenge to her authority in the classroom. She develops a strategy for the ones who behave inappropriately, and she sends the students to the principal room to think about what they do and what they should have done instead. When she mentions her classroom management strategy in one of the reflective discussions, one of the participant teachers explains the possible consequences of this strategy. For instance, the misbehaved students miss the opportunity to learn within the classroom. Also, it could be harder to deal with the managing issues when the students react negatively. In the following reflections, she worries about inefficacy of her management strategy for certain students. She realizes that the same students are called to leave the classroom. She further wonders if classroom procedures support her students in finding better ways of acting as well as a reason for changing their behavior, or she has a classroom where students do not want to be and where they do not have any motivation to behave properly. Hale Teacher realizes that the way of total authority just does not work. As an example, she writes about her experience of the negative outcomes of isolation on the student in a seventh grade classroom:

There was one student who was sent to the administrative office because of her misbehaviors. I realized that this girl acted the way she did because of the way she was treated. I sent her away in order not to be able to disrupt the classroom. But, she is the one who is always interrupting and acting misbehaved.

She wants to change the way of managing the classroom. She also speaks of how this helps to accomplish her academic goals. She explains that if she goes into the classrooms and just starts the lesson, then she admits that she is not successful at her job. The following excerpt, she reports this point:

I told them my expectations and the consequences of their behaviors at the beginning of the semester. The consequence was going to the administrative room and thinking about their behaviors. This was just punishment and it did not work to correct the behavior. This made them feel unwelcome into the classroom and my lessons. These students were also behind the classroom activities and they lost their chances to learn. I need to address the problems without making them leave the classroom. This was not my job to send them away to go to a think time.

In her recent reflections, as she approaches students differently, she thinks of the need to work on positive relationships with students and she integrates relationships into her management of the classroom.

I still believe that I should hold students more accountable for their actions. But also, I should create clearer expectations and consequences, not rules and punishment. I need to rebuild my relationship with students to establish a well-running classroom. I talked about my concerns about their behaviors and asked them to think about how we could address these problems together.

As she experiences reflective practices, although she retains the role of subject expert in the classroom, through her new understanding of her role as a teacher, she becomes an information resource rather than an information provider. She starts to give priority to students as she describes her concerns about finding a balance between attending to her students' needs and her desire to move forward with the lesson. This shift from focus on content to focus on students demonstrates a major change in her thinking about herself as a teacher:

I think they are two different things. I became aware of how much time I used to be spending worrying about what I have to teach rather than what my students are constructing.

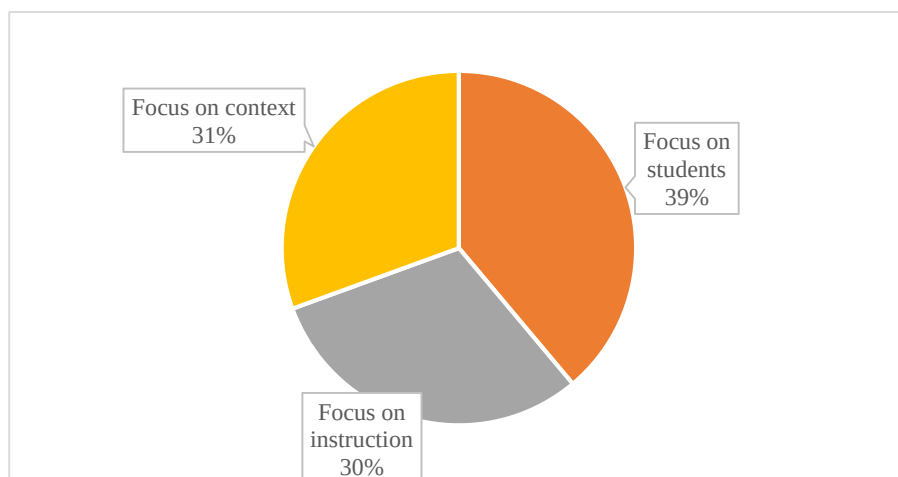


Figure 4. 12. Categories of Mine Teacher's Focus Through Written & Oral Reflections

4.2.2.7. Mine Teacher as a responsive teacher. Mine Teacher's focus of her six written and six oral reflections are particularly (1) diversity, (2) inequity, (3) her understanding towards students, and (4) applying scientific knowledge to students' daily lives as categorized under three main foci illustrated in the following figure.

Across the reflective practice, Mine Teacher' reflections show a higher sense of empathy and understanding towards her students, with a continuous dedication to embrace students with diverse needs and interests and maintain high expectations with her classroom relationships. For example, in her initial reflections she spends time discussing how to provide opportunities for students' active engagement in her lessons. Some students in her class, though, are less involved and less engaged in the lessons compared to others. She acknowledges her motivation to get to know her students better to understand why those students do not show any interest in her lessons. When asked to report classroom strategies that deal with students' differences, she points at strategies that create connections with them asking their opinions about anything in the classroom. She notes that:

Actually it was not hard for me to understand my students and this has to do mainly with their different socioeconomic backgrounds. I ask my students about their opinions, because I am interested in what they think and because I want them to feel comfortable in the classroom while sharing their ideas.

She mainly describes her aims in teaching ‘*to inspire students' interest in science*’ and show students who may not like science how it can be ‘*applicable and important in their lives*’. She reports her teaching style as constructive because she implements hands-on classroom activities designed to engage students more in their learning without much success. However, due to crowded classroom size, she feels disappointed because she does not have much freedom to try new things. This focus is evidenced in the following reflection:

... it's my hope that students leave my lesson questioning and with a greater awareness of the wide breadth of application of scientific knowledge into their daily lives. But, it is more complicated than I thought in the crowded classrooms, sometimes I feel disappointed but the notion of students critically examining what they know, how they construct knowledge, is very important to me.

She mainly aims to cultivate her reflections on the diverse backgrounds of her students and the realities within the classroom such as classroom size, particularly on how she interacts with the contextual background of her students and the way they construct their learning in line with their needs. She shares her further experiences about teaching low-income students and mentions the socio-economic inequality she observes in one of the classrooms, as in reflected the following entry:

My new students were all very disadvantaged in terms of their families' socioeconomic status. Working with them had an impact on my teaching experience. I can say that I was lucky when I was a kid because my education was a privilege for me. Those students have very few resources not only at home but also in this school, and this might affect their future lives. I am sure that when we provide those students with much more resources and better opportunities, we can change their future lives.

Her reflection illustrates her awareness of how inequitable conditions impact student learning and how she benefits from a privileged educational background. She has a desire to teach disadvantaged students, which might make a difference in their future lives. To do this, she recognizes that it is important to create a tolerant and an inequitable classroom atmosphere where students could feel secure and more focus on lesson objectives, as in she notes the following quote:

It is not enough as a teacher when I am the only person who tolerates other people or understands them. But in my classroom, I teach my students how to accept other people and be more open to the

differences. I believe this is really a big step for them. But that's very difficult and very challenging in this school...

4.2.2.8. Sibel Teacher as an expert teacher. Particular data emerged through six reflective journal entries and five reflective discussions of Sibel Teacher that represent one main theme of instruction with three subcategories: (1) planning and preparation, (2) pedagogical preferences, (3) classroom management.

As a prominent content theme emerged from the data, Sibel Teacher perceives that planning and preparation is prerequisite for effective teaching and therefore her initial reflections frequently converged into planning and preparation of her teaching practices that would create a productive learning environment. Her reflection below illustrates this point:

I had a group activity and there were five stations at which students needed to complete the activities. I was trying to make sure each student was participating where possible. But, I was noticing a lot of pairs were confused by station one. I was getting frustrated by the number of times I had to get students to slowly reread the procedure, check the materials list, because they couldn't follow the procedure without having the correct materials. There were some groups which were so sure the procedure couldn't be done, they were ready to give up. I Asked them to reread carefully and try once more. I did not want to just give answers. I felt it was important for them to discover they had the resources to work each station if they would slow down and think. I know some students found the activity fun because they were working with friends and eventually they all learn, but it was not fun for me because I could not consider the procedural information that I provided was not clear enough for my students. It was not that much complicated but I wish I had a backup plan or planned better at the first place because I am not sure I guided them enough.

During reflective conversations, Sibel Teacher also focuses primarily on instruction. Her concerns about instruction appears to be twofold. She is concerned with knowledge of students. She states that she believes in involving the students in group activities and hands-on activities. However, in most of time, she admits that she has to lecture to her students and mostly used a teacher-centered approach. In that sense, she mostly reflects her understanding of how students learn better,

I try to approach topics with many different lesson styles and activities to be sure that most of students can understand the concept. I feel that when I have crowded classrooms and lack of resources,

lecturing the only way my students can learn science correctly. Every student has different learning speed and level. So, I cannot trust my students to learn the right way if I permit too much group work and other student-centered approaches all the time. But, when I feel that they are bored, I can grab their attention with various activities.

Furthermore, professional responsibilities are noted as another sub-category under her reflections regarding instruction. One reflection comment illustrates that Sibel Teacher is thinking about her professional responsibilities towards her students and she addresses students' needs in contextualized materials, as can be seen in the following excerpt:

Through my teaching profession, I have learnt that as a teacher, I need to be patient. I learnt I do not make any assumptions about students and their capability to achieve. For instance, one group of students cannot understand what I teach, so I provide them another way of looking at it. this will help. This experience allows me to better my teaching skills and implement my lesson as I plan when it comes to having a classroom that is responsive to the needs of my students.

Most often, Sibel Teacher reflects about the classroom environment, referring to the creation of a climate of discipline in the classroom. She discusses the classroom climate for working with students who has behavioral issues. She follows a philosophy about behavior control in her classrooms that is quite similar to the other participant teachers. Her classroom management philosophy is characterized by an emphasis on order in the classroom and students' obedience to her authority, which consisted of three essential parts: (1) clearly defined rules that students must follow; (2) positive recognition for following the rules; and (3) possible outcomes that are applied when students do not obey the predetermined rules. Sibel Teacher expresses her belief in managing the classroom:

A good technique for handling behavior issues that I apply since forever is when students know what teacher expect from them. They know what is expected and what is inappropriate and they follow that. Behavior expectations need to be put out there early on. I remind the classroom rules and possible outcomes when they violate them in the first class. If they know what is expected and what the consequences are, then they cannot say I do not know this rule or they know exactly what happens when they act a certain way.

4.2.2.9. Sevda Teacher as a conscientious teacher. As she reflects on and analyzes her teaching practices, three main themes emerged from the explanations developed in her six oral and five written reflections as illustrated in the Figure 4.13.

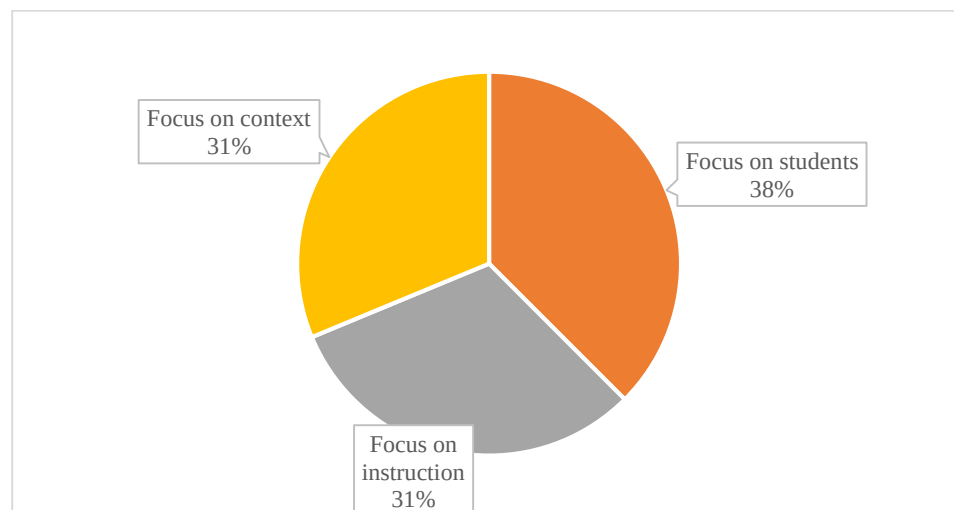


Figure 4. 13. Categories of Sevda Teacher's Focus Through Written & Oral Reflections

Those themes have five subcategories: (1) managing the classroom, (2) nurturing all students, (3) relationships with students, (4) planning and organization of the instruction, and (5) the need of professional support from her colleagues. From these themes and the issues surrounding her reflections, it is evident that her reflections mostly concentrate on how to support students' learning in a diverse classroom.

In her first reflections, Sevda Teacher examines issues related to classroom management and how these issues influence her students' learning. She plays a role of a classroom authority, for which she needs to use certain strategies to elicit her authority. According to her, it is important to give simple orders to students and organize lessons in a very clear way and she describes her approach as being somewhat rigid:

Generally, I start the lesson by using a loud tone and straightforward message to interrupt classroom disruption and gain the students' attention. I use direct questions and pressure them for answers to encourage their engagement in the lesson. Students should play the role of the student and a teacher should play the role of a teacher.

When she watches her video footage, she realizes her negative attitude towards some students who could not answer her questions in a very short time of period. She criticizes herself about forcing her students to answer her questions quickly. Then, she becomes aware of the different backgrounds and learning needs of each student in her classroom and attempted to address these issues to enhance student learning as in she notes:

In the video, I just forced them to answer my questions and even I did not give any time for them to think about their answers. Like I was in hurry. My aim to ask questions was to remind the previous knowledge. I know my students differ in learning level, motivation, etc. So, I need to give more time and opportunity to share their ideas.

In the following reflections, Sevda Teacher starts to believe that most of her students do not fit into traditional classrooms, and the hardest task for her is to address the needs of each student in her science lessons. The following comments by Sevda Teacher illustrate this point:

Meeting the needs of all students is the hardest thing to do as a teacher because I do not know how to address all students' needs in one lesson. I have nearly thirty students in each classroom and they all have different learning pace. Some students can learn quickly and some of them can learn slowly. I am not sure it is possible to spend required amount of time for each student with different needs. I even do not know how to identify the needs of students at the first place.

According to her, the diversity in students are mostly the sources of lack of homework support at home, families' socioeconomic background, and limited science experiences. She suspects that her students do not receive required academic support at home. She does not think students are encouraged to develop understanding about scientific concepts as in she states in the following excerpt:

My students have backgrounds and home-lives that are different from each other and my own as well. They do not have anybody at home that can help them with their homework because some of them are illiterate or they have lack of scientific experiences. I am working with such students who do not have any support from their parents.

She is not sure about having a strong understanding of science content and how her students react to certain concepts and activities. She states that she does not know how to address when her students might feel confusing and what to do to fix it. While

reflecting one of her classroom video footages, she realizes that as a first step, she needs to identify the problematic parts during a certain lesson. As an action plan, other participants suggest her to spend more class time discussing those parts and making sure students understand them. She believes that it is important to plan and organize the lesson effectively to meet the needs of her students and to reduce off-task behaviors of students or when students are confused and not interested in the lesson. She argues that each activity in the classroom should be connected to another activity or concept and each needs to serve for a specific purpose:

The most important thing is to plan the instruction and to be prepared before entering the classroom. Planning the lesson with considering time and students' needs can solve my basic problems. I do not feel safe while teaching some topics. For them, I need to give extra attention and time to the students whether they understand or are confused. As a teacher, I have to plan for everything that the students are going to do because there is a purpose for everything that happens in the classroom.

According to her, these differences of students impact the way of teaching in her science classroom. In addition to raising awareness in a diversity in a classroom, she starts to move away from behaviorist approach of reinforcement and punishment. She accepts the importance of relationship building to reduce problematic issues in the classroom such as disruptive behaviors, lack of students' engagement, etc. For example, Sevda Teacher describes her previous experiences regarding relationship with students and notes that she needs to support development of students' capacity to accept responsibility for their own actions:

Even if I want them to do the work together, when they want to fight me on it, sometimes I could not control myself and started to fight with them. This never worked. Instead of fighting back, I rather listen to them, and ask them what's wrong? Why are you doing this? They need to accept their responsibilities as a student and this makes them feel more important.

Although she wants to develop strategies for addressing these issues in her classroom, she argues the absence of collaboration between her colleagues. She believes that collegial relationships might have great benefit to her teaching experiences and she argues that her colleagues are not interested in sharing their ideas as in she describes this:

Sometimes, I feel lonely if I cannot interact with another teacher about what is going on in the lessons. In my school, some teachers are just doing their own thing and they do not really want to hear what other teachers are doing. This is important, especially because even I am an experienced teacher, I feel confused and do not know what to do. I can learn from their experiences.

4.2.2.10. Zeynep Teacher as a traditional teacher. Data analysis indicates that the Zeynep Teacher's five oral and five written reflections focus on four main topics under one main theme of instruction as illustrated in the following figure: (a) managing classroom, (b) her expectations from her students, (c) her instructional concerns, and (d) lesson planning and preparations.

Zeynep Teacher centers primarily on the students she teaches. In her initial reflections, she mentions her expectations from her students to behave properly in the classroom, be punctual to her lessons, to participate and get involved in all activities that she implements, to respect her, and to take up the responsibility for their own learning. This view is presented by her journal entry on her expectations from her students in terms of that they need to feel responsibility for their own learning and she put it in this way:

I noticed with my students. Some students don't really look at what's happening in the class very often. I want my students to take me seriously and take responsibility for their learning. As a teacher, I am looking at what the students are doing in my class, whether they are getting it or if they are not getting it. As a student, they also need to take responsibility for reaching the objectives of my lesson.

Although Zeynep Teacher wants to establish her authority in the classroom and she expects from students to follow the classroom rules, she demonstrates a strong belief in the importance of making connections with each student in her classrooms. Her major concerns are classroom management and student control. Many of the remarks make are related to discipline, motivation, and student engagement. She works as a tutor in a private teaching institution before working in this school. After she starts to work in the current context, she mentions that she is faced with the reality of students' lack of motivation and interest, and she has difficulties understanding the reasons why students behave disrespectful towards her. This leads her to question her own teaching styles, herself as an individual, her ability to manage the classroom. According to her,

an effective teacher should be the one who has control over students as in she notes in her oral reflection:

Last week I was worried about managing classroom; this week I am worried about lack students' motivation in my lessons. I feel that I am not an effective teacher and this makes me feel bad. When I am teaching I would be a different person than I am now. I want my students to obey the classroom rules and be attentive to my lessons. My main goal is having them feeling something other than boredom in my lessons.

She feels that it is important to immediately identify her delivery strengths and weaknesses. That is why she decides to get some feedback on her teaching from her eight grade students. She receives some comments on this on how she manages to activate all students by using various teaching activities. One of her students explains that Zeynep Teacher does more teacher talk and constantly repeats what she says. The way she uses to teach science made students feel bored and decrease their interests in her lessons. She explains, *"After I give directions to my students, I ask them to repeat the directions. By doing this, I have an opportunity to immediately check for whether they understand the topic or not."* According to Zeynep Teacher, this feedback from her student gives her a chance to go back and ask herself important questions about her teaching strategy.

Effective lesson planning and preparation is considered as one the major issues that arose during reflective practices that Zeynep Teacher engages in. After she watches the first video footage of her teaching performance, she realizes that when she implements more traditional structured science classes, her students easily struggle during the lesson. She believes that when she effectively plans her lessons, she easily gets opportunity to meet the needs of her students and to deal with off-task behaviors that arise when students are bored or not interested in the lesson.

I was not prepared for today's lesson. Today, I started teaching an experiment about density. Although I had all materials for the experiment, it did not work properly. I could not provide any explanations to my students why the material did not flow on the surface of the water. Without preparation I could not feel secure in class. After the lesson, I decided to search about this issue and realized that I should have used salty water to increase the density of the water and to make the material flow at the surface. When I am more prepared, the class can progress better I guess.

Zeynep teacher also states that she makes a point of ensuring that her pedagogical content knowledge is not sufficient to allow her to confidently approach every teaching session. She is often overwhelmed and confused about lesson planning and implementation. She sometimes questions her readiness to teach. The following excerpt captures this aspect:

I need to catch myself, and to ask about whether my approach is the right thing to make my students learn better. During my teaching practice, I am not sure about what I am missing and in the case of my students are not doing correctly, I cannot decide how I can fix this. Sometimes, I feel I am not ready to teach that topic maybe because of my lack of lesson planning and preparations. I have to do something different when they don't learn and to feel more safe while teaching.

She also wants to show her students that she is there for them both in and outside of class and to help them if they are struggling in science lessons. She illustrates this to her students as she encourages them to let her know if they need additional help or they would like to meet with her at another time to discuss the course content. By making this explicit to her students, she attempts to help students focus on learning science without the fear of failure as illustrated by Zeynep Teacher's following reflection:

In the last week I felt good. I planned a classroom discussion activity and some students are quite serious while discussing. But, one student was busy to distract everyone. I tried to stop her but she kept doing it. It was hard for me to understand why she did not engage in the discussion. So, I can help her increase her motivation. to do this, learning more about this student from her parents is essential. So this helps my students to learn better. But, it is hard to guide my students without their parents' support.

4.2.3. The nature of the changes in the depth of reflection. As described in the methodology part of the thesis, the depth of teachers' reflections is categorized into four dimensions: Routine, Technical, Contextual and Critical. In this section on the nature of the changes in the depth of reflection, the result of data analysis is illustrated in 2 main graphs: (a) The Depth of Reflection Over Time in Journals, (b) The Depth of Reflection Over Time in Reflective Discussions. These illustrations are developed to show the nature of the changes in the depth of reflection by time (eight weeks) with two different reflection modes (oral vs written).

4.2.3.1. Aysel Teacher as a sculptor. As can be seen in the following figures, the depth of reflection evidenced in Aysel Teacher's written and oral reflections span three categories: Technical, Contextual and Critical. It is also shown that her reflections mainly belong to Technical and Contextual. For her, written and oral reflections are placed at the Critical category in very limited numbers, even though there is a growing tendency toward this category over time. The changes in the depth of her reflections will be discussed by time and by communication mode in the following paragraphs.

While only 39% of her reflections demonstrate technical reflection, subsequently, more instances of contextual reflection are found in her 37% of reflections. 11% of her reflections ever demonstrate critical reflection and 13% of them are categorized as routine reflection. In terms of depth of reflection, Aysel Teacher demonstrate the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups, and the following Figure 4.14, Figure 4.15 and Figure 4.16 illustrate the change in the depth of reflection over time.

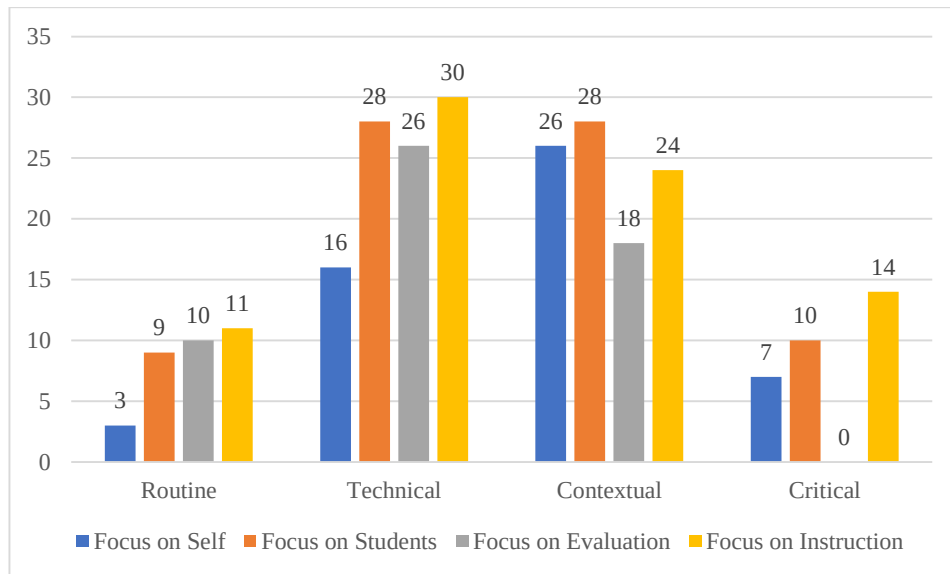


Figure 4. 14. The Changes in The Depth of Aysel Teacher's Reflections for Each Focus

Throughout the guided reflective process within the context of this study, Aysel Teacher's written and oral reflections show changes in the depth of reflection over time. Her reflections are most often placed at Technical, then Contextual, and to a limited extent at lower category of Routine and higher category of Critical Reflection. However, as can be seen in the following Figure 4.16, lower categories tend to increase with engaging in the guided reflective practices.

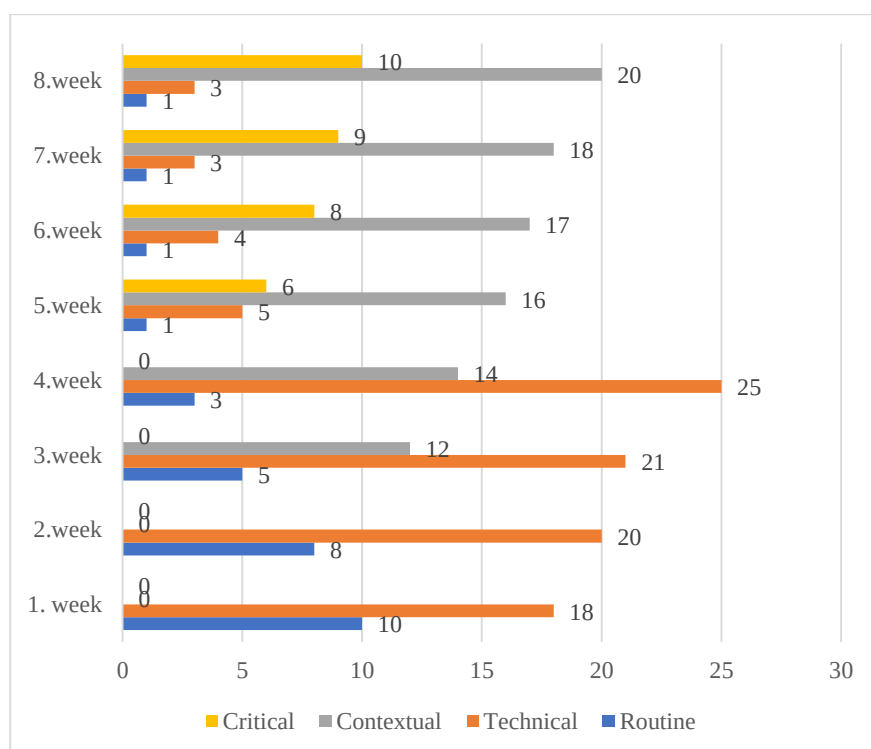


Figure 4. 15. The Depth of Aysel Teacher's Reflections Over Time

In the beginning of the current investigation, Aysel Teacher reflections mostly contain descriptive and superficial explanations without much justifications behind her ideas and actions. Her initial thoughts at this category appear to be mostly based on narrow understandings of teaching with limited experiences of reflecting her actions. Then, her reflections at the technical category also include many descriptive elements, and she seeks alternative practices and solutions to resolve dilemmas from her experienced colleagues. However, these reflections still lack evidence of looking beyond herself to the addressing students' needs and interests.

Most of her reflections placed at the contextual category demonstrate the attention on the management of the class and facilitation of instruction. She describes the incident and moves to the contextual category to search for credible solutions that would result in more effective instructional time. While she is engaging in the guided reflective process, there appears to be very little evidence of critical thought in her reflections. In this category, she clearly shows evidence of an understanding of contextual factors including students, school environment, and her relationship with students' parents, which are considered as a critical component of the success of teaching outcome.

However, the duration of the guided reflective process is not the only factor attributing to the changes in the nature of depth of reflections of Aysel Teacher. Regarding oral and written reflective modes, there exists some differences in terms of the depth of her reflection. Hence, it is also essential to examine the changes in the depth of reflection by mode of reflection.

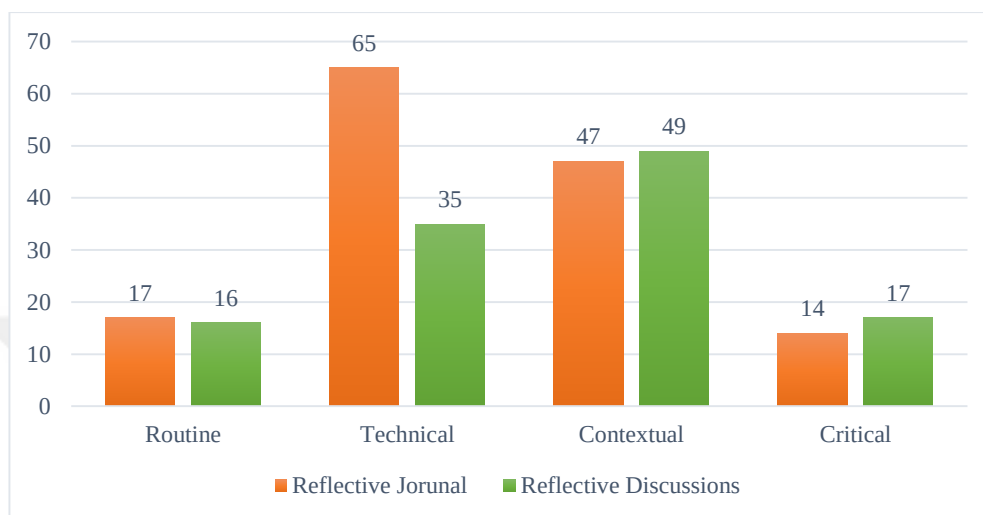


Figure 4. 16. The Depth of Aysel Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.16, the patterns of Aysel Teacher's depth of reflection do not indicate a difference among written and oral reflections in general. Her thought occurs mainly at technical and contextual, and then to a limited extent at critical reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show the evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and began to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching, there appear a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the routine reflection. Unlike her initial reflections, Aysel Teacher's reflection level evidenced in

oral and written formats constantly show a growing tendency toward deeper and critical reflection.

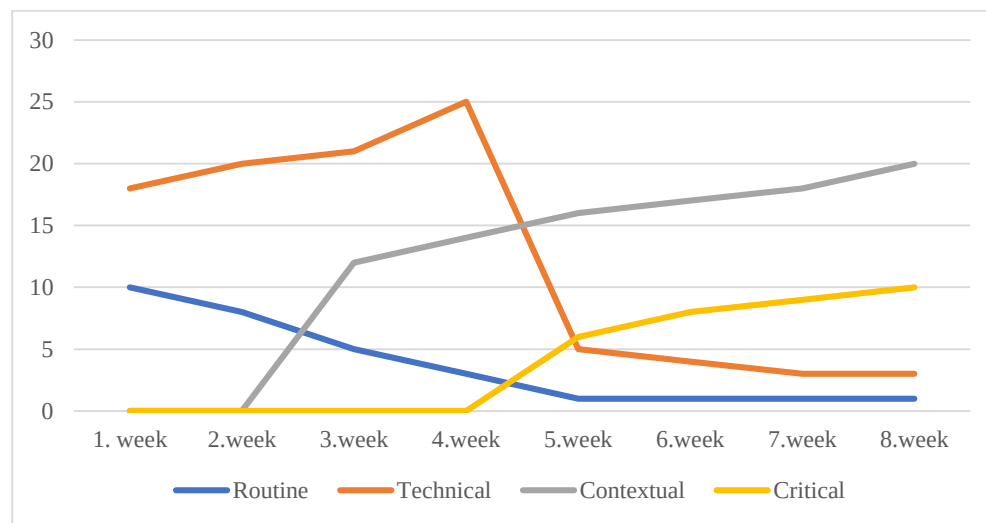


Figure 4. 17. Changes in Aysel Teacher's Depth of the Reflection Over Time

As seen in Figure 4.17, there are four different change patterns. While there is a sharp decrease in the category of Routine and a dramatic increase in Contextual and Critical Reflection categories, the Technical Reflection initially rises, remains temporarily constant, and then falls.

4.2.3.2 Banu Teacher as a teacher in control. There is no significant change in the content of her reflection during the guided reflective process. However, even if there is no significant change, the following figures help to clarify the tendencies in her reflections as she engages in the reflective practices. Among the four categories of reflection, three of them are evidenced by Banu Teacher during her own reflective practices as outlined in this section. While only 54% of her reflections demonstrate routine reflection, subsequently, more instances of technical reflection are found in her 34% of reflections. 12% of her reflections ever demonstrate contextual reflection. In terms of depth of reflection, Banu Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups,

and the following Figure 4.18, Figure 4.19 and Figure 4.20 illustrate the change in the depth of reflection over time.

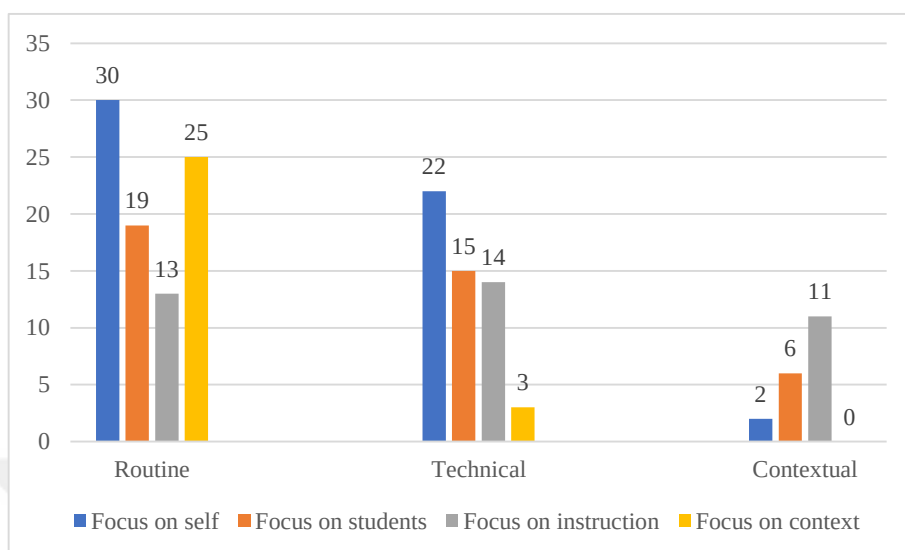


Figure 4. 18. The Changes in The Depth of Banu Teacher's Reflections for Each Focus

Certainly, before Banu Teacher engages in reflective practices, the depth of her reflection is mainly interpreted as Technical reflection. Her oral and written reflections are revealed at all three levels as his reflection most often occurs in the Technical category and slowly extends to Contextual category. Most of her initial reflections include the description of classroom incidents mostly related to dealing with students' disruptive behaviors. Then, during reflective practices, her reflections include why the lesson goes a certain way and what her role should be in the lesson, as well as descriptive reflections on her responses to students' behaviors.

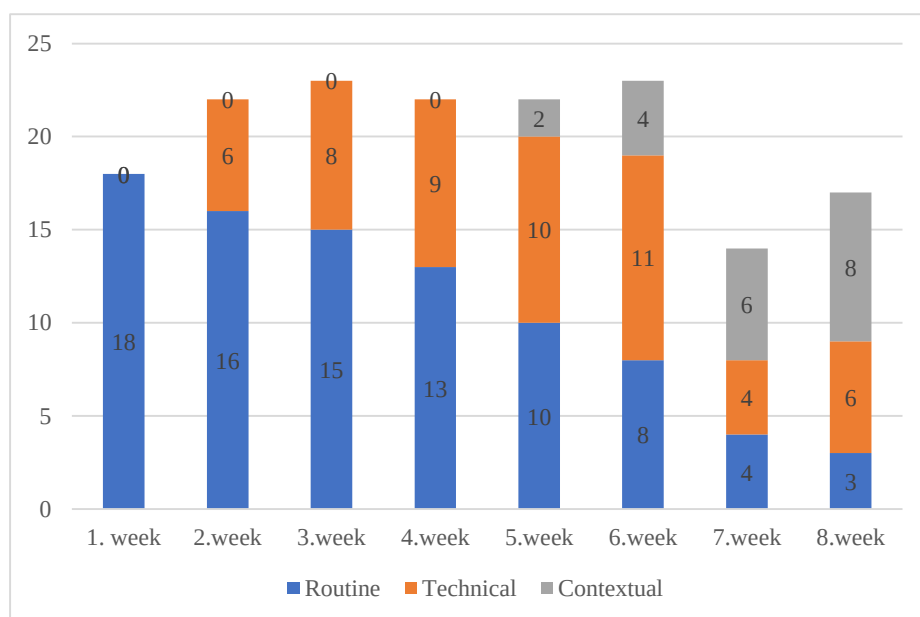


Figure 4. 19. The Changes in The Depth of Banu Teacher’s Reflections Over Time

Figure 4.19 illustrates the changes in the depth of her reflections under each focus. In her case, there are some noticeable differences in the depth of reflection across each focus. Banu Teacher’s reflections on the contextual issues are mostly placed at Routine and Technical reflections are slightly extended under this focus. On the other hand, her reflections on herself, students and her instructional decisions already occur at the higher category of Contextual. This shows that the technical behaviors start with management concerns, specifically dealing with disruptive behaviors of students, move toward instructional concerns, with the ultimate guiding purpose being that of student learning.

During reflective practices, the written and oral reflections of Banu Teacher coincide with all three categories, however, Figure 4.19 demonstrates her progress towards the higher category of Contextual Reflection. Her initial reflections consist of very conclusive descriptions based on her recollections of personal experiences or preferences. Then, she attempts to include her rationale with her preferences and decisions about her teaching practices throughout the guided reflective process. Her reflections on instructional actions become deeper than other issues over a shorter period of time.

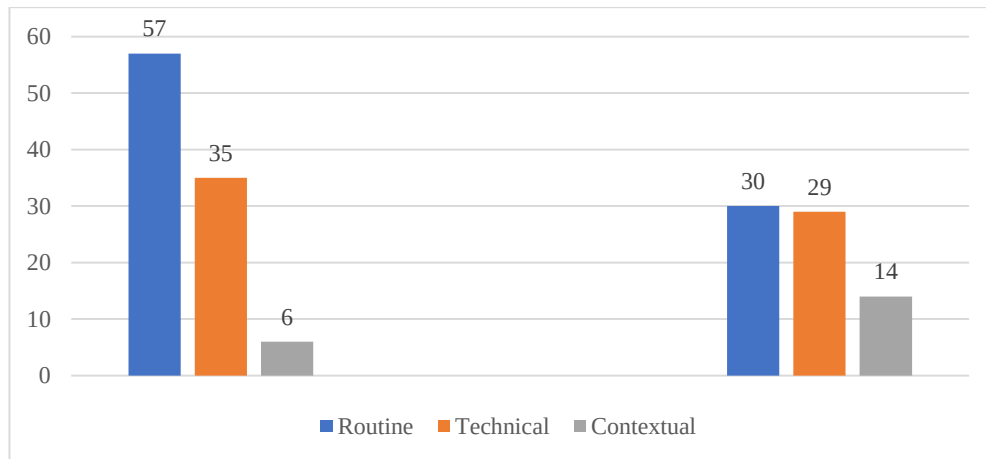


Figure 4. 20. The Depth of Banu Teacher's Reflections by Mode of Reflection

Figure 4.20 shows that Banu Teacher's reflections in journal entries are mostly interpreted as Routine category, then Technical category and very limited at Contextual category. As mentioned earlier, her reflections are mainly on events especially as applied to students' disruptive behaviors. On the other hand, her reflections in oral mode constantly showed a growing tendency toward deeper reflection in a way that her reflections on her role and responsibilities, lesson preparation and students' engagement are extended to Technical and Contextual categories.

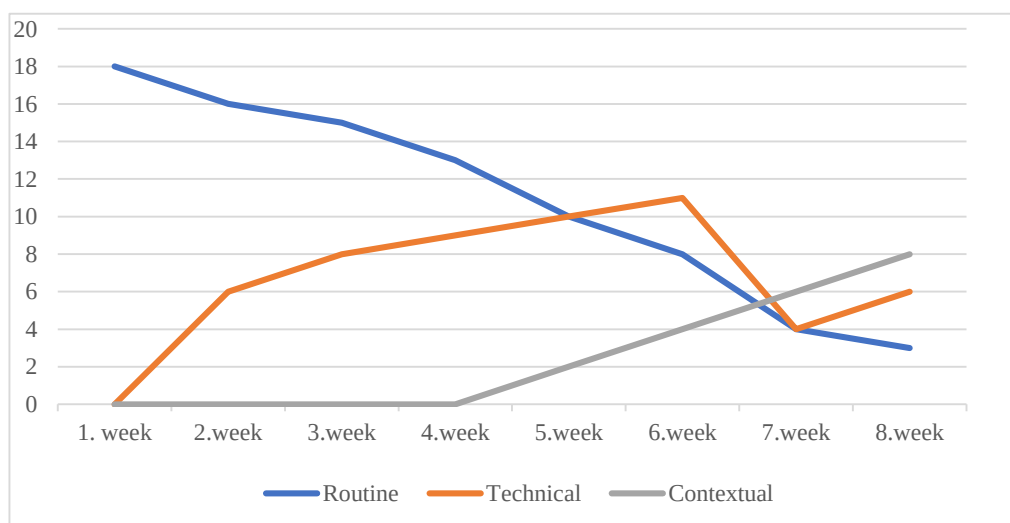


Figure 4. 21. Changes in Banu Teacher's Depth of the Reflection Over Time

In Banu Teacher's case, although there is no consistent trend in the depth of reflection over time, Figure 4.21 illustrates the changes in the nature of her reflection category in each period. The depth of her reflection has changed at a different pace after she engages in reflective practices. When there occur reflective discussion sessions on her teaching, she agrees to implement alternative instructional approaches that her colleagues offer. In time her reflections show awareness of the complexity of teaching as well as consideration of instructional approaches regarding students' needs.

4.2.3.3. Esra Teacher as a wizard teacher. Among the four categories of reflection, three of them are evidenced by Esra Teacher during her own reflective practices as outlined in this section. While only 48% of her reflections demonstrate technical reflection, subsequently, more instances of contextual reflection are found in her 30% of reflections. 22% of her reflections ever demonstrate critical reflection. In terms of depth of reflection, Esra Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups, and the following Figure 4.22, Figure 4.23 and Figure 4.24 illustrate the change in the depth of reflection over time.

During oral and written mode of reflection, Esra Teacher seems to be very comfortable about sharing her successes and problems regarding her teaching experiences. Most of the topics discussed are of a technical, contextual or critical nature. Successes tend to be equally divided between building a positive relationship with students and the students' progress. Most problems identified are related to her skill and effectiveness, student behaviors, and classroom management. Figure 4.22 illustrates the changes in the depth of her reflections under each focus. In her case, there are some noticeable differences in the depth of reflection across each focus.

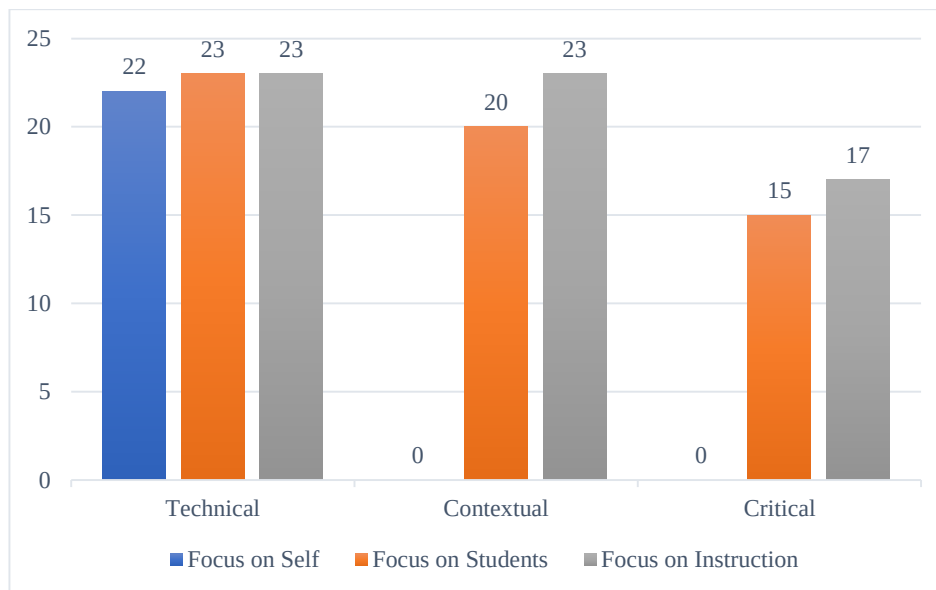


Figure 4. 22. The Changes in The Depth of Esra Teacher's Reflections for Each Focus

At the beginning of the investigation, Esra Teacher admit that she does not have any tendency to question her teaching practices even though she does not feel good about it. Throughout the guided reflective practices, she is encouraged to reflect on her lessons through responding to open ended questions such as, "How did you feel the lesson went?" or, "Can you identify any incident deemed to be critical that happened during the lesson?" This strategy produces mainly technical responses as exemplified by the following:

I think it went well. I explained everything clearly. I was glad about the starting activity in which we were looking at the properties of reflection of light, where we see it during our daily lives and how we use it and by the answers I got back from the class.

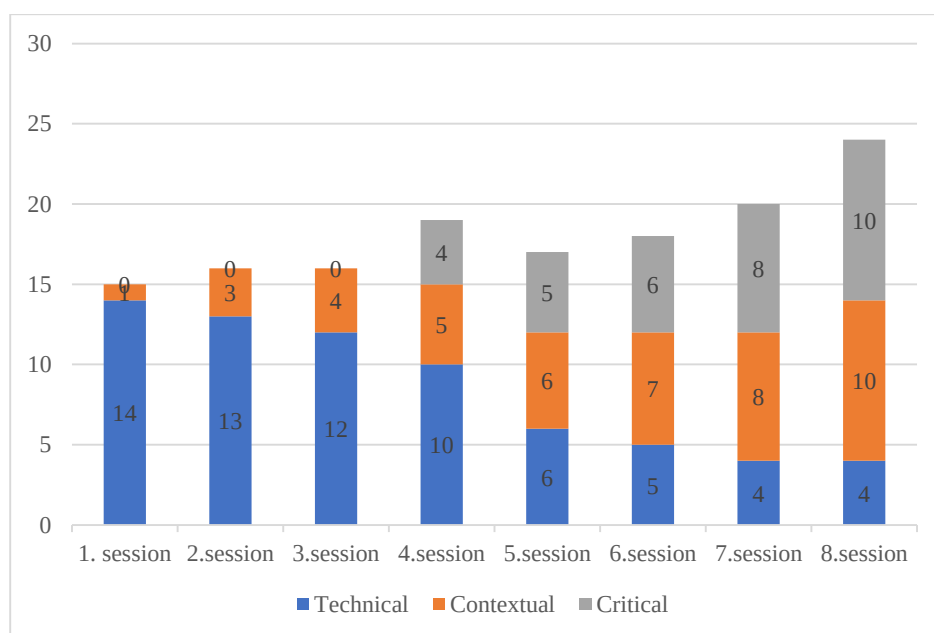


Figure 4. 23. The Changes in The Depth of Esra Teacher’s Reflections Over Time

As illustrated by Figure 4.23 above, lower categories tend to increase with engaging in the guided reflective practices. As she engages in the reflective practices, her reflections become more context specific and concern for their students’ learning and achievement become more prevalent. Some of the concerns include being more assertive and dealing with intentional disrespectful behavior of students. A few weeks later, Esra Teacher exhibits this developing awareness:

Although I am not able to adjust my practice accordingly, during this experience of reflective practice I more fully realize that it is not enough to just notice what students are doing, but to change what I’m doing to deal with the problems.

Although most of the evidence points to Esra Teacher operating in a contextual category and, at one point, she does not move into a critical category as expected. At the beginning of the study, she is primarily operating in a technical category. Her perspective remains at a technical reflection where decisions are mandated and she simply conforms without questioning. On the other hand, the times when she appears to reflect more at the contextual reflection are times that she allows the students to guide the curriculum through their questions and their interests.

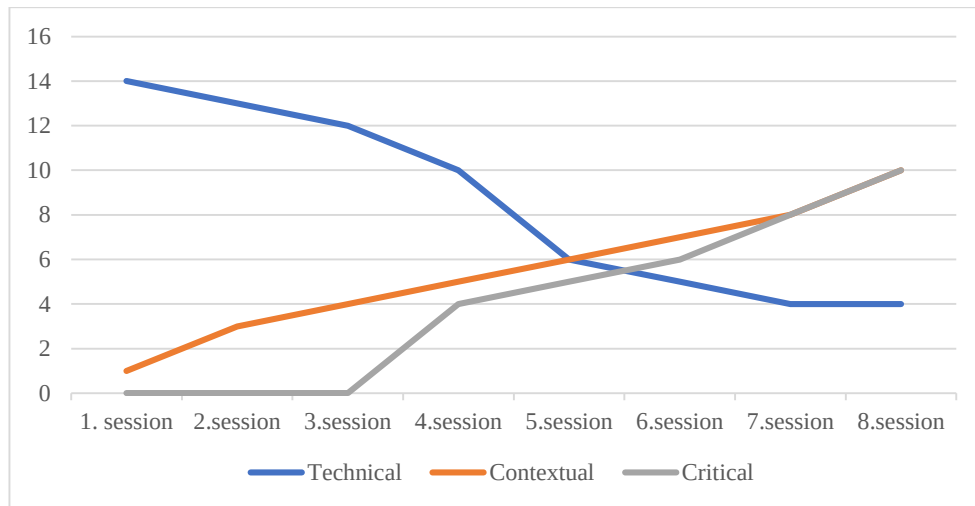


Figure 4. 24. Changes of Esra Teacher's Depth of the Reflection Over Time

Even though most of her reflections are centered on technical and contextual matters, issues of a more critical nature do arise as displayed in the Figure 4.24. For example, the reflection is interpreted as a critical reflection category which ponders her many choices in classroom management. She describes one of her critical incidents in which she needs to run a highly structured classroom where without her permission students could not get up or talk. While expressing the incident, she compares it with another classroom where her students could sit on top of their desks and move around as they want. She questions the fairness by stating that:

I am not sure whether my different ways of managing classrooms are equally good for my students. some students benefit from one climate while others could suffer. Some students hate me, others adore. As a teacher and a mother of a daughter, I am aware that all students deserve an equal and more caring touch from me.

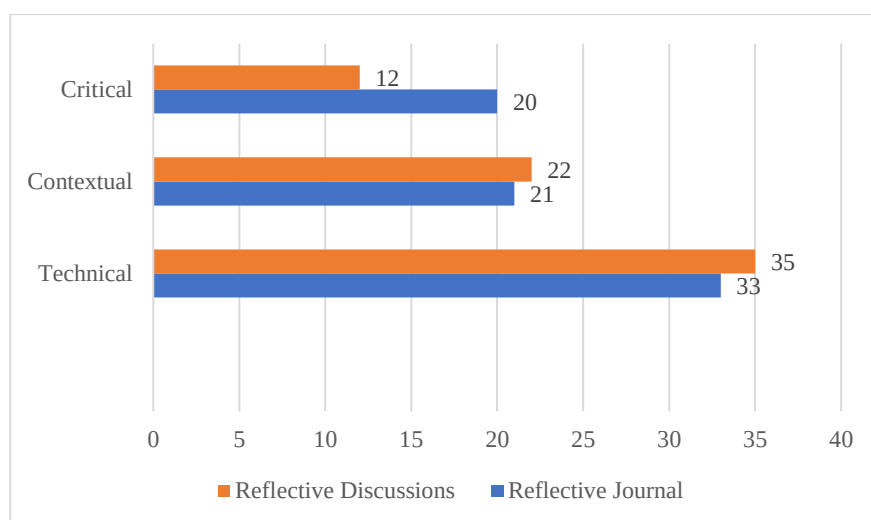


Figure 4. 25. The Depth of Esra Teacher’s Reflections by Mode of Reflection

As can be displayed in Figure 4.25, the patterns of Esra Teacher’s depth of reflection indicate a difference among written and oral reflections in general. Her thought occurs mainly at technical and contextual, and then to a limited extent at critical reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching, there appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the technical reflection. Unlike her initial reflections, Esra Teacher’s reflection level evidences in oral and written formats constantly show a growing tendency toward deeper and critical reflection.

4.2.3.4. Filiz Teacher as a high expectation teacher. Among the four categories of reflection, three of them are evidenced by Filiz Teacher during her own reflective practices as outlined in this section. While only 55% of her reflections demonstrate technical reflection, subsequently, more instances of contextual reflection are found in her 34% of reflections. 11% of her reflections ever demonstrate critical

reflection. In terms of depth of reflection, Gaye Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups, and the following Figure 4.26, Figure 4.27 and Figure 4.28 illustrate the change in the depth of reflection over time.

As Filiz Teacher enters her fifteenth year in teaching, she takes responsibility to get all of her students to master the various skills established by the mandated nationwide science curriculum. Although she is aware of the diversity in her students' learning levels, she remains focused on their performance in the classroom. Still, she also notes that there are times when it is important for her students to all learn to do things the same way and that it is difficult for some of her students. Hence, she feels satisfied with her students' ability to accomplish objectives at the level she expects from them.

Many of my students have experienced more hardships than I ever knew. I mean, I once encountered a sixth grade student who had really bad learning difficulties. I know I'm supposed to teach in a diverse classroom. It was not easy for me or for him as well. He had trouble with his classmates. They sometimes mocked him. I saw he was not happy at the school. I do not know what to do.

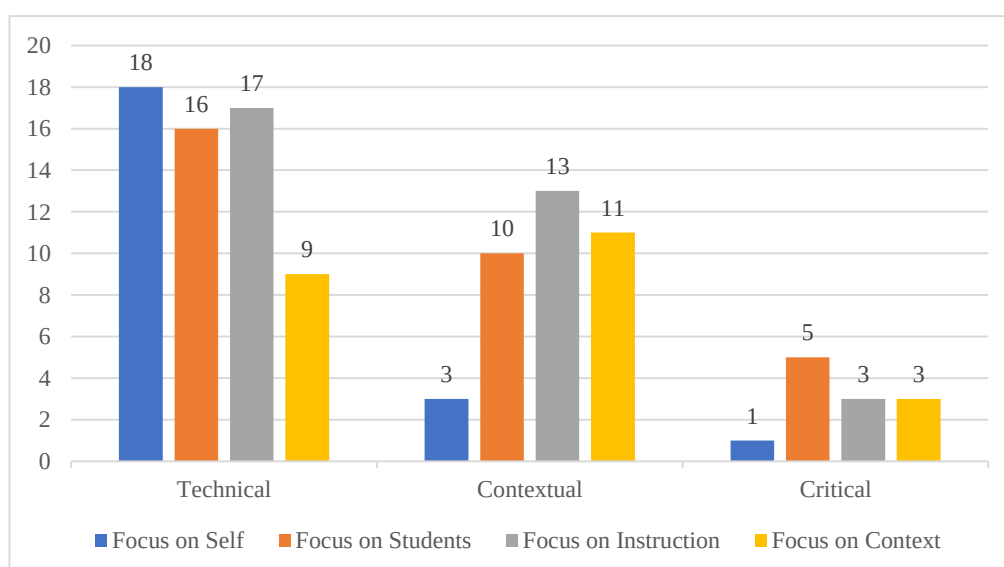


Figure 4. 26. The Changes in The Depth of Filiz Teacher's Reflections for Each Focus

Regarding her depth of reflection, she is clearly placed at the technical reflection at the beginning of the study. Throughout the study, she fails to address the complexities of her classroom and she makes decisions based on a mandated curriculum, which she simply follows without any questioning.

I struggle to find a way to ensure all students receive the information needed and even though I feel like our curriculum doesn't provide enough time, I need to teach the way it offers because in the exam, my students will be responsible for the topics covered in the curriculum.

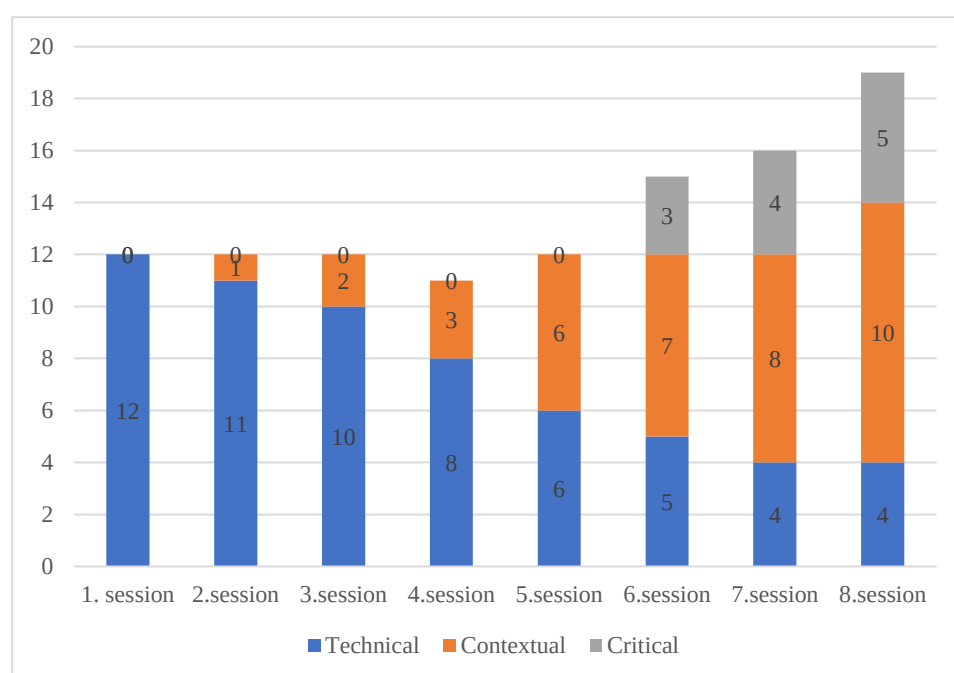


Figure 4. 27. The Changes in The Depth of Filiz Teacher's Reflections Over Time

Then, after engaging reflective practices, she appears to reflect more at the contextual reflection when she is trying to take into consideration the context of students' needs and interests and to promote her students' understanding from the curriculum through allowing them to ask questions and tie the scientific concepts to their daily life experiences. A more explicit example of she has reflections at the contextual category, she welcomes her colleagues' alternative practices for better outcomes in her classrooms. Along with accomplishing her goals, she also cares about her students and she invests in relationships with her students through providing a learning environment

where they feel respected, secure and validated. Her reflections reveal that she often uses the term “we” when talking about her classroom and the decisions that are made. This also indicates that she is operating in the contextual reflection category.

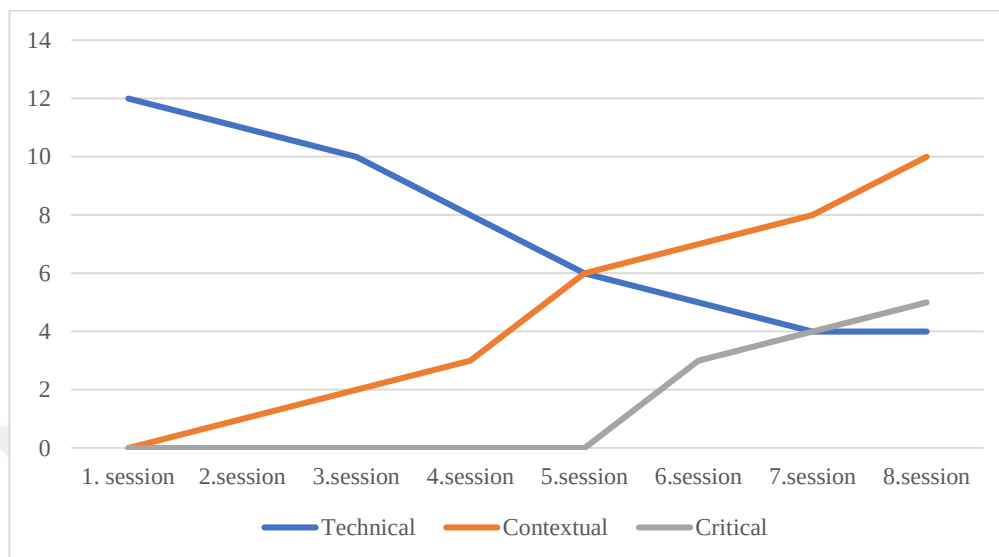


Figure 4. 28. Changes of Filiz Teacher's Depth of the Reflection Over Time

When there is a discussion on the ways of teaching in a diverse classroom with some students need special attention, her reflections move into a critical mode where ethical criteria, based on weighing various perspectives in an effort to analyze to question the status quo:

Now, I knew that it is my responsibility to include my students with special needs in the classroom and that I have the moral and legal obligation to teach them but it was complicated. One of the students who needs special attention in my class spent most of the time walking around class and I admitted that he is not easy to teach at all. After graduation, I did not have any clue about how to teach this kind of student better so I found some ways to help him but I still struggle with whether teaching special needs students is my responsibility when there are so many to handle and so little time and energy. I need to be the one to help my students realize they can do it.

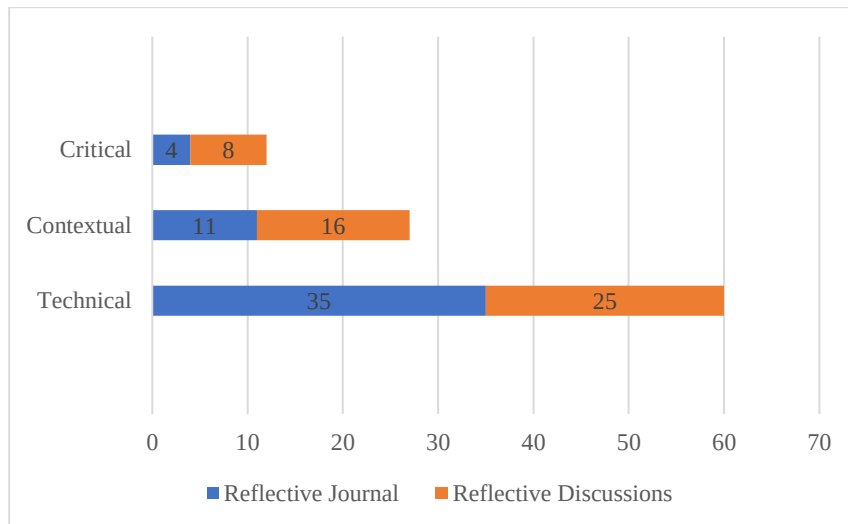


Figure 4. 29. The Depth of Filiz Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.29, the patterns of Filiz Teacher's depth of reflection indicate a difference among written and oral reflections in general. Her thought occurs mainly at technical and contextual, and then to a very limited extent at critical reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching, there appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the technical reflection. Unlike her initial reflections, Filiz Teacher's reflection level evidenced in oral and written formats constantly show a growing tendency toward deeper and critical reflection.

4.2.3.5. Gaye Teacher as a caring teacher. Among the four categories of reflection, three of them are evidenced by Gaye Teacher during her own reflective practices as outlined in this section. While only 36% of her reflections demonstrate technical reflection, subsequently, more instances of contextual reflection are found in

her 39% of reflections. 25% of her reflections ever demonstrate critical reflection. In terms of depth of reflection, Mine Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups, and the following Figure 4.30, Figure 4.31 and Figure 4.32 illustrate the change in the depth of reflection over time.

At the beginning of the study, Technical reflection is seen in her reflections particularly on general instruction and management behaviors. Similar to other participant teachers, she also experiences a wide gap between the theory about teaching and the experience of actually teaching in her classroom. She describes the initial critical incident on regardless of doing what other people offer her to do, the actual situation in her classroom is not changing at all:

It was hard, what I didn't really have was any modeling to follow. I don't know what anybody else did, I was sort of dealing with disruptive behaviors of my students by myself. I'm following all the steps that I've been told to follow, but there is not anything changing.

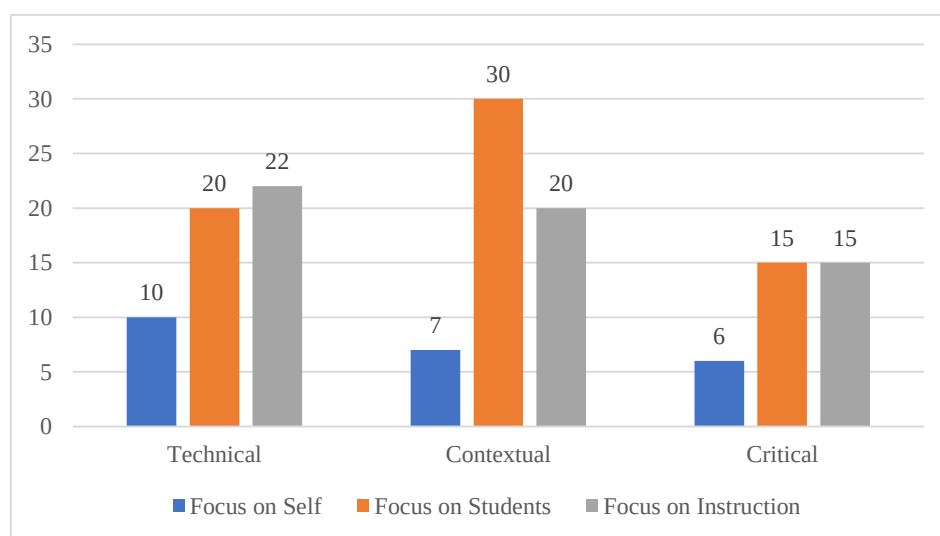


Figure 4. 30. The Changes in The Depth of Gaye Teacher's Reflections for Each Focus

Contextual reflection is most apparent as Gaye Teacher engaged in reflective discussions in which she begins to critically examine her practices with other teachers

dealing with similar problems, and considering their practices as an alternative way to do. For instance, she usually uses questioning techniques in her classrooms. When she examines her video footage, she realizes that when her students do not respond the way she expects, the correct answer is immediately provided by herself. Also, with her questions she encourages short answers with filling the blanks or only yes or no answers. There is little time for students to think about answers, or to develop their own answers as a result of the productive conversation with her. Then, she begins to reflect on her own questioning strategy as an aspect on which she wants to focus. She reports that she is just accepting yes or no as answers, but there are no explanations to guide them or let them think about it. Other participant teacher gives some examples for her in asking questions that enables students to elaborate on, explain or justify their understanding and she takes their advice and reflected on her experiences about alternative way of questioning:

Now I realized how I need to generate more productive questions. And that helped me to think differently or ask different questions that encouraged my students to focus more. That was helpful for me to hear your suggestions about asking the right questions and think about how they are related and where you are going with those questions.

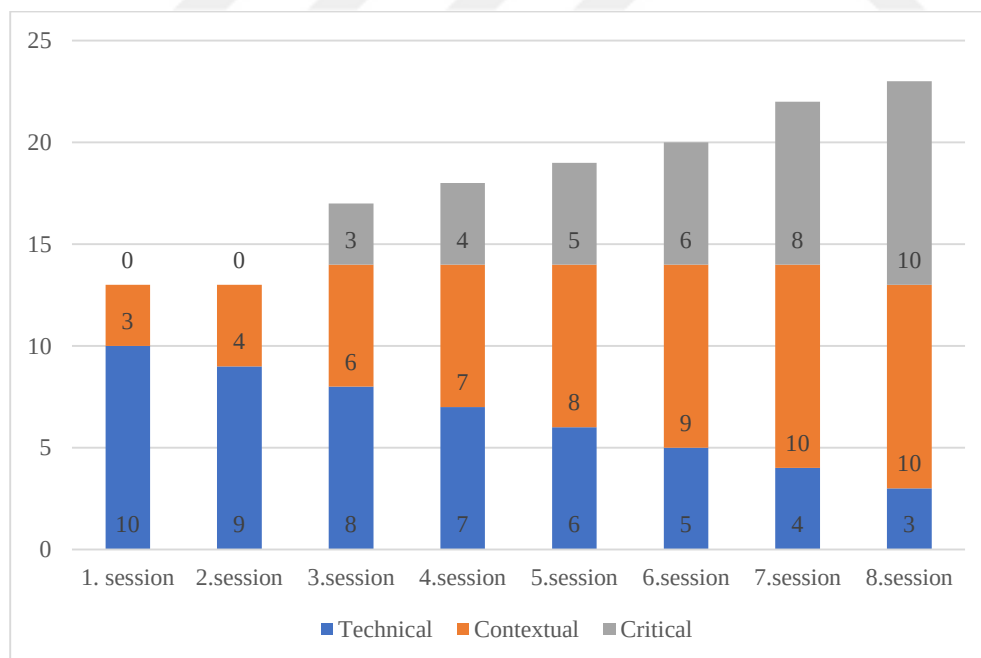


Figure 4. 31. The Changes in The Depth of Gaye Teacher's Reflections Over Time

As illustrated in the Figure 4.32 and 4.33, with the change in her understanding of questioning technique, she documents her successful experiences in her teaching practices throughout the study, which illustrates the developing awareness of that her actions have an influence on performances of her students in her class:

Students are much more aware about why I'm asking the questions and what I expected from them with those questions. I think realizing what you're doing right and wrong results in better outcomes with my students in addition that I enjoy teaching science more.

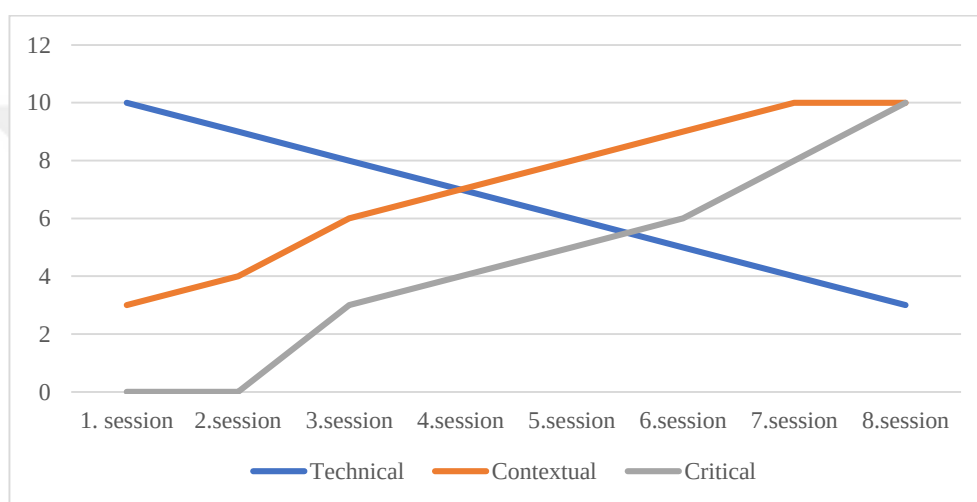


Figure 4. 32. Changes of Gaye Teacher's Depth of the Reflection Over Time

Managing the classroom effectively is another priority for Gaye Teacher. She is also having journal entries about what is happening in class regarding the occurrence of off-task behaviors. She develops a complete reflective thought by describing that she praises her students for appropriate behaviors, and ignores the ones who do not obey the rules because she wants to prevent disruptive behaviors in her classroom. Lately, she reflects that she has not noticed a significant decrease in behavior problems with her specific procedures for better classroom management. Even though she gives importance to building a positive relationship with her students to create the climate she wants her classrooms to have, she does not regard building relationships as a key component in encouraging positive behavior. Regarding the depth of reflection, her

recent reflections move into a critical mode where empower students for decision-making for classroom rules is apparent in the following journal excerpt:

I had a behavior system in my classroom that only supported my students who are already either ignored or hard workers. After we talked with my colleagues about the best strategy to deal with behavioral problems in the classrooms, I realized that I need to gain the attention and respect of all students' opinions. Students need reason and purpose in order to intrinsically motivate them to behave properly. When I involved all students to generate our rules for the classroom and when I showed respect for each student's idea, they showed respect back to me and, eventually, they are more likely to follow the rules than I could ever imagine.

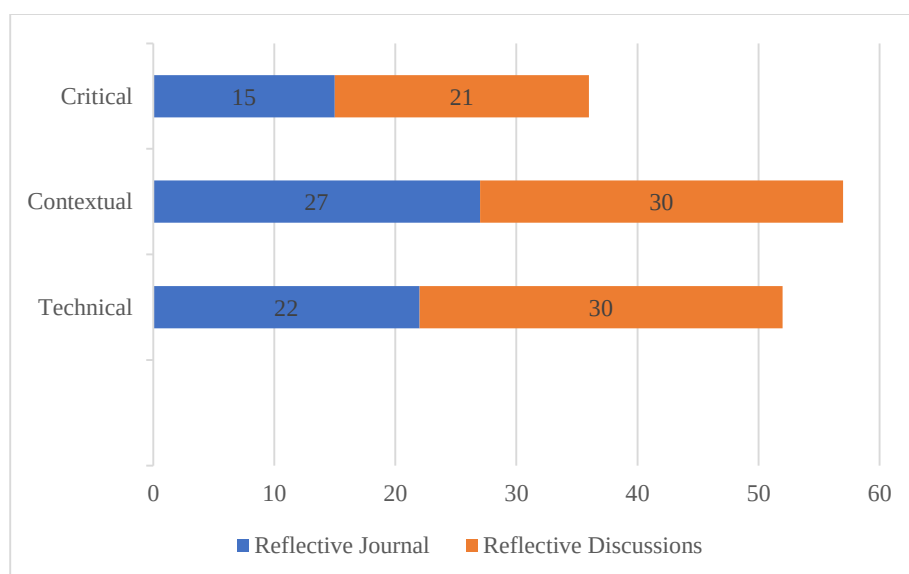


Figure 4. 33. The Depth of Gaye Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.34, the patterns of Gaye Teacher's depth of reflection do not indicate a definite difference among written and oral reflections in general. Her thought occurs mainly at technical and contextual, and then to some extent at critical reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching, there

appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the technical reflection. Unlike her initial reflections, Gaye Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper and critical reflection.

4.2.3.6. Hale Teacher as an information giver. Hale Teacher's reflections contain evidence of all four categories of depth of reflection. While only 35% of her reflections demonstrate routine reflection, subsequently, more instances of technical reflection are found in her reflections overall. 29% of her reflections ever demonstrate technical reflection. There are reflections categorized as contextual with a lower percentage of 22% and as critical reflection with 14%. In terms of depth of reflection, Mine Teacher demonstrate the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into four groups, and the following Figure 4.35, Figure 4.36 and Figure 4.37 outline the change in the depth of reflection over time.

In the beginning of the study, she exhibits routine reflection characterized by a narrower self-focus. The following initial reflection shows evidence of routine reflection because the focus is on self and the evaluation is limited with no attempt to evaluate what could have been done differently.

What I did not change my students' misbehavior. I could not catch their interest in my lessons... They did not have any intention to change the way they act in my classroom. I do not think anything can help these kids.

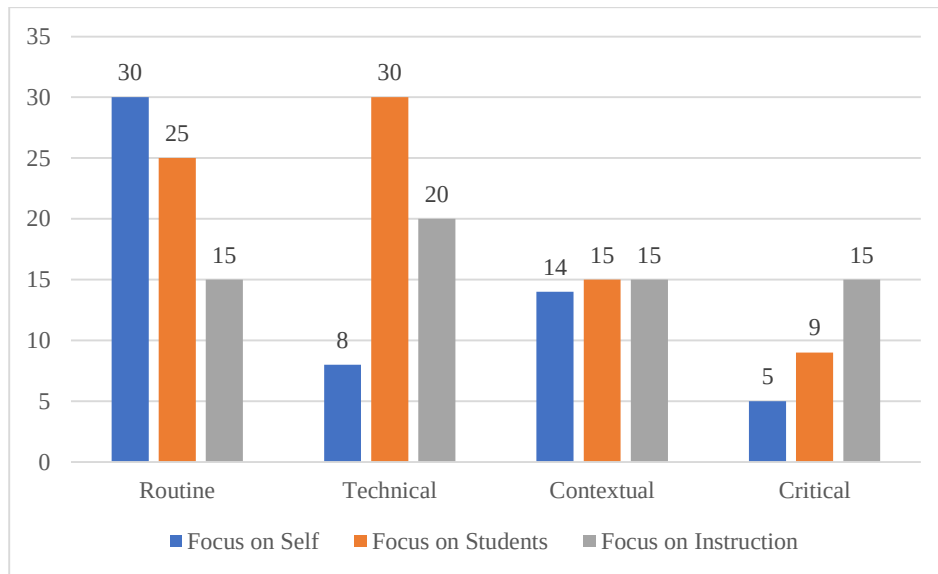


Figure 4. 34. The Changes in The Depth of Hale Teacher's Reflections for Each Focus

Then, Hale Teacher shows technical reflection, by shifting her focus more toward her students when she says that,

I should have provided more detailed information on how to do the activity. I disagreed with myself not to do that because of limited time. Then I said, ok maybe they understand.... I thought maybe I would distract them from doing the activity...I guess that's why there were many students who could not complete the task as I expected. I should have guided them maybe at the beginning of the lesson or mid or at the end.

Her focus is on her dissatisfaction about a classroom activity and with how it goes. She realizes she does not explain well to students how to do the task and debate when would be a good time to provide some explanations to her students to complete the task.

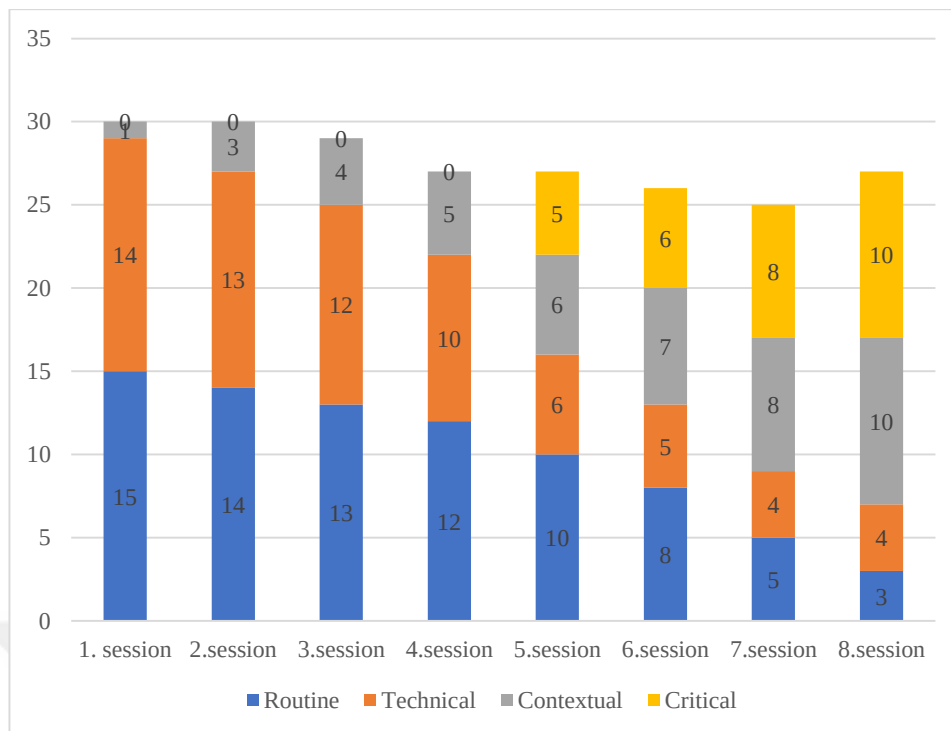


Figure 4. 35. The Changes in The Depth of Hale Teacher’s Reflections Over Time

The majority of her reflections demonstrate contextual, in which she accepts the possible consequences of her decisions on her students and she is able to understand multiple ways of teaching in order to reach all of her students. As illustrated by Figure 4.36 and 4.37, this represents a shift toward a more contextual type of reflection on her instructional decisions. She mostly focuses on the students and on the ways of assisting all of the students, including those that were struggling.

Hands-on activities provided the most effective way for the students to learn the concepts. They engaged actively in the lesson and I could pay more attention to my students in order to better meet their individual needs. Every student can have a different understanding and in order to guide them I need to learn more about individual performance.

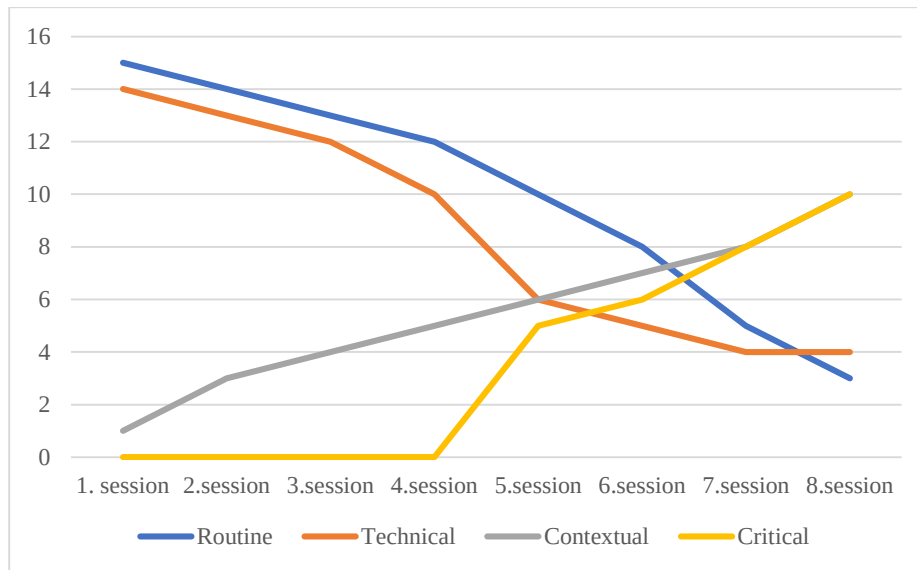


Figure 4. 36. Changes of Hale Teacher's Depth of Reflection Over Time

As the study progresses, she demonstrates an attempt to address the ethical and cultural concerns of the contexts through asking fundamental questions and considering change. She finds that classroom management is effective in a low socio-economic setting with student involvement while constructing the rules and procedures. She says that,

The students showed enthusiasm and ownership when I asked their opinions about classroom rules. The enthusiasm was carried home with them and promoted curiosity among the parents. Some parents are really interested in their students' performance at school but most of them do not care because they do not know how to care for their children. Those students could not have any chances in sharing their ideas about anything at home. I have learned that I need to encourage and support student involvement in any decision about the classroom that we need to make.

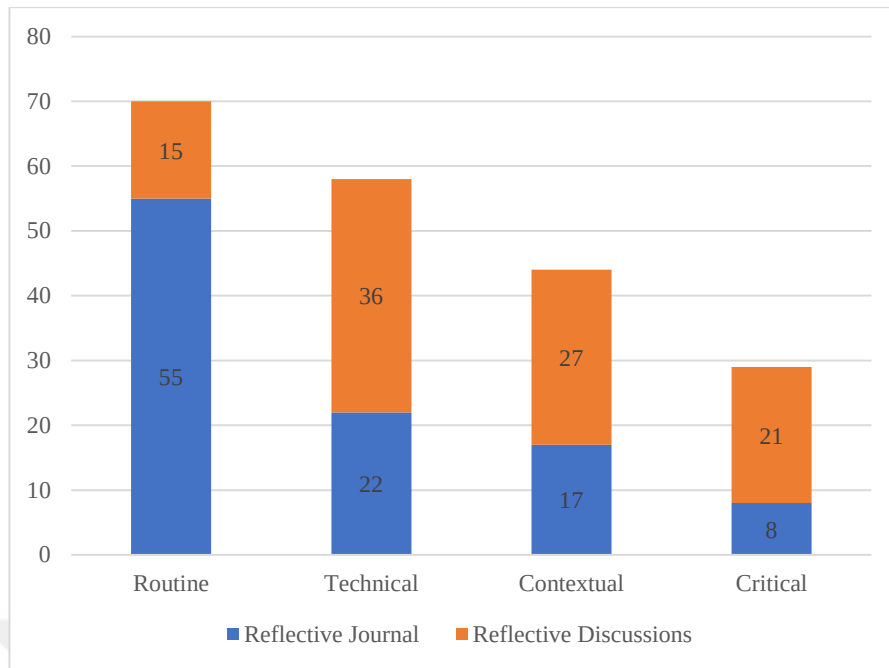


Figure 4. 37. The Depth of Hale Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.37, the patterns of Hale Teacher's depth of reflection indicate a difference among written and oral reflections in general. Her thought occurs mainly at routine and technical, and then to a limited extent at critical and contextual reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching categorized as either routine or technical, there appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the routine reflection and to some extent at the technical reflection. Unlike her initial reflections, Hale Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper and critical reflection.

4.2.3.7. Mine Teacher as a responsive teacher. Mine Teacher's reflections contain evidence of two categories of depth of reflection. While only half of her reflections demonstrate contextual reflection, subsequently, more instances of critical reflection are found in her recent reflections overall. Other half of her reflections ever demonstrate contextual reflection. In terms of depth of reflection, Mine Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into two groups, and the following Figure 4.38, Figure 4.39 and Figure 4.40 outline the change in the depth of reflection over time.

She generally prefers to use project based learning approach in which students could develop their projects either within the groups or as an individual work. She states that although she makes a point of ensuring that her content knowledge is satisfied, she needs to spend some time for searching related the project topic. While doing this, she argues that her role as a teacher is mainly to guide students when they need. An illustrative reflection at contextual category, for example, states:

My students know they have to make decisions for themselves. My role is only to provide the environment in which learning can happen. I always have to research the project topic, and it can't be five minutes before the lesson. The activities are usually hands on and my students need to use all the senses and imaginations. It's not chalk and talk in my classroom as in other teachers mostly prefer. Sometimes I have to guide my students about where we're going and what I expect from them. I always observe them while they are doing the activity. They know I am there when I am needed.

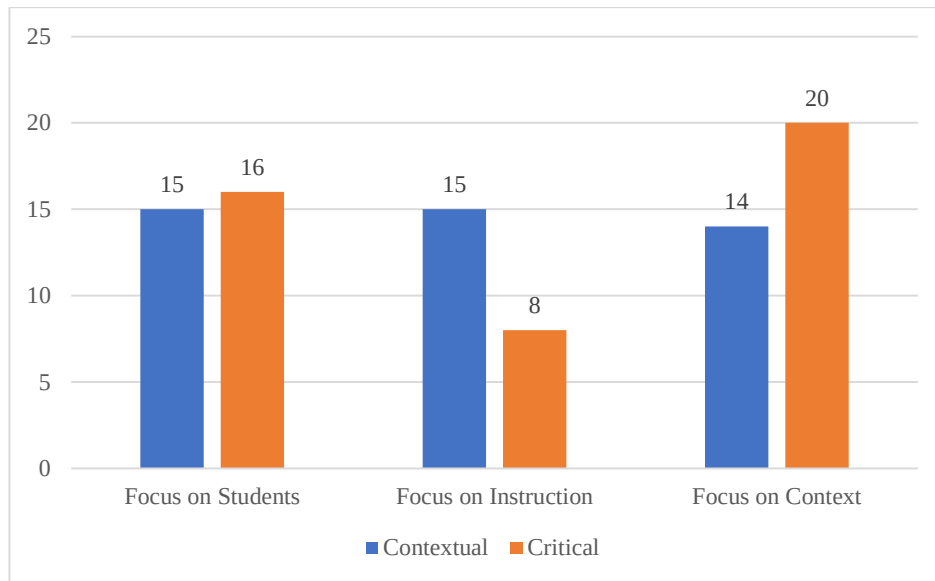


Figure 4. 38. The Changes in The Depth of Mine Teacher's Reflections for Each Focus

When Mine Teacher talks about her teaching approach (i.e. learning is not memorizing but doing; students should be able to apply scientific knowledge in their daily lives), she shows that she has critically questioned some of her students' reactions and responses to the hands-on activities. In that sense, she mentions how she feels unpleasant about her students' reactions as in this example:

Last week, I planned a recycling activity with my 7th graders. Before that lesson, I asked them to bring some materials from home that could be recycled. This class has over 40 students and very small space for that kind of activity. At the beginning of the lesson, I realized that some students did not have their materials. So, I suggested that they could share the materials. Then, I prepared a space for the materials so that everyone could get whatever they need. Still, these students did not want to use somebody else's materials and I think they felt shy. I tried to convince them because our main purpose of this activity was to create some toys from used materials for our kindergarten students in the school. We wanted to prepare a gift for them. Sharing was the main point here. They just did not want to engage in the activity and even some of them put their heads on the table and seemed to be unhappy. Whatever I said did not work and I could not manage to motivate them to use other's materials.

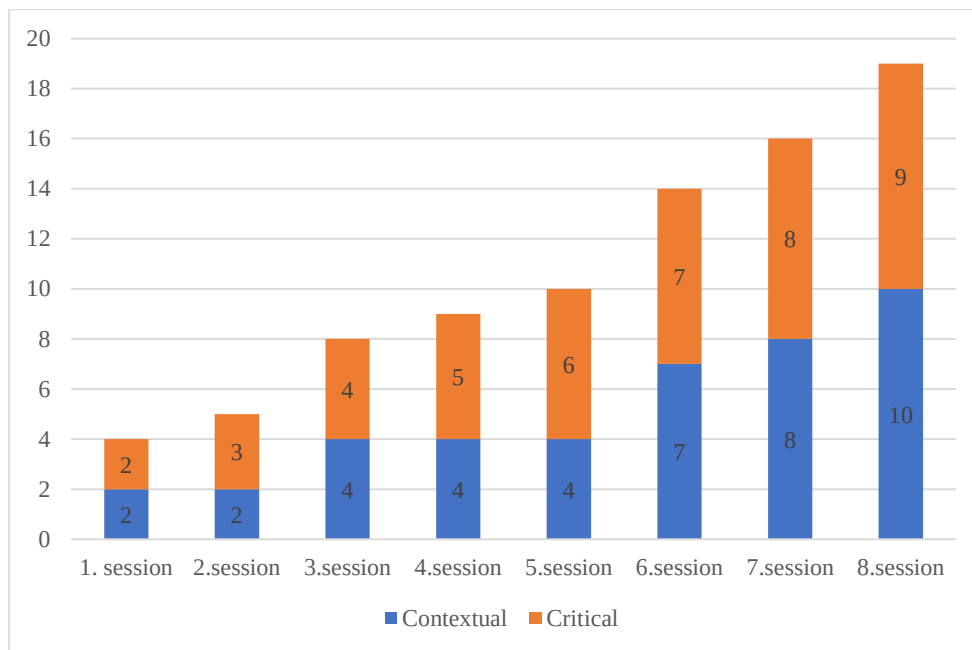


Figure 4. 39. The Changes in The Depth of Mine Teacher's Reflections Over Time

These points display that her reflections are mostly more context specific and concern for addressing her students' needs and interests. A few weeks later, Mine Teacher speaks of her awareness about why some students do not show any interest in participating in hands-on activities in the science lessons:

It was hard for me to know what to do in the situation because I planned my lesson in a way that I want my students to enjoy the lesson. To be honest, I do not care for the curriculum requirement or national wide exams or grading. The only thing that is important for me is that I want my students learn something by doing and having fun. But, some of my students do not want to be part of this. They just do not like being in my classroom and doing such activities. Yesterday, there was a lovely weather and I wanted to implement my lesson in the garden. I planned an activity that students were mostly expected to do role playing. Before initiating the activity, I mentioned some ground rules because we were not in the classroom and we needed to be careful. Even I reminded the basic rules such as raising hands before talking, listening to the others, talking one by one. Even though I warned him not pushing his friends more than once, he just kept doing it. Then, I decided to continue the lesson inside because I felt down. After the lesson, I just wanted to talk to him about his behavior. After talking, I realized that he just did not feel belongingness to this classroom. He behaved similarly in other lessons. He just did not want to go to school. This was his own words. It was sad because it made me wonder how I would deal with this situation and I did not want to lose him.

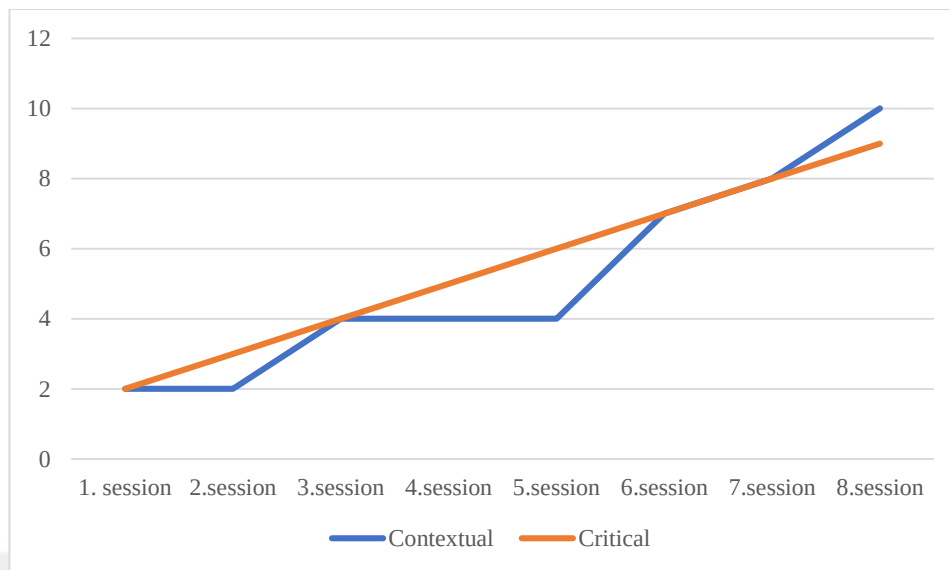


Figure 4. 40. Changes of Mine Teacher's Depth of Reflection Over Time

It is important to note that these circumstances are merely mentioned in her written reflections and discussed at some length within reflective sessions. Most often, she points out that she should be sensitive to the needs and interests of her students, encourage them to make connection the scientific knowledge and daily life experiences increase their motivations to learn, make them feel determined to do something and treat them with fairly and nice. She argues that she needs to make changes in her instruction in a way that her students get benefit from those changes, which lead to better learning outcomes. Her reflective statements are contained with equally strong and positive tones of contextual reflective category. Her attitudes are best described in her discussion of lesson planning, in which she develops the habits of planning her instruction based on the diversity in students, which might lead to significant change in their prospective lives:

When I plan the lesson, I take into considerations the possible cases that students may not follow the lesson or they may be bored. Then, I know I need to modify the lesson to meet the needs of my students. I can say I am sensitive to my students. I try to reach out to them. Also, in my activities, I try to see if they get interested or at the same time I try to observe that maybe it doesn't work for them, and try to make changes to address their interests. When I do this, I believe this makes such a difference for them.

Mine Teacher's reflections do not only include problematic issues but also her solutions. As she engaged in reflective practices, there is evidence that Mine Teacher discerns an equality dimension in her classrooms and some pertinent entries are made in her reflections as illustrated in Figure 4.40 and 4.41. She generally refers to the creation of a climate of equality and tolerance in the classroom. Notably, she also takes the view that students should have equal access to the resources even if they have lower socio-economic circumstances. Her another reflection entry places at the critical category demonstrates that she prioritizes building positive relationships with students in the classroom to make a room for every student without looking at their differences:

I know that nobody likes to be treated differently. This school is located at one of the poorer region. So, students come from poor families and they do not have much. Before they come to the class, they already feel isolated from the society because of how they look like. They look like they are disadvantaged economically at the first place. But, this also makes them feel disadvantaged emotionally. They do not feel confident at school. They do not feel belongingness. Most of the teachers treat them with badly. As a teacher, I need to welcome all my students in my classroom. As a teacher, I need to create such environment in which every student feels secured and equally treated. I expect that they need to show some respect to me. To do this, I need to show some respect them as an individual and listen to their ideas. They need to know their difficulties. To help them, I try to act from a place of care and sympathy. I need to understand their differences. This is more inclusive of everyone.

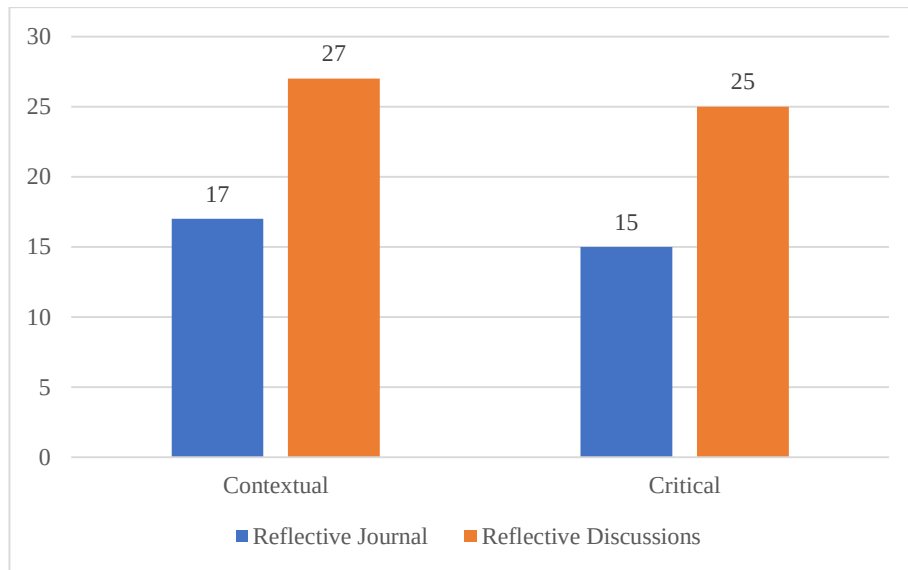


Figure 4. 41. The Depth of Mine Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.41, the patterns of Mine Teacher's depth of reflection indicate a definite difference among written and oral reflections in general. Her thought occurs mainly at contextual, and then at critical reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Thus, Hale Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper and critical reflection.

4.2.3.8. Sibel Teacher as an expert teacher. Sibel Teacher's reflections consist of clear evidence of three distinctive subcategories under the main theme of instruction in the depth of reflection as outlined in this section. Although her initial reflections demonstrate mostly technical reflection, there are some instances of routine and technical reflection found in her journal entries. While only 35% of her reflections are categorized as technical reflection, less than 10% of all her reflections demonstrate routine reflection. Subsequently, more instances of contextual reflection are found in her recent reflections overall. 55% of her reflections ever demonstrate contextual reflection as displayed in the following Figure 4.42. In terms of depth of reflection,

Sibel Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into three groups, and the following figure shows the change in the depth of reflection over time.

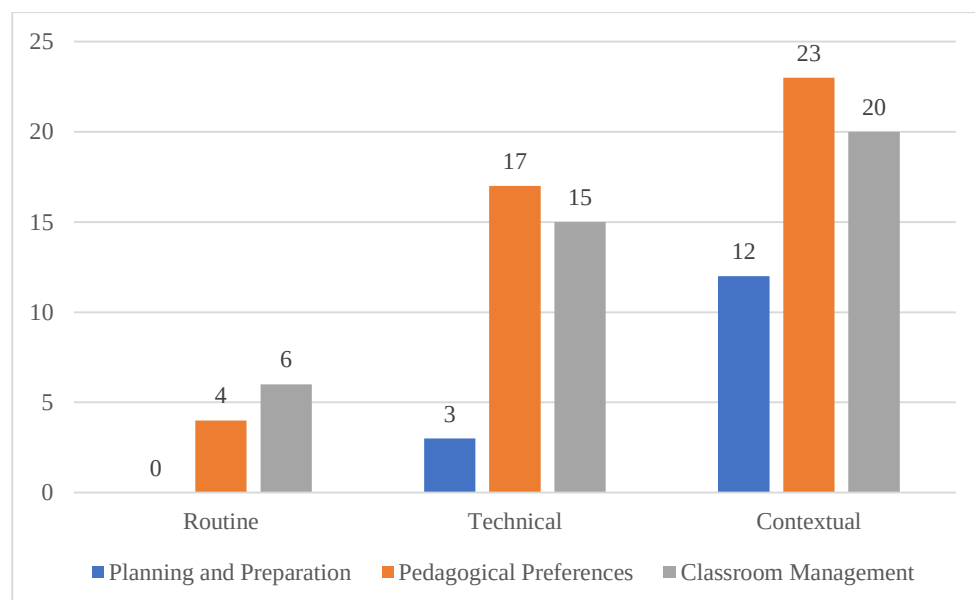


Figure 4. 42. The Changes in The Depth of Sibel Teacher's Reflections for Each Focus

Sibel Teacher's initial reflections is characterized by superficial analysis, and a focus on herself and blames other people particularly students and parents when she encounters a problematic situation or when she could not solve the problems. Below is an example in which she merely describes what she experiences in terms of maintaining the classroom discipline:

In several classes I have used this kind of arrangement. When students are doing group works, it does not work so well because students keep talking all the time about things different to the class activity. There some students who are not easy to manage within group works and makes me conclude that individual work is better to avoid their noises and off-task behaviors and eventually to manage the class better.

Her majority focus on her own actions, not on students' learning in the beginning of the study. In the new demanding situation, she could not take each student's position into account. The beginning reflections show no evidence of pondering about

supporting individual learning processes by means of using information about pupils. This highlights that the reflection is internally oriented and categorized as technical reflection category, focusing on herself as a teacher, not on her students in the classroom. Her following reflection below nicely summarizes the feature of technical reflection:

I often observe what's happening in the class. But, there is a list of tasks that my students are supposed to do and but not all of my students can get them. I can say that I'm observing what they are doing with my tasks, and if they understand it clearly or not. If most of my students understand the task, it is enough to move on the next task.

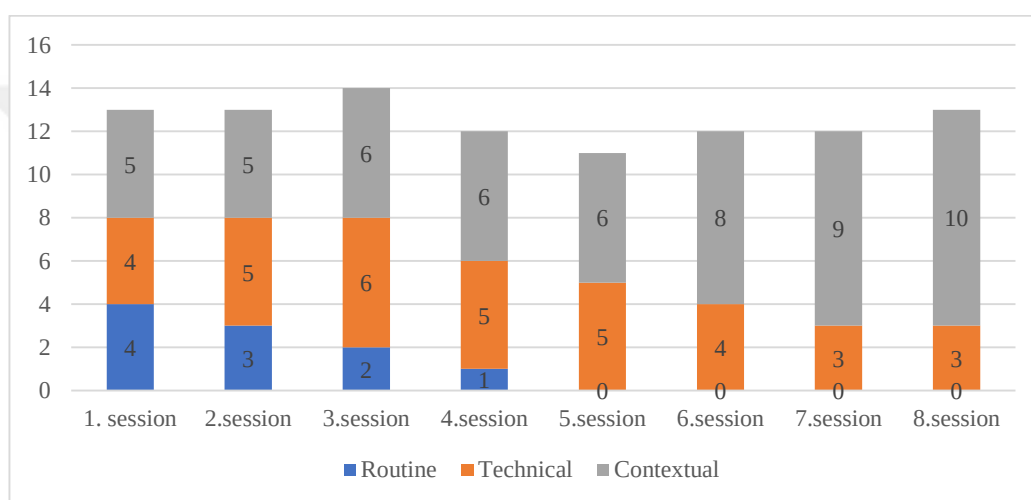


Figure 4. 43. The Changes in The Depth of Sibel Teacher's Reflections Over Time

Her some reflections centers on management strategies are also categorized as technical reflection because her main concerns in the beginning of the study are how to manage the classroom in addition to reaching her goals of the science course set. She considers herself as an experienced teacher with managing classroom effectively. Her reflections are often associated with classroom management issues such as organizing classroom, distributing equipment, spending enough time for lecturing, classroom rules and regulations, etc. She explains her management strategies without taking a further step to assess in what ways such methods could be effectively used, or how the problems could possibly be solved. Consequently, the process of inquiry does not always take place in her initial reflections. For example, Sibel Teacher talks about how she manages the classroom:

I think managing a class is fundamental for an experienced teacher. Rules and protocols are necessary, to keep the classroom running smoothly is necessary because I want my students to take me seriously ... I am not really worrying that I do not get to teach what I want. I have many more tricks in my bag. I feel like I have confidence in managing the classroom.

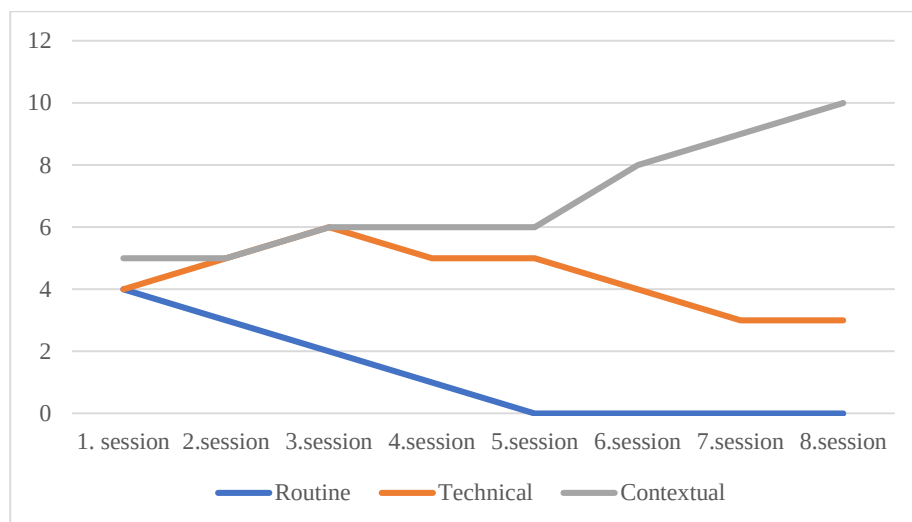


Figure 4.45. Changes of Sibel Teacher's Depth of the Over Time

Further reflections are characterized by more sophisticated analysis as well as a great emphasis on students rather than herself or teaching itself as illustrated in Figure 4.43 and 4.44. Since she works with a large number of students that could be an impediment to effective teaching, she frequently reflects on how to effectively meet challenges that a big class size caused. In her reflections, she comes up with strategies to overcome those challenges through creating innovative teaching strategies to deal with the big class size. The following example below illustrates those strategies:

I wanted to work on science laboratory because students have fun while learning when we implement experimental activities, but we have very little space in the laboratory for a whole class that is almost thirty students. So, I sometimes set up the experiments in the regular classroom, and when my main focus that day was learning by doing or enabling my students making meaning from concrete examples through experimenting. To do this, I change the seating arrangement so that they can work with a small group of students, then I can see every student within the groups.

While she reflects on planning and enacting experiment-based lesson, safety issues also appear. For example, Sibel Teacher, in several occasions, talks about laboratory accidents and how that accidents impacts her teaching orientation while setting up the experiments in the regular classroom rather than in the laboratory. Thus, she expresses her concerns that her priority on safety often limits student learning and she does not want to take any risks because she allows her students to do simple experiments that not put her students' safety in risks. It is clear that safety as one of the topics her reflection centers on and shapes her teaching actions can be categorized as contextual reflection illustrated by the following excerpt:

I learned a lot from that happening. I should have taken more caution with that. So, I've been more cautious with students' injury and safety is my first consideration'. We've could have done some more striking like with bats, but my concern with bats, clubs, and hockey sticks were safety. I haven't quite figured out how to do in a safe enough situation. I need work on it with this large group.

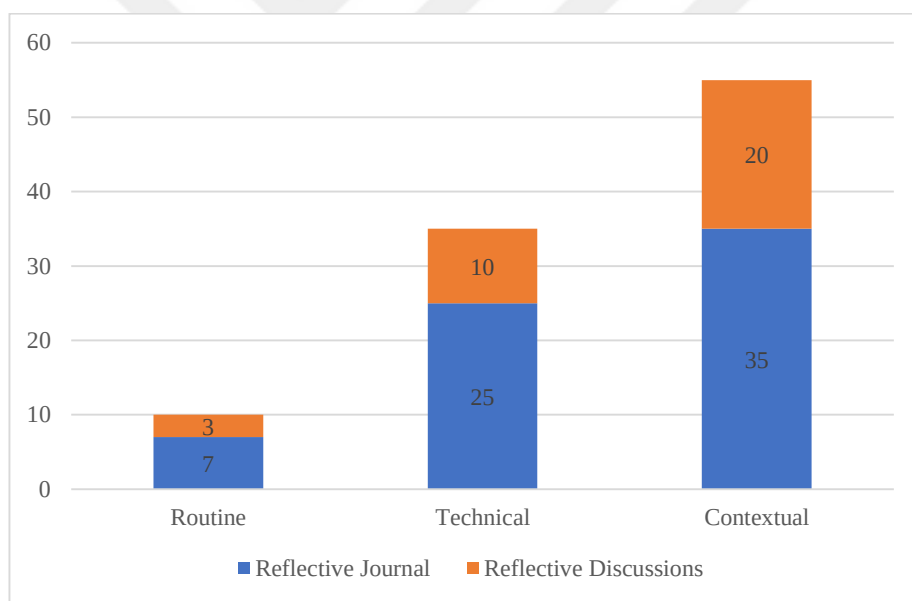


Figure 4. 44. The Depth of Sibel Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.44, the patterns of Sibel Teacher's depth of reflection indicate a difference among written and oral reflections in general. Her thought occurs mainly at routine and technical, and then to a limited extent at the contextual reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written

reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching categorized as either routine or technical, there appears a more critical examination of the classroom situation throughout the investigation, which illustrated contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the routine reflection and to some extent at the technical reflection. Unlike her initial reflections, Sibel Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper reflection.

4.2.3.9. *Sevda Teacher as a conscientious teacher.* Sevda Teacher's reflections consists of clear evidence of three distinctive categories in the depth of reflection as outlined in this section. While only 30% of her reflections are categorized as technical reflection, less than 25% of all her reflections demonstrate critical reflection. Subsequently, more instances of contextual reflection are found in her recent reflections overall. 45% of her reflections ever demonstrate contextual reflection. In terms of depth of reflection, Sevda Teacher demonstrates the aforementioned patterns across sources, over time she demonstrates different categories. When examining the change in category of depth of reflection while she is engaging in the reflective practices, her reflections are categorized into three groups, and the following Figure 4.45, Figure 4.46 and Figure 4.47 illustrate the change in the depth of reflection over time.

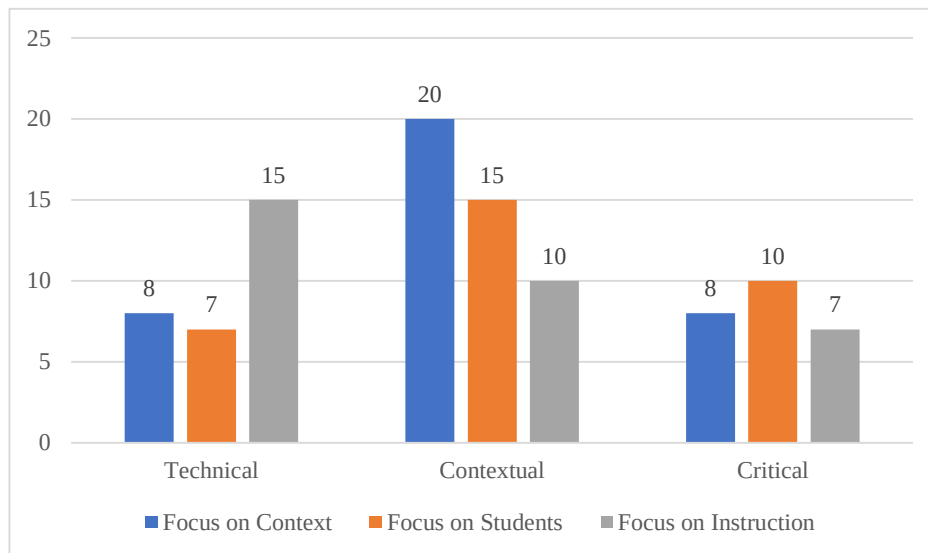


Figure 4. 45. The Changes in The Depth of Sevda Teacher's Reflections for Each Focus

In the first journal entries and reflective discussions, Sevda Teacher generally fails to focus on acknowledging the situation she wants to change and explaining why she considers it a concern. She is less likely to explore possible interpretations of the event and she generally generates superficial solutions for her problematic situations. For instance, one of the first concerns Sevda Teacher reflects on in her video footage involved asking open-ended questions that facilitated higher thinking skills. She realizes that she does not provide sufficient time for students to think before responding her questions and she generally asks yes-no questions as reported in her oral reflection. This reflection is categorized as technical reflection since she asks herself about the way she is asking questions and whether or not these questions facilitated her students' thinking or previous conceptual understanding. In the following vignette, she is not an adept at describing the context of her teaching and asking questions to make her students better understand the topic:

At the beginning of the lesson, more than once I have used yes-no questions but it did not work so well because students could not find any opportunity to respond properly. When they could not answer, I even did not give any extra time and let them think more. And at that time I was not aware. This was like monologue like I was asking and answering.

Her depth of reflection is coded as a contextual reflection. She identifies the problem by listing the effects of student absences that she has observed and arrived at a solution that she experiences by herself. She deals with the problem as best she could at that time in her teaching. According to her, her strategy is effective. She views students missing the classroom as the result of family issues.

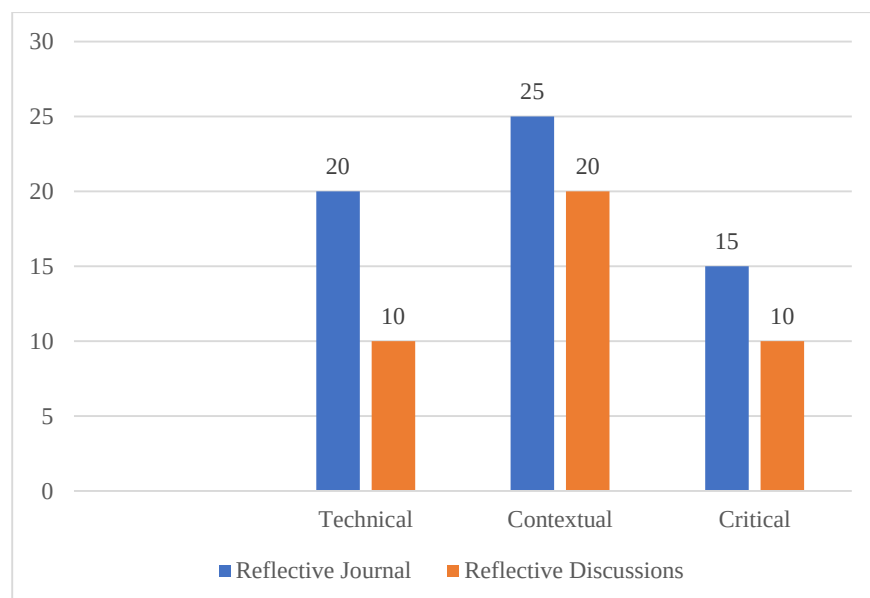


Figure 4. 46. The Depth of Sevda Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.47, the patterns of Sevda Teacher's depth of reflection indicate a difference among written and oral reflections in general. Her thought occurs mainly at technical, and then to a limited extent at critical and contextual reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as critical, then, she frequently expresses her rationale behind her actions and decisions in her journal writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching categorized as technical, there appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the technical

reflection. Unlike her initial reflections, Sevda Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper and critical reflection. She notes the difficulty of managing the classroom. Her concern seems closely tied to avoiding problems in classroom management. She also writes about maintaining classroom discipline. For instance, when she asks to suggest how she manage her classrooms, rather than taking internal knowledge (i.e. personal experiences and contextual information regarding the students she is teaching) into consideration, she is controlled by external sources such as what other teachers are doing in their classrooms. The experience of her colleagues and her desire to maintain a good working relationship with them seemed to be strong factors in the decisions Sevda Teacher is trying to make to solve her problems. In that sense, her depth of reflection continues to be the technical category as stated by Sevda Teacher:

I have a group in which my colleagues have been very supportive since forever. We talk a lot about our concerns in the classroom. I always listen to their suggestions because they are more experienced than me. I like the idea of communicating and sharing teaching experiences. When I first came to the school, they told me I needed to be an authority in the classroom to maintain classroom discipline. They always told me that don't let them take advantage of you.

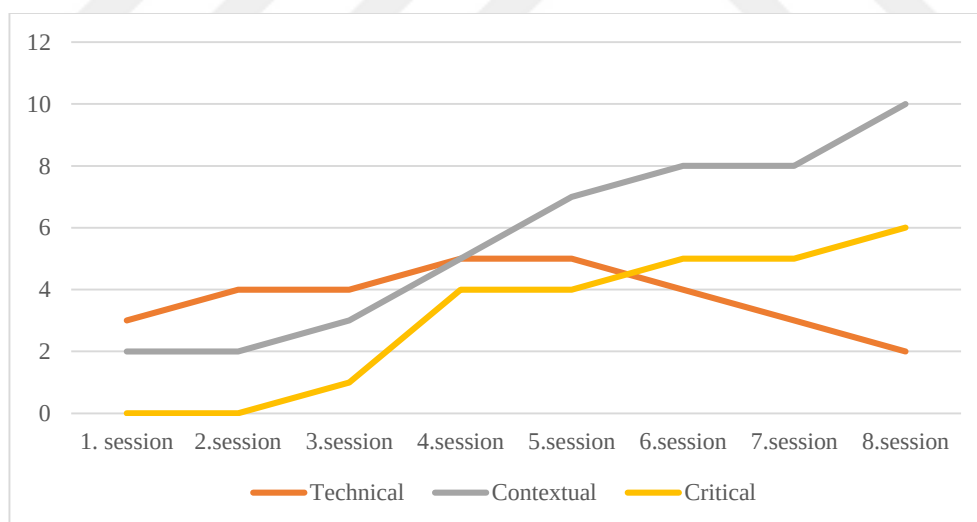


Figure 4. 47. Changes of Sevda Teacher's Depth of the Reflection Over Time

However, when classroom decisions are made within a specific teaching context, Sevda Teacher's reflection category generally shifts to contextual. While the research is progressing, the shifting of categories as well as a pattern for technical and

contextual reflection can best be identified by looking at not only Sevda Teacher's journal entries but also her oral reflections. She becomes aware the necessity of the adjustments for differentiating instruction and strategies used for classroom management between and within classrooms. For example, she begins to have concerns about dealing with absent students even though she feels extra burden on her:

When my students miss the lesson or when they do not submit their assignments on time, I give them make-up work or extra time to resubmit it. Some teachers do not care about their absence at all. And I know my students sometimes cannot come to the school because of house work not because of vacation or something. That is why I have responsibility to cover the topics for them again when they miss the classroom even though this requires extra time and energy. I tried to provide a quick overview but the students were generally very lost as well as already behind.

As Sevda Teacher gains more experience in reflective practices, she deals with the questioning of moral and ethical issues related directly and indirectly to her teaching practices. She begins to devote some time in her classes to cultivating good manners among her students. As she states, *"I contribute the best I have and I am, not only in academic issues but in those aspects of life like respect, discipline and responsibility."* This exemplifies that she feels she has responsibilities went beyond teaching science, encompassing aspects such as moral values and well-being in order to guarantee a safe and respectful environment for the learning process. Also, the way she perceives herself is regarded as being a factor that shapes her position in the society. She considers herself not just as a teacher but also a teacher with a responsibility for making important contributions to the society by having an influence on her students' growth not only academically but morally. That is why taking responsibility for her actions is challenging for her because her actions might result in unexpected outcomes.

Last but not least, while she describes the problematic situations, she employs a contextual reflection and then moves to a critical reflection in her recent reflections. According to her, she has a better understanding of the problem which, in turn, results in an important pleasant surprise for her. Sevda Teacher is able to focus her attention on the initial source of the problems. She tries to recognize that her own actions are also contributing to things happened in the classroom instead of blaming students or others. After analyzing the problems, her beliefs and behaviors require to change and

initiated new actions and strategies to resolve them. For instance, Sevda Teacher focuses on one-on-one relationship with a 7th grade student who has disruptive behaviors in her classroom, which also represents a shift in her depth of reflection from contextual to critical category. The following scenario with Sevda Teacher illustrates her reflection in a critical category:

Today I had a meeting with my student from 7th grade. She did not behave properly during my last lesson. She did whatever she could waste time and, if I told her to start working to turn in an assignment, the work she handled was unacceptable. Without making a scene, I told her that we need to talk after class. I asked her, “Do you know why you are here?” and she was silent. Again I asked her. She nodded her head yes. I said, “Your behavior is inappropriate. Do we need to go into it?” She said, “No.” I said, “I don’t want to have to talk about this again. Take care of it.” I do not know how to feel about it but I think it was constructive for me. I started to build a positive relationship with that student. This is also a part of a teacher’s responsibilities.

4.2.3.10. Zeynep Teacher as a traditional teacher. In data analysis, three categorizations of depth of reflection could be found in Zeynep Teacher’s reflections and they are presented in this part. The characterization of depth of reflection is described and then citations from the authentic data are presented. Very few reflections (10%) are coded as routine reflection. More than half (66%) of her reflections are placed in the technical reflection category. About of 24% her reflections are coded as contextual reflection category. Over the time period of the current research, Zeynep Teacher could not provide any evidence in her critical reflection.

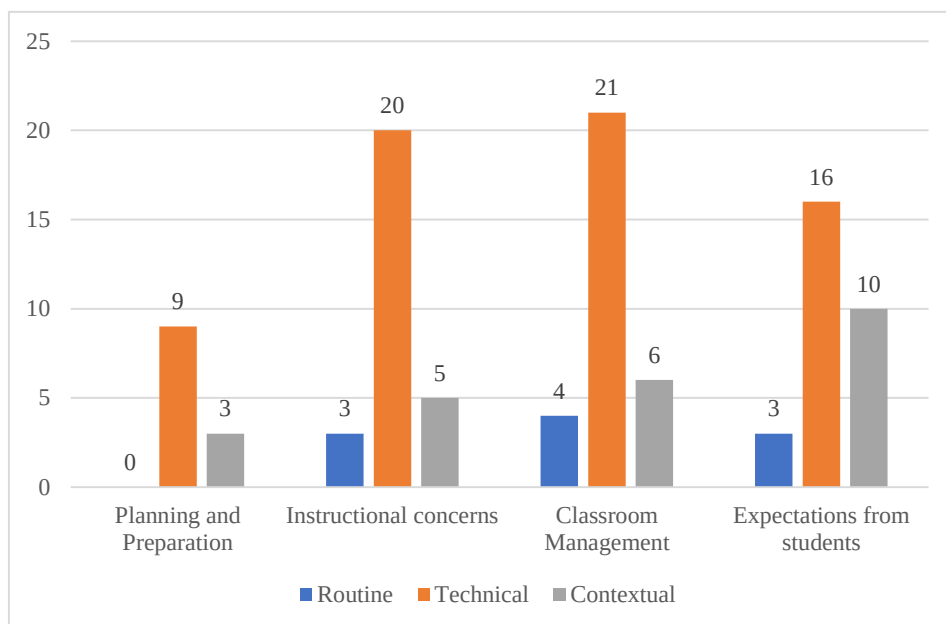


Figure 4. 48. The Changes in The Depth of Zeynep Teacher's Reflections for Each Focus

Zeynep Teacher's reflections coded as routine or non-reflection category involve nearly her automatic response with little conscious thought and is not necessarily defined as a reflection. In her initial reflections she describes both her own and her students' actions during her teaching performance as she notes in her journal entry:

It was worse than I expected. I mean I expected to carry out the experiment so easily because the experiment was also on EBA but I didn't know why it did not work at that moment and they also could not understand what happened. I wish we had just watched the experiment video form EBA.

This quote can be representative of a non-reflective category because she fails to offer some possible reasons for her actions about dealing with problematic situations. However, in her further reflections, Zeynep Teacher sees her responsibility as a science teacher to get her students to accomplish the objectives established by the national curriculum. Although she is becoming aware of her students' socioeconomic background, she often concerns about her students' performance in the classroom. She generally describes, evaluates and validates her teaching experiences, but she does not go any further in her reflection. One of the distinct examples of Zeynep Teacher operating at a technical reflective category is related to one of her own lessons on heat and temperature as successful because her students remember the difference between

among the concepts of heat and temperature as in she notes in the following oral reflection:

Most of my students managed to differentiate the concepts of heat and temperature correctly. I felt good because they could construct the other related concepts on the topic later. I could say that that they had gained a lot and they understood a lot about the related concepts we covered.

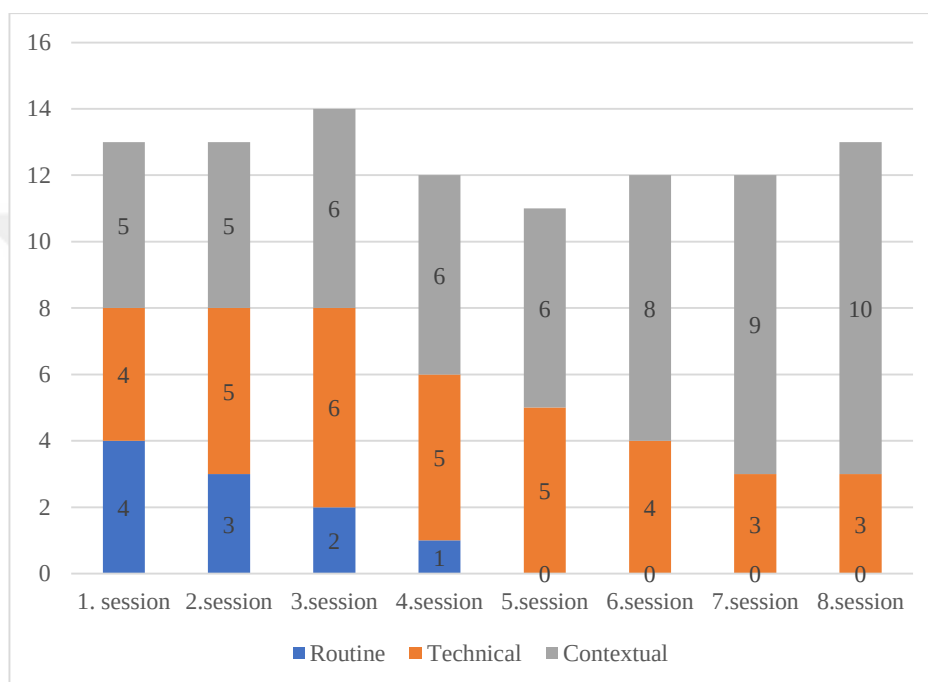


Figure 4. 49. The Changes in The Depth of Zeynep Teacher's Reflections Over Time

While the research is progressing, although the following incident shares similar evaluative characteristic of technical category, she engages more attempt to expand her evaluation of the situation she faces. Zeynep Teacher reports that she raises awareness about encouragement of students' making meaning of scientific concepts through daily live experiences, showing that she is looking for ways to increase students' understanding about what she teaches and she argues how she influences her students' learning, as the following excerpt further illustrates the example of her technical reflection:

I became conscious of the fact that I was not using as much of the students' experiences to connect the content. From now on, I

realized that my students could learn better when they would make the connection between class content and their own daily experiences because when they extracted meaning from their daily life experiences, I observed that they enjoyed the classroom and the classroom atmosphere was better. I also enjoyed being in the classroom because almost all of them understood what we covered in this week.

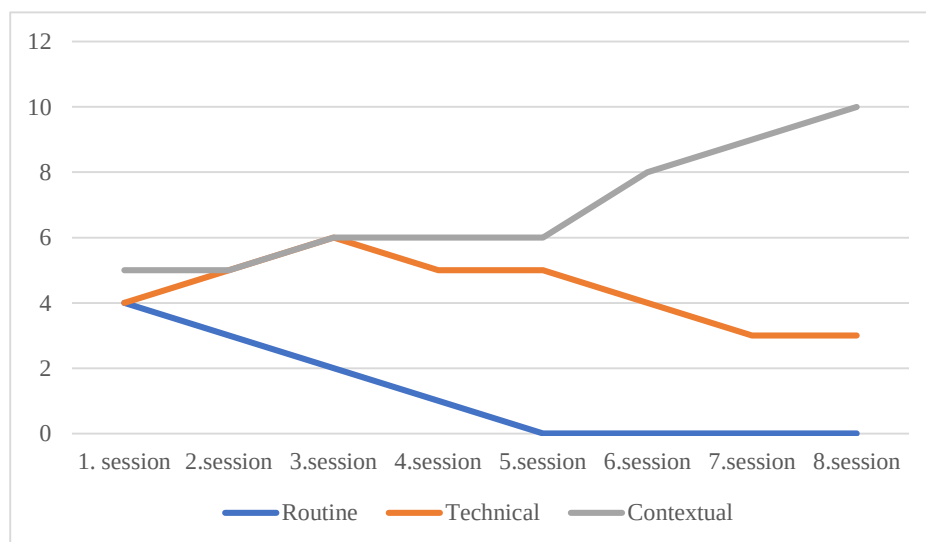


Figure 4. 50. Changes of Zeynep Teacher's Depth of the Reflection Over Time

Zeynep Teacher's reflection exemplifies her concern with designing instruction that is consistent with how students learned better. When this example is compared with the previous example of technical reflection category, this reflection above is placed at the more sophisticated category within technical reflection because she draws personal judgments and analysis into her instructional reflection and prioritizes how her students could learn better, and thus she is able to apply that experience into another context. She shows progress from surface levels of consciousness toward deeper levels of awareness, leading to potential changes in her beliefs and instructional practices. As her reflective progress more develops, she demonstrates the ability to engage in more complex evaluation as in her recent reflections are categorized as contextual reflection. For example, she reflects on her concerns she has when covering the topics. She emphasizes her understanding of her students' socioeconomic backgrounds and their needs outside the context of the classroom. The following excerpt exemplifies this type of contextual reflection:

I realized that like many other teachers in my school I am also in a hurry to get through and cover the material so that I could move on to next topic because I still have concerns about not being behind the program and the other science teachers as well. We have common exams and when I could not cover the topics that they cover, they see me not an effective teacher. I don't view myself as a perfect teacher either because I see that I have challenged everywhere since I started to work as a teacher here. Rather, I think I try to be a good teacher because I displayed true interest in my students. I want to build a good relationship with each of them. I try to understand their home lives because most of our students are coming from poor families. They have difficult lives at home I know that. I always say that I am more than a teacher for them.

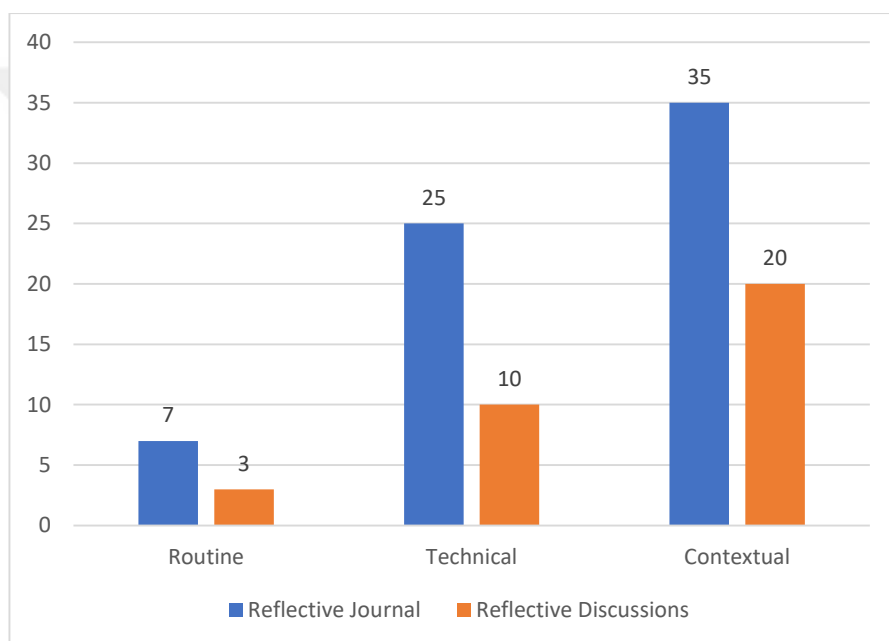


Figure 4. 51. The Depth of Zeynep Teacher's Reflections by Mode of Reflection

As can be displayed in Figure 4.51, the patterns of Zeynep Teacher's depth of reflection indicate a definite difference among written and oral reflections in general. Her thought occurs mainly at routine and technical, and then to a limited extent at the contextual reflection. Her oral reflections within reflective discussions mainly move beyond description of what is happening and show evidence of concern for her students. Although her written reflections consist of very conclusive descriptions based on her recollections of teaching experiences identified as technical, then, she frequently expresses her rationale behind her actions and decisions in her journal

writings and begins to question their ability to be effective in the classroom. Although her initial thoughts appear to be based on limited and narrow understandings of teaching categorized as either routine or technical, there appears a more critical examination of the classroom situation throughout the investigation, which illustrates contextual reflection. On the other hand, her initial journal reflections and reflective discussions are mostly placed at the routine reflection and to some extent at the technical reflection. Unlike her initial reflections, Zeynep Teacher's reflection level evidenced in oral and written formats constantly shows a growing tendency toward deeper reflection.

4.2.4. The nature of the changes in the form of reflective dialogue. As described in the methodology part of the thesis, the form of dialogue of teachers' reflections is categorized into four dimensions: Purely Descriptive, Descriptive Reflection, Low Reflective Dialogue and High Reflective Dialogue. In this section on the nature of the changes in the form of dialogue, the result of data analysis is illustrated in 4 main graphs: (a) The Form of Dialogue Over Time, (b) The Form of Dialogue by Mode of Reflection, (c) The Form of Dialogue Under Each Focus, and (d) Changes in the Form of Dialogue Over Time. These illustrations are developed to show the nature of the changes in the form of dialogue by time (eight weeks) with two different reflection modes (oral vs written).

4.2.4.1. Aysel Teacher as a sculptor. As can be seen in the following figures, the form of dialogue evidenced in Aysel Teacher's written and oral reflections span three categories: Descriptive Reflection, Low Reflective Dialogue and High Reflective Dialogue. It is also shown that her reflections mainly belong to Low Reflective Dialogue and High Reflective Dialogue. For her, written and oral reflections are placed at the High Reflective Dialogue category in very limited numbers, even though there is a growing tendency toward this category over time. The changes in the form of dialogue in her reflections are presented by time and by communication mode in the following paragraphs.

Throughout the guided reflective process within the context of this study, Aysel Teacher's written and oral reflections showed changes in the form of dialogue over time. Her reflections are most often placed at Lowly Reflective Dialogue, and to a limited extent at lower category of Descriptive Reflection and higher category of Highly Reflective Dialogue. As can be seen in the following Figure 4.52 and 4.53, while lower categories tend to decrease with engaging in the guided reflective practices within eight weeks, participants are more likely to have the higher reflective dialogues in their reflections.

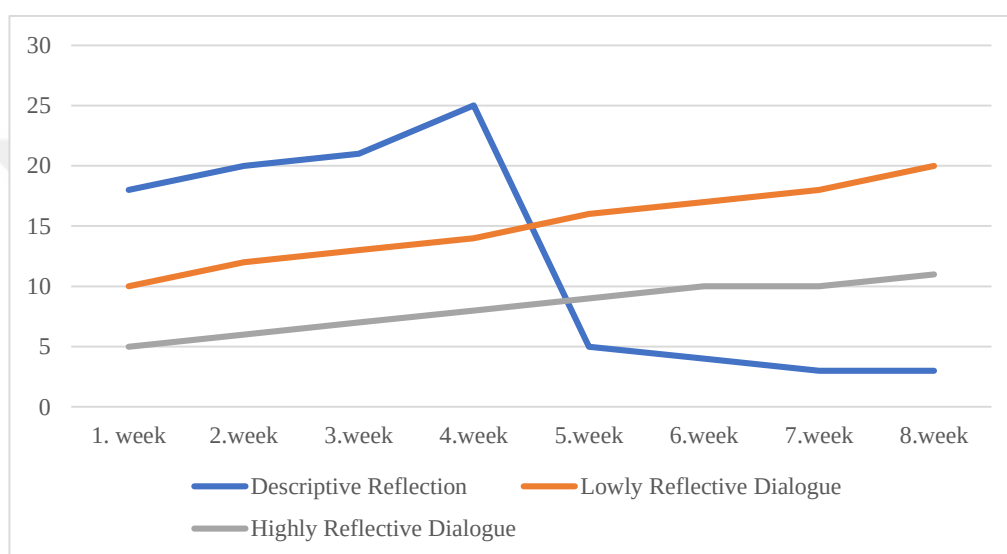


Figure 4. 52. The Form of Dialogue of Aysel Teacher's Reflections Over Time

In general, the data indicates that 74% of reflective units are coded in the reflective categories low reflection dialogue (makes a judgement and justifies it) and high reflective dialogue (explains possible causes and/or imagines future actions), and the remaining 26% are coded in the descriptive categories of descriptive reflection with an evaluative element.

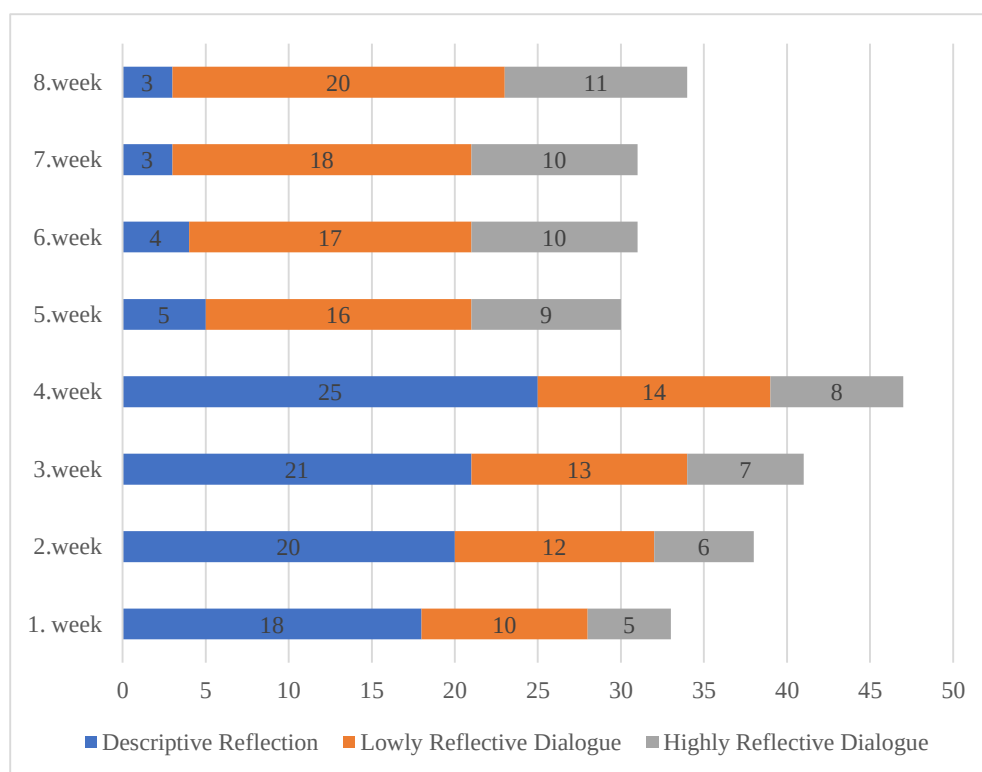


Figure 4. 53. Changes in Aysel Teacher's Form of Reflective Dialogue Over Time

Aysel Teacher's reflections covers all four main themes. As illustrated by the Figure 4.53, regardless her reflections' focus, she displays a growing tendency in the form of low reflective dialogue. Her reflections on herself are generally coded as either descriptive reflection or low reflective dialogue. While reflections on students and instructional preferences are mostly categorized as high reflective dialogue in terms of the form of dialogue, her concerns about contextual issues mostly display the evidence of high reflective dialogue. Following reflective journal entry indicates that deeper and broader reflections are evident when specific issues are mentioned:

My class is usually well organized. In the last lesson, I questioned students for 5 minutes to check if they remembered what I taught in the previous lesson. Then, I asked them to solve example problems in the textbook. There were 10 minutes left in the class. But, I needed a few minutes more to cover the rest part of the topic and I asked my students to stay more after the bell rang. They immediately responded back that they did not want to lose their break time. I thought they were right. Otherwise, it would not be fair for them. To resolve this issue, I recommended that we could begin late for the next class so we could be even in that sense.

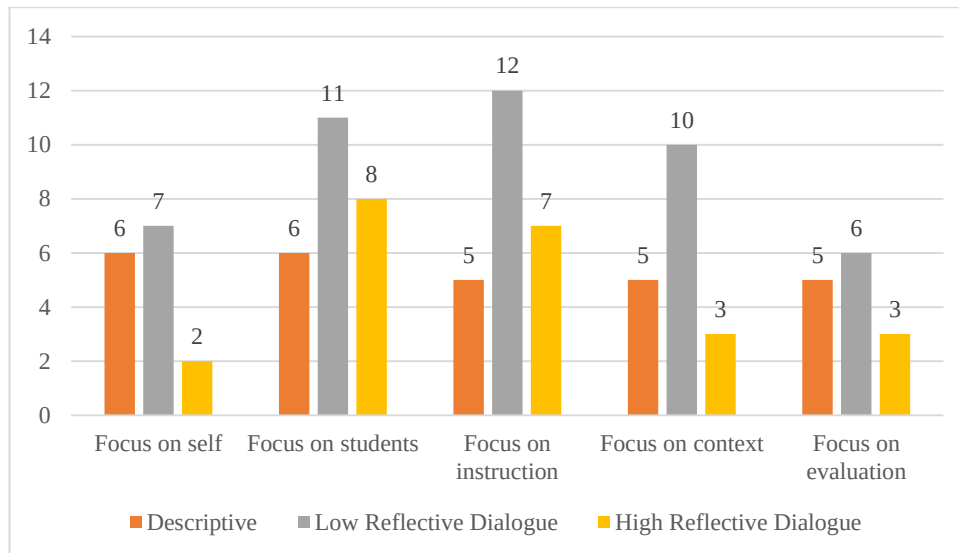


Figure 4. 54. The Form of Dialogue of Aysel Teacher's Reflections for Each Focus

As can be displayed in Figure 4.54, the patterns of Aysel Teacher's form of dialogue display a difference among the written and oral modes of reflections. It is revealed that Aysel Teacher shows higher reflective dialogue when she engages in discussions about her teaching experiences within the professional learning community compared to their internal dialogues through reflective journal writings. For instance, when there is an argument with regard to the important conditions for effective teaching outcomes, Aysel Teacher indicates the changes in her beliefs about this issue as in the following reflection:

I believe that there are three important elements for effective teaching: my enthusiasm for being a teacher, my students' open mindedness and their active engagement into activities. I think teacher's enthusiasm is the most critical one. If a teacher is enthusiastic about teaching, then students can follow their teacher and other factors are the results of being enthusiastic.

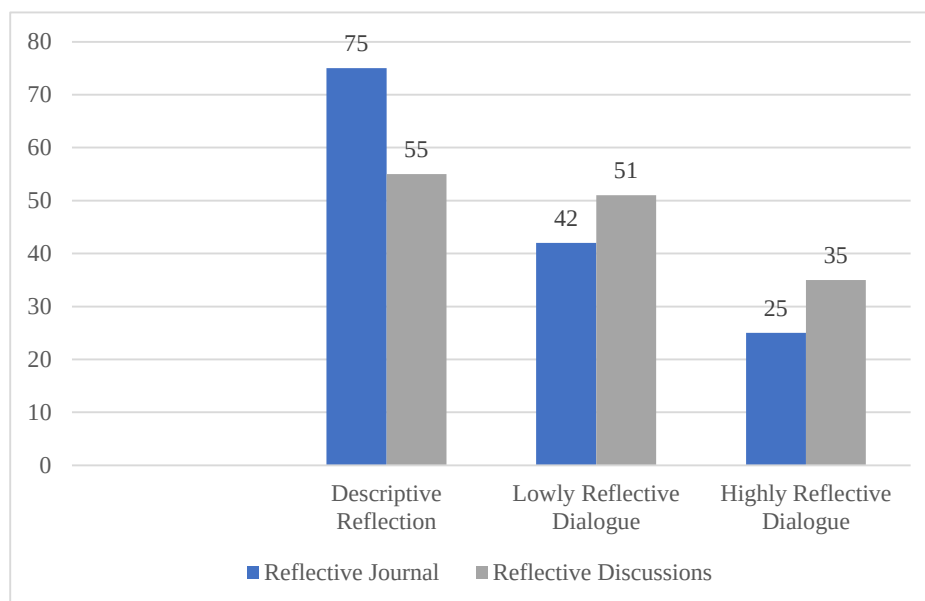


Figure 4. 55. The Form of Dialogue of Aysel Teacher's Reflections by Mode of Reflection

As can be seen in the following Figure 4.55, changes in the form of reflective dialogue vary according to the mode of reflection. In her reflections in journal entries, Aysel Teacher is mainly descriptive of events and simply recalled her classroom incidents with a limited analysis of these incidents. On the other hand, her oral reflections reveal considerably more at either low reflective or high reflective dialogue and throughout the reflective practices, she develops more sophisticated and nuanced approaches to her both oral and written reflections.

4.2.4.2. Banu Teacher as a teacher in control. The changes in the form of dialogue within Banu Teacher's both written and oral reflections are identified at the beginning of the study, during and at the end of it as seen in the following figures. Her initial reflections are mostly characterized by a lack of detail and depth and consisted mainly of low-level forms of writing. She makes inferences about issues happening in her classrooms without any supporting evidence. Even though most of her reflections are centered on purely descriptive, descriptive reflection and low reflective dialogue, the reflections interpreted as high reflective dialogue arose as she is engaging in reflective practices. In general, the data indicate that 33% of reflective units are coded in the reflective categories low reflection dialogue (makes a judgement and justifies it) and high reflective dialogue (explains possible causes and/or imagines future

actions), and the remaining 67% are coded in the descriptive categories of purely descriptive and descriptive with an evaluative element.

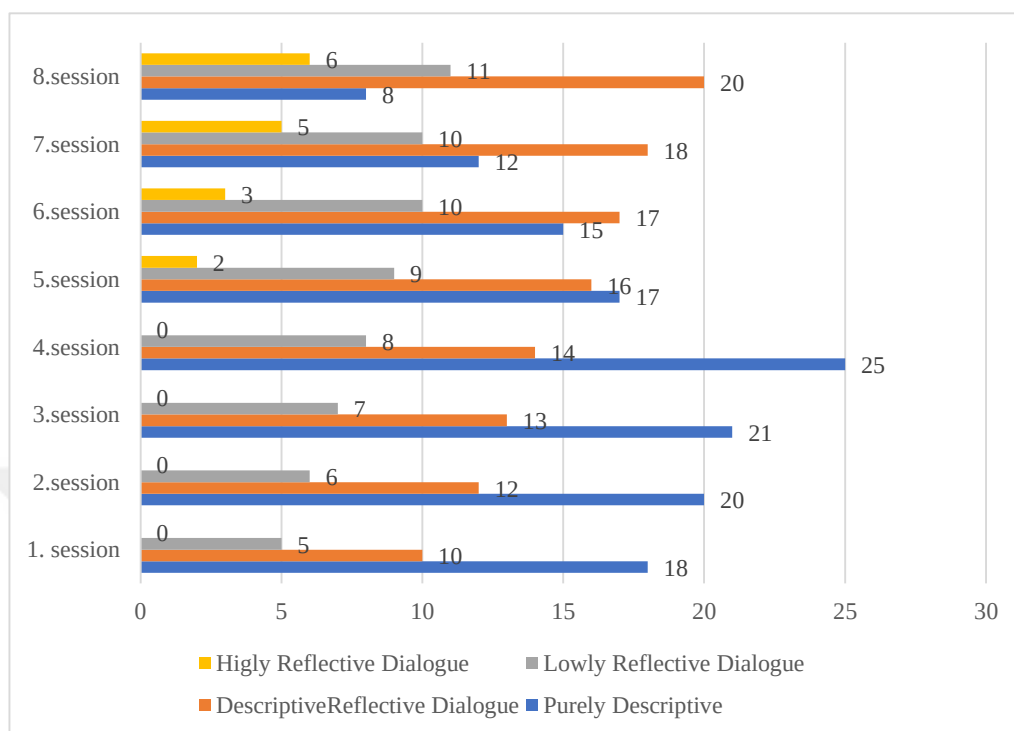


Figure 4. 56. The Form of Dialogue of Banu Teacher's Reflections Over Time

As Figures 4.56 and 4.57 display, after the fourth session, the higher form of dialogue in her reflections increase dramatically and in these reflections she mostly pays attention to the “Why” questions and explains possible causes of what happened in the classroom. In the similar vein, her reflections in the form of lowly reflective dialogue displayed the growing tendencies throughout the investigation while her purely descriptions in her reflections are getting decreased. Her recent reflections become detailed and included rationale with detail examples as in she is discussing an effective pedagogical way for improving learning process of her students:

Connect prior learning as much as possible. And then let students understand principles. Memorize the least and apply the most. Why is it effective? Students can have confidence if they can connect new concepts with what they know.

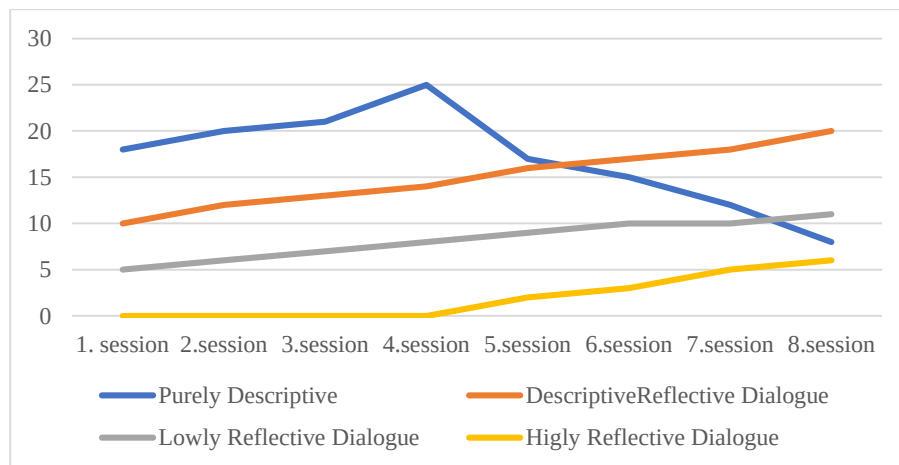


Figure 4. 57. Changes of Banu Teacher's Form of Reflective Dialogue

As can be seen in Figure 4.57, the patterns of the form of dialogue of Banu Teacher's reflections indicate a significant difference by mode of reflection. Her thought occurs mainly purely descriptive, and then descriptive reflection and lowly reflective dialogue, and to a limited extent at highly reflective dialogue. However, it is not pertinent to conclude from this result only, since each data source shows a significantly different tendency over time as seen Figures 4.58 and 4.59. Therefore, it is necessary to examine the various modes of reflection one by one across the time variable.

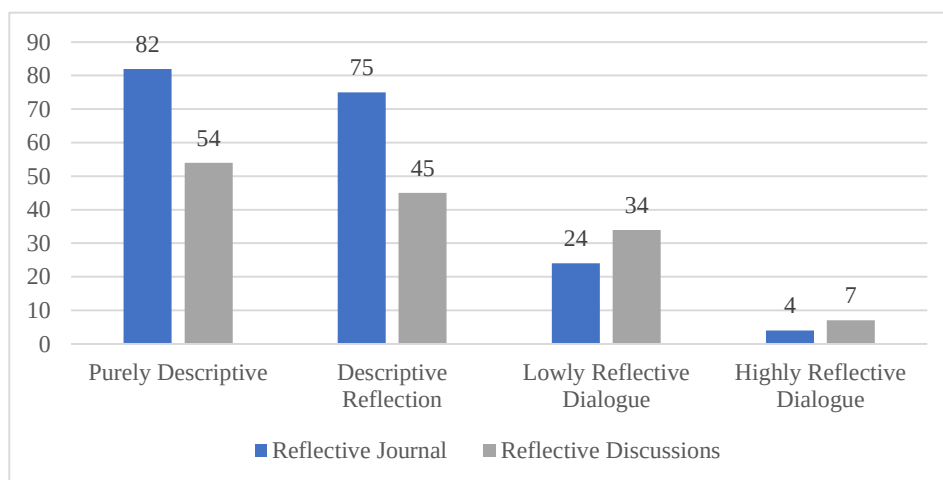


Figure 4. 58. The Form of Dialogue of Banu Teacher's Reflections by Mode of Reflection

Her journal writings are mainly complaining about students' indifferent disrespectful behaviors and attitudes with simple sentences. As she gains reflective experiences, her journal entries become more varied and sincere. She writes her reflections not only with a descriptive tone but also with rationale and suggestions. Also, detailed and rationalized reflections are focused through mostly engaging discussion with her colleagues within a professional learning community. As can be seen in Figure 4.58, changes in the form of reflective dialogue vary according to the mode of reflection. In her reflections in journal entries, Banu Teacher is mainly descriptive of events and simply recalls her classroom incidents without much analysis of these incidents. On the other hand, her oral reflections reveal considerably more at either low reflective or high reflective dialogue and throughout the reflective practices, she develops more sophisticated and nuanced approaches to her both oral and written reflections. For instance, she is less bothered by students' disorderly behavior compared to the previous time. She seems to understand students' behavior more readily as in she reflected in her ideas in one of the reflective discussions:

I knew as a teacher I should understand my students who are not good at the subject and I always try to be a role model for my students. But I realized that this was not enough. I also need to understand students having a difficult time in learning science or misbehaving. When students behave disruptively, this means that they are more likely to get bored in the lesson. And it is not a big

deal anymore because I feel more confident about understanding my students' behaviors and I try to observe them to get to know them better.

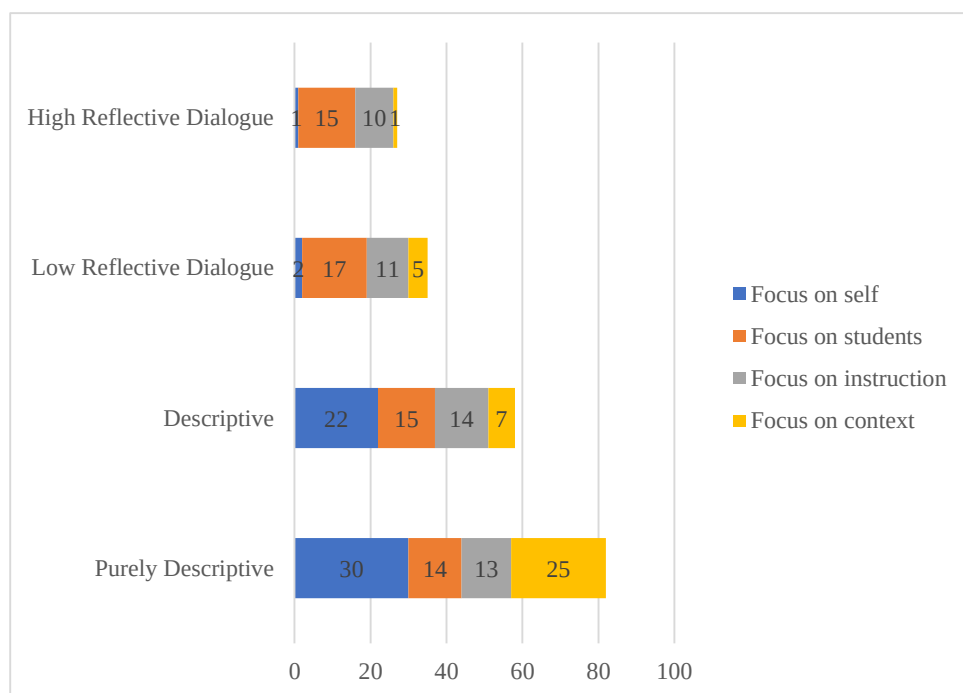


Figure 4. 59. The Form of Dialogue of Banu Teacher's Reflections Under Each Focus
Her reflections cover a few issues such as her authority, pedagogical issues and students' behaviors in the classroom. With regard to pedagogical issues, although her concerns about instructional skills do not show any difference, she displays a growing tendency in the form of dialogue of her reflections. She starts to believe in the importance of lesson preparation throughout the current investigation. While reflections on students particularly discipline issues are increased in terms of the form of dialogue, her concerns about contextual issues are getting decreased with the increase of the form of dialogue. This indicates that deeper and broader reflections are evident when specific issues are mentioned as can be seen in Figure 4.60.

4.2.4.3. Esra Teacher as a wizard teacher. In general, the data indicates that 43% of reflective units are coded in the reflective categories low reflection dialogue (makes a judgement and justifies it) and high reflective dialogue (explains possible causes and/or imagines future actions), and the remaining 57% are coded in the descriptive categories of purely descriptive and descriptive with an evaluative element.

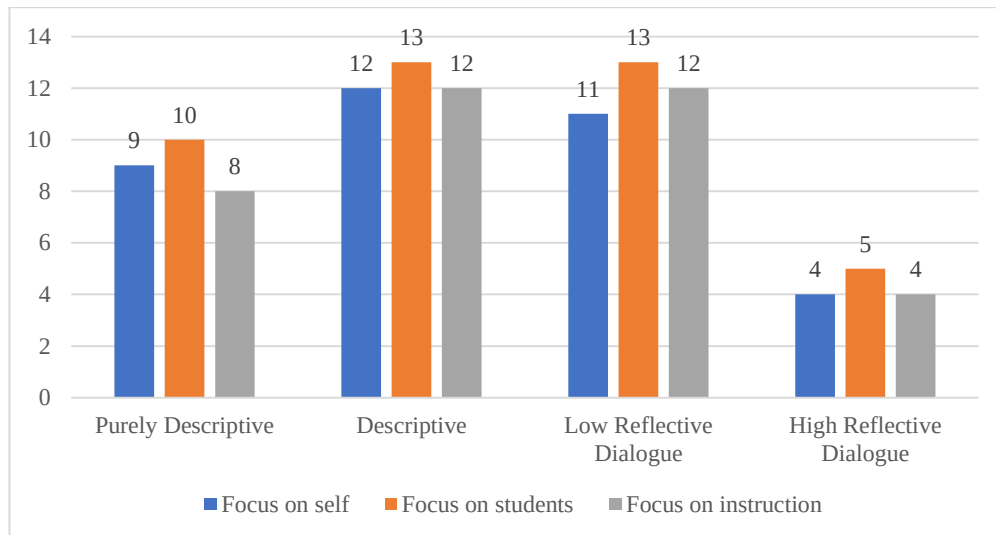


Figure 4. 60. The Form of Dialogue of Esra Teacher's Reflections Under Each Focus

The data show that Esra Teacher does not attempt to question her values or reflect upon her assumptions regarding her teaching profession at the beginning of the study. She assumes that the mandated curriculum is what is best for her students without an attempt to examine the context of the classroom or how the students' backgrounds might affect her lessons. This points to a lower form of dialogue as illustrated in the following excerpt:

The mandated national curriculum is my guide because there will be a national exam regarding the topics covered in the curriculum. As a teacher, I need to follow the curriculum. This is of course best for my students and myself as well. I feel secure in that sense and my students do not need to worry about the exam.

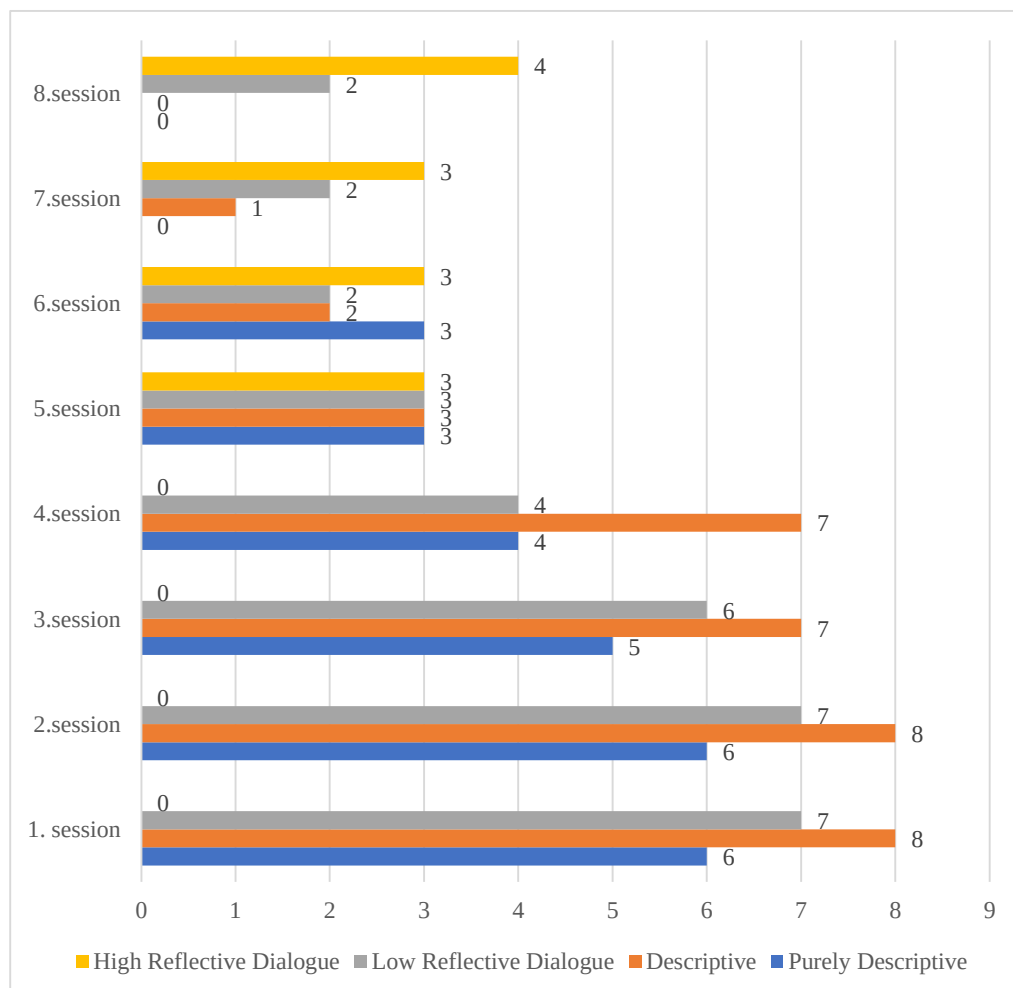


Figure 4. 61. The Form of Dialogue of Esra Teacher's Reflections Over Time

The Figure 4.60 and 4.61 displays the summary of the evidence that supports the analysis of the data regarding the changes in the form of dialogue over time. The times when she appears to reflect more at a higher level of reflective dialogue are times that she allows the students to guide the curriculum through their questions and their interests. In the similar vein, there is also evidence throughout the data for Esra Teacher that suggests she is reflecting at a higher form of dialogue when she wants to be sure of many of the teaching decisions that come her way. She mostly describes the dilemmas and situations faced that require her to question her actions and decisions.

That is why she welcomes the opportunity to have her colleagues' views and suggestions about her teaching practices, which demonstrates a willingness to learn more about her being a teacher and to look for the alternatives for future actions to make the learning relevant and meaningful. This reflects her belief that the teacher's role is most important in teaching the lesson. That is, students would pay attention and participate in the lesson, if she as a teacher uses appropriate instructional techniques:

I feel more successful when I put more effort and become prepared before the lesson. When my students construct their own understanding, this is what I am looking for now. Lesson preparation is the first step for it. Using appropriate technique is another step.

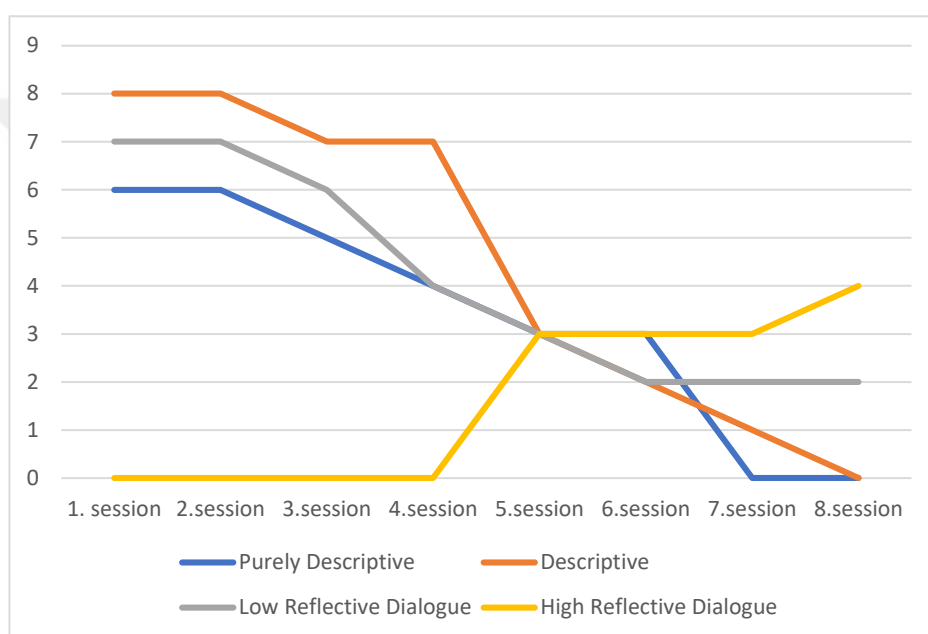


Figure 4. 62. Changes of Esra Teacher's Form of Reflective Dialogue Over Time

As can be seen in Figure 4.62, changes in the form of reflective dialogue vary according to the mode of reflection. In her reflections in journal entries, Esra Teacher is mainly descriptive of events and simply recalls her classroom incidents without much analysis of these incidents. On the other hand, her oral reflections reveal considerably more at either low reflective or high reflective dialogue and throughout the reflective practices, she develops more sophisticated and nuanced approaches to her both oral and written reflections.

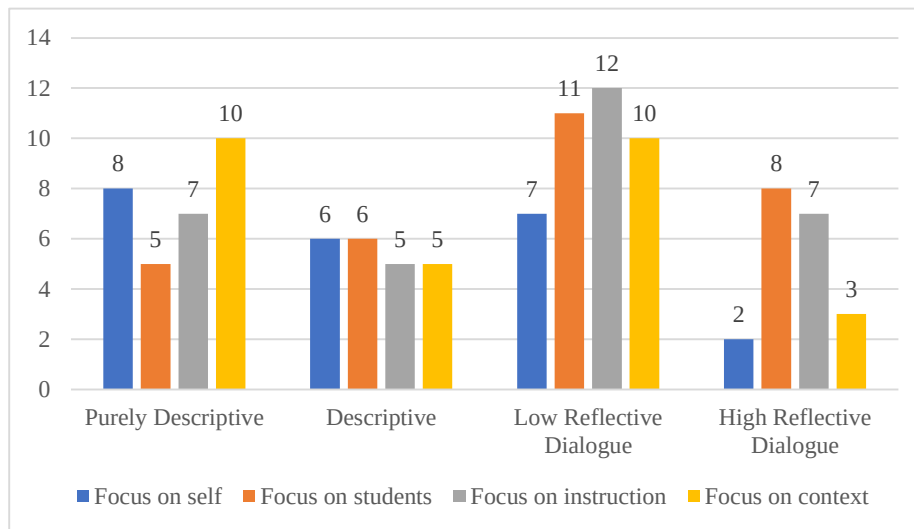


Figure 4. 63. The Form of Dialogue of Esra Teacher's Reflections by Mode of Reflection

4.2.4.4. Filiz Teacher as a high expectation teacher. The written and oral reflections made by Filiz Teacher are from a range of subject disciplines, each of which nearly always concerned a single idea or critical incident. To evaluate the form of dialogue of her reflections, key words and phrases are identified at the different forms of dialogue.

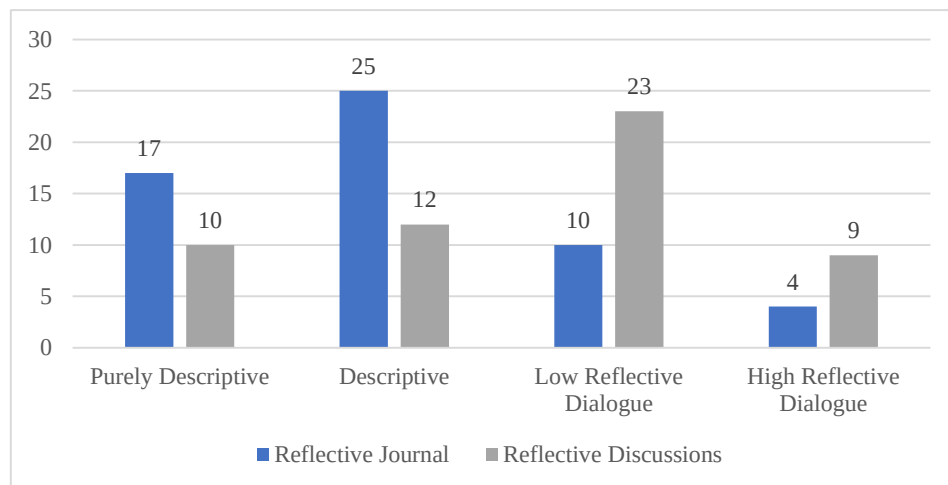


Figure 4. 64. The Form of Dialogue of Filiz Teacher's Reflections Under Each Focus

The Figure 4.64 helps to clarify the tendencies in Filiz Teacher's reflections as she gains experience in reflective practices through the current study. There is a slightly

difference in the focus of her reflections in terms of different forms of dialogue. While the dominant component of Filiz Teacher's reflection related to issues concerning instruction and students are mostly coded high level of form of dialogue, in her reflections, the concerns on herself and contextual issues are generally categorized as low level of form of dialogue.

As seen in the following Figure 4.65 and Figure 4.66, her beginning reflections demonstrate some of the evidence that supports mostly descriptive reflections containing an evaluative element and lower reflective dialogue with a judgement and a justification. An example of lower reflective dialogue is her clarity about structures to foster student organization: *"I think student performance has improved because I have high expectations from them. My class is more organized and well prepared for the exam."*

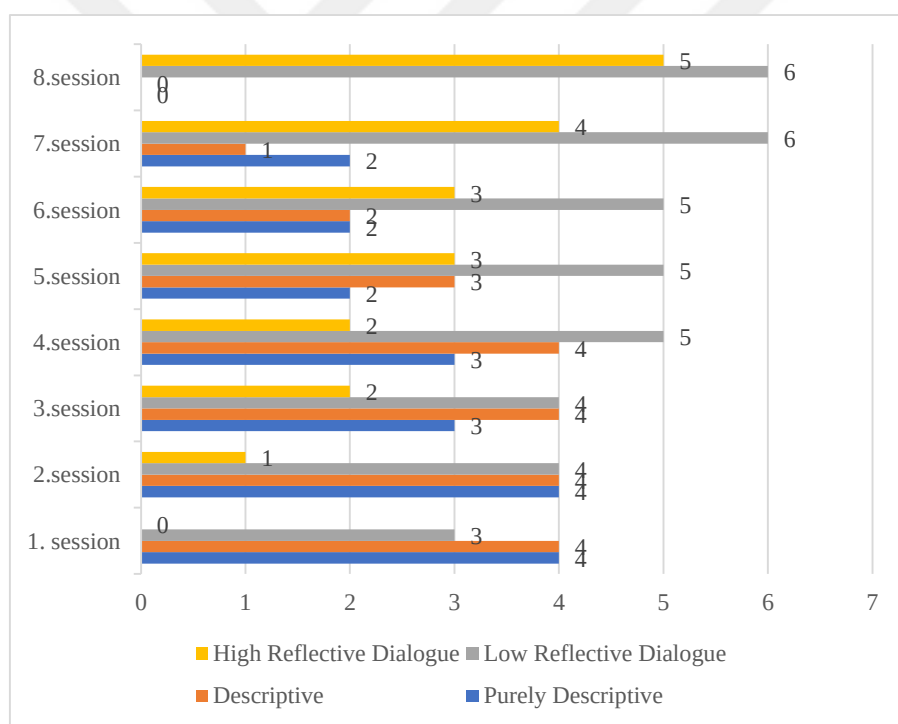


Figure 4. 65. Changes of Filiz Teacher's Form of Reflective Dialogue Over Time

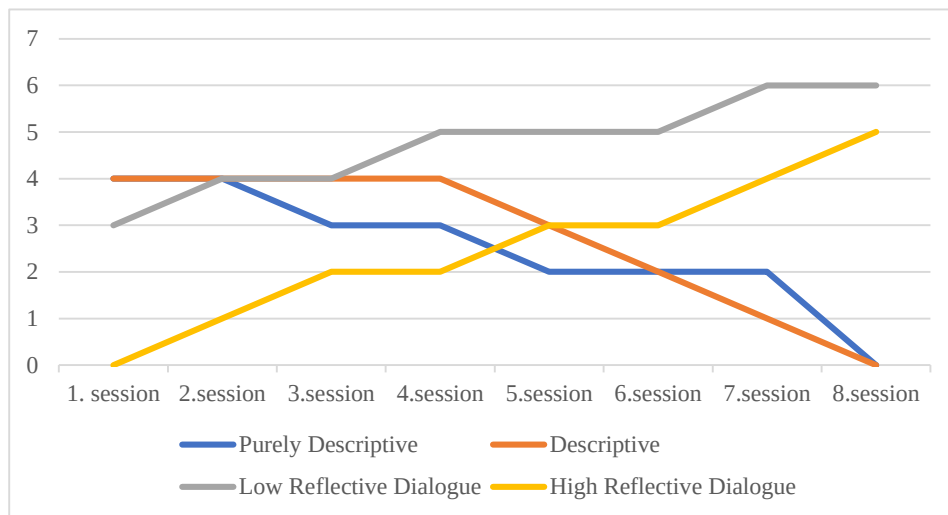


Figure 4. 66. The Form of Dialogue of Filiz Teacher's Reflections Over Time

As the study advances, she appears to reflect a higher form of dialogue with explanations of possible causes and plans for future actions. The following comments correspond with her sense of efficacy in using her repertoires of teaching skills to manage productive classroom environments. She systematically links her different ways of teaching to the success of her students in the classroom and ultimately in their future lives as well by stating that *“By trying a different teaching method, I can significantly affect my students’ performance. I am certain I will make a difference in the lives of my students.”*

The figure 4.66 above illustrates the changes in the form of dialogue in her reflections. Two thirds of the reflections are made during and at the end of the reflective practices. The data also indicate that 53% of reflective units are coded in the reflective categories lowly and highly reflective dialogue, and the remaining 20% are coded in the descriptive reflection. Even 27% of reflective units are categorized as purely descriptive writing, there is no evidence of any of its characteristics at the end of the study.

As can be seen in Figure 4.67 below, there are slightly differences in the form of dialogue of Filiz Teacher's reflections based on the mode of reflection, showing that she is more capable of higher level of form of dialogue in verbal than in written format.

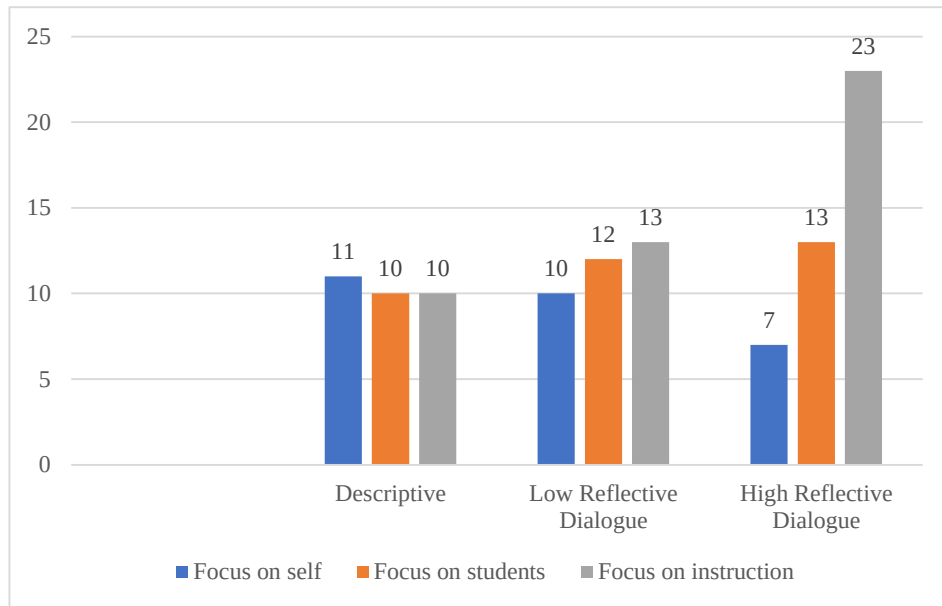


Figure 4. 67. The Form of Dialogue of Gaye Teacher's Reflections Under Each Focus

Although Filiz Teacher's oral and written reflections do not show a consistent trend over time, the changes in the form of reflective dialogue in her case show noticeable differences according to mode of reflection. She shows more progress in oral format than in written format as displayed in the following Figure 4.68.

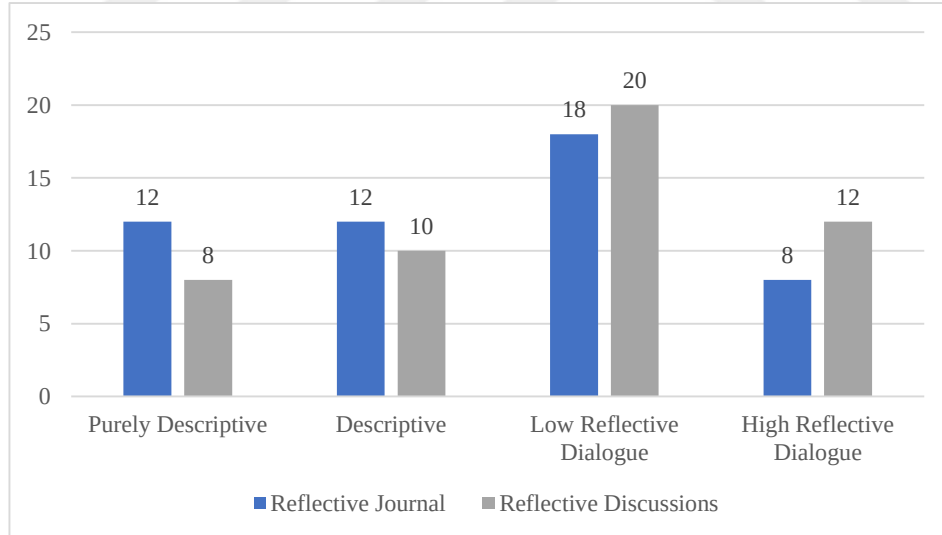


Figure 4. 68. The Form of Dialogue of Filiz Teacher's Reflections by Mode of Reflection

4.2.4.5. Gaye Teacher as a caring teacher. This study identifies three general categories of the form of reflective dialogue from her reflections: descriptive reflection (28%), lower reflective dialogue (32%), and higher reflective dialogue (40%). For

better visual representation, the changes in the form of dialogue that Gaye Teacher has are presented in the following figures below.

In Gaye Teacher's case, there are noticeable differences in the form of reflective dialogue across content as shown in the Figure 4.70. As mentioned earlier, Gaye Teacher's reflections are mainly on herself and her roles and responsibilities as a teacher. When she reflected on these issues, she often just described what is happening. That is, her reflections on the issue are primarily at the descriptive reflection throughout the current investigation.

As illustrated in the following Figure 4.69 and Figure 4.70, in her reflections, she generally provides explanation and description of the identified critical incidents with her rationale about what happened in the classroom. On the other hand, her reflections on the relationships with students, and her instructional concerns are extended to either low or high reflective dialogue level. It appears that Gaye Teacher is more concerned with her judgments, reactions, and teaching behaviors in relation to the teaching and learning processes in the classroom. She identifies the effects of her positive feeling towards being a teacher and offered a rationale or explanation for her actions on students' happiness and being successful at the school:

When as a teacher I am happy and feeling positive about my job, I am really focus on my students. Also, I can provide a safe, supportive, and structured environment so that my students can be successful and happy at school.

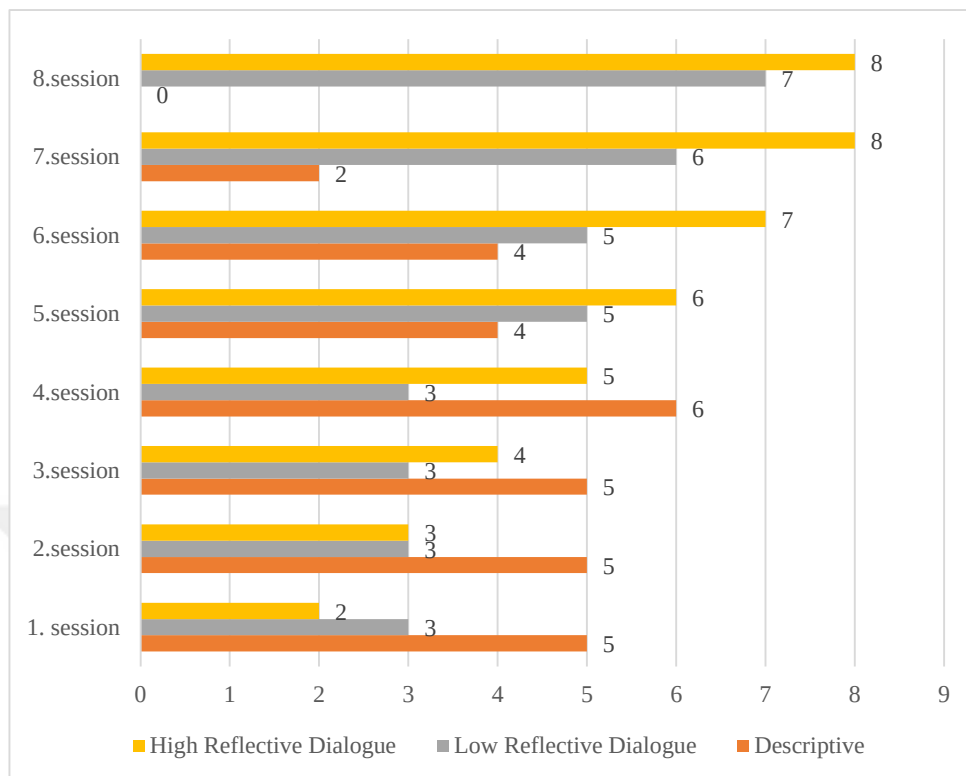


Figure 4. 69. The Form of Dialogue of Gaye Teacher's Reflections Over Time

Then, she moves beyond higher reflective dialogue with identifying how the classroom contexts affect, determine, or influence her teaching practice and as a possible source of students to lose interests and motivation to learn in the classroom:

I try to think about the diversity in the classroom, but I could see some students do not concentrate on what I say and I just think there must be a better way - I need to get them more engaged in the process - perhaps using fun ways to teach can help.

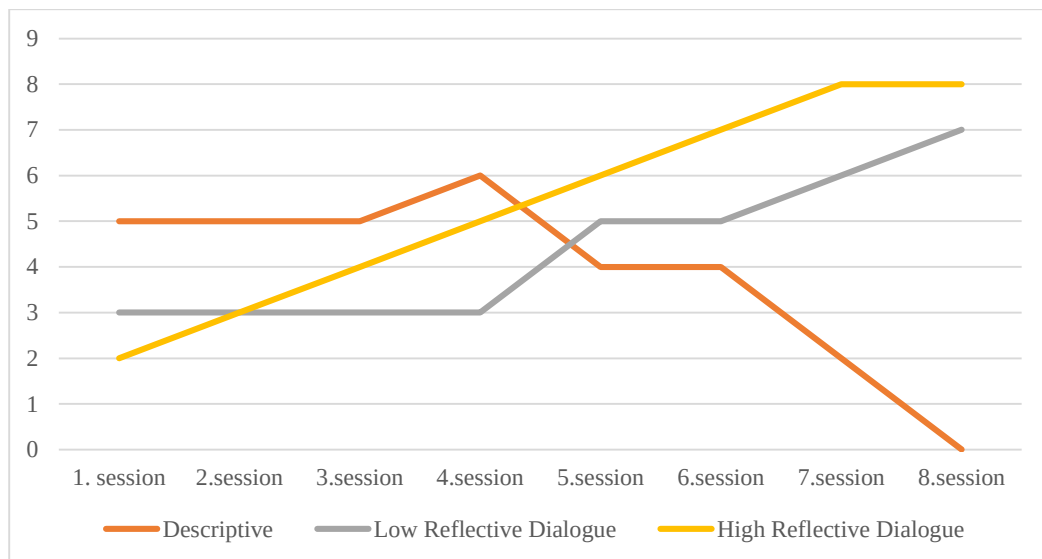


Figure 4. 70. Changes of Gaye Teacher's Form of Reflective Dialogue Over Time

Gaye Teacher's oral and written reflections show a consistent trend over time. In the similar vein, the changes in the form of reflective dialogue in her case also show noticeable differences according to mode of reflection. She shows more progress in oral format than in written format as displayed in the following Figure 4.71.

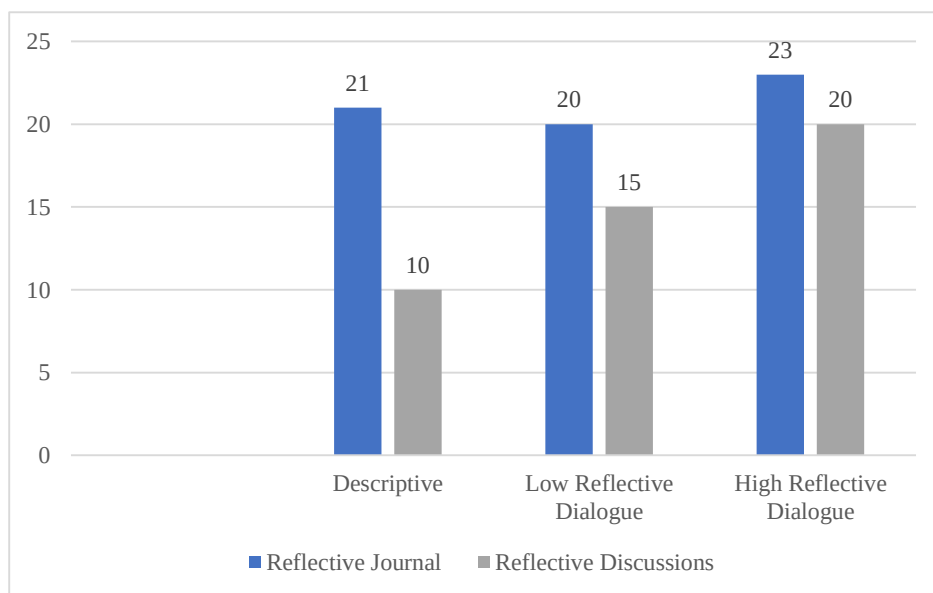


Figure 4. 71. The Form of Dialogue of Gaye Teacher's Reflections by Mode of Reflection

4.2.4.6. Hale Teacher as an information giver. Her reflective dialogues mainly belong to the categories of lower (40%), and higher reflective dialogue (32%), yet, she sometimes stays at descriptive reflection (28%). For better visual representation, the changes in the form of dialogue that Gaye Teacher has are presented in the following figures below.

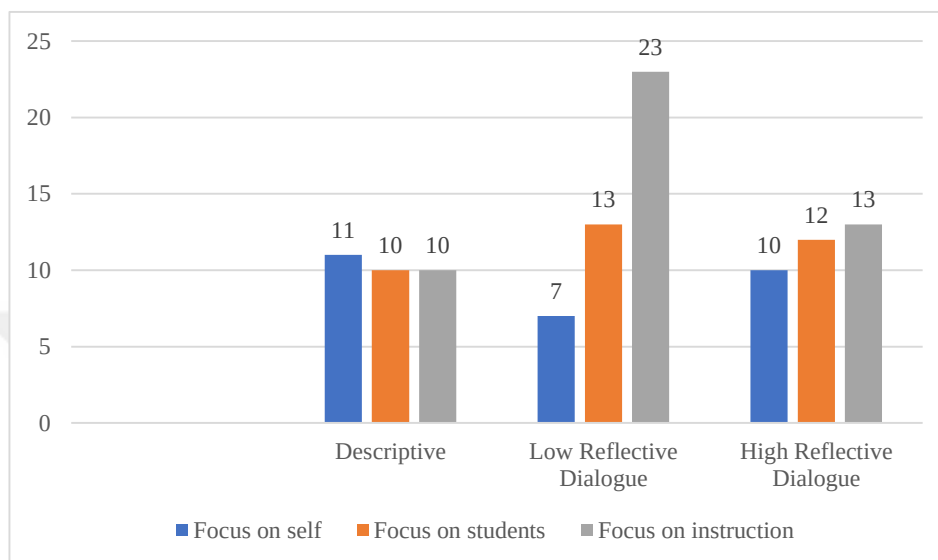


Figure 4. 72. The Form of Dialogue of Hale Teacher's Reflections Under Each Focus

When Hale Teacher first participates in the study, her reflection is a descriptive explanation with no evidence of rationale, which is placed at purely descriptive reflection. She does not have major concerns for her students. She only focuses on her own responsibilities regarding instructional practices as a teacher. She stresses how important it is for her to primarily convey the content of the lesson. She engages in relatively more purely descriptive dialogue. At the same time, she only shows descriptive reflection to a small extent. Her reflections indicate that in terms of the form of reflective dialogue, Hale Teacher reports some difficulties in reflecting deeply on her own teaching behaviors. That is to say, she mainly reflects on students' behavior and only to a small extent critically reflects on her behaviors. She mainly describes what is reproduced in the incident without further critical justification. For instance, when she watches the video footage of an incident that she deals with students' misbehavior, she asks the student to leave the classroom and visit the administrative office due to his behavior. She remains on a more superficial

description and evaluation, and fails to link to why the student behave improperly in the classroom as notes in the following excerpt:

Even if there were no students interrupting class after a student with a misbehavior paid attention just a little bit more outside the classroom or visit the administrative office, the class atmosphere was in disorder. They need to learn behave properly in the classroom.

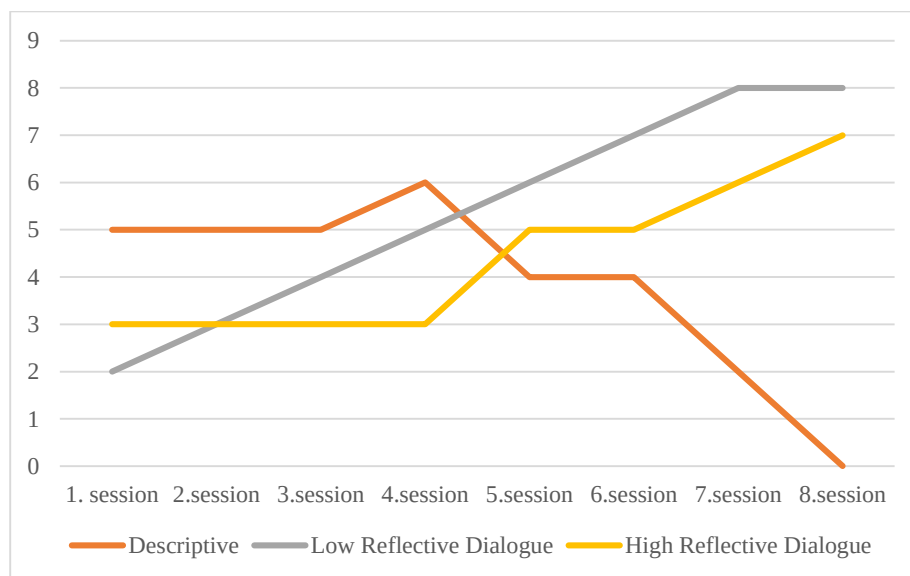


Figure 4. 73. Changes of Hale Teacher's Form of Reflective Dialogue

As displayed in the Figure 4.73, there is a growing tendency toward higher reflective dialogue. She tends to find the problematic issues in her own teaching practice and decisions and she tries to explain the reasons of what happened in the classroom. She also tries to make changes in her actions based on considering actively involvement of students in the activities. She gradually increases her awareness in the way of managing the classroom and teaching science and concerned more students' needs and interests. She eventually decides to take students' voice in making decisions about the classroom.

I realized that when the lesson is clearly presented and when my students engage in the activities, it will be outstanding. But, it can't be good teaching without managing the classroom effectively. For a successful classroom management, a mutual satisfaction is required from both me as a teacher and my students. For this result, students' voice is needed when making decision about the classroom rules and procedures.

Even with a tendency to grow over time, Hale Teacher's form of dialogue in her reflections indicates differences according to the mode of reflection. Figure 4.73 clearly illustrates these differences.

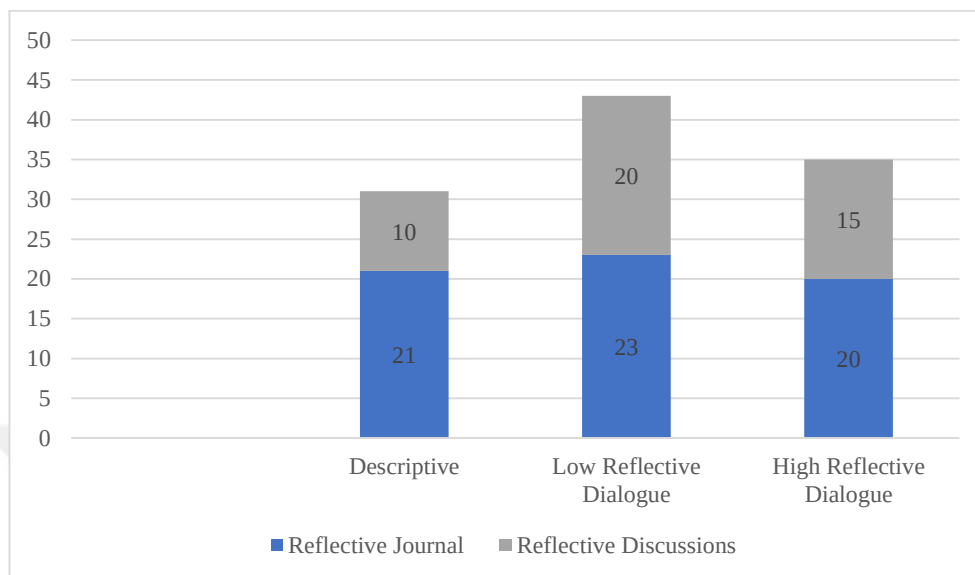


Figure 4. 74. The Form of Dialogue of Hale Teacher's Reflections by Mode of Reflection

Even though Hale Teacher seems very comfortable and articulate while the interview is conducted, her oral reflections are primarily placed at low reflective dialogue, and gradually at high reflective dialogue. Her oral mode of reflections are coded as descriptive reflections to a limited extent. Since Hale Teacher mainly explains her rationale for her actions and decisions in addition to describe what is happening in the classroom in oral reflections, the graph in Figure 4.74 could show such an inclination. However, one can note a progressive tendency in Hale Teacher's oral reflections as she gains experience in reflective practices. In the similar vein, her journal entries remain mainly at low reflective dialogue and her reflections in journal entries are relatively categorized as descriptive reflection at the beginning of the investigation. However, the form high reflective dialogue in her reflections in the journals become evident throughout the guided reflective practices.

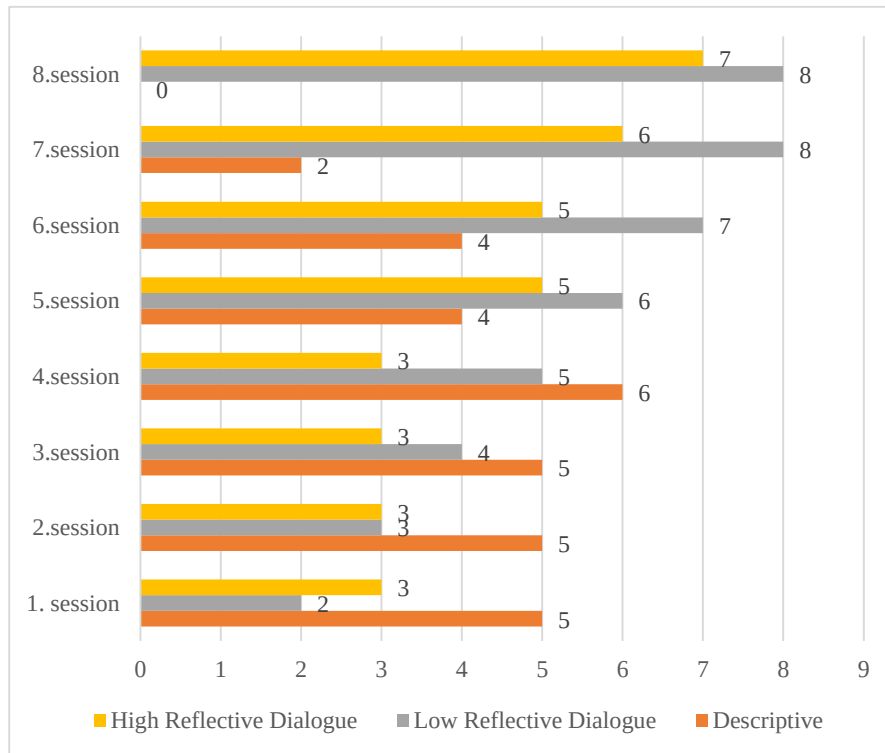


Figure 4. 75. The Form of Dialogue of Hale Teacher's Reflections Over Time

Hale Teacher's reflections in Figure 4.75 indicate the changes over time. Her oral and written reflections reveal at three categories as her reflection most often occurs at low reflective dialogue, then slowly extends to high reflective dialogue. The number of reflective units categorized as descriptive reflection is significantly decreasing throughout guided reflective practices that she engages in. Similarly, Hale Teacher's recall-oriented reflections decrease and her rationalization-oriented reflections increase.

4.2.4.7. Mine Teacher as a responsive teacher. About 15% of Mine Teacher's reflections are placed at the descriptive reflection. However, nearly half (45%) of her reflections are considered as lower reflective dialogue. Also, she has reflections at the higher reflective dialogue (40%). There is no evident in purely descriptive dialogue in her reflections.

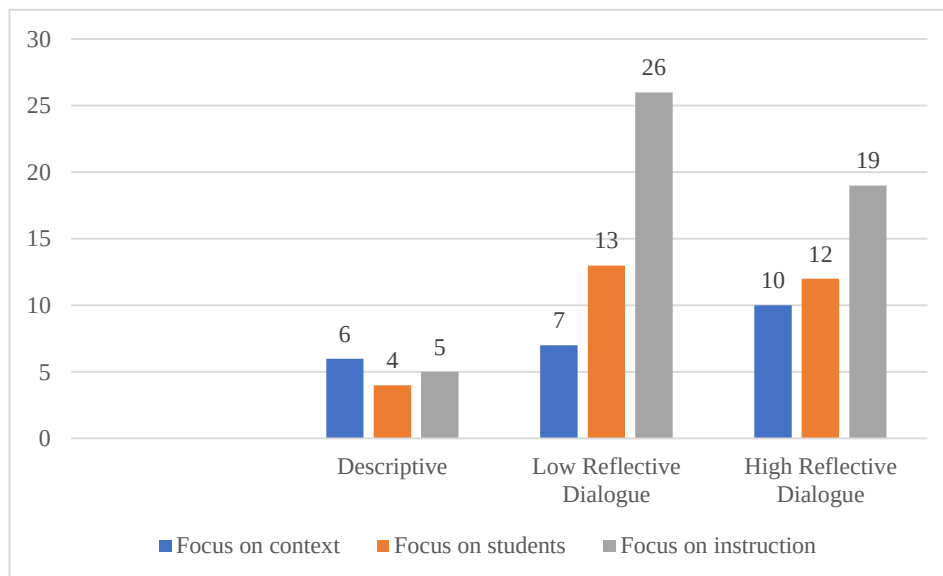


Figure 4. 76. The Form of Dialogue of Mine Teacher's Reflections Under Each Focus

As illustrated in the Figure 4.76, Mine Teacher's reflections cover nearly all the issues. Concerns on instruction show a growing tendency, while the number of her reflections related to her students increases. Her concerns on the contextual issues reflected, though, are limited compared to the other issues that she reflects on. In regard to the form of dialogue, reflective units are coded as descriptive reflection if she simply describes her classroom experiences with additional evidence of her rationale and lacks analysis of how an experience could shed light on her future teaching practices. For instance, she looks for the relationships between her actions and students' responses to her actions and interprets the situation with rationale. She generally accomplishes to explain the reasons why she did it as in the following entry that is "*I prefer to plan my instruction based on projects and hands-on activities because students can learn better when they are actively involved in the lesson.*"

Due to her teaching approach in which students are actively involved in the hands-on activities, administrative office complains about students' noise coming from her classrooms. In response to this incident, she kindly tries to explain her philosophy and this does not bother her at all because the classroom is crowded and most of the activities are group works and it is expected to have some noisy in the classroom. According to her, it is meaningless when she tells the students to be quite. However, she also feels uncomfortable about how her colleagues approach negatively to the way

of her teaching. The following journal entries used as the supporting evidence are quoted verbatim.

Looking at how I have managed the classroom when we carried out hands-on activities. Personally I do not feel uncomfortable when there is noise in my classroom. Actually, this shows they have fun and engage in the activity with group their mates. When administrator complaint about students' noisy in my classroom, I tried to explain my ideas kindly. But, I do not think my colleagues understand this. They are more like authoritative teachers and they think that when students are not talking, they listen to them and learn better. I have doubt that they are right. Next time, I need to show my students' products. Maybe, they will see the results.

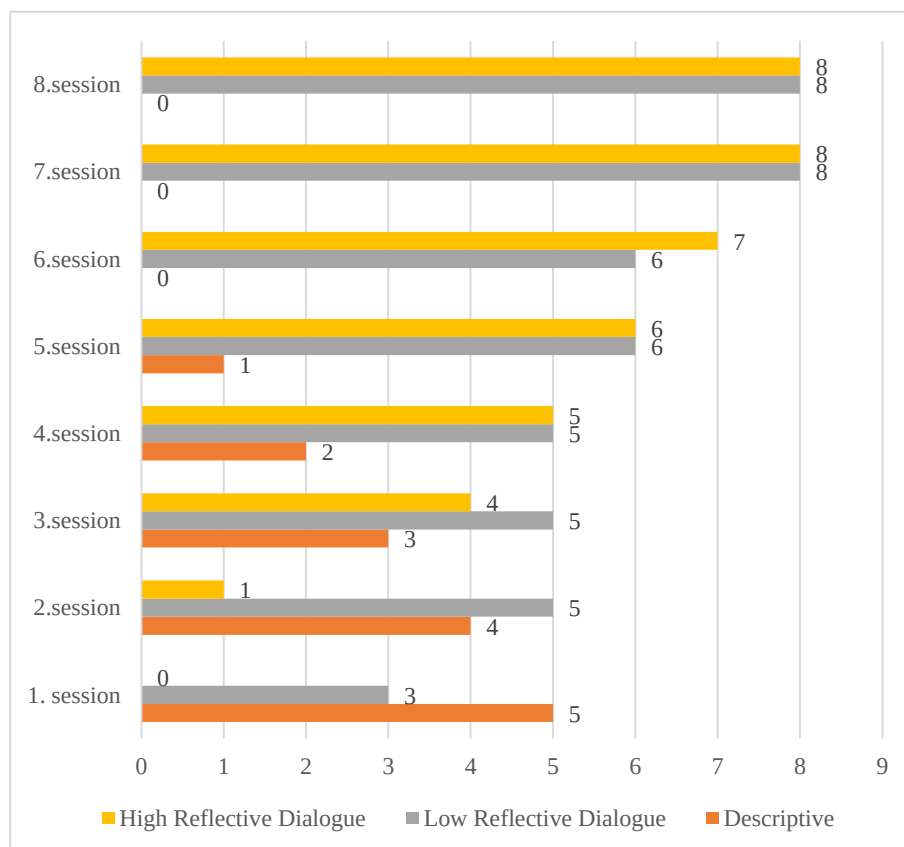


Figure 4. 77. The Form of Dialogue of Mine Teacher's Reflections Over Time

Overall, Mine Teacher's form of dialogue improves as she gains experience in reflective practices. In regard to the form of dialogue, her reflections are mainly categorized as low and high reflective dialogue. The form of dialogue of her reflections indicates a tendency to increase over time as displayed in the Figure 4.77 and 4.78.

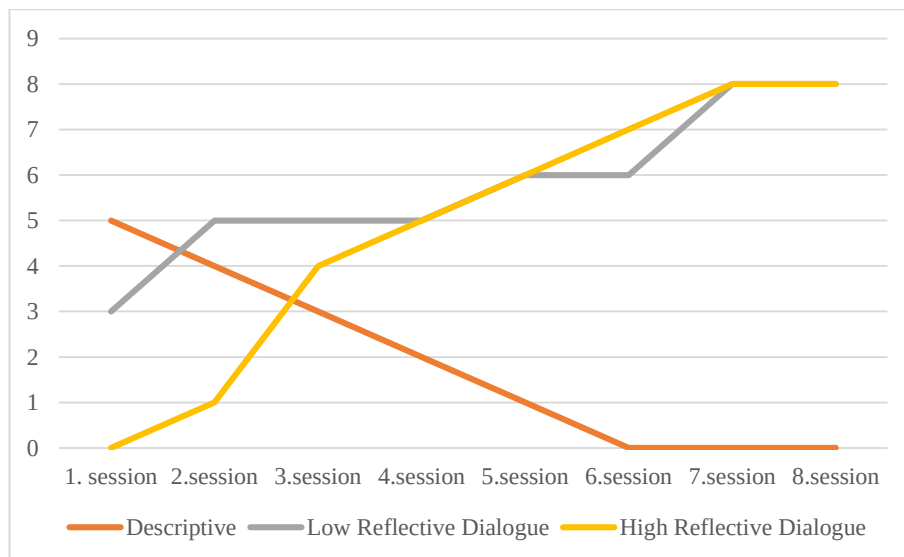


Figure 4. 78. Changes of Mine Teacher's Form of Reflective Dialogue Over Time

Differential progress is noticed depending on mode of reflection, as in other participant teachers' cases. Figure 4.79 clearly illustrates these differences. In Mine Teacher's case, reflections in journal entries show up relatively strong compared to oral reflections. It seems that the engaging in the guided reflective practices facilitates her form of dialogue in oral mode as data show her strength of form of dialogue in her written reflections.

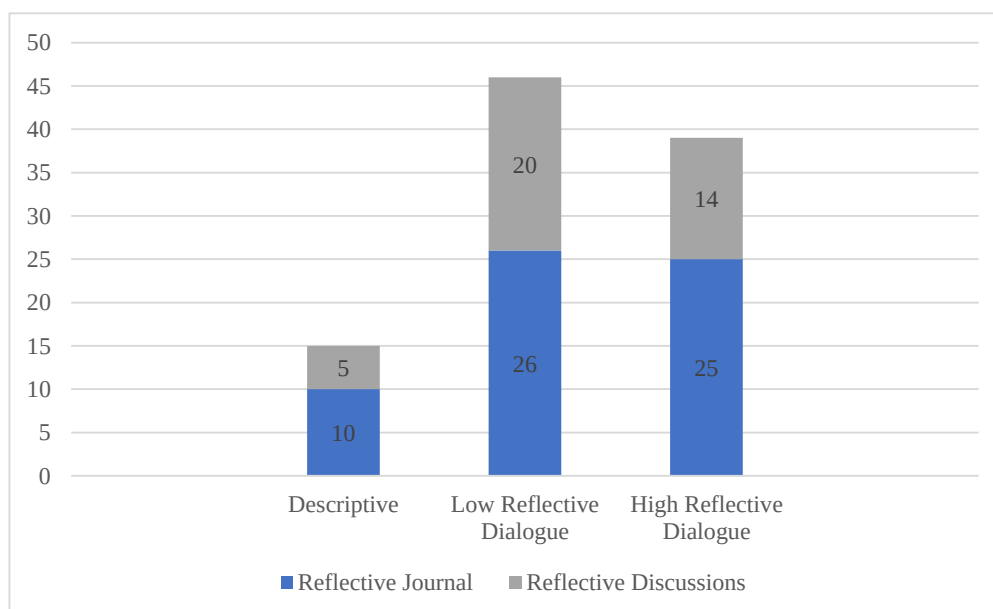


Figure 4. 79. The Form of Dialogue of Mine Teacher's Reflections by Mode of Reflection

Regarding the form of dialogue, Mine Teacher's reflections in her journal remain mainly at low and high reflective dialogue as displayed in Figure 4.79. This figure shows that reflection at low and high reflective form dialogue is dominant in journal entries and the form descriptive reflection is evident in the beginning of the study. Her oral reflections are primarily coded as low reflective dialogue, and gradually high reflective dialogue. Reflections at descriptive reflection are very limited during reflective discussions. Since her oral reflections mainly include a judgement and justifications about what is happening in the classroom and explanations of possible causes and her future actions, Figure 4.79 could display such an inclination. A progressive tendency in her oral reflections is noted as she is engaging in the reflective practices.

4.2.4.8. Sibel Teacher as an expert teacher. This study identifies three general categories of the form of reflective dialogue from her reflections: descriptive reflection (50%), lower reflective dialogue (40%), and higher reflective dialogue (10%). For better visual representation, the changes in the form of dialogue that Sibel Teacher has are presented in the following figures below.

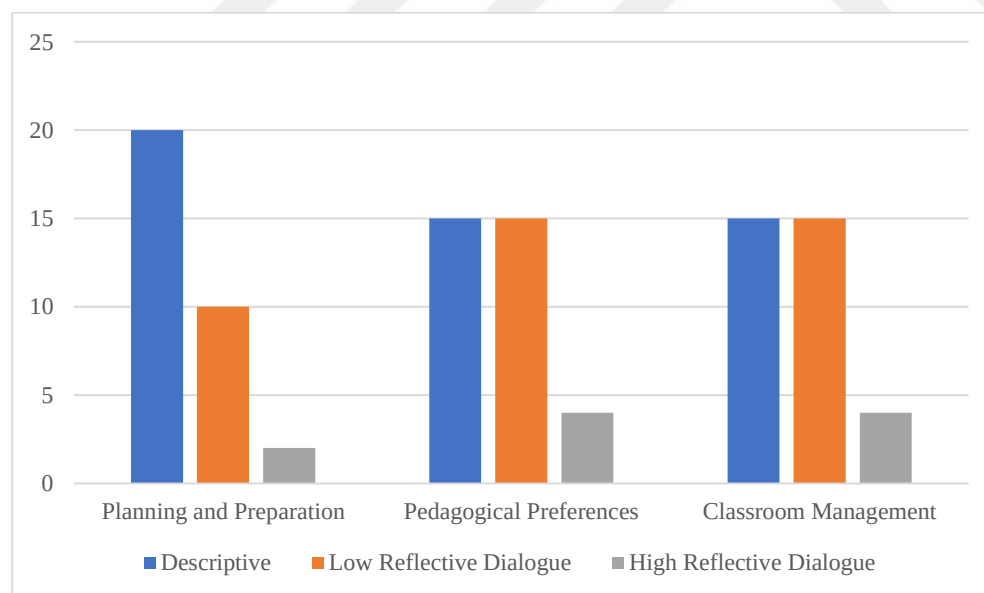


Figure 4. 80. The Form of Dialogue of Sibel Teacher's Reflections Under Each Focus
 Figures 4.80 shows that Sibel Teacher's reflections are focused on limited instructional issues throughout the current investigation such as planning and preparation, pedagogical preferences and classroom management. This tendency suggests that

Sibel Teacher's reflections are focused on instructional issues related to herself rather than considering the whole teaching context.

Figures 4.80 also illustrates the changes in the form of reflective dialogue in regarding the instructional issues that she reflected on. At the beginning of the research, three clearly distinctive categories of form of dialogue are identified in the reflections of Sibel Teacher. The largest proportion of reflective units (50%) constituted descriptive reflection. Sibel Teacher describes what happened and how she responded to the situation with an attempt to analyze critically the problem that she encountered. For example,

I have a special graded assessment system but I had a grading problem arose last week. If the students complete the assignments, they have a plus for each completed assignment. As they cannot complete an assignment, they get a minus point. If they have half of the assignment, they get a half plus and after they complete it, they get a full plus. Last week, some students complained of me giving lots of assignments and because I grade all the assignments, they felt pressure on themselves. But, at the beginning of the semester, I explained my assessment principles and expectations from my students. They understood and accepted them. Now, they wanted to violate the rules and do not want to take any responsibility for their learning.

The second largest proportion of reflective units (40%) in her reflections is lower reflective dialogue. In addition to the description of the case, these reflections contain an attempt to provide reasons and justifications for her actions with a critical way. One of the categories consist of her reflections where she seems to be unsure about how to solve the situation related to changing disruptive behaviors of her students and even she knows the recipe, she claims that it is not an easy job to do with other responsibilities that she needed to take. Still, she reflects on the importance of getting to know students individually to resolve the issues about classroom management, as exemplified in her following extract:

Now I have been working as a teacher for almost ten years. Since the beginning, I always have some students violating the classroom rules. Most of time I do not know what to do. But, getting to know each student plays an important role in managing disruptive behaviors. But, as a teacher, in this semester, I have four different classes and each class has nearly 30 students. Talk is cheap. I mean, it is more difficult to be able to offer every student the possibility of

introducing herself or himself within a limited time of period and I have various responsibilities as a teacher you know.

This reflection consists of the first descriptive stage with limited to a critical evaluation of classroom settings. She mainly describes her own experience and pays little attention to the student' viewpoints. While there is no evident in purely descriptive dialogue in her reflections, only small proportion of (10%) reflections of Sibel Teacher are coded as higher reflective dialogue. Her recent reflections illustrate how Sibel Teacher's viewpoints start to shift from herself to her students with having future plans to change her pedagogical decisions and actions to provide more student-centered learning environment. The following example shows the characterize units coded as higher reflective dialogue:

I realized it is important to raise students' interest on the topic and offer different ways of learning. Although other teachers argue that it seems impossible to do in the crowded classroom like in our school context, I will try different ways for various learning styles of students to teach better.

In this reflection, she cites alternative teaching methods for different learners, and she pointss out critical aspects of the classroom settings, which indicates a predominantly higher reflective dialogue.

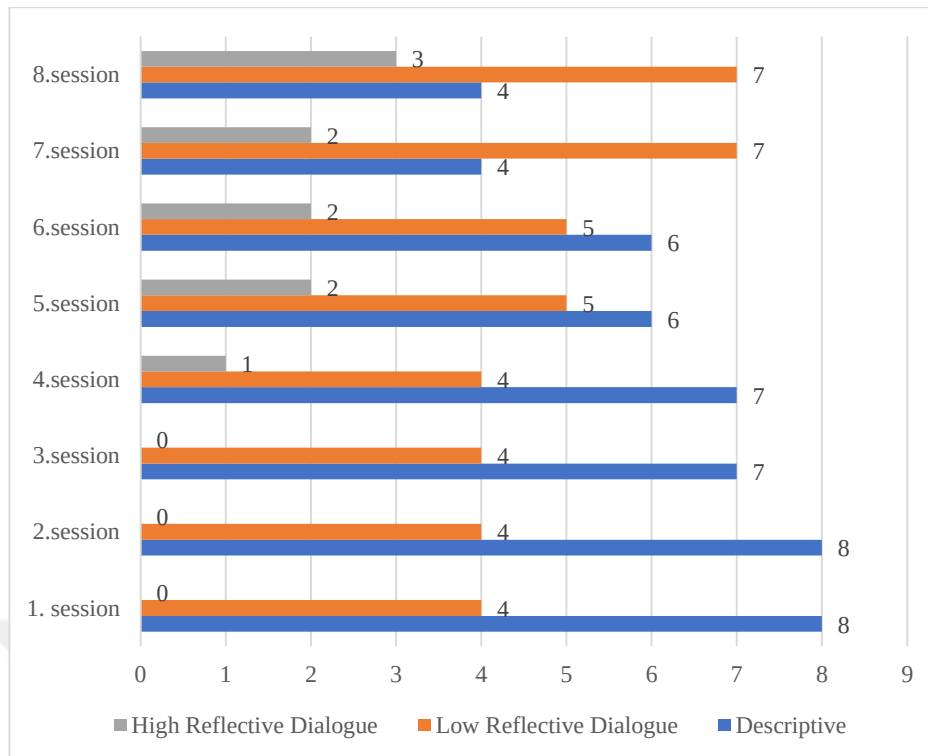


Figure 4. 81. The Form of Dialogue of Sibel Teacher's Reflections Over Time

As can be seen in the Figure 4.81 provided, the form of reflective dialogue evidenced in Sibel Teacher's reflections are mainly at descriptive reflection category overall. Most of her initial reflections are a description of classroom events, which are still placed at descriptive reflection category. However, she also reflects on what approach she would use beyond describing what happened in the classroom. In that sense, however, for her, reflections coded as low and high reflective dialogue are very limited.

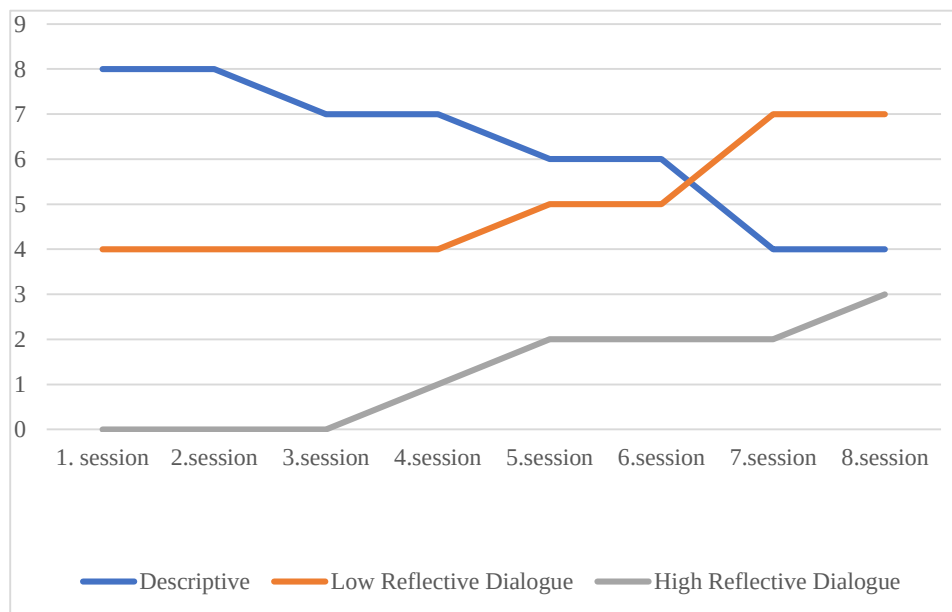


Figure 4. 82. Changes of Sibel Teacher's Form of Reflective Dialogue Over Time

Unlike other previous participant teachers, Sibel Teacher's reflections show slightly changes in the form of reflective dialogue over time as illustrated in Figure 4.82. Overall, however, she shows significant progress in terms of the form of reflective dialogue in her reflections and possibilities for improvement are noted as well.

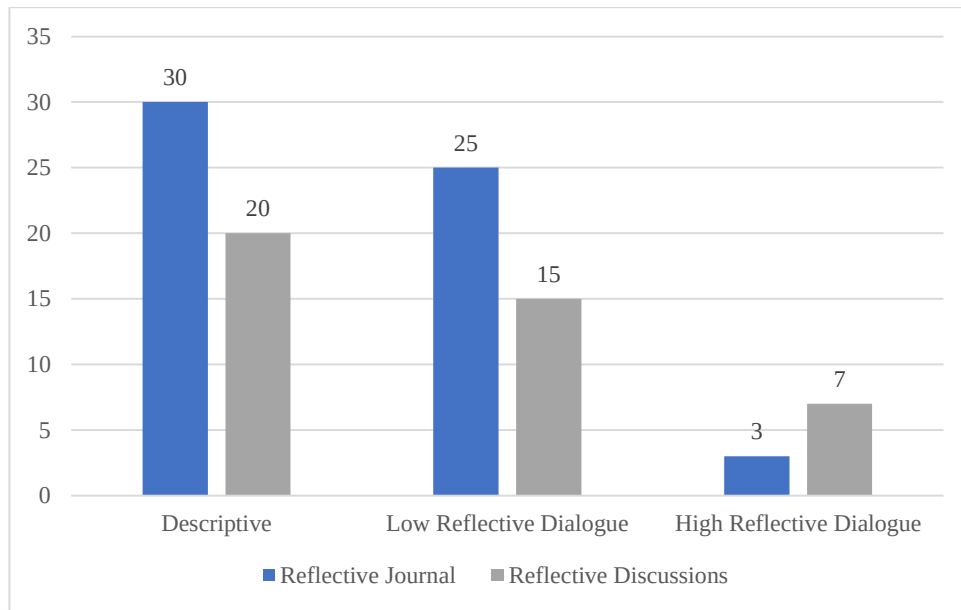


Figure 4. 83. The Form of Dialogue of Sibel Teacher's Reflections by Mode of Reflection

As can be seen in Figure 4.83, with a slow tendency to grow over time, the patterns of Sibel Teacher's reflections indicate some differences in the form of dialogue according to the mode of reflection. With regard to journal entries, Sibel Teacher's reflections include her perspectives regarding mostly instructional concerns categorized as descriptive reflection with simple sentences and low reflective dialogue with more an analytical perspective. Some differences are also found in her oral reflections. Regarding these changes, she reflects not only with a descriptive tone but also with rationale and suggestions. However, in her both oral and written reflections, high reflective dialogue occurs with a limited extent although during reflective discussions, there is an apparent increase in the form of high reflective dialogue compared to her journal entries.

4.2.4.9. Sevda Teacher as a conscientious teacher. This study identifies three general categories of the form of reflective dialogue from her reflections: purely descriptive writing (55%), descriptive reflection (22%) and lower reflective dialogue (23%). For better visual representation, the changes in the form of dialogue that Sevda Teacher has are presented in the following figure below.

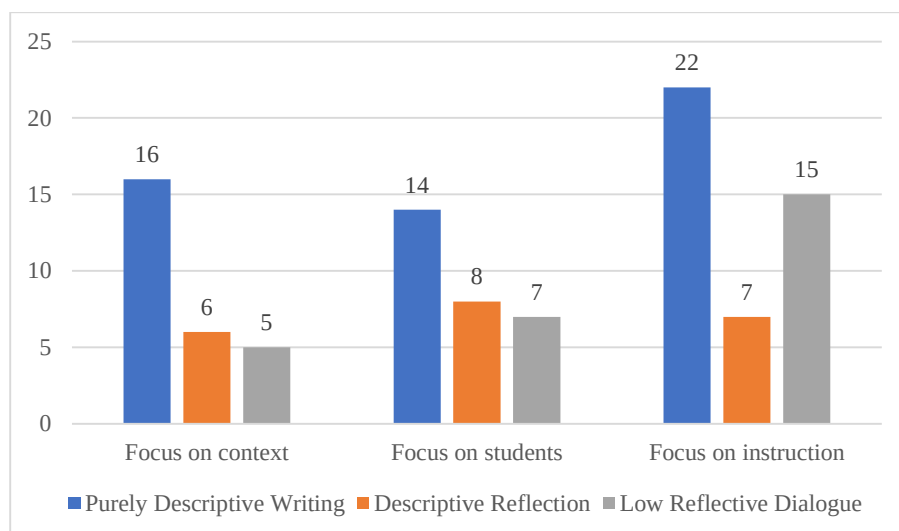


Figure 4. 84. The Form of Dialogue of Sevda Teacher's Reflections Under Each Focus

Figure 4.84 shows the changes in the form of dialogue of Sevda Teacher's reflections under each focus. As can be seen in the figure, her reflections are focused on limited issues relative to context, students and instruction. This figure also shows that there are some changes among her reflections' focus. The largest proportion of reflective units of Sevda Teacher (55%) constituted *descriptive writing*. In her reflections, she only describes what happened and how she responded to the situation, but did not provide an analysis of the problem by stating that "*I didn't remember how many times I reminded certain students to pay attention and listen to me, but I tried to keep those students busy until the class almost over.*"

The second largest proportion of the reflective units (22%) in her teaching experiences is *descriptive reflection*. In addition to the description of the case, she attempts to provide reasons or justifications for events or actions, but again reports or described events in an uncritical way as in stated in the following excerpt that "*I think I achieved it after I explained my classroom rules and expectations from students. They understood and accepted them.*"

Only limited reflective units (23%) are coded as *low reflective dialogue*. As defined previously, in addition to description and analysis of the problem, she steps back and tentatively explores reasons for the incidents treating pedagogical problems as stated in the following example reflections that are coded as dialogic reflection:

It is not possible to see everything, hear everything, and know everything in the classroom. But when I watched my classroom video, I realized that it was also my fault because I needed to put more effort into understanding my students and seeing them as a human being. Sometime I am confused about either treating them as a person or acting as a teacher not letting them forget that they are in my classroom.

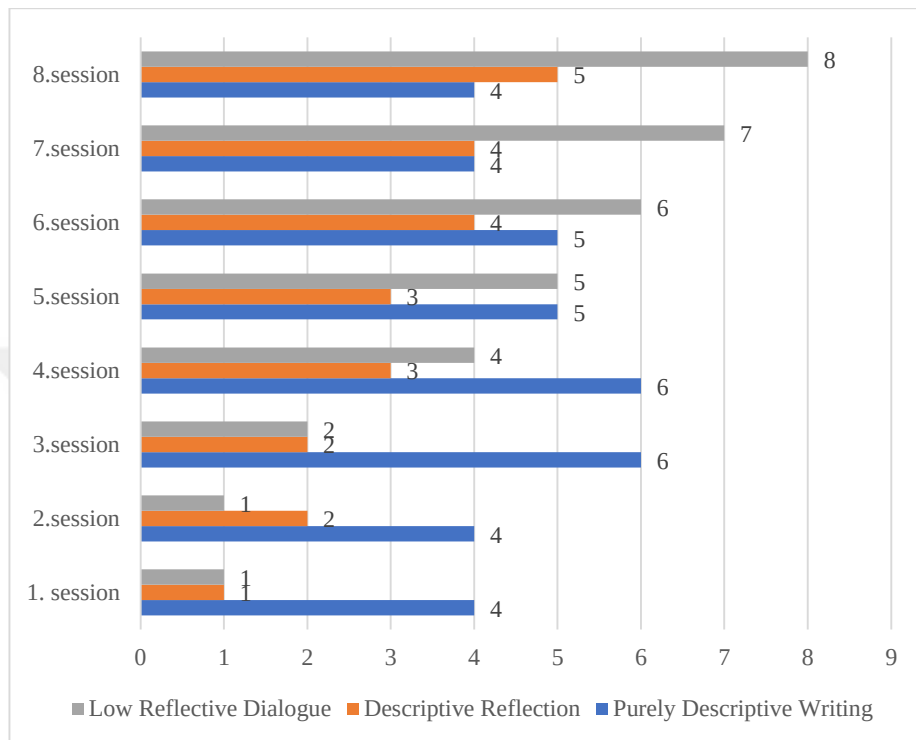


Figure 4. 85. The Form of Dialogue of Sevda Teacher's Reflections Over Time

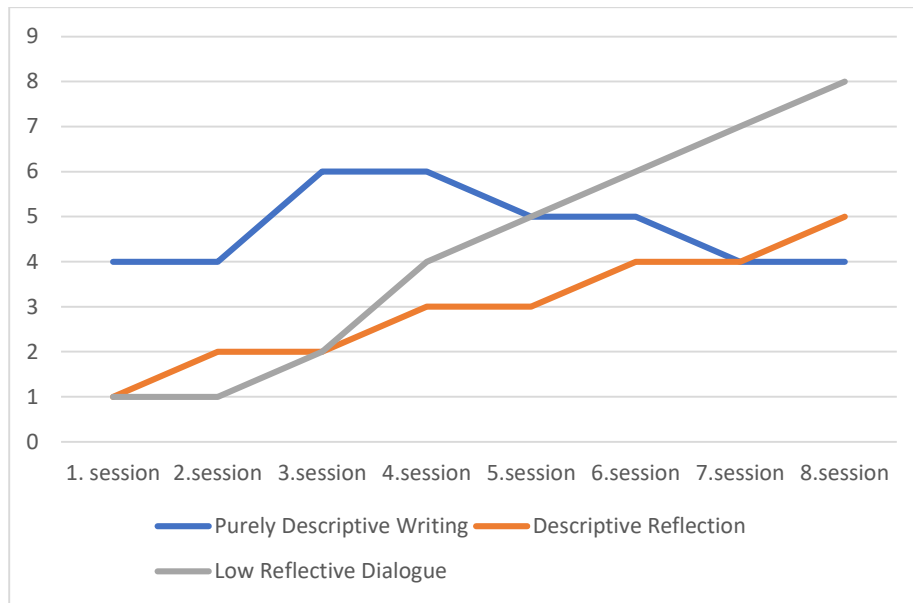


Figure 4. 86. Changes of Sevda Teacher's Form of Dialogue Over Time

As can be seen in the provided figures 4.85 and 4.86, the form of reflective dialogue evidenced in Sevda Teacher's reflections mainly belong to purely descriptive writing. Her reflections at the descriptive reflection category and low reflective dialogue are rather limited and they showed almost the same percentage. As can be seen in the figure 4.87, Sevda Teacher's reflection at low reflective dialogue and descriptive reflection apparently increases and her reflections at purely descriptive category are getting decreased while she is engaging in the reflective practices.

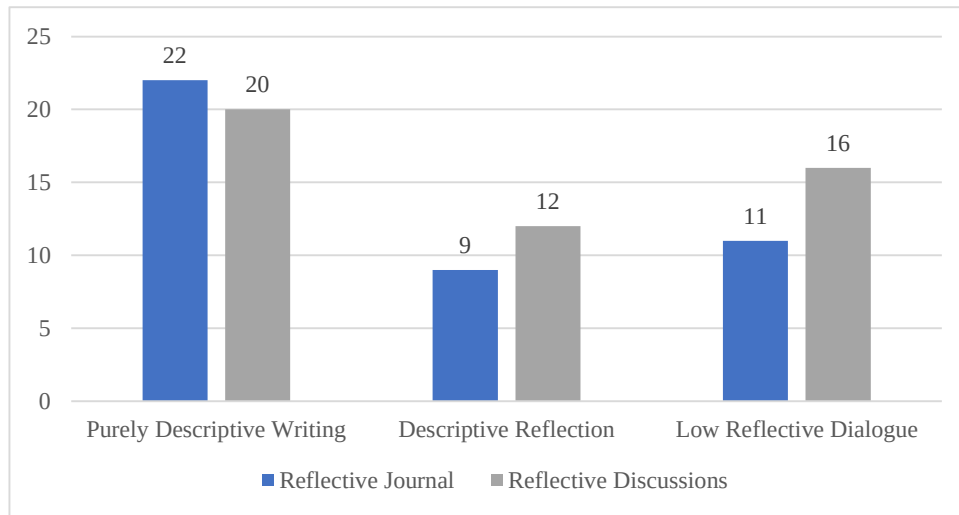


Figure 4. 87. The Form of Dialogue of Sevda Teacher's Reflections by Mode of Reflection

With regard to journal entries and reflective discussions, while she reveals mainly purely descriptive writing (47%). As can be seen in Figure 4.87, Sevda Teacher's oral reflections are deeper than her written reflections. Most of her initial reflections are recall-oriented in terms of what happened in the classroom without analyzing why those things happened or how to improve the lesson. Thus, her oral and written reflections mainly fall at the purely descriptive reflection. Her form of reflective dialogue in written form did not deepen over time while a few changes are found in her oral reflections.

4.2.4.10. Zeynep Teacher as a traditional teacher. The majority of Zeynep Teacher's oral and written reflection entries (55%) are at lower level of descriptive writing. At times, she links her personal experiences to particular situations in her own teaching practices. She shows progress in her form of reflective dialogue over time, with 24% of her later reflection at descriptive reflection and 16 % of her reflection at lower level of reflective dialogue and 4% of them at higher level of reflective dialogue. For better visual representation, the changes in the form of dialogue that Zeynep Teacher has are presented in the following figures below.

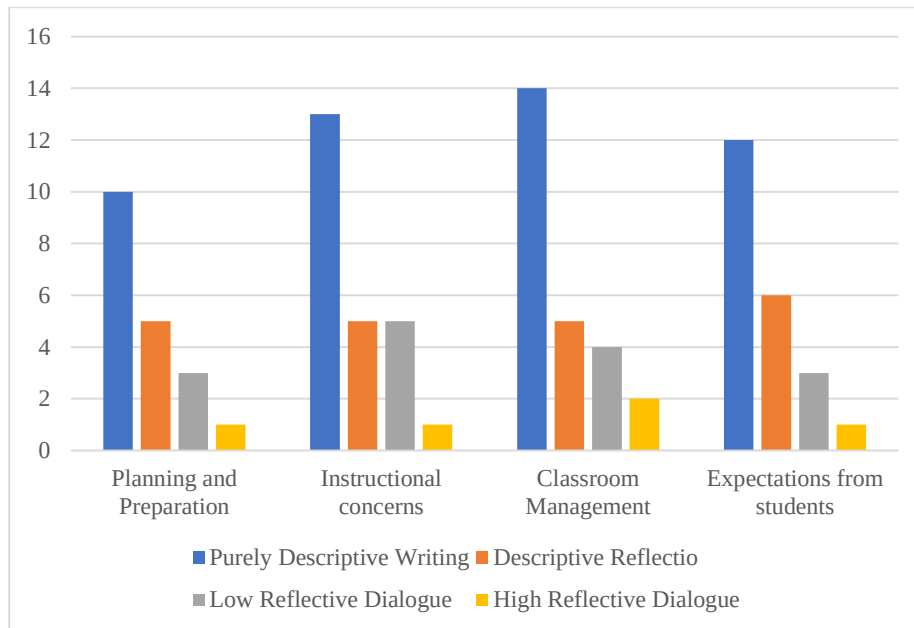


Figure 4. 88. The Form of Dialogue of Zeynep Teacher's Reflections Under Each Focus

As Figure 4.87 clarifies the tendencies in Zeynep Teacher's reflections as she gains experience in the guided reflective practices, there are some differences in the form of reflective dialogue under each focus that she reflects on during the current investigation. One noticeable feature of Zeynep Teacher's reflection is that her reflections are mainly placed at purely descriptive writing and other categories are very limited no matter of which focus she reflected on. There is evidence that she attempts to write beyond a descriptive level by including her own ideas and evaluation of the situations that she faces. This reflection included signs of her recognition of the role of individualization and different teaching methods. For instance, during a science class, she mainly describes the incident that takes place and demonstrates some form of reasoning why this incident happened in the following excerpt:

I observed that some of my students are relying too heavily on me for guidance on how to do the classroom activities. It concerns me that these students have not yet learned to follow my directions while doing an activity. There are some students who do not get what the other students pick up. This is because maybe Some activities are more complex and demanding that do not correspond to the students' level of learning.

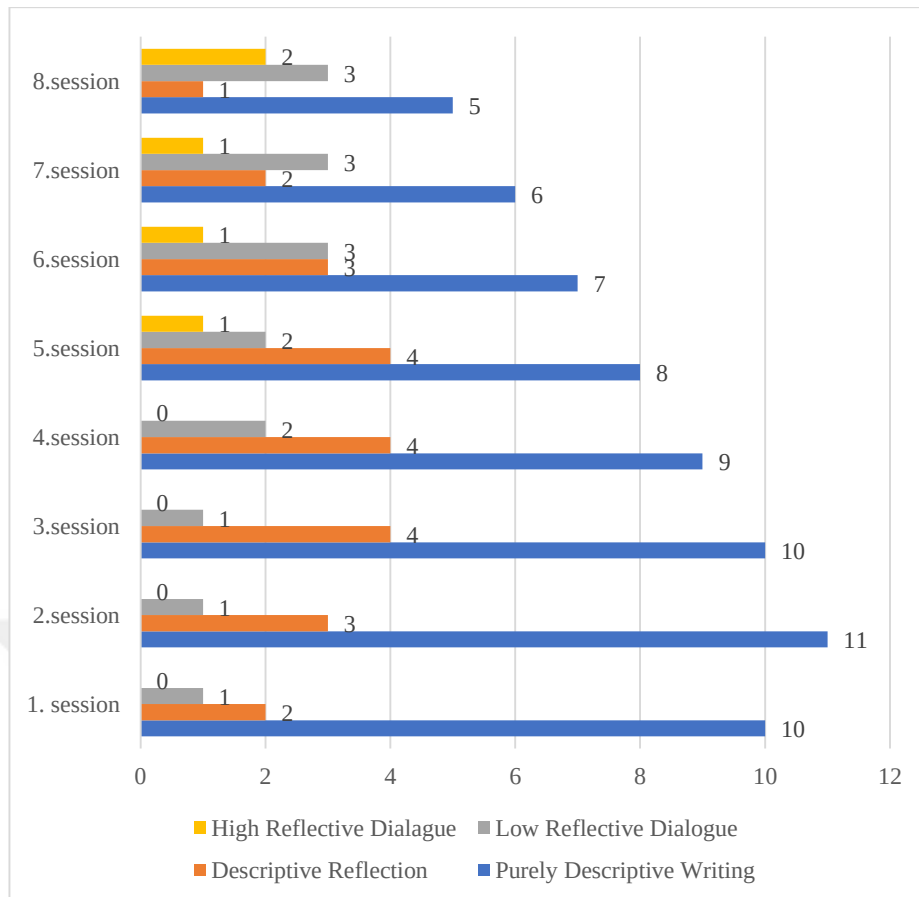


Figure 4. 89. The Form of Dialogue of Zeynep Teacher's Reflections Over Time

There is also evidence of association in her reflections through patterns identified and relationships observed, drawing a conclusion on the experiences and forming new insights. For example, in the following excerpt, she raises self-awareness that leads to changes in outcomes in teaching actions as well as her professional perspective. The following reflection indicates an increase in her future-oriented reflection with higher reflective dialogue:

Now I have more understanding on some of my students' feelings and also their family situations. I didn't ignore them but I need more time to help them. I need to show a good role model such as being patient, being soft when talking, being responsible and so on. I also have to engage in a good relationship with them.

The following reflections are characterized by more sophisticated analysis, personal involvement, as well as a focus on teaching practices with more reflective dialogue. This pattern is most commonly found in post reflections. Unlike previous reflections, the recent reflections tend to specify strategies for future actions, as well as evaluate

them. The following extract illustrates how Zeynep Teacher's viewpoints start to shift from herself to her students. For example, after describing the lessons that take place in the classroom, Zeynep Teacher argues:

I think that it was a good idea to take them to science laboratory, because they told me that they were bored with the repetitive work they were doing in class. I think that it was useful when I switched up the environment and type of activities. I must put more effort into listening to how they feel about my lesson.

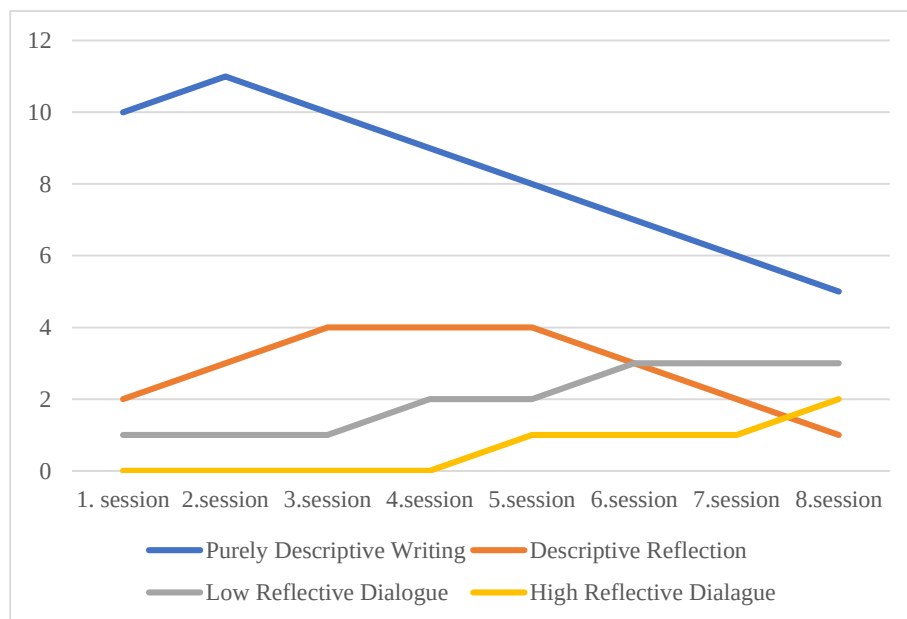


Figure 4. 90. Changes of Zeynep Teacher's Form of Reflective Dialogue Over Time

In Zeynep Teacher's case, there is no consistent trend in the form of reflective dialogue over time as can be illustrated in the Figure 4.89 and 4. 90. Her initial reflections consist of very conclusive descriptions based on her recollections of personal experiences or preferences. She does not attempt to include her rationale with her actions and decisions. Then, while she shows some progress in the engagement of reflective practices, her reflections extend to at the low and reflective dialogue categories and she shows a growing tendency toward deeper reflection even if they are very limited.

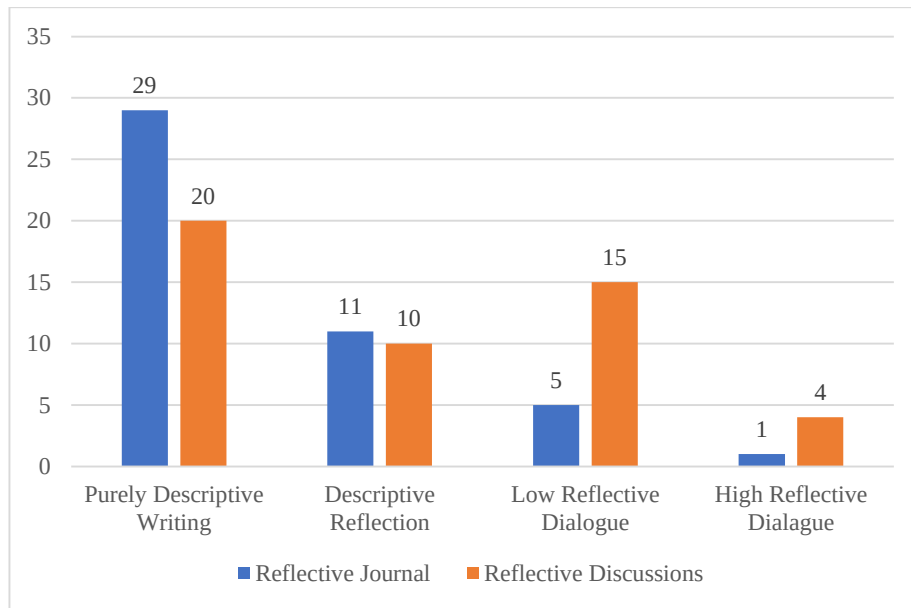


Figure 4. 91. The Form of Dialogue of Zeynep Teacher's Reflections by Mode of Reflection

As can be seen in Figure 4.91, there are differences in the form of reflective dialogue of Zeynep Teacher's reflections based on the mode of reflection, showing that Zeynep Teacher is more capable of higher reflective dialogue in verbal than in written format. Her reflections in journal entries are mostly placed at purely descriptive writing. She mainly reflects on events descriptively, without a sophisticated analysis of the classroom events that she describes. In the similar vein, her reflections in oral mode only display very limited progress.

4.2.5. The nature of the changes in the affectivity of reflection. In this section, the results of the analysis of the nature of changes in the affectivity of reflection is presented for each case of ten elementary science teachers. As previously mentioned, the emotions they experience their teaching practices that they reflect on are reported associated with the specific situational incidents.

4.2.5.1. Aysel Teacher as a sculptor. Although she reports experiencing a wide range of positive and negative emotions, in her initial reflections on critical incidents, she is more likely to describe experiences of her negative emotions such as frustration and hopelessness. She describes that she most commonly gets frustrated when her teaching is blocked by the misbehavior, inattention, or lack of motivation of her

students. She does not like talking about her difficulty with her negative emotions. For instance, she reflects in her first journal entry by saying that:

Yesterday, I was very positive and full of energy when I entered my seventh grade class. With my students we were having a great day, and several students just decided to get up and not to sit down for a while even if I warned them several times, I think they just wanted to get attention. This really made me frustrated. Nothing worked to go back to the lesson again. They just took my time for no reason. There were moments I felt deeply unhappy particularly with these children. They do not care about education. They do not even try.

On the other hand, her later reflections provide several examples of positive emotions (enjoyment and satisfaction). From her reflections, her enjoyment and satisfaction arose from particularly students being compliant with classroom rules or when her students show some progress in science lessons, she claims that she feels satisfied and she also describes her interactions with students as a positive experience.

I had a student who was not particularly motivated in my lessons. But I tried to talk with this kid and understand the underlying reason behind his disruptive actions. In these times, it was more the interaction with him outside the classroom on a one-to-one basis. I feel I'm becoming a more conscious teacher.

In the same vein, she realizes that students also have some emotions that might interfere with their learning when they are acting out. She tries to be more attentive to students' emotions in the classroom and more tolerated their emotional disturbances in line with her colleagues' suggestions. For instance,

After we talked about being responsive to students' needs and emotions and using I-messages to build a positive relationship with students, I tried to encourage my students if they have a bad day where they don't feel good or they didn't sleep well last night or there's a problem, they could tell me at the beginning of the class so that I did not expect from them to be engaged as much as I would normally. This somehow worked. They did not interrupt my teaching. They just sat and stayed quiet.

Finally, in the beginning of this investigation it is found that Aysel Teacher is most likely to attribute the cause of her negative feelings to students (83%), followed by circumstances (19%), and then herself (6.5%). Then, she shows

an effort to analyze the resources of her emotions. For instance, she describes the following incident that:

When a student put his head on the desk and seemed not to listen to me, I tried to be more tolerant because I realized that he had a bad day before coming to the class. Then, I just ignored this kind of behavior because I know this was not personal.

During classroom activities, for instance, when students are challenged and raised a lot of questions and asked for her help, she does not consider the situation to be a problem because that is exactly what she expects to happen. In such cases, she becomes excited and thinks that everything goes fine. On the other hand, when an activity goes quietly and students has no problems or questions, she considers the situation to be a potential problem, and starts to make changes in her lesson plan. She interprets the situation as indicating that the task is either too easy and boring or too difficult and unfamiliar.

4.2.5.2. Banu Teacher as a teacher in control. She easily addresses the affective domain through oral and written reflections. She records that she experiences both positive and negative emotions. She expresses negative emotions particularly in relation to problems of student disruptive behaviors. In her oral reflection, she explains her being disappointed and helpless when her students do not conform with classroom rules:

I want to make it clear that there is a boundary between me and my students. This requires keeping distance and being professional. That is why I always remind them which behavior is acceptable and which one is not acceptable and the consequences for violating the rules that I made. When they do not follow the rules, I do not know what to do and I feel disappointed. Because we need those rules for better class.

Also, academic issues give rise to reports of negative emotions in the accounts of her. She feels tired when her students do not show any interest in what she presents and gets angry with students who complain that things are boring after all the efforts she has made so far:

... I sometimes use traditional ways of teaching because it is not easy to find out the way for increasing students' interests. So, I am getting angry when I see some students not raising their hands and making

noise instead of listening to me and responding to my questions. I do not like noise in the classroom. Students of the new generation do not take any responsibility for their learning.

On the other hand, throughout this study her several reflections reveal enjoyment and satisfaction with her own teaching performances. She describes her positive feelings when she manages to motivate her students to participate in the lessons and to attain her lesson goals. In that sense, the dominant positive emotions that she clearly illustrates are mainly happiness and satisfaction by stating that:

I got great satisfaction when my students engaged in the activity and they had real fun. That means they were learning. I am particularly happier when the students who never raise their hands participate in the lesson and they seem to be motivated.

Her emotions are mostly attributed to the issues related to her instructional practices (25%), her role as a teacher (15%) and students' reactions and behaviors in the classroom (60%). More specifically, in her reflections, she generally places an emphasis on maintaining a healthy distance between her and her students because she gives importance to her own authority over students for better outcomes.

4.2.5.3. Esra Teacher as a wizard teacher. Esra Teacher reports experiencing a wide range of neutral, positive and negative emotions. Still, she is more likely to describe experiences of her either neutral such as calm or positive emotions as enjoyment, happiness and rewarding. She spontaneously talks about her happiness regarding classroom teaching experiences. The data show that the resources of her positive emotions are mostly related to students' enjoyment of their learnings in her classrooms (45%), building positive relationships with students (35%) and attaining her academic goals as a result of her teaching performance (20%). Overall, she still feels that she could really generate significant impact on students' learning in the school as she comments:

The exam results were satisfactory, but the change of my students' attitudes towards science made me even happier. To be honest like all teachers, I really care about the exam results. But when my

students told me that they thought science was fun and they were not afraid of science anymore, I felt rewarding.

On the other hand, she also reports that she most commonly has negative emotions when her teaching practice is blocked by the disruptive behaviors (35%) and lack of motivation and interests of students (65%) as in her journal entry that *“In class I usually get angry, when I feel that my students haven’t shown any interest in my lesson or when I entered the classroom in which disruptive behaviors of students still existed.”*

Her emotions are mostly attributed to the issues related to her instructional practices (45%), her relationships with students (35%) and students’ reactions and behaviors in the classroom (20%).

She expresses her negative emotions such as frustration and anger as minor, momentary feelings and not intense. She claims that throughout the reflective practices her understanding of being angry and frustrated is increasing, especially when she realizes that her thoughts and behaviors in relation to her teaching practices are influenced by the experiences and intensity of these negative emotions. On the other hand, despite her teaching experiences, she admits that she is not sure how to cope with her emotional complexities. That is why she says that dealing with her negative emotions enables her to focus more on the goal of academic learning and to nurture her relationships with students. Here is the example quote in her reflective journal entry:

I felt a bit overwhelmed as I did not know how to react to some situations ... During my entire career, no one had talked about how to manage our emotions in school contexts. At first glance, I was worried that other teachers would think of me as immature, unprofessional and incompetent. That is why sharing my emotions with other people was challenging to me. Still, I am glad we do this. I felt safer and confident because other teachers also faced similar situations.

Then, she tries to reduce her negative emotions in the classroom because she knows that yelling does not work or could hurt her relationships with students, which influences her effectiveness in the classroom. As an example, she reports her anger about students who has broken a science material in the

laboratory while fooling around, and then she realizes that staying calm helps her to achieve her goals:

I knew that getting angry could distract my students from what they were doing. So I needed to handle it in a calm way, I think it helped to continue and move on instead of letting this be the focus of this class.

4.2.5.4. Filiz Teacher as a high expectation teacher. Her emotions regarding her teaching experiences are identified at the beginning of the study, during and at the end of it. The following are the emotions she expresses: negative emotions (tension, disappointment, burnout and defensiveness), and positive emotions (rewarding, satisfaction, proud and enjoy). Her emotions are mostly attributed to the issues related to her relationships with colleagues and students (35%) and students' reactions and behaviors in the classroom (65%). All the positive emotional incidents cited by Filiz Teacher are rooted in the classroom. She values being missed by her students when she enters the classroom; being her students' favorite teacher; being loved by students; enjoying humor and informality with them; and creating a positive and friendly atmosphere in which she enjoys being together in the science lessons. She admits that she possesses more classroom power than her colleagues with showing more care. She reports her great joy with the relationships with her students, which becomes the major source of pleasant emotions. She describes her communications with her students as frequent, close and intense. She explains,

My relationship with my students...most of the time I am the authority in the class, but sometimes I'm like their mom.... they are more open to what I have to say, more willing to talk about their personal lives.

She also describes situations with her students when unpleasant emotions do arise. For instance, she shows evidence of her anxiety and defensiveness before her video footage is played within one of the discussion session and says that:

This was not a normal class... The one you are going to see today because students were going to do much of the talking without listening to me. It was not easy to stay calm and ignore their behaviors.

Another cause of her negative emotions is bad relationships or no relationships. She reports that building positive relationships with colleagues is hard. Insofar as exploring the emotions of participant teachers within the context of the current investigation, Filiz Teacher is the first one to share her disappointment regarding the school organization and colleagues in her current school. She reports the lack of support and encouragement she has at the school. She complains about the lack of communication with the principal and she describes her colleagues as non-supportive and not friendly. She describes an incident where she has a disagreement with the principal by stating that *“I had the struggle with the administrator, who was not an easy person to communicate at all. Now this year we are at the same place and do not feel any good about it now.”*

She expresses her negative feelings towards the school environment and she demonstrates certain attitudes of resistance towards working with her colleagues and principal at school. She complains about being misunderstood in the following quote:

...I tried to share what I was doing with other science teachers in my school so they too could instruct using more authentic methods. However, all they did was criticize me with a sense of jealousy.

However, she also indicates that it is important to determine whether there is a bigger underlying problem behind this bad relationship. As her participation in the reflective practices advances, however, she demonstrates her willingness to try to be more positive towards her colleagues. She tries to be more attentive to the communication problems with them and *“deal with them in a positive manner, try to listen and understand them.”*

4.2.5.5. Gaye Teacher as a caring teacher. Gaye Teacher’s emotions are mostly attributed to the issues related to her relationships with students (35%) and parents (25%) and students’ misbehaviors in the classroom (%40). She does not ignore the influences of family issues on classroom behaviors of her students. That is why she works to have positive and supportive relationships with them. In that sense, based on her reflections she believes in

accomplishing various responsibilities with multi-layered interactions with her students such as being a teacher, a caregiver, a role model, etc. She describes this relationship and the kinds of emotions she has in interactions with her students as stated in the following entry:

I have different relationships with my students like sometimes they see me as a friend or as their mom teacher in addition to as a teacher. I try to spend some extra time with them outside the school and this helps me to be more open to what I have to say, more willing to talk about their misbehaviors or problematic issues in the classroom.

Although she does not state the emotion specifically, her descriptions in her reflections indicate that building relationships with her students become the major source of positive emotions.

She also reports situations when negative emotions do arise. Classroom events where some students behave in unacceptable ways elicit intense negative emotions like frustration and anger. One example of this is documented in one of the reflective discussions describing Gaye Teacher's response to a student who is not listening to her and talking with his classmate. This incident is intensely emotional for her for multiple reasons. The following the incident, Gaye Teacher explains why she feels anger and frustrated:

I just feel really angry because I have really tried hard with him. I know that he has it really hard at home, it's really hard for him but he can't behave like he ignores me. He knows that if he needs anything, he can talk with me after the class time instead of sabotaging my lesson so it is just frustrating. I know he has potential but his bad relationship with his father really negatively affects his chances to fix mistakes.

Gaye Teacher also has mixed emotions that are triggered by the event. Interestingly, her response to the situation is not to punish him for his misbehavior; instead, she determines that she has to rethink her approach to working with him. Then, based on her student background and home life she thinks she has responsibility to be a teacher to guide him to talk with a counselor to support his psychological needs. Her belief in her student's potential to become a good student with her ability to empathize with his life

struggles lead her to reflect on the situation and think about a new course of action that might be more effective with her student. Instead of being angry or judgmental, foregrounding his needs calm her and encouraged her to focus on better ways to work with him.

Along with this incident she describes, her relationships with his parents tends to be stressful and sad. Tensions arise when his parents violate the professional boundaries Gaye Teacher tries to establish and when his parents do not actively support their son's learning and did not bother to visit Gaye Teacher to discuss his situation even if she invites them more than once after the incident occurs. She expresses these tensions in the following journal entry:

It makes me stressed when I do not have access to the parents; it's just sad. But then we always blame the students. They always blame the teacher for not paying any attention to their children's cries for help and I do not respect that because they do not care enough to be there for their son when he is in trouble. I talked with the counselor teacher in the school and other teachers as well to discuss what we can do to fix the problematic behaviors of students. Only thing that I want is to help him. That is all I can do.

4.2.5.6. Hale Teacher as an information giver. This part reveals how Hale Teacher's emotions are mediated by her interactions with students and her teaching performances. Her emotions are largely determined by the accordance of obeying or disobeying classroom rules (65%) and being more aware of her pedagogical preferences regarding students' engagement in the lessons (35%).

Hale Teacher always feels responsible for everything regarding her teaching practice. She is an enthusiastic teacher as she is in her first year of teaching. She mostly pays her attention to the major teacher work, particularly managing the classroom. Her reflections are generally embedded with negative emotions such as anger regarding the classroom management issues.

It was so unlike me to be angry in school. But, one time one of my hard working students did not finish the homework that I assigned. He seemed not to care at all. He did not say anything about why he could not do his homework. When the bell rang, he suddenly left his desk and kicked the garbage bin. When I saw this, I lost my temper

and yelled at him. He was petrified with astonishment. He did not expect my reaction. He later apologized to me and promised me not to do it again.

Obviously Hale Teacher could not control her anger. While describing her feelings regarding the incident, she realizes she should have done it another way. She needs to stay calm and seeks the reasons for why he could not finish his homework. She accepts that even she could give him extra time to finish his homework.

In the similar vein, she has a sense of failure if the students do not follow her instructions. She believes that her students are expected to listen to teachers. She is frustrated when her students do not listen to her while she is teaching. She believes that students should do what they are expected to do. If they fail to obey the rules, she gets frustrated.

I felt frustrated when my students did not listen to me and misbehaved in class. As a teacher, I need to have absolute authority over students inside the classroom in order to gain my lesson objectives.

Her other reflections show positive emotions mostly with her students when she enjoys her teaching practices. She is happy when her students display that they enjoy the lesson and improve their performance.

When my students are actively engaged in the lesson and enjoy being in my class, I feel rewarded and happy because I think my ways of teaching science are effective and my students learn what I teach. This is nice because I feel satisfaction with accomplishing my duty of transmitting the content.

4.2.5.7. Mine Teacher as a responsive teacher. As similar affective concerns emerged in other participant teachers' reflections, different forms of expressing those concerns also emerged in Mine Teacher's oral and written reflections. Her emotions are largely determined by the accordance of establishing relationships with students (65%), students' engagement in the lessons (25%) and her influence on students' progress (15%). On the whole, she describes various emotions most of which are considered positive (75%) whereas slightly less than half are classified as negative (25%).

Positive emotional expressions mainly include care, hope, and joy. The primary source of her positive emotions of care is her relationships with students. For example, she addresses the importance of establishing student-teacher relationships as in she expresses in her journal entry:

It is not fair we expect that students have to be willing and eager to learn all the time. I believe that my students can have a lot of different things going on in their lives and when something happens in the classroom, they cannot always react in the best manner as I expect from them as a teacher. So, I need to be understanding to their feelings and try to know them more personally. I try to talk to them outside the classroom. I care for every student in my classroom.

A second affective concern expresses by Mine Teacher is joy when students are actively engaged in the classroom activities. She notes the importance of using pedagogical approaches in order to promote students' engagement in her reflective discussions. She sympathizes with students who do not enjoy school and feel bored:

I try to teach my students science in an environment where we all enjoy what we are doing. I prefer an active and talkative class. I know when you walk in my class you hear a lot of noise. You see a lot of walking around and my students talking to each other. I do not want my students sit quietly at their desks. There are some students who do not enjoy being at school and mostly feel bored. In that case, I try to remember what it was like to be a student back day. I try to understand their feelings. Sometimes, it was hard for me to keep straight what I was expected to do. That is why I try to entertain my students with different kinds of activities and projects. This can hold my students' attention and I enjoy my teaching.

She also acknowledges that students' growth represents the greatest source of hope. She believes that her influence makes a difference in students' future lives. She argues that it is possible to see changes in students' attitude and behavior when she works with her students. Mine Teacher, for example, expresses her hope on issues of students' independence and autonomy, and in particular on encouraging active role in their own learning process:

I think one of the things that gives me a lot of hope is seeing my students become more confident in scientific concepts, and able to use them in their daily lives. That's really important for me when

my students are motivated. Then, I can say that my students will be successful in their future lives.

The relationships between Mine Teacher and her colleagues are often a source of negative emotions, particularly when she perceives differences in pedagogical approaches. She mentions her frustration about her colleagues' criticism and feels isolated from them in terms of her educational values as in she reports in one of the reflective discussion sessions:

Other teachers in my school seem not to be care for students' needs, interests, students' differences. They do not seem to have faith in their students about what they can do. I always think that they have such approach that students can't do it, they're not able to do this, they're not very good, they're even getting worse. I am not sure how they can teach with that mindset. For me, they also do not understand my approach and always criticize me. This is a big area of frustration.

Within the emotions that are considered negative by Mine Teacher, disappointment is described when other teachers have lack of trust in herself as a teacher. As a result of the negativity which leads to her disappointment with the lack of institutional support and lack of trust in herself, Mine Teacher often looks to the wider professional networks for collaborative growth and development. For her, not having professional support from her colleagues and not sharing with them are the main sources of her negative emotions as reflected in her journal entry:

I get really disappointed when I go to the teacher's room and cannot find a person to share my experiences. I need to meet with my colleagues who have a similar interest. I like talking about my teaching and by talking about it, I find it relaxing when I have a bad day. Otherwise, this room gives me a negative energy.

4.2.5.8. Sibel Teacher as an expert teacher. Emotions that Sibel teacher experienced are different mainly in terms of how she interpreted students' behaviors. Overall, she described various emotions among which the amount of positive (55%) and negative emotions (45%) is almost equal. She expresses her positive emotions such as happiness, joy and pleasure coming from her interactions with students (20%); watching them learn, having professional support from her colleagues (20%); and make progress (35%) and

showing respect towards her (25%). She feels pleasure when one of her 7th grade students who need additional support eventually succeed to understand the topic covered as in she notes in the following excerpt:

Oh, it's great... when I see him understand what I taught, who usually need additional help and time to understand. We worked together after the class hours in this week. I admit that it is the moment that I feel the most pleasure because when I spend enough time with this kind of students, I can observe they are successful like the other students. He also gained his confidence in the lessons and raised his hand when he wanted to respond my questions. I can say he is also happy like me.

She mainly describes the sources of contentment in relating to the issues of having support from the school environment. She feels most joy in the positive atmosphere resulting from overcoming obstacles through having support the people around Sibel Teacher. For example, she describes her contentment in the following vignette:

There are some teachers always supporting me when I have an issue. This is a good feeling. I do not feel alone or isolated in my school like the other teacher mentioned. I'm the type of person who likes having that supportive working environment and having colleagues, I can talk to whenever I need.

On the other hand, she experiences negative emotions particularly anger and frustration from a number of sources mainly related to disruptions of her goals. She mentions that she feels negative emotions when she taught the topic as she planned (20%), when her colleagues support her when she needs (15%), when her students violate the classroom rules (25%), when her students do not show any progress in academic works (15%), and when families of students show respect her judgments (15%). When she is asked to explore the most striking emotions experienced during her recent practice, her discourse is dedicated to the expression of her frustration when she could not get everything as she plans before the class and she loses the control in a moment and does not know what to do in the time of unpredictable students' behaviors as in the following except that she said:

In the first lesson, I said my 6th graders that we continued our lesson with an experiment in the science laboratory. They are always happy

when we carry out an experiment in the laboratory. I also enjoy implementing an experimental activity. I planned all the process but something happened that I took into account while planning. The activity was related to the topic of states of matter and we used little iron balls. I divided all students into groups and provided them more than one ball. But as soon as they got the balls, they all started to play with them. I know they are small and just kids. But I did not know what to do and tried to control myself and not yet at them. It took half of the lesson duration to stop them playing with the balls. It was frustrating because I could not do my activity and even I could not start it. It was a waste of my time.

Another situation that creates more unpleasant feelings are associated with misunderstandings of some parents. Sibel Teacher mentions her negative emotional experience with one of her students' mother as she is interviewed while analyzing a critical incident:

I know she is a single mother and she goes through a lot since her husband died. Her daughter is also aggressive towards me lately. I tried to ignore her at the first place because she is a teenager and now only person she has is her mother. I also know she underwent high pressure with the preparation for the high school entrance examination. But, last week, I could not control my feelings and I was really angry with her at her inappropriate behavior in the classroom. This was unacceptable because I haven't experienced this kind of incident before. I decided to talk with her mother and resolve this issue between us. I thought most parents were reasonable. However, this one was different. So, I talked with her and she blamed me I was not enough understanding towards what she experienced lately and at that moment I felt inadequate not as a professional teacher but as a human being. I told her this was not fair and I did not deserve this accusation for all I did for my students.

4.2.5.9. Sevda Teacher as a conscientious teacher. Sevda Teacher can be considered as an emotional person. In all the opportunities provided to her to reflect on her teaching experiences, she expresses her feelings on certain incidents. On the whole, she describes various emotions most of which were considered positive (55%) whereas slightly less than half are classified as negative (45%). There are seven different emotions expressed by Sevda Teacher in her reflections. Among positive emotions are eagerness, pleasure and satisfaction, while among negative emotions are disappointment, sadness, anxiety and anger. Her emotions are largely determined by the accordance of classroom management and lesson preparation (45%), students' performances

and motivations in the lessons (35%) and collaboration among colleagues (20%).

At the beginning of the study, during her initial interview, she expresses her eagerness to become a science teacher although sometimes she does not feel satisfied with her students' performances in the classroom. She usually made general statements such as, "*I couldn't have been happier with my students and my teaching especially when I have my plans.*" In the similar vein, she feels satisfied when her students display success and autonomy, and she feels disappointed when her students are not following instructions, not motivated towards the classroom activities or not doing their best. Another general reflection is stated by Sevda Teacher:

This week, I was very disappointed with how my lessons went. Some students were giggling and chatting but not working. I just wished my students could have showed some interest in my activities.

She does not only express her positive feelings but there were occasions when she expresses negative feelings. She mentions negative emotions towards students. For instance, she expresses her sadness when her students are fighting with each other. Especially she feels anger when her students did the exercise incorrectly because they did not follow her directions. Her relations with her colleagues are another source of negative emotions. She never hesitates to share the frustrations and challenges she faces with her colleagues in her schools. She wants support and trust from the principal. As she narrates in one of the reflective discussions:

Whenever I had any issues with students or their families, I tried to solve it on my own. But some problems could be beyond me, so I needed to take some advice from the Principal to know what to do. Most of time, he was not aware that his duty was to be there for us how to do it. That's why feel disappointed when he did not spend any time to hear me out and give me a solution.

She also complains about lack of professional support among peers and she does not trust them. The following quote shows this professional influence:

So, although some teachers in my school help me a lot when I needed, there are some teacher just do not care. For example, there are some paperwork we need to do. I prefer to divide the work among us because this saves our time. So, most of these teachers do not share their materials or paperwork. For me, this is not a pleasant work environment, that's why I think I do not trust them at all.

According to Sevda Teacher, she has to be careful about her emotions and she has to keep her emotional expressions under control. To be concrete, she generally prefers to hide or suppress her negative emotions especially anxiety and anger. The following example illustrates that negative emotions is usually seen as a threat for her authority in the classroom:

When I feel anxiety, I am good at hiding it because when students feel that your anxiety, you can lose control over the class. But when I feel angry, sometimes I tried to talk calmly with students, instead of shouting at them. But I am a human, as we all mentioned earlier, and there are limits to what I can do. And I try hard but if, you know, I accept that I cannot succeed every time.

4.2.5.10. Zeynep Teacher as a traditional teacher. The results show that Zeynep Teacher experiences a wide variety of emotions during the research. On the whole, she describes various emotions most of which are considered negative (60%) whereas slightly less than half are classified as positive (40%). She describes a total of eight emotional experiences: three different positive emotions and five different negative emotions are identified from the data. The emotions experienced range from enthusiasm and belonging to frustration and loneliness. For example, she describes frustration caused by lack of students' engagement and enthusiasm initiated by the recognition of students' progress in her lesson. Her positive emotions, such as happiness, motivation, and joy, always occurred in situations such as a positive relationship with students, classroom interactions, and outcomes of effective teaching. Findings indicated that Zeynep Teacher feels happy if her students make progress, engage in learning and enjoyed her teaching. Her positive emotions are largely determined by the accordance of students' progress and engagement in the lessons (65%) and her teaching performances (35%). Practice experiences are often heavily emotionally loaded. A set of positive emotions is present in situations such as student growth and her modified

instruction over a period of time. For example, Zeynep Teacher describes her enjoyment with the progress of her low-achievement students:

I have one class that I teach from the beginning of the semester. This class includes nearly thirty students who are mostly low achievers. At the first place, I felt much stressed when I entered this class. But I thought they are my responsibility. I tried to understand their individual needs, showed positive emotions to them, and adjusted teaching strategies. After a while, I realize that, like students in other classes, they were more interested in learning but they just learnt slowly and needed more time. I started to enjoy learning with them together and I feel pride, satisfaction, and enjoyment.

Also, she mentions experiencing negative emotions such as stress, worry, and tiredness regarding her personal and professional lives. It seems that she does not have enough time to establish a rapport with her family, have no energy to take care of her little child and to pursue professional development. Her negative emotions are mainly linked with not taking students' ownership of learning, not improving students' achievements, collegial relationships, and the imbalance between her personal and professional lives. Zeynep Teacher describes negative feelings caused by imbalance between her personal conditions and her professional requirements:

And the worst experience was the teaching practice. It was the most horrible eight weeks of my life. I had no life of my own. I have one little child and to get here, I need to change two transportation and round way takes at least four hours.

She feels unpleasant emotions as a consequence of unhealthy collegial relationship and ignorance of effort and contribution in addition to the imbalance of personal and professional life in situations such as heavy workload. One example demonstrates that Zeynep Teacher feels sad because of unhealthy collegial relationship:

I prefer a happy relationship with my colleagues. But, in this school, I was hurt by my colleagues because they do not provide any support for me. I have a little child and I have a long way to get here. At the beginning of the semester, I wanted to choose the morning the sessions because of my condition. But, they even did not try to understand me and they did not care at all. this was sad for me. I selected the afternoon session by chance. I tried to change but no one wanted. So, here I am. All the time, I feel tired and unhappy with my classes.

4.3. Cross-Case Analysis

In this section the main themes discussed in the case studies are summarized, compared and analyzed further to better understand how elementary science teachers' experiences during the guided reflective process impact on their development of reflection. That is, this cross-case analysis helps to uncover the factors impacting on the development. This section consists of two subsections as follows: (a) the nature of changes in the breadth, the depth, the form of dialogue and the affectivity of reflection; and (b) the factors affecting the changes.



4.3.1. The nature of changes in the quality of teacher reflection.

With regard to the breadth of the reflections, ten elementary science teachers describe their teaching experiences including five main issues related to teachers, students, instruction, evaluation and context. All participant teachers seem to believe that students are significant to the process of teaching even central to their teaching practices. Therefore, their reflections mostly include issues about managing classrooms and time, student behaviors, instructional preferences and lesson preparation. Differences in perspectives rest to what extent they have particular concerns to reflect on. All ten teachers describe their reflections on the teaching practices including issues related to nearly all five different aspects of teaching, namely teachers, students, instruction, context and evaluation. Among these main themes, all participants show greatest concern on classroom management throughout the current investigation. They mention their disappointment at the students' misbehaviors particularly in the beginning of the study. They generally express anger and frustration about their students' attitudes towards their lessons or themselves as well. On the other hand, this concern apparently decrease while they are engaging in the guided reflective practices where they realize the importance of building a positive relationship with students, gaining the understanding towards them, and having a positive and encouraging classroom atmosphere. Hence, their priority concern changes from classroom management issues and student disruptive behaviors to instructional preferences and lesson planning and preparation. All ten teachers illustrate awareness of the importance of being prepared for each lesson and having a detailed plan for not only better learning outcomes but also dealing with unexpected situations as shown in both their oral and written reflections.

As another dominant concern in the reflections, nearly all participant teachers reflect on what they did in the class and what they should do in terms of instructional preferences except Mine Teacher as a responsive teacher. Particularly, Mine teacher often expresses that she attempts to follow different and student-centered ways of presenting the lesson even she implements the activities in the most crowded classrooms compared to the others' classrooms.

In contrast, other teachers have concerns about seeking additional sources to improve their teaching. In that sense, Mine Teacher suggests other teachers about not only learning activities that she has experienced before. This illustrates not only the changes in the content of their reflection but also the importance of collaborative learning community for professional development of teachers. While the current study is progressing, all participant teachers show a growing interest on not to do this time and to do whatever they decide to do in their action plans for getting better outcomes.

The main issue that all participant teachers realize that building a positive relationship with students is the essential element for not only managing classroom but also effective teaching. All teachers believe that teaching would be better if they have a positive relationship with their students. Particularly, they wish to satisfy that they have a balance between being an authority in the classroom and building a meaningful relationship with students.

Another noticeable concern is contextual issues. Particularly, at the beginning of the study, nearly all participant teachers generally complaint about not being a decision-maker about their teaching in terms of selecting content and learning activities, time allocations for each content, and even the way of delivering the content mainly due to the nationwide mandatory curriculum. Most of the teachers prefer to use more direct instruction, demonstration experiments and asking questions due to inadequately equipped school facilities for other student-centered ways of delivering the content. Only Mine Teacher as a responsive teacher does not show the same pattern as the others and she strongly show her eagerness to become a decision-maker in her own class. That is, she tries to do what she believes important and effective for her students' learning process since the beginning. However, it grows gradually for other participant teachers as well. They eventually look at their teaching not from a self-oriented view point but with an awareness of teaching as a multi-faceted activity. This sort of growth indicates the more they experience the reflective practices the more they promote their teaching practices in line with the needs and interests of students.

In the similar vein, there is an increased concern regarding the teacher's role in encouraging their students' engagement and understanding in their lessons. As mentioned previously, nearly all teachers want to be a very strict teacher with every intention of maintaining the authority and resolving disruptive behavioral problems in the classroom. As they engage in reflective practices, they broaden and deepen the focus of their reflections from themselves to their students and classroom actions, extending their perspectives and understanding of the multiple roles and responsibilities that they need to have. All teachers start to raise an awareness of their students' viewpoints and their individual needs and less concentrate on their own needs and actions. They cite alternative teaching methods for different learners, and they point out the critical aspects of the classroom settings and school context, which indicates the growth of a critical consciousness.

All four categories of the depth of reflection evidence in nearly all ten teachers' oral and written reflections throughout the current investigation: Routine, Technical, Contextual and Critical. In which category of the depth of reflection elementary science teachers reflect on varied by different context variables, time and mode of reflection (written vs oral). Although all ten teachers' reflections indicate growth over time, only Hale Teacher's reflections are coded as all of four categories from Routine through Critical category.

As the changes in the depth of reflection are clearly illustrate in the figures provided in each case study: mostly decreasing at the Routine category and growing at the Contextual and Critical categories. In the cases of Banu Teacher, Sibel Teacher and Zeynep Teacher, their reflections show an increasing tendency at the Contextual category and there is not any evidence of Critical category in their reflections. Also, the majority of other teachers' reflections show a decreasing tendency at the category of Technical while reflections at Contextual and Critical categories grow by a small percentage. With regard to the depth of reflection of Mine Teacher, she is the only show significant growth in the category of Contextual and Critical categories and

she does not show any evidence of remaining categories (Routine and Technical) in her reflections.

The results of analyzing teachers' reflections show a consistent pattern in terms of the mode of reflection. All teachers show more strength in oral reflections than the written ones. Particularly, their reflections in journal entries occur mostly at the category of Technical while their reflections in oral format are placed at the category of Contextual or Critical. This suggests that their reflections reveal more depth in the reflective discussions than in journal entries even though each teacher has different abilities and preferences in expressing their thinking. This finding proposes that teachers are able to reflect deeper in a collaborative environment with other colleagues.

It is also found that participants' depth of reflection changes at different paces according to the focus of their reflections. There is a clear pattern indicated in ten teachers' reflections. For instance, their reflections on students and instruction become deeper than other issues over time. In contrast, their reflections on self and contextual issues gradually deepen in each category while they are engaging in the reflective practices. Since only Aysel Teacher reflects on the focus of evaluation, it is not possible to discuss changes by this content of reflections in every case of teachers.

Although individual differences appear with respect to the form of reflective dialogue in the written and oral reflections, the guided reflective practices produce several commonalities. All four categories of the form of reflective dialogue evidence in nearly all ten teachers' oral and written reflections throughout the current investigation: Purely Descriptive, Descriptive Reflection, Low Reflective Dialogue and High Reflective Dialogue. In which category of the form of reflective dialogue elementary science teachers reflect on varied by time and mode of reflection (written vs oral).

All ten teachers' reflections indicate growth over time with respect to the form of reflective dialogue. However, four of the participant teachers (Banu, Esra, Filiz and Zeynep Teachers) has all of four categories from Purely Descriptive

through High Reflective Dialogue. Only Sevda Teacher's reflections does not show any evidence of future-oriented or transformative reflections as the form of High Reflective Dialogue. In the cases of Aysel, Gaye, Hale, Mine and Sibel Teachers, more instances of descriptive reflections and low and high reflective dialogue are found in their reflections overall. As evidenced before, the majority of teachers' reflections show a decreasing tendency at the category of Purely Descriptive and Descriptive Reflections while reflections at Low and High Reflective Dialogue categories grow over time.

Similarly, teachers' reflections in the two mode of communication show a consistent pattern and improvement in terms of the form of reflective dialogue. All teachers show more strength in oral reflections than the written ones. Particularly, their reflections in journal entries occur mostly at the category of Descriptive Reflection while their reflections in oral format are placed at the category of Low and High Reflective Dialogue. In that sense, reflective discussions can be considered as a sufficient stimulus to deepen the reflective dialogue of teachers. This proves the commonly held belief that teachers support and improve their own reflective dialogue by the provision of reflective discussions within a professional community even the need for journaling to go beyond reflective dialogue is confirmed by the oral reflections of participant teachers.

It is also found that participants' form of dialogue changes at different paces according to the focus of their reflections. There is a clear pattern indicated that their reflections on students and instruction specifically go beyond to a critical analysis of the context, the issue and possible impacting factors with more emphasis on their future actions. In contrast, their reflections on self and contextual issues are placed initially at the most basic levels of reflective dialogue and they are gradually characterized by more sophisticated analysis and they propose strategies along with descriptive reflections over time.

This research also seeks to describe the affectivity of reflection throughout the reflective practices that they engage in. The changes in the emotions teachers experience in their professional lives are also summarized as follows.

In general, all participating teachers express emotions in dichotomous terms: the primary emotions of joy, hope and satisfaction and the opposed emotion of sadness, anger and frustration. The emotional discourse, especially regarding negative emotions, is relatively scarce as they gained experience in the reflective practices. Most of the negative emotions described are mostly related to the ineffective classroom management strategies and lack of students' engagement, whereas the positive ones are mostly related to interactions with students and their success in achieving learning outcomes. Students' well-being and success are the classroom situations in which positive emotions are most experienced by the participant teachers, whereas issues related to problems of student disruptive behaviors which interfered directly in the classroom trigger their negative emotions.

All participant teachers initially describe emotionally striking incidents with more negative feelings than those presented at the end of the study. The number of negative emotions reduced by interaction with students as the main sources of their satisfaction and joy. Particular attention is given to the students' classroom behavior. Teachers' anger, in particular, is associated with students' lack of discipline in class.

Also, teachers see other colleagues within this community as a critical friend supported for further reflection and critical analysis on the appropriateness and effectiveness of their action plans. Interestingly, teachers mention more professional emotions than their own personal emotions in their discourses over time. Nearly all teachers initially express surface emotions without recognizing their deeper emotions when they reacted to the situations that they encountered in their professional lives. Throughout the investigation, teachers are discussing about their emotions and how to cope with emotional situations that they encountered in the classrooms. As a result, there are some practices

that enabled teachers to identify and uncover the real motivating emotions for the situations in the classrooms. As they become more reflective and are engaging in the reflective practices, they start to adjust their classroom procedures and be more proactive to the emotional situations. They work on targeting the root of the emotional reactions and challenging the negative emotions she has about themselves and students. They also then are able to focus more on the classroom procedures, and trust the knowledge they have about curriculum and management as well as set boundaries for keeping the rules for the class. They also start practicing positive self-talk, reappraising situations as they arise where they may have felt offended in the past, and seeing themselves and students with more compassion. For instance, Gaye Teacher expresses her emotion-regulation strategy in which she gives a student a time out when he has disruptive behaviors in the class. Before the discussion, she mentions that she generally avoids students who evoke the difficult emotions for herself. However, according to her, this new strategy allows for herself to have time to think of what she would respond to the student in the most appropriate manner and to be calm before making a conversation with the student.

4.3.2. The factors affecting the quality of teacher reflection.

Throughout the current research study, elementary science teachers' reflections illustrate different nature of four main dimensions of our framework according to their key characteristics, personal backgrounds and school context that they are working in. This section provides some insight into the differences in the nature of the reflection. As previously mentioned, some teachers demonstrate relatively low integration of their ideas into their lessons and limited analysis, and other teachers demonstrate relatively high integration of their ideas into their lessons and more extensive and critical analysis in their reflections.

Since all participant teachers have different personal and professional backgrounds in their teaching career, their understanding and beliefs about educational issues varied. They have different personal characteristics such as

age, personality, and years of teaching experience, whereas the nature of their reflection are not affected by the teachers' years of teaching experience. Gaye Teacher, who is the most experienced teacher in the study, does not necessarily have the deepest reflection category. Likewise, the reflections of Mine Teacher who has less teaching experience are predominantly more specific to her students and in-depth compared to the reflections of Sevda Teacher who has more teaching experience.

With regard to their educational backgrounds, all participant teachers have educational bachelor degree in elementary science teaching except Esra Teacher who has chemistry bachelor degree and pedagogical certificate after she graduated. However, this different experience is not considered as a hindrance in her beliefs about herself as a teacher since she expresses her positive attitudes towards students and in her reflections she listens carefully to what the students' ideas are and what they are learning and she is worrying about how engaged her students are in the lesson. As in the case of Esra Teacher, the participant teachers who mostly center on students' interest and motivation in their reflections are more likely to have more meaningful and productive reflection and mostly move beyond description and toward more productive reflection involving critical analysis, particularly they have a desire to listen to more sides. Other teachers who gradually shift their viewpoints on educational issues from themselves to learners need further guidance on moving beyond description in their reflections.

In the similar vein, nearly all ten teachers feel confident in their teaching science except Zeynep Teacher since she has mostly teaching experience at the private tutorial institutes in which she supports students for the national high school entrance exams. Consequently, she mostly has concerns about pedagogical content knowledge and disciplinary issues since she expresses her feelings about not being comfortable in teaching in the crowded classrooms with diverse students' learning needs and levels. On the other hand, since Sibel Teacher and Hale Teacher has further educational background such as getting master's degree and PhD degree, they express their assurance of their science

content knowledge and consider themselves as an expert teacher and an information-giver respectively. Zeynep Teacher rarely questions her assumptions or generate alternatives to her decisions and she predominantly centers on subject matter her reflection rarely demonstrates the depth of critical analysis as in demonstrated by other teachers who are self-confident in their content knowledge. Still, all participant teachers seem to shift slightly over time and they have genuine respect for their students and to be concerned about what the students are learning and they describe what they would do next time to have better outcomes.

As previously mentioned, all participant teachers are asked to describe their personal beliefs about teaching science. This information provides a picture of all ten teachers' viewpoints on teaching and learning, roles and responsibilities of teachers and students and the elements of a successful science lesson. Even though all participant teachers differ starkly in their professional visions, they are all ware of the worthiness of the teaching profession. They all expresses their eagerness to be a science teacher and to be with elementary students. This is also noticed in their both oral and written reflections. Yet, throughout the reflective practices that they are engaging in, the connections that they are making between students and their learning and the impacts of a teacher's actions and decisions on students' learning become more explicit in the reflections of all participant teachers.

In relation to differences in the mode of communication to promote reflective practices, all ten teachers are ambivalent about the value of sharing in improving their reflective practices. They appreciate hearing the views of others on issues of concern because hearing others' views sometimes stimulated them to further reflection. On the other hand, they are sometimes reluctant to share their reflections because of their personal nature. On the other hand, collaborative professional environment makes a difference because all participant teachers are comfortable to share their own ideas with each colleague in the study. Thus, all participant teachers are unanimous that reflective discussions enabled them to have more productive and in-depth

reflections and they start to view teaching as an interactive process since the understanding of students is predominantly stressed in the reflective discussions.

Last but not least, it is observed that teachers' reflection is affected by the school context. All participant teachers are working in the schools in two main central districts, having similar school settings in which students with low or medium socio-economic backgrounds. Despite the similar school settings, the focus of teachers' reflections is often seen as unique and context specific, often links to the numbers of students in each class, the grade of students, the facilities or resources of the school and the interactions among other teachers in the school. For instance, since the students in Filiz Teacher's class are preparing for the national exam for high school entrance, Filiz Teacher predominantly has concerns about covering all the topics in the curriculum rather than using various instructional approaches. Another contextual difference among the teachers is the use of science laboratory. Particularly, Banu Teacher has no chance to use the science laboratory for experimental activities because the science laboratory is used as a regular classroom in the school. That is why she mostly performs the demonstration of experiments by using instructional technology. The interactions among colleagues in the school should not be also ignored in terms of teachers' reflection. It is clearly indicated that all teachers in this study attempt to avoid conflict with other science teachers in their schools and follow what other teachers cover. These are all contextual factors in restricting the focus of teachers' reflections.

4.4. Understanding Teachers' Experiences About the Guided Reflective Practices

Based on elementary science teachers' lived experiences and feelings about guided reflective practices, four themes emerge to seek answers of the third research questions. The following four key themes, subthemes, and extracted statements provide an analysis of participants' experiences about engaging in guided reflective practices: (1) Core beliefs about reflective practices; (2) Feelings about engaging in reflective practices; and (3) Advantages of

engaging in reflective practices; and (4) Challenges of engaging in reflective practices.

4.4.2. Core beliefs about reflective practices. When participants are asked about how they define a reflective teacher, they identify basic reasons of why they are willing to reflect on their teaching experiences.

Participants define a reflective teacher as a way to look back at their teaching practices ($n = 6$). They mention that teachers could learn from their previous experiences ($n = 4$) and in the community meeting, they are encouraged to take further steps regarding what they have learned from their practices ($n = 7$). Correspondingly, all participants note that reflection is similar to looking into a mirror in such a way that this process provides them not only a reflection of how they look but also who they are and what they have learned. They do not only have focus on the areas that they need to support but also on their strengths about their teaching practices ($n = 3$). For instance, Esra Teacher refer to a reflective teacher as

A teacher who is not only looking back after they engaged in teaching practices but also a teacher who looks forward. Reflective discussions helped us to describe both our strengths and the areas needed to improve. We did not just focus on how things went wrong, we also gave importance to what was going well.

All participants discuss the importance of learning from not only their mistakes but also their colleagues' experiences. For Mine Teacher, throughout the reflective discussion meetings with other teachers who also teach science education, she could learn what other teachers think about her teaching practices and how she could improve them. She finds opportunities to reflect together about what works and what does not work. With such a community, when she looks back at her reflections with her colleagues, she claims that she could make the necessary improvements before encountering similar situations and she could analyze the effectiveness of the methods and approaches suggested by other science teachers.

Another significant feature of a reflective teacher points out by participants is associated with problem solving. All participants describe how they are able

to solve their problems by using reflective practices with a professional community. Hale Teacher offers her experience with solving problematic situations and she recalls how they engage in reflective practices to solve problems based on real classroom situations and explain that as a first step, she identifies a critical incident as a focus to address in the meetings. Then, she analyzes the incidents critically and generates multiple solutions with my guidance. Before the future meeting, she reports that after she implements the suggested methods and approaches for problem solving, she shares her experiences in a collaborative problem solving context to discuss the effectiveness of the methods.

All participants also address how they analyze not only their actions but also contextual factors that has an influence on their actions through engaging in reflective practices. For Sibel Teacher, before the meetings, she already considers her teaching practices after her classes. Through reflective practices, she expresses her thoughts about how she spends more time on focusing on why these things are happening and what the underlying reasons are before jumping to draw certain conclusions. She gives an example of this theme by stating that:

I had a class, where most of the students were misbehaving during my class. I remembered struggling with students not following rules. At first, I was angry with them. I did not think about why they behave like that. I only recognized how louder students misbehaved in the class. After we discussed this incident with my colleagues, I realized that I did not think about why they were misbehaving in the class. I always blamed them for being disrespect not only for me but also their friends in the class. After reflecting on this incident within this community, I realized that my rules were negative and included “don’t do” or “no” to this. I also talked to my students in order to understand what the reasons of their behaviors were. I scheduled one-on-one meetings with each student to get to know them better. They explained that not only me but also other teachers labeled those students as problematic students, which made them repeat the behavior. I also noticed that there are two sides to every story, and as a teacher, I learnt that students had a different perspective about what happened because they came from different contextual backgrounds with different family structures.

It is essential to identify a definition of a reflective teacher through the participants' point of views in order to make this phenomenon clear through their experiences and feelings. For all participants, throughout the reflective practices, it becomes clear that the focus and concerns of teachers change from their self-perspectives towards students' needs and interests. They all have a desire to continually improve their own teaching practices in order to meet the needs of students. When teachers are asked to define a reflective teacher, each response is associated with particularly students meeting their needs, maximizing students' learning and enhancing students' engagement into lessons. Participants reflectively discuss that a reflective teacher should have certain characteristics, mostly directly tie into students. All participants define a reflective teacher as tightly related to develop such understanding towards students, careful thought about students' perspectives and caring their students, Esra echoes this notion by stating:

Reflective teaching has more to do with looking into mirror and fostering multiple perspectives in order to understand our students. Because we are human and we have reasons behind our actions even we are not aware of that. When I face a difficulty in interacting with students, I learnt there are both sides and as a teacher, it is important to show rapport with children and they could have problems before coming to class and when you have something in your mind, I really understand how difficult it is for you living in that moment without thinking about your own problems. I have never considered that if I want students to respect me and my lessons, as a first step I have to respect their needs and concerns. Reflection comes in that moment in order to do what's best for both my students and my selves.

As another dimension of features of a reflective teacher, participants describe their experiences of reflective practices as they recognize adapting and adjusting their teaching actions. Throughout the process, they are encouraged to be more open minded and to think critically. They note that reflective teachers should be active and work continually in order to improve their practices. Mine Teacher further explain about these features in this way:

I just learnt that I always need to open myself up to be a reflective teacher with critically thinking. I need to get to know what I do and why I do. I do not think I am a perfect teacher. But I always do my best for my students. I now notice that there is not one right way to be an effective teacher. This process required to be more patient. Because it is a long journey. As a reflective teacher, I need to consider the contextual factors

and I developed a tendency to wonder about the implications of my actions and the consequences of my behavior. So, thinking critically about my actions and their consequences made me feel that I am not only a reflective teacher but also a reflective person in my own personal life, my marriage and my relationship with my children.

Participants also share many details about that they make more efforts to implement a democratic and fair pedagogy in their classrooms. The reflective practices enable participants to change their beliefs, thoughts and decisions on educational matters in the context of their teaching process. They address the challenge of democratizing their pedagogy particularly to deal with classroom management issues. As a first step for effective classroom management, they establish an equal and respectful classroom constitution, in which every student has opportunities to contribute to make meaningful decisions about every aspect of teaching that affect them. This positive approach to the classroom climate also creates a place to work with a mutual relationship of equality and fairness. Gaye Teacher describes this theme by stating:

I have more energized classes. Sometimes, I have classroom management issues. My critical incidents are generally related to managing the classroom. After we discussed with my colleagues about several strategies to help with the management of the classroom, I found building more democratic and fair classroom climate was making an impact and it made it easier to teach with less minor behavioral issues. I allowed my students to know me as a regular person and this helped me to have respect as a person rather than a teacher in my classroom. Also, this made me see my students as more than just students. Now, they know me that I always respect their ideas and they also feel free to share their opinions within the classroom.

The understanding of teacher reflection is affected not only by teaching experiences, but also by their own personal life experiences. They speak of having children of their own as being a turning point in the way they view their students. They feel more empathy for their students especially when they encounter a difficulty or an issue related to students' behaviors. Zeynep Teacher explains that how the experience of having a child of her own affects her teaching by stating that: "*I always reflected on what would I think if my child is in this class? What would my perception be?*" Esra Teacher also discusses her feeling of empathy not only toward her students but also their parents by stating that:

I try to feel more empathy and during parent meetings I start to say at least one really great thing about their children but before I am not sure if I did that before. But now because I have a daughter, when I have conferences I better hear they also appreciate my daughter's performances.

Participants describe how reflective practices foster improvement in their teaching professions. The science teachers report the main motives driven for engaging in reflective practices is their focus on pursuing professional growth, which includes different subgroups such as addressing classroom challenges ($n=8$), and determining new alternatives for better instruction ($n = 6$). It is clear that all participants perceive a connection between their improved performance and their students' empowerment. Participants describe how they facilitate students' empowerment in relation to mostly building strong relationships with students ($n = 7$), caring more their needs and students ($n = 10$) and showing respect for differences of students ($n = 8$). They consider reflective practices serving as a guide for creating a learning environment, where teachers develop caring, enhancing strong teacher-student relationships and supportive peer interactions among students.

All participants perceive that reflective practices help them to adjust their teaching practices in order to come through students' needs because they explain that their actions and behaviors has an influence on students' performance in their classes. This can be referred as responsive practices of teachers, which teachers constantly reflect on the decisions and consequences of their actions, indicating a desire to respond to students' needs through integrating various methods and strategies into their teaching practices.

Participants report that they systematically question their teaching practices and engage in inquiry and are more open minded for further improvement in a way that they seem to create welcoming and caring environments for their students. They note that they develop empathetic approach to others, particularly students. They feel themselves more effective to managing classroom issues and time. During discussion meetings, after analysis of each critical incident, participant develop some action plans for future practices to resolve the issues in the case of encountering similar situations. Participants

claim that they give more importance to be more prepared against unexpected circumstances as a result of thinking teaching actions thoroughly, which reflective practices provide lots of opportunities for planning each lesson with the help of colleagues' suggestions.

4.4.2. Feelings about engaging in reflective practices. Participants in the study are asked to describe how they feel about engaging in reflective practices. They share their feelings about their reflective practices and beliefs that demonstrate a sense of self-confidence. All of the participants share their desire to continue their jobs for the rest of their lives and all report that they feel confident in their abilities as demonstrated in their sharing of the outcomes of their action plans created as a result of reflective discussion meetings with colleagues.

Six participants specifically reflect the increase in their sense of self-efficacy and speak about how reflective practices make contribution to their ability to stay strong in the face of challenges they encounter in their professional experiences, which are overlapping with feeling commitment to teaching. Among the participants ($n = 3$), Banu Teacher feels grateful and more committed after she is engaging reflective practices. She compares her previous mood and associated with teaching commitment to the physical exhaustion that she feels. She describes this theme by stating that:

Before these meetings, I always felt tired before, during and after each school day. sometimes, I got myself completely lost. But thankfully, becoming a part of this community made me feel I can handle this tired even it is still though for me. When I am doing reflection on a critical incident and I could not know the answer to resolve this particular issue, I am writing how I feel on my reflective journal and I am looking forward to meeting my colleagues to share my critical incident. And generally we almost always could succeed to find answers to my questions through reflective dialogue. Because we had colleagues with different experiences and ages. Everybody felt free to express their perspectives and experiences. And, I think that process makes me stay strong and be more motivated to go to school and teach my classes.

Participants reported that they experience professional renewal and re-energized, which enables them to strengthen their commitment to the teaching profession ($n = 7$). They appreciate creating such opportunities for themselves and their colleagues as members of the same community to reflect and learn together. This process helps them to re-energize together as well. Aysel Teacher speaks about using various tools for reflective practices provide so rich learning environment for each member of the community, which is totally energizing because it leads to engagement and better results through asking “what”, “why” and “how” questions. All participants explain throughout the process they feel well-prepared against unexpected situations and they feel well-positioned to make further adjustments and feel renewal when they implement resourceful strategies obtained from the meetings.

Besides, increasing in self-efficacy, in self-confidence, and in commitment to teaching and feeling re-energizing and renewal, all participants report that engaging in reflective practices encourage teachers feel accountable to change the existing practices based on colleagues’ suggestions. After identifying their critical incidents as a result of watching their own video footages and sharing them with colleagues, in the earlier stages, participants describe how difficult it is for teachers to accept that their teaching needed to change ($n = 8$). Gaye Teacher explains how she feels accountable to show progress in order to gain better outcomes of her teaching practices. Each time she discusses a critical incident, she wants to resolve the issue through discussions with colleagues. Participants also could see their changes in their actions in the video footages and other colleagues in the community encouraged each other to change. Parallel to this theme, participants are also motivated to make more effort to analyze the issues they identified in detail because they want to show other colleagues how they are motivated to make changes in their actions, and eventually see the progress in their teaching practices. Filiz Teacher has similar descriptions especially after she views her video recording of a lesson and stated:

When I was watching my video records, the first thing I noticed was that I tended to stand more on the left side of the room as I addressed

the class. I did not walk around the whole class. Even I could not be aware of that two students in the right side of the class were constantly talking with other and did not listen to the lesson. Also, after watching the video, I saw that I frequently called on the same group of students, who wanted to answer the questions that I asked them. I did not realize other students who also raised their hands it. As one of my colleagues suggested, I worked on my proximity to the students and made sure that I walked around the whole classroom to make every student engage in the lesson.

Participants share about how they enable to take ownership over their actions by analyzing and questioning their teaching practices. They are asked to address their areas they needed to improve. Within the meetings, they often describe several strategies for addressing their weaknesses. Regarding this, Zeynep Teacher discusses her responsibility for her improvement on her students, and she is open to any suggestions of her colleagues to be able to deal skillfully with the similar difficulties and she are more intrinsically motivated to face them.

4.4.3. Advantages of engaging in reflective practices. One key theme associated with advantages of engaging in reflective practices with ten overarching subordinate themes for better understanding of science teachers' experiences about the guided reflective practices is noted. All participants talk extensively about how engaging in reflective practices provides various benefits: (a) changing own mind set; (b) increasing sense of self-monitoring and assessment; (c) raising self-awareness; (d) increasing professional success and personal satisfaction; (e) gaining new insights that have immediate implications for their classroom behavior; (f) learning how to use new alternative instructional methods, (g) increasing trust in peer feedback; (h) creating resources for future teaching practices through peer dialogue; and (i) developing a sense of community.

Participants note that reflective practices are beneficial for their professional developments. As they discuss their teaching practices with colleagues, they are able to gain new insights on their teaching experiences ($n = 6$). Also, they talk about how their mind sets are changing in a way that they are strengthening their focus on students' needs as they are systematically questioning their own

practices and reflecting on decisions and consequences ($n = 5$). Filiz Teacher describes the way she put students first and empowers her 8th grade students, who are preparing a national exam for high school entrance, and asks them to evaluate whether the lessons are going well or not. This sense of caring for the students and to systematically question her practices aligns with changing her mind set, more focus on students' own meets and interests by stating that

The feedback that I got about how my students feel about the lessons enabled me to make decisions about my lessons' effectiveness. After attending the meetings, I tried to care about my students' feelings and opinions about how I delivered the topics.

Another significant element of reflective practice pointed out by participants is conducting a self-assessment regarding teaching effectiveness. They describe how reflection occurs through self-monitoring and assessment process in order to make sense of the experience and interpretations of their teaching practices ($n = 4$), which is seen as an advantage for increasing their self-awareness ($n = 3$) and the professional areas they need for improvement ($n = 3$). Gaye Teacher explains that in each meeting with her colleagues, they conduct a self-assessment so often in such a way that they are assessing what they are teaching, how they are teaching it, and if their students comprehend what they are teaching. She also describes the process of self-assessing their teaching experiences in response to colleagues' feedback. While participants express positive emotions around these professional practices, with the use of various tools of reflective practices, participants also enable to follow their progress by receiving feedback from colleagues. They indicate their willingness to look at alternative point of views from other science teachers. Banu Teacher points out that each teacher interprets same situation differently and then, she also gets many benefits from the observations of other teachers. She talks about how they feel trust each other because her colleagues provide the feedback about how they could improve their practices rather than concentrating on how she responds to the feedback or how their feedbacks make her feel. Also, she accepts that she could not see herself as other teachers notice in her performances. She simply states that the community offers a

trustable and friendly environment for themselves to share their opinions through reflective dialogues.

Correspondingly, the participants in this study explore various ways to continue to enhance and improve their professional practices. For many participants ($n = 7$), seeking out instructional strategies and methods is a keystone. Participants in this study believe that the reflective practices allow them to create and experiment with new ideas and instructional approaches to gain better outcomes because of various teaching experiences of other participants. They express that it is essential to learn from other experiences. Regarding this, they would like to do more if they have the resources and time. Participants demonstrate positive attitudes toward keeping up to date and innovative resources, which is also important for their future practices. All participants agree on creating a set of resources, materials and ideas, which emerged through discussing within reflective meetings. Sevda Teacher discusses various aspects of teaching such student-teacher relationships, classroom management, parent conference, etc. caused stress, which has negative implications on her job satisfaction. She mentions that after engaging in reflective practices, she feels less stressed. Within the community, participants introduce their issues need to be dealt with for better outcomes of their teaching performances with the use of critical incident analysis as a tool for reflective practices. Other participants also highlight the major role of reflective practices as a way for increasing professional success and personal satisfaction ($n = 3$) for their teaching experiences because they claim that these reflective practices offer an environment of collaboration as they question and modifying their own practices through supporting each other based on their needs. This process results in a more productive working environment with the increase in job satisfaction.

Last but not least, participants mention about their experiences of developing a sense of community with their colleagues throughout the reflective discussion meetings. Collegial relationships, such as building supportive relationships ($n = 10$), developing collaboration and cooperation ($n = 10$),

establishing rapport with colleagues ($n = 8$) through this professional learning community are woven in the interviews. Among the participants, they express how they feel free to share their experiences in a respectful and supportive environment ($n = 7$). Having colleagues experiencing similar situations within the community, is considered as an urgent need for all science teachers of this study. Being able to share their story with other colleagues who could understand it is seen as a great benefit. Zeynep Teacher highlights the sense of belongingness in this community ($n = 5$), where oneself surrounds with colleagues, as demonstrated with enthusiasm in her interview:

I had a number of different science teachers to reflect with. We have carried out various reflective practices in the meetings. It was really great to have time and space to do these kind of activities with my colleagues. We could share our teaching experiences with them without hesitation and we had a kind of supportive and respectful environment. In some activities, we paired off and just two of us talked about the critical incident, 'In this incident, this is what I did, this is what happened. This is how students react.' those were the most beneficial days for me.

4.3.4. Challenges of engaging in reflective practices. Although it is revealed that participants give importance to engaging in reflective practices, they acknowledge its obstacles. Participants identify lack of time and resources as a major obstacle in reflective practices. Teachers associate these constraints with mandated policies and administrative requirements. For themselves, there are daily demands and overwhelming responsibilities, which makes difficult to find enough time for reflection to improve their teaching practices. For instance, Mine Teacher also describes why, and how, she struggles with reflecting during the school day because of a heavy workload and this means that she does the most of her reflecting at home after the school time. Similarly, Sevda Teacher refers this theme to the lack of access to databases to find new materials, books and journals, and to keep themselves more updated like reflective teachers by stating that:

I don't have time to reflect because of extra things and responsibilities to do during the school day. There's not enough time and resources for engaging in any kind of reflection because I am doing one lesson and I have only 10 minutes break between each

lesson and it is really difficult to find time to think if a lesson went well or not.

Also, it is found that participants are dissatisfied with lack of support from their administrations and colleagues, which restricts the opportunities for teacher professional growth in one way or another. Participants are unhappy that they do not have opportunities to share their experiences with other teachers in their own institutions and to gain benefits from their experiences since they have a number of colleagues with various background, who are working in the same context. Besides lack of support from colleagues, participants are upset with the mandated policies of the institute which decreases their chances of engaging in reflective practices. For instance, they feel angry about how their administrations and more experienced colleagues disrespecting their power in employing different teaching approaches, methods and strategies which is considered as a prerequisite for being more reflective.

Needless to say, how much difficult it has been for participants to spend time on being reflective while doing their best to teach because they are additionally troubled with the burden on their shoulders to finish additional works with long working hours. Mine Teacher also sees about teaching in overcrowded classrooms as a hindrance for reflective teaching by elaborating that *“Our average class size is over 40 and I need to spend a huge part of my work time on checking my students' assignments and their pace of learning. I need to say that time is a challenge.”*

CHAPTER 5

DISCUSSIONS AND IMPLICATIONS

This current mixed research study yields important findings to document (1) the quality of elementary science teachers' reflection, (2) the changes in the quality of the reflection of ten elementary science teachers while they engaged in the guided reflective practices through critical incidents analysis with collaborative reflective dialogues, and (3) the meaning of reflection from the perspective of elementary science teachers who engaged in guided reflective practices through critical incidents analysis with collaborative reflective dialogues. The major findings of this research is discussed in this chapter along with implications, recommendations, and suggestions for further research.

5.1. The Quality of Reflection of Elementary Science Teachers

Four dimensional teacher reflection framework is used to explain how elementary science teachers employ reflection in order to consider the holistic view of the reflection they represent. The information gathered from a vignette-based instrument developed in this present study is evaluated. The findings are mostly associated with the depth of teacher reflection (nature of reflection), breadth of teacher reflection (concerns), form of reflective dialogue (form of writing) and the affectivity of reflection (emotions). This section presents the way those findings are categorized according to the four dimensional reflection framework.

5.1.1 Depth of teacher reflection. Concerning the depth of teacher reflection, all elementary science teachers participated in this study demonstrated all categories, except Critical category. In general, quite a large portion of reflections is interpreted as the transition between Routine and Technical categories where their reflections mostly tend to contain problems with addressing students' needs and interests, discipline of students' behaviors and lack of students' engagement. These reflective writings generally focus on blaming others and has focus on school context and concerns on lack of resources and time with crowded classroom size. These results are consistent with previous research (e.g. Dinkelman, 2000; Erginel, 2006; Francis, 1995; Kayapınar, 2010) and suggest that teachers generally rely solely on pedagogical preferences and instructional related issues used to accomplish predetermined objectives and they applied reflection narrowly, limiting it to their thoughts about students' disruptive behaviors, and to whether they are achieving outcomes for their students (Benade, 2015). There are several possible explanations for this result. A possible explanation for this might be that nearly all participant teachers stated that they did not use any reflection tools or methods for challenging assumptions and questioning their existing practices. Based on this information, this may relate to the fact that teachers do not critically analyze what happens in the classroom and that they are more likely to be technician rather than reflective practitioners as Schön (1987) stated that technician teachers can be considered as self-related and one-sided in this regard. It seems possible that this result is due to the fact that reflection does not occur in vacuum. It can be inferred that teachers are more likely to lack required skills for and experiences in engaging reflective practices as Russell (2005) suggests, some teachers need support for learning how to reflect.

Also, it may have something to do with writing as another element that is attributed to the quality or relevance of what they write as reflection (Brookfield, 1995; Freidhoff, 2008; Larrivee, 2000; Reid, 2004). The knowledge and experience as well as the attitude they hold towards the topic they reflect on might matter as well (Reed, Davis & Nyabanyaba, 2002). What

is more, the intrinsic value, which teachers give to the reflective practices, also exerts its own impact (Pennington, 1996). It could not be beneficial when they are asked to reflect without their seeing any value in the act of reflection (Cole, Maxwell & Martin, 1997). Moreover, some authors (e.g. Russell, 2005; Zeichner & Liston, 1991) have speculated that reflective practices require an appropriate and supportive school context in which teachers can have collegial support and can discuss their ideas with their colleagues. The teachers whom we believe to be the more reflective are teachers who discuss their work with one or more colleague at their school (MacDougall & Drummond, 2005). Last but not least, in reviewing the literature, research is found to identify influences of national examination on teaching. Related studies suggest that teachers mostly have major concerns about the student performance on the national examination (Darling-Hammond & Rustique-Forrester, 2005) and due to preparation for exams, the use of instructional strategies focusing on the higher order thinking skills such as reasoning, problem solving and critical thinking has tended to decrease (Jones & Egley, 2004; Stecher et al., 2000), which may result in the loss of instructional time (Linn, 2000). Thus, they mostly think that they do not have enough time to engage in reflective practices (Bishop, Brownell, Klingner, Leko, & Galman, 2010).

5.1.2. Breadth of teacher reflection. With regard to the breadth of the reflections, the findings of this study indicate that elementary science teachers focus on five main issues related to teachers, students, instruction, evaluation and context. The overall results for the breadth of reflection indicate that the main concerns of teachers are instruction related and the teacher themselves. Both these two themes are closely associated with teacher actions. The next most frequent categories are student and context related. In contrast, evaluation is the least discussed issues. These results match with those observed in earlier studies (e.g. Cavanagh & McMaster, 2015; Star & Strickland, 2008) and suggest that teachers are more likely to focus mainly on teacher actions rather than student-related issues.

As shown in the result section, content analysis of teachers' reflections gives us the opportunity to trace what those teachers focus on across eight different imaginary situations. It is important to note that the means of the depth of the reflections vary in accordance with the focus of teachers' reflections. These findings, while preliminary, indicate that there occurs a difference in both the depth and the breadth of the reflection of teachers and suggest that it is hard for teachers to move beyond immediate concerns of their teaching practice (routine) towards long-term inquiries of their profession particularly when they have concerns about the categories of teachers and students. In the same vein, it is also apparent from these results that, majority of the reflective units under the categories of instruction and evaluation mainly concentrated on the basic requirement for the completion of lessons and the transfer of knowledge without addressing to the specific rationale that are regarded as the technical level of reflection (Van Manen, 1977). It can thus be suggested that instructional-related factors and evaluation aspect of teaching may be of critical importance. This study signifies that the teachers engage in more routine and technical reflection with no critical reflection (Cheung & Wong, 2017). These results are not very encouraging and might be no further evidence of reflection beyond the Contextual category. Their reflection rarely occurred at the Critical Category where they examined the ethical, social and political consequences of their actions considering the ultimate purposes of schooling

(Larrivee 2008). It is thus possible that teachers are more likely to see many of the imaginary situations presented in the instrument only from their own perspective, not from more open perspectives. This feature implies that critical reflection is a challenging task even to experienced teachers (Macdonald & Tinning 2003; Ovens & Tinning 2009). These findings are also in agreement with the findings of Maccullum (1993), Sprinthall, Reiman and Thies-Sprinthall (1996) and Reiman (1999) which showed a close relation between the nature of reflection and the capacity to consider a situation from different perspectives. That is to say, teachers are more likely not only to look at the things differently but also to see differently (Luthenberg, 2008).

5.1.3. Form of reflective dialogue. Regarding the form of reflective dialogue, there are also some clear differences among the focus of reflections. Overall, the participants have reflections which are primarily placed at the transition between Descriptive Reflection and Low Reflective Dialogue. This result means that majority of the reflection contents do not articulate beyond mere description of events with some evaluative remarks but do not give any reasons, justifications or rationale for their entries. However, the findings of the current study do not support the previous research (e.g. Hatton & Smith, 1994; Tsui, 2003; Dinkelman, 2000; Francis, 1995) and contrary to these studies, experienced teachers are not more likely to reflect beyond the description of events and do not have the ability to further justify their descriptive events positioned them into deeper reflection. Our preliminary results challenge this idea of the fact that teachers need to be more analytical and interpretive as they gain more experiences in teaching profession.

Another interesting finding is that the form of reflection exhibited by teachers in their reflections is varied across different reflection focus. It becomes apparent that when reflections of teachers address the themes in relation to Focus of Evaluation and Focus of Context, they reach a higher form of reflective dialogue than those focusing on Teacher, Students and Instruction. While comparing the weight of each focus area, it can be revealed that although the teachers focusing on Context and Evaluation are not more prevalent than

those focusing on Self, Students and Instruction, they have a higher reflective form of dialogue, which requires to provide some degree of reasoned justification or explanation on what has been described. These results indicate that teachers relate to the contextual issues and evaluation aspect of teaching in a way that they are enabled to deepen and internalize them comparing to the issues of methods, self and students (Laboskey, 1994). These findings also echoed previous research carried out by other researchers (e.g. Cheung & Wong, 2017; Gelfuso, 2016) on the typologies of written reflections by teachers and have indicated that reflection is content specific.



5.1.4. Affectivity of teacher reflection. The impetus for this study is also an exploration of the affectivity of teachers' reflection. Specifically, what emotional and personal issues related to teaching and learning that teachers express might be while reflecting upon specific and imaginary situations. The reflections of elementary science teachers include highly emotional experiences that call up a mix of both positive and negative emotions. Some emotions are generated by a mismatch between their expectations and the realities they encounter during their teaching experiences; they also frequently discuss being surprised by specific situations or contexts such as lack of resources, crowded classrooms and overloaded curriculum. Elementary science teachers connect their discussions of emotions to specific situations or contexts predominantly interactions with students, evaluation of students' learnings, managing the classroom, organization of the lesson, etc. While teachers' pleasant emotions seem to be associated with a range of desirable outcomes, including student motivation, enjoyment of learning, attainment of students' performing well (Babad, 2007; Frenzel et al., 2016), their unpleasant emotions tend to be linked to undesirable outcomes, including disruptive behavior and decreased achievement among students (Aldrup et al., 2018; Arens & Morin, 2016; Frenzel et al., 2016; Klusmann et al., 2016). teachers discussed more positive emotions than negative in the context of reflecting on their concerns about students, and this result can be explained the idea of caring developed by Noddings (2012) as in Cochran-Smith (2003) asserted that *"teaching involves caring about students as human beings"* (p.372). Yet, teachers also reported experiencing a variety of negative emotions with increased enthusiasm for the disciplinary issues and lesson preparations, which are consistent with previous research (Frenzel et al. 2016; Tsouloupas et al. 2010) suggesting that students' lack of discipline in class is associated with teachers' negative emotions. In keeping with the findings of the present research, as argued by Chang and Davis (2011), students' misbehavior in the classroom represents a *"threat to teachers' instructional or management goals"* (p. 102), which is strongly connected to negative emotions.

However, the findings of the current study in accordance with teachers' negative emotions and the lack of lesson preparations do not support the previous research by Liljestrom, Roulston and Demarrais (2007) who demonstrate that the negative emotions expressed by teachers is dominantly student directed and not self-directed although it is consistent with those of Bullough et al. (2011) and Harmsen, Helms-Lorenz, Maulana and van Veen, K. (2018) who discuss that lack of preparedness to teach is another source of teachers' negative emotions. Teachers also reported neutral and surprising emotions with a limited number of mentions. Teachers mostly preferred to express their emotions relatively neutral either in the case that they seemed "apathetic" or they did not want to say anything or do anything about the issues. It appears that teachers may not have prioritized reporting their emotions. A possible explanation is the selectivity of the sample in the present study, which comprises of mainly experienced teachers. Ria et al. (2003) found that experienced teachers who have more than five years of teaching experience are less emotionally challenged than novice teachers. That is why they did not prefer to express their emotions in relation to the specific situations.

Taken as a whole, the findings of this study provide evidence of the fact that teachers' emotions can vary across situations (Deci & Ryan, 2000). This means that the emotions that teachers display can be linked to the context specificity (Hagenauer & Volet, 2015), as teachers interact with different students, and work in different schools. The context-related differences are more likely to have influence on how teachers feel about their teaching experiences.

5.2. The Nature of Changes in the Quality of Teacher Reflection with the Guided Reflective Practices

This study also attempts to shed some light on the process and outcomes of the guided reflective practices within a collaborative professional learning environment. The analysis of the data reveals the depth, the breadth, the form of reflective dialogue, affectivity of reflection, the changes of teachers' reflection and the factors influencing their reflection.

5.2.1. Changes in the depth of teacher reflection. Concerning the depth of reflection, overall results indicate that even though significant patterns in the changes in depth of reflection are not found, they show different trends over time within four months, mostly decreasing at the Routine and Technical categories and growing at the Contextual and Critical categories. Regarding different mode of reflection, deeper reflections are evidenced in reflective discussions compared to the reflective journal writings. These differences can be explained by the fact that the opportunities to share reflections through reflective discussions allow the participant teachers to reflect deeper category. As Valli (1997) asserted, teachers' reflection does not occur in a vacuum. Rather, it is situationally driven and contextually bound (Tsangaridou & O'Sullivan, 1997; Ovens & Tinning, 2009), since the presence of an external voice can serve to challenge current ideas and practices (Boud & Walker, 1998).

This study show that the depth of reflection is affected by the teachers' reflection focus and the extent to which the teacher connected their thoughts with actions. In this regard, there is a clear pattern indicated in ten teachers' reflections. Although all participants demonstrat four different categories of the depth of reflection, they are mainly engaged in Contextual and Critical reflection particularly where they focused on students and instruction related. In contrast, their reflections on self and contextual issues predominantly occurred in the Technical or Routine categories. This is interesting because there is a widespread belief that teachers mostly rely solely on self-related concerns in their reflections. Our preliminary results challenge this one-sided belief and confirm that each teacher see the issues differently as each brought their own personal foundation of theoretical knowledge and set of teaching experiences with them (Boud & Walker 1998; Jung, 2012; Larrivee 2008; Van Manen 1977).

5.2.2. Changes in the breadth of teacher reflection. This study confirms that elementary science teachers make little progress toward improving their reflection over time through engaging in a wide range of reflective practices, such as keeping journals, analyzing critical incidents and sharing their ideas with their colleagues. With regard to the breadth of the reflections, the findings of this study indicate that ten elementary science teachers described their teaching experiences including five main issues related to teachers, students, instruction, evaluation and context. In their reflection about teaching experiences, regardless of which incident they reflect on, all participant teachers struggle with managing classroom, teaching methods, and timing, ordering and structuring of the lesson. These results are consistent with those of other studies (e.g. Bain, Ballantyne, Packer, & Mills, 1999; Cavanagh & McMaster, 2015; Lee, 2004; Shoffner, 2011; Star & Strickland, 2008) and suggest that teachers concentrate mainly on teaching actions rather than students learning in the beginning of the study.

However, based on data analysis, one main conclusion emerges. While they are progressing throughout the study, their primary concern on student learning and student engagement greatly shaped their reflections. This implies that with the contribution of their participation in the procedure of guided reflection within a professional community environment, their focus shifts from what they are doing toward what their students are doing. This shift leads them to adjust their instruction to meet different student learning needs and to increase their engagement in the activities. They begin to build a positive relationship with students, to understand the students, and then to create a productive classroom atmosphere. In this regard, teachers need to be encouraged to analyze their teaching experiences in line with the perspective of student learning rather than of their teaching actions.

Yet, these findings cannot be extrapolated to all teachers. These results therefore need to be interpreted with caution. It is important to bear in mind that all ten teachers are chosen based on the criteria on the idea developed by Dewey (1933) as the reflective action requires three main attitudes: (1) open

mindedness, (2) responsibility and (3) wholeheartedness. Thus, they all showed greater willingness to devote effort to improve their teaching practices. Also, they feel responsible and are open minded to give and take constructive criticism about their teaching practices. This finding, while preliminary, suggests that although improvement over time is accomplished, teachers' dispositions to become a reflective practice are the major contributions to their encouragement of growth in the teaching practices (Holt-Reynolds, 1992). Moreover, it is important to note that if teachers attach more importance to reflective practice and perceive it to achieve significant benefits, it is likely to have a significant impact on their promotion of reflective practice (Bean & Stevens, 2002).

5.2.3. Changes in the form of reflective dialogue. Another characteristic of those teachers' reflections is related to the changes in the form of dialogue. Overall results of this study indicate that although individual differences appeared in their written and oral reflections, the guided reflective practices produced several commonalities concerning the form of dialogue. All four categories of the form of reflective dialogue evidence in all ten teachers' oral and written reflections throughout the current investigation. These findings are expected and supported by the previous research (e.g. Cavanagh & McMaster, 2015; Star & Strickland, 2008) which demonstrated that teachers can advance beyond simple descriptions of classroom incidents when reflecting on their teaching experiences. In that sense, participant teachers of this study are not simply described what they have noticed but are also seeking to understand the causes of these events and imagine alternative future actions for better outcomes as they are engaging in the reflective practices with my guidance.

It is also interesting to consider the changes in the form of reflective dialogue of ten elementary science teachers with respect to time and mode of reflection (written vs oral). In this regard, all ten teachers' reflections indicate growth over time regardless of the focus of their reflections. This result agrees with the common assumption that it is not hard for teachers to move beyond

immediate concerns of their teaching practices (Descriptive Reflection) to addressing long-term inquiries in their profession (High Reflective Dialogue).

Another important finding is that the differences in the form of the reflective dialogue across two different mode of reflection. All teachers show more strength in oral reflections than the written ones. Particularly, their reflections in journal entries occur mostly at the category of Descriptive Reflection while their reflections in oral format are placed at the category of Low and High Reflective Dialogue. In that sense, reflective discussions can be considered as a sufficient stimulus to deepen the reflective dialogue of teachers. This indicates that the teachers are more willing to imagine alternative actions for their own lessons while they are sharing their views with other participants in the reflective discussions. This result could simply show that over time teachers valued shared discussions on their own teaching in explaining causes and imagining future actions as consisted with those of Muir and Beswick (2007) and Bain, Ballantyne, Packer and Mills (1999) who suggest that teachers appreciate the opportunity for dialogue and perceive it to be a valuable contributor to go beyond self-report with the intensive involvement of both critical analysis and future actions of their teaching.

It is also found that participants' form of dialogue change at different paces according to the focus of their reflections. There is a clear pattern indicates that their reflections on students and instruction specifically go beyond to a critical analysis of the context, the issue and possible impacting factors with more emphasis on their future actions. In contrast, their reflections on self and contextual issues are placed initially at the most basic levels of reflective dialogue and they are gradually characterized by more sophisticated analysis and they propose strategies along with descriptive reflections over time. In accordance with these present results, previous studies (e.g. Husu, Toom & Patrikainen, 2008; Lee, 2004) have demonstrated that reflective practices enable teachers to question their practices, identify social and cultural constraints or facilitators, and also vision their work into the future. Broadly, this research confirms the valuable influence of guided and structured

reflective practices in the development of reflection on teaching practices and advances the understanding of the role of reflective practices in enhancing professional practice of teachers, as it is expected based on several authors (Husu, Toom & Patrikainen, 2008; Leijen et al., 2009; Sööt & Leijen, 2012). In line with several authors (e.g. Benammar, 2004; Dewey, 1933; Leijen et al., 2012; Procee, 2006), the results of the current study also confirm that reflection should happen in interaction with others and the oral reflection conducted within a collaborative professional learning community is more beneficial than reflecting alone in order to move beyond towards deeper and productive reflection. In that sense, this study adds to the dearth of description in the literature about practices that can be used to promote reflection in groups of teachers. As Wildman and Niles (1987) pointed out, there should be three major constraints to the successful development of reflective practices among teachers in the public school settings. The primary constraint is associated with a lack of the required time to develop teachers' ability to reflect since reflective practices can be considered as a cycle and evolutionary process in which teachers need time to give priority to effectively engage. Other major constraints predominantly cited in the literature are a lack of administrative support (Minott, 2010) and having a narrow mind to take the risk of changing in their own professional practice to create better learning environments for their students (Marcos, Sanches & Tillema, 2011). Furthermore, according to Nolan and Huber (1989), when reflective practices is done in a structured and dedicated manner over a period of time, teachers gain more benefits from the process in terms of personal empowerment and increasing control over their professional practices. This current study is responsive to address these constraints to elicit effective reflective practices for the participant teachers.

5.2.4. Changes in the affectivity of teacher reflection. It is apparent that teaching is considered as an emotional practice in which teachers use their emotions all the time (Babad, 2009). This use of emotion can be helpful or harmful for their professional performance (Hargreaves & Fullan, 1998). Last but not least, this research also sought to describe the emotions that ten teachers experienced in their teaching practice. In general, among participant teachers,

pleasant and unpleasant emotions are cited in their reflections and included all kinds of emotions from joy and happiness to disappointment and anger. Teachers' positive emotions are aroused mostly in situations where they have interactions with students and they feel successful in achieving learning outcomes. On the other hand, negative emotions are triggered by the situations of lack of managing classroom and lack of students' engagement in their lesson. These findings further support the idea of teachers' feeling of responsibility for not only quality of teaching but also students' achievements (Prosen, Vitulic & Skraban, 2011).

The analysis of both written and oral reflections also indicate that teachers' negative emotional discourse is relatively scarce as they gain experience in the reflective practices. All participant teachers initially describe emotionally striking incidents with more negative feelings than those presented at the end of the study. The number of negative emotions reduced by interaction with students as the main sources of their satisfaction and joy. These results may be explained by the fact that participant teachers are encouraged to become aware of the underlying appraisals they gave to certain situations, mostly related to students' behaviors, through their emotions (Zembylas, 2014). In this regard, this study confirms that the guided reflective practices contributed to better emotional understanding in a way that they built positive relationships with their students (Ishak, Iskandar & Ramli, 2010).

It is somewhat surprising that teachers mention more professional emotions than their own personal emotions in their discourses over time. Nearly all teachers initially express surface emotions without recognizing their deeper emotions when they react to the situations encountered in their professional lives. However, as the study progresses, they work on targeting the root of the emotional reactions and challenging the negative emotions they have about themselves and students. They also then are able to focus more on the classroom procedures, and trust the knowledge they have about curriculum and management as well as set boundaries for keeping the rules for the class. They start practicing positive self-talk, reappraising situations as they arise where they may have feels offended in the past, and seeing themselves and students

with more compassion. This study produces results which corroborate the findings of a great deal of the previous work in this field (e.g. Hosotani & Imai-Matsumura, 2011; Zembylas, 2014).

Besides this, teachers are discussing their emotions and how to cope with emotional situations encountered in the classrooms. As another strength of this current research, an external view of teachers' emotions is provided for the participants through mostly using self-reports of their critical incident analysis during reflective discussions. In this regard, they are enabled to identify and uncover the real motivating emotions for the situations in the classrooms. As they become more reflective and are engaging in the reflective practices, they start to adjust their classroom procedures and be more proactive to the emotional situations. It seems possible that these results may be due to the fact that teachers' emotional awareness, emotional balance and capacity to analyze situations and recognize emotions might be promoted throughout the present study (Bahia, Freire, Amaral & Estrela, 2013).

5.3. Teachers' Lived Experiences About the Guided Reflective Practices

This study is comprised of what and how the elementary science teachers experienced guided reflective practices. Although the importance and potential benefits of reflective practices has been stressed in the literature, the studies on how teachers use reflective practices for their professional development is limited (Marcos, Sanchez, & Tillema, 2011). Therefore, this study contributes to the literature because the results acknowledged how elementary science teachers used reflective practices toward professional growth.

As the data gathered are analyzed and triangulated, four main categories arise in order to answer the last research questions of the study. The first one makes reference to teachers' core beliefs about reflective practices. The second category presents a description of the teachers' statements about how they gain benefits from experiencing reflective practices. Another category is associated with the teachers' feelings about engaging in reflective practices. The final

category stimulates teachers' views about the challenges that influence their reflective practices.

One of the main purposes of the meetings is to facilitate reflective dialogue for elementary science teachers' professional performance and therefore, promote changes in their teaching practices through the critical analysis of identified problematic situations by themselves. Even though there is a lack of common agreement regarding a definition for reflective practices or how teachers undergo reflective practices (Tannebaum, Hall, & Deaton, 2013), science teachers in this study believe that reflective practices provide the opportunity for them to develop a sense of community. The teachers view reflective practices within a nurturing environment in which they developed a feeling of trust and feels respect for each other while sharing their ideas and experiences. Collaborating and reflecting with colleagues is important to the teachers, since they develop a sense of belongingness in a community where they work together as a team to solve their problems. In this vein, teachers highlight the importance of working with colleagues to spend their energy both for teaching and reflecting on their practices. This generally stems from the fact that the sense of ownership is considered as an urgent aspect of interacting teachers with each other for collective professional development (Decuyper, Dochy, & Bossche 2010). Teachers need colleagues whom they trust and whom listen to them in respect. Thus, feeling a sense of emotional safety, collective responsibility and trusting each other to share participants' personal experiences can contribute to promotion of reflective dialogues (Admiraal, Lockhorst, & Van der Pol, 2012).

The science teachers in this study define and describe reflective practices as self-monitoring and self-assessing of their teaching performances. This finding of this study support the notion that reflective practices are considered as invaluable for teachers to understand their own beliefs about teaching and learning through an examination of their own practices (Horn & Little, 2010). They use reflective practices as a mean of thinking critically about their teaching performances and taking steps to incorporate diverse methods of

instructional practices for meeting their students' needs and interests. In this way, teachers believe that the spirit of sharing, communication, and a setting for reflection would be promoted. Communicating instructional ideas and sharing them with peers might help reflection to be evident in teacher communities (Wardrip, Gomez & Gomez, 2015).

Reflective practices are described by the participants in this study as a process involving both looking back and looking into mirror to improve their future teaching by not only learning from their own experiences but also from their colleagues' experiences. This implies that the teachers initiate a process of consciousness; they reflect on their practices, so that they are required to remember things, to describe their practices and to question their inner thoughts about the aspects of teaching (Bengtsson, 1995).

Science teachers in the study denote different professional values for reflective practices that they engaged in. In relation to the teachers' needs for modifying their instruction, they argue that reflective practices promote self-motivation, self-efficacy, and self-confidence through making efforts to address the issues and challenges of their teaching, which is parallel to previous research (Hall & Simeral, 2017).

As the study advances, the participant teachers describe certain characteristics of a reflective teacher. They report that they value their students as human beings who needed to be offered not only academic supports but also affective supports. This evidence portray that the teachers feel responsible for their students and are willing to be there for them. The teachers apparently consider reflective practices as the means of holding themselves accountable for improving their teaching and for meeting needs of their students (Finlay, 2008).

The teachers in the study tend to spend more time reflecting on issues such as classroom management, effective teaching strategies, and the needs and interests of students. The understanding of teacher reflection is affected not only by their teaching experiences, but also by their own personal life

experiences. They speak of having children of their own as being a turning point in the way they viewed their students. They also feel more empathy for their students when they encounter a difficulty or an issue related to students' behaviors. Also, the teachers express they are willing to try new practices and they realized the importance of innovating and how reflection promote changes of their teaching practices in such a way that they provided more democratic learning environment for building positive relationship with their students. Teachers think that in meetings, it would conducive to discuss how students are motivated to learn considering their individual differences. Differentiation is regarded by the teachers as one of the crucial element for effective teaching outcomes. Through reflective practices, the teachers focus on individual differences that each student brings to the classroom. Teachers have conversation about alternative and effective ways to differentiate their instructional practices to foster better learning outcomes through promotion of reflective dialogue with colleagues (Horn & Little, 2010).

The teachers identify professional development as a way to innovate, update their pedagogy and change their actions. Each one feels more committed in her teaching performance. Throughout the study, the teachers explain their experiences of sharing with others in order to solve various problems that they encountered. The problems encountered by the teachers range from difficulties with managing the classroom and using alternative teaching methods. The teachers describe the reflective practices of seeking an appropriate collaborative context in which they could find the solutions of their problems. Besides gaining more experiences in teaching, it appears to be important for teachers being in an environment that is conducive to promote reflective dialogue (Raywid, 1993). The teachers in this study expresses that being able to talk with a colleague is so important even if they do not feel comfortable doing so within their own school. Observing and reflecting with other colleagues allowed the teachers to compare and contrast their own teaching, and to learn from considering alternative perspectives. They speak of having discussions with other colleagues in order to define problems, receive feedback, consider alternative perspectives, and to share their successes. The

importance of sharing of teaching experiences through critical reflection with peers is emerged in a way that teachers have desire to have time to meet with other teachers in the similar contexts in order to reflect and collaborate (Bold, 2008).

Notwithstanding the heightened interest in promoting reflective practices, the last category intends to describe how factors are described and the extent to which they might have inhibited teachers' reflective actions. In supporting teachers to engage in reflective practices, a number of challenges are encountered by the science teachers participated in the study. The listed challenges include lack of time and resources for teachers to upgrade themselves, their heavy workload with long working hours, and lack of support from colleagues and administration of their institutions. This study is a further proof of the idea that reflective practices suffers from a number of theoretical and practical problems, as envisioned by Akbari (2007). Challenges with reflective practices are associated with the demanding nature of the approach itself and the complexities involved in its implementation in teaching profession.

5.4. Implications of the Study

The findings of this study have several theoretical, methodological, and practical implications that attempts to serve to advance approaches to the study of teacher reflection. More specifically, this study has three important implications especially for teachers, teacher educators and policy makers: (1) assessing teachers' reflection through working with vignettes as an efficient technique based on a four-dimensional framework (2) the role and main features of various reflective practices through critical incidents analysis with collaborative reflective dialogues; and (3) the factors contributing to the changes in the quality of teacher reflection over time and by different modes of reflection. Through adopting this approach of reflective as a social practice with multifaceted dimensions, the developed theoretical framework for reflective teacher are modified and enhanced as the Figure 5.1. Different

dimensions of reflection do not remain separate and are thus productively associated with each other.



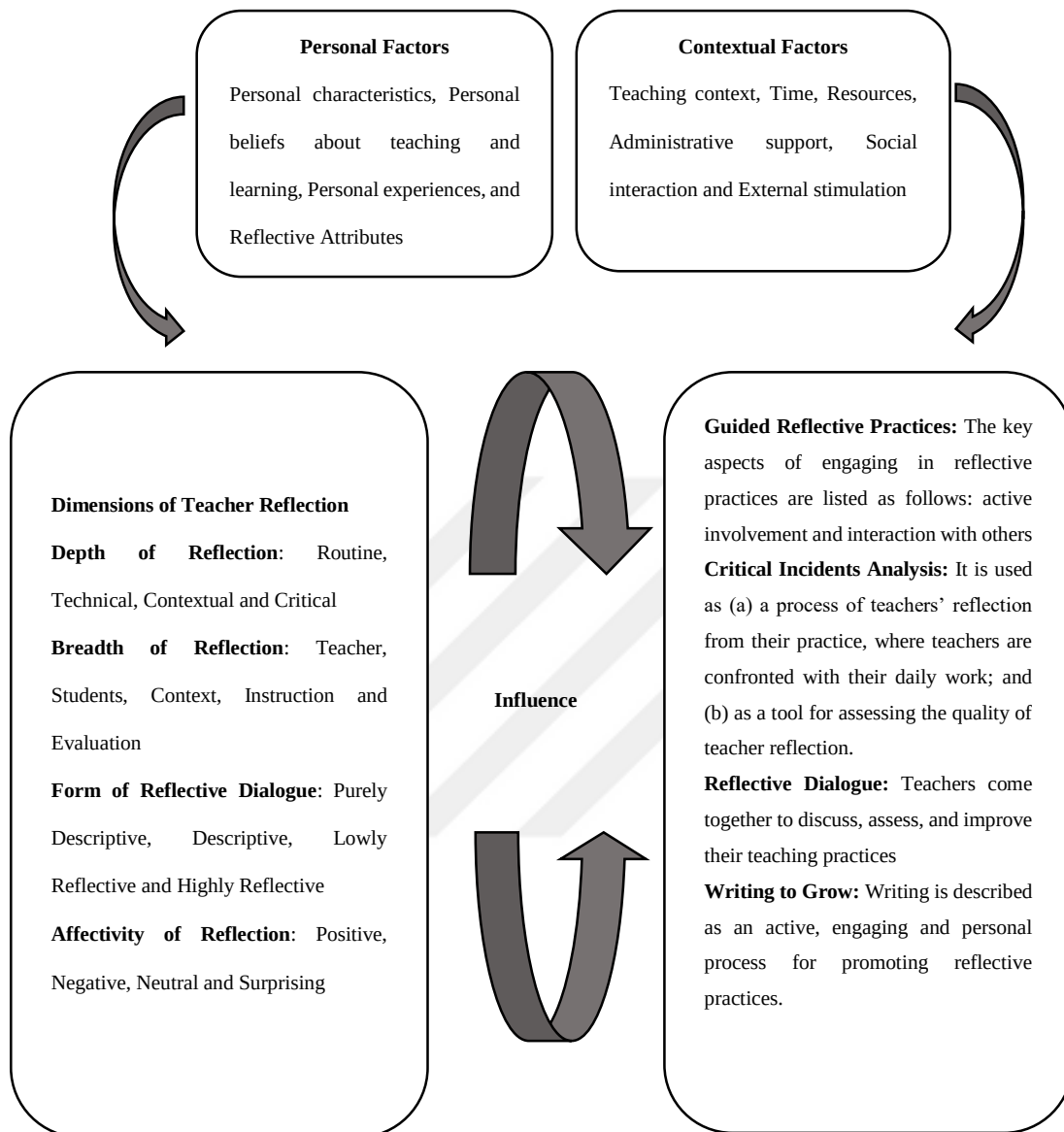


Figure 5. 1 An Adopted Theoretical Framework for Promoting Reflective Practices

Throughout the current investigation, the definition of teacher reflection has been questioned. The main reason is that previous studies have adopted hierarchical structures specially to identify different categories of reflection, mostly based on the content of reflection. However, the recent research studies revealed that what a teacher reflects depends on the context and situation. In other words, when a teacher is concerned with moral and ethical issues, this demonstrates deeper reflection, on the other hand, when s/he just agrees with other people, s/he can be called as a non-reflective teacher. Therefore, in this study, teacher reflection is viewed from multiple perspectives: the breadth (content) of the reflection, the depth (level) of reflection, the form of dialogue and affectivity of reflection. In an attempt to develop a valid and a reliable process for identifying and assessing teacher's reflection on vignettes in relation to science teaching, it is important to describe four dimensions of reflection. In this study, a vignette-based instrument with preliminary but promising results are presented. Once further validated, these vignettes have potential to be used in assessing teacher's reflection related to science teaching classrooms. The process for establishing construct and content validity for both the vignettes and the scoring rubric is established through consultation with experts particularly on the realism in the vignette scenarios and the utility of the scoring rubric. Evaluations of inter-scorer reliability suggested statistical validity for ratings from two scorers for each participant written reflection. Vignette-based assessment is an unrevealed research area in education in promising potential for measurement of teacher reflection. It is important to assess teachers' reflection to be able to identify appropriate strategies for creating effective learning environments and to be able to certify that teachers have developed the capacity to design through reflective practices. However, reflection is intangible and barely observable, which makes it difficult to assess teachers' reflection. In that sense, this study contributes to the literature by designing a vignette-based instrument, with preliminary reliability and validity as an assessment tool and it will also have value as a diagnostic tool for and pre-service teachers to promote reflection and better instruction at the end. It is hoped that these vignettes will yield more research in vignette-based

assessment of teachers' reflection in terms of various components of teacher reflection. Moreover, qualitative analysis of the vignette responses can be more source of information in terms of different dimensions of teacher reflection compared to the other currently available teacher reflection measurements. The study suggests that reflective writings of teachers can be used as evidence for allocating them to the different under each dimension. Further, allocation of teachers to the categories revealed many common and distinct features of the writings within each category. The scoring rubric developed in this study suggests an alternative way for the qualitative analysis of vignette responses, which can be used as a complementary instrument to the present self-reported measures.

In this study, a typology of teacher reflection is developed and the applicability of the typology to the actual practice of teachers is examined. Although this study characterized teacher reflections with four different dimensions based on different angles without oversimplifying it, it is important to note that these dimensions of reflection are not mutually exclusive. In fact, they become intimately intertwined to compose a complete picture of teacher reflection. With the aid of this typology developed in this study, this study has attempted to illustrate how the different dimensions of reflection did not remain separate and are thus productively associated with each other. Reflection categorized under one dimension can lead to insights in other dimensions as well. And this can give both teacher educators and teachers a greater understanding of teacher reflection.

This study involved an examination of elementary science teachers' reflection based a four-dimensional framework. Despite the limitations of the coding scheme utilized, the study raises a number of implications concerning the assessment of teacher reflection. In the first place, the findings of the study support the importance of assessing teacher reflection based on multiple perspectives. This can be considered as an important step in developing reflective practice of teachers who are often unfamiliar with the concept prior to teaching. This picture highlights that there is evidence of reflective units

coded as the simple level of reflection and for some respondents, there is also evidence of reflective units placed at higher level of reflection in terms of various dimensions of teacher reflection. Based on the findings of this study, we are able to develop a list of several different foci of teacher reflection. The emergent themes seem to present a pattern from merely showing personal concerns to compare and contrast different issues and contexts, and to further presenting their arguments and challenging of their personal assumptions, of looking at things from different perspectives, of questioning their own behavior and performance. Most of reflective entries contained descriptive accounts of events, with little to no critical reflection present. The understanding of reflection in this current investigation is powerfully motivated by the potential of reflective practice to create effective teaching. As one of the concerns of this study, it is important to understand the habit of mind of teachers, this study gives us a starting point of finding the appropriate strategies to help teachers to facilitate deep and critical reflection. In that sense, the findings of the study are preliminary to understand the current status of teacher reflection within the Turkish context. Additionally, this study explores the notion that implementing of a curriculum is value laden and has hidden multiple social meaning. As long as the philosophy of the national curriculum continues to pursue social constructivist theories of learning, teachers are more likely to fail to develop a critical consciousness to implement such curriculum with their rigid understanding of curriculum as a cook recipe. The implications are vast as teachers prepare to enter the next millennium: notions such as the reflective practitioner and the knowledgeable doer feature highly on the profession's educational agenda, both of which implicitly require empowering teachers to have freedom to make decisions about what to teach and how to teach primarily based on the needs and interests of their students. The study is meant to highlight the current status of teachers based on more evidence-based or research validated information, which have a significant impact on how teachers participate in reflective practices and what they take away from them through empowering their teaching decisions and actions.

With a small size of participants in the qualitative part of the study, it seems impossible to draw empirical conclusions based on the findings of the study. On the other hand, the consistent experience of ten teachers in the current investigation give rise to several implications that should be considered in the evolution of teaching practice and the development of the policies that govern and inform it. It almost seems simplistic to assume that teachers would seriously and analytically think about their past teaching events as a way of improving their professional practice. However, the experience of the participants in this study confirms previous research and indicates that this is not the case. Teachers are not naturally reflective about their work. In fact, they mostly need time, administrative support, social interaction and external stimulation to engage in effective and constructive reflective practices with positive results. This study has attempted to shed some light on the process and outcomes of guided reflective practices. The findings of the study support the importance of engaging reflective practices with my guidance on their professional practice. As previously mentioned, the ability to engage in a structured reflective practice is developmentally acquired. Rather than simply prescribing reflection as an activity, it is important to situate reflection within the current teaching context. This study holds significance especially for teachers because the process requires a critical analysis of their own teaching decisions. Teachers first raised awareness the full context of their teaching practice, they increased control over their own teaching, then, they could generate alternatives for better learning outcomes, and they has a greater impact on students eventually.

Although the improvement over time has been accomplished in this study, it is also essential to identify the factors making contribution to the final performance of their reflection. While the findings point to successful strategies that appear to enhance teachers' capacity to reflect on teaching experiences, it must be stressed that this is a small scale study undertaken by willing teachers to devote efforts to change their practices. This supports the findings of the present study that teachers' existing personal backgrounds such as personal characteristics, teaching context and personal beliefs about

teaching and learning guide their development of reflective practices. Therefore, for both teacher educators and teachers, it is important to have prior knowledge of what those personal backgrounds are. Through awareness and understanding of themselves, teachers can challenge and reinforce themselves as well as their teaching performance.

Moreover, as a nature of teaching profession, teachers need to be ready for classroom situation that are continually changing, unpredictable, and complex, which requires reflection of teaching experiences. However, current teacher preparation programs in Turkey are mostly content-oriented courses, which does not seem to be enough to cultivate reflective teachers. It is important to follow the process of comparing, trying things out, and analyzing the results in order to develop teachers' reflection in their professional lives. In that sense, it is also important to be aware that one should be cautious of the long-term effects of this reflective experience. This study rather represents short-term outcomes of the guided reflective practices. Thus, it is required to follow-up of these results and the intention is to investigate whether the teachers have changed or developed their actions and thinking as well.

This study adopted a sociocultural perspective to explore the outcomes of guided reflective practices within a professional collaborative environment on teachers' reflection. This study offers some insights in the differences of individual reflection and collaborative reflection, which are to expose the participants simultaneously. Although both methods promoted deep reflection, this study shows that scaffolding and reflective dialogue among participants helped to focus teachers' reflections and overall, their participation in a collaborative reflection group led to positive outcomes. The nature of this guided reflective procedure allowed for considerable flexibility and consideration of a variety of different perspectives. While each individual teacher's experience has unique aspects, what they all shared is the opinion that similar collaborative reflection groups should easily transfer to their own schools as well. The study gives insight into the importance of engaging teachers in multiple opportunities of reflection and interaction through a

supportive collegial community. Policy makers are advised that long-term commitment and collegial supports are necessary for teachers developing their professional abilities rather than using short-term meetings.

This study holds significance especially for teachers because it allows them to describe freely their lived experiences and feelings about reflective practices that they engaged in through critical incidents with interaction with colleagues. Rather than simply prescribing reflection as an activity, it is important to situate reflection within the current teaching context. Engaging reflective practices enables teachers to strengthen their teaching practices that lead to better learning outcomes. Because teachers work in isolation within a classroom throughout school days and have little time to learn from their colleagues, they will benefit from knowing how reflection is approached by other practicing teachers. Comparing and contrasting their experiences with the experiences of other colleagues can lead to focus on their underlying tacit beliefs and assumptions, which in turn can help deep and critical analysis of their own point of views related to teaching.

As a final point, some of the issues that emerge from these findings relate specifically to teacher education programs. In order to cultivate high quality teachers and to encourage pre-service teachers to be reflective in their future teaching careers, teacher education programs should provide pre-service teachers with opportunities to engage in reflective practices, especially during field practices, practicum and supervision sessions. Therefore, the approach of using guided reflective practices in teaching practicum courses can be a critical way to help pre-service teachers capture any possible actions that can be used to generate more empowered their future teaching practices.

5.5. Suggestions for Future Studies

This section contains several suggestions for further studies since the limitations to the current investigation warrant attention as mentioned in the

method part. The following suggestions are made for further studies to highlight additional important issues for educational policy and practice.

Although a consensus understanding of teacher reflection has not yet been reached, the typology and the example of its use is offered to contribute some ideas about teacher reflection. While the understanding of reflection continues to grow and change, the study puts some efforts into the potential of reflective practice to create effective teaching. In that sense, further study into the practices of using this typology in the assessment of the quality of teachers' reflection is recommended.

Moreover, this study proposed an in-depth examination of teachers' reflection through a vignette-based instrument, in which they are asked to write their opinions and feelings independently without external prompting. The results of this study are limited to the participants' ability to reflect through writing. Some teachers are clearly better able than others to characterize their experiences in their writings. Then, it is worth noting that future research on the assessing teacher reflection, this concern can be addressed by cross referencing data generated through informal interviews with the multiple conversations held with me within a longer research time of period.

Although this study only examines elementary science teachers' reflection and the sample size is satisfactory for further analysis of the data, the reader should bear in mind that the study is limited to the teaching context and the beliefs of the elementary science teachers, who volunteered to participate in the study. Also, I used all available time to collect data as much as possible and visited schools more than once as a result of formal arrangements to meet teachers at the time that they are accessible. For future research, it is recommended to conduct further studies with larger sample sizes within different contexts.

Furthermore, the results of the present study are limited to eight imaginary situations occurring in the science classrooms described in the vignettes and certainly therefore, not representative of the professional practices of teachers as a whole. The present study nevertheless concerned experienced teachers

with a high level of professionalism, which means that they should have been adequately prepared to reflect upon and articulate a wide variety of teaching considerations. Dealing with problematic circumstances is certainly part of the teaching profession. In that sense, it remains open to question of to what extent the problematic situations presented as part of this study are representative of other professional practices and thus how teacher reflection manifests itself under other professional context. Further research is thus needed to address this question.

Considering the multiple case of examining the impacts of guided reflective practice activities on the professional practice of ten female teachers, deep and rich data are provided by participating teachers during the investigation. Since a small participant size and limited diversity among participants regarding gender, teaching experiences and geographical conditions, the findings are limited regarding transferability of the study to make more wide-ranging conclusions (Creswell, 2013, Yin, 2009). However, there are things that make it possible to see that the results may have significance beyond this study's context; teachers' work in different contexts also has many similarities. Concerning transferability, Larsson (2009) argues that the interpretation ought to be useful in relation to other teachers' contexts, but that it must be evaluated in relation to each context; the value system might be different, resulting in other kinds of changes. Hence, based on the findings of this study, this student is considered as a promising road for future research and practice working with teachers with different backgrounds.

Additionally, the scope of this study was limited in terms of its duration, timing of the study and the issues discussed among participants by using various tools for reflective practices. Since the nationwide high school entrance exam occurs at the end of the Spring term, the participants are more occupied with covering all the topics in the curriculum in the semester of that time. Thus, the current study has only examined teachers' reflections that are mostly oriented to promote the development of content specific and general teaching practices.

Regarding the timing issues, there are some cases in which participants left their weekly reflections to the last minute due to other immediate and overloaded classroom issues, which might limit their ability to recall exactly what they taught and what is occurring during their teaching performances. However, the reflective discussions and critical incidents analysis allowed the teacher to bring to mind the actual classroom situation as clearly as possible and to verbalize the thought processes in connection with the actions in the classroom. Although this line of research, when accumulated, will suggest ways that support teachers in their reflection, follow-up studies should be carried out for a longer research period.

Other avenues for future research also can be suggested. While all of the participant teachers in this study are experienced teachers, and although there is no possible way for comparison with novice teachers, some observations on this issue may be informative for future research. A further avenue would be to seek a deeper understanding of how guided reflective practice is different among teachers with different teaching experiences.

Furthermore, the participants are all experienced teachers, who engaged in professional development with a career in teaching in mind. This suggests that they are strongly motivated to reflect collaboratively and probably has above average reflective and peer coaching skills. Consequently, a further study with more focus on groups of teachers not as highly motivated, therefore could be suggested.

The study provides indications for changes in teachers' beliefs and attitudes regarding their professional teaching lives. However, this is not directly measured and neither the effects of these changes on teaching practice are addressed. There is abundant room for further progress in determining the changes in teachers' beliefs and attitudes by using direct measures.

All in all, although this study is specifically designed for exploring the changes in teachers' reflections across time and by mode of communication as a result of engaging in guided reflective practices, a replication study could be done to

analyze the lasting effects of teacher reflections on instructional decisions, and ultimately student learning outcomes. In relation the outcomes of reflective practices on students' learning and performance in the classrooms, this study is based on the teachers' self-reports and follow-up studies should address examination of the possible roles of teachers' reflection on student outcomes.



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APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER



ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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10 EKİM 2017

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Doç.Dr. Hanife AKAR ;

Danışmanlığını yaptığınız doktora öğrencisi Elanur YILMAZ'ın "Fen ve Teknoloji Öğretmenlerinin Yansıtımlı Öğretim Uygulamalarının Kritik Olaylar Analizi Aracılığıyla İncelenmesi Üzerine Bir Durum Çalışması" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay **2017-EGT-164** protokol numarası ile **18.10.2017 – 30.12.2018** tarihleri arasında geçerli olmak üzere verilmiştir.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN

Başkan V

Prof. Dr. Ayhan SOL

Üye

Prof. Dr. Ayhan Gürbüz DEMİR

Üye

BULUNAMADI

Doç. Dr. Yaşar KONDAKÇI

Üye

Doç. Dr. Zana ÇITAK

Üye

Yrd. Doç. Dr. Rınar KAYGAN

Üye

Yrd. Doç. Dr. Emre SELÇUK

Üye

7



23.11.2017

Vefa BARDAKCI
Vali a.
Milli Eğitim Müdürü

27-11-2017-1846

23/11/2017
Ok
Mehmet ÖZDEMİR

Sımsıkıyolu Başkent Öğrenciler İleri Akademi Bireyler ANKARA
 e-posta: imr@istikol.org.tr

Ayrıntılı bilgi için
Tel: (0 312) 321 01 17/135-136

bu evrak güvencü elektrofta tıxatı de jayladınlar, <https://evraknpu.meb.gov.tr/adresinden> 5554-4194-50d8-9b71-efc8 kodu ile teyit edilebilir.

C: SAMPLE ITEMS FROM VBAQTRI

Durum 1: Hilal Öğretmen, Fen Bilimleri dersinde 7-A sınıfında öğrencileri 3-4 kişilik küçük gruplara ayırıyor ve bu grup çalışmasında öğrencilerden ne beklediğini sesli olarak belirtiyor. Grup çalışması süresince, Hilal Öğretmen bazı öğrencilerin grup çalışmasına aktif olarak katılmadan sessizce oturduklarını gözlemliyor ve bu öğrencilerle ilgili notlar alıyor. Dersi yetiştirmek için sadece çalışmayı bitiren gruplar arasında her gruptan yalnızca bir öğrenci, tahtaya çıkıp yaptıkları çalışmanın sonuçlarını arkadaşlarıyla paylaşıyor. Hilal Öğretmen, etkinliği tamamlayan gruplara eksik puan verirken, tamamlayan gruplara tam puan veriyor. Her grubun aldığı puan, bireysel puan olarak o gruptaki öğrencilere derse katılım notu olarak veriliyor.

1. Hilal Öğretmenin bu sınıf içi uygulamasına yönelik problemler nelerdir?

Nedenlerle açıklayınız.

..... Çünkü.....
.....
.....

2. Siz olsaydınız bu uygulamada nasıl bir strateji izlerdiniz? Nedenlerle açıklayınız.

..... Çünkü.....
.....
.....

3. Bu durum ile ilgili neler hissettiniz? Nedenlerle açıklayınız.

..... Çünkü.....
.....
.....

D: SAMPLE REFLECTIVE JOURNAL ENTRY

01.03.2019 / Cuma

8/A Fen Bilimleri Dersi

Isınma-söğurma eğrileri anlatıyorum. Veriler, tablolar, grafikler,...

Tartışıyoruz. Burada madde kısı, burada eriyor, şöyle hâl değişimi, sıcaklık arttı, ... Mehmet söz istedi. Bu cümleleri söyledi:

— Öğretmenim, Dünya'daki bütün göpleri Ay'a göndererek bir proje tasarlıyorum.

Şaşırdım. Konumuzla hiç alakası yok! Ama cümle hayli ilginç ve üstünde durmazsam olmazdı. Kollar 15-20 dakikamızın tamamını buna tartışarak geçirdik. Sonuç "Kendi göplerimizi kendimizden uzaklaştırmanın uygun olmayacağına" karar vererek bağladık.

E: INTERVIEW PROTOCOLS

Fen Öğretimine Dair Görüşme Soruları

1. Sizce öğrenciler fen ve teknoloji dersini en iyi nasıl öğrenebilir?
 - a. İyi bir fen öğretimini için olmazsa olmaz nedir?
2. Sınıfınızda öğrencilerin fen ve teknoloji dersini öğrendiklerini nasıl anlarsınız?
3. Öğrencilerin fen ve teknoloji dersindeki başarılarını nasıl arttırabilirsiniz?
4. Sizce fen öğretiminde öğretmenin rolü nedir?
5. Derslerinizde bir konudan yeni konuya geçişleri nasıl yaparsınız?
6. Fen ve teknoloji derslerinde ağırlık verdiğiniz konuları nasıl belirlersiniz?

Öğretmenliğe Dair Görüşme Soruları

1. İlk öğretmenliğe başladığınızda, kendinizde gördüğünüz en büyük gelişim ve değişim hakkında bilgi verir misiniz?
 - a. Hangi alanlarda kendinizi daha çok geliştirme ihtiyacı duydunuz?
 - i. Öğretim ortamının düzenlenmesinde nasıl gelişmeler gösterdiniz?
 - ii. Derslerin planlanmasında nasıl gelişim gösterdiniz?
 - iii. Kullandığınız öğretim yöntem ve teknikleri ile ilgili gösterdiğiniz gelişimler nelerdir?
 - iv. Kullandığınız sınıf yönetimi teknikleri ile ilgili gelişimler nelerdir?
 - v. Öğrenci öğrenmesinin değerlendirme/geribildirim konusuyla ilgili gösterdiğiniz gelişimler nelerdir?
2. Öğretmenlik yapmanızla ilgili en çok göze çarpan, sizi en çok motive eden durumlar hakkında bilgi verir misiniz?
 - a. Öğretmenlikte en çok hoşlandığınız şey nedir?
 - b. Öğretmenliğe karşı motivasyonunuzu nasıl tanımlarsınız?
 - c. Neden öğretmenlik yapıyorsunuz?
3. Kendinizi etkili bir öğretmen olarak hissettiğiniz bir dersi anlatır mısınız?
 - a. Ders hazırlığı için ne kadar süre harcadınız?
 - b. Ne tür aktiviteler geliştirdiniz? Neden?
 - c. Ne tür materyaller kullandınız? Neden?
 - d. Öğrencilerinizin önceki bilgi ve becerilerini nasıl ölçtünüz? Neden?
 - e. Öğrencilerinizi öğrenmeleri için nasıl motive ettiniz?
 - f. Öğrenmeyi teşvik etmek için sınıf ortamını nasıl düzenlediniz?
 - g. Öğrencilerinizin performanslarını nasıl değerlendirdiniz?
 - h. Öğrencilerinize verdiğiniz geribildirimlerden bahseder misiniz?

Kritik Olay Analizi Görüşme Soruları

1. Bugün işlediğiniz ders hakkında bilgi verir misiniz?
 - a. Dersi planlama sürecinden bahseder misiniz?
 - b. Dersin kazanımları nelerdir?

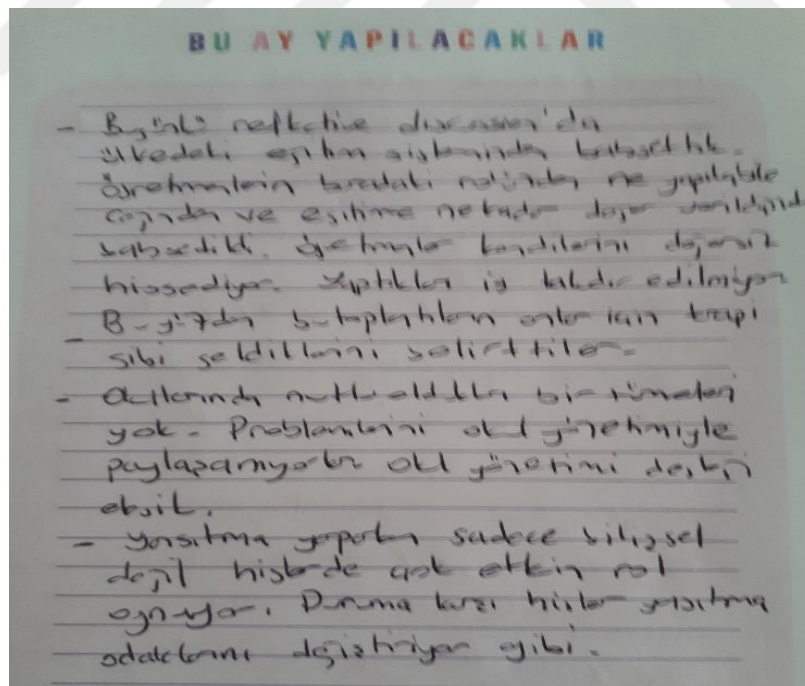
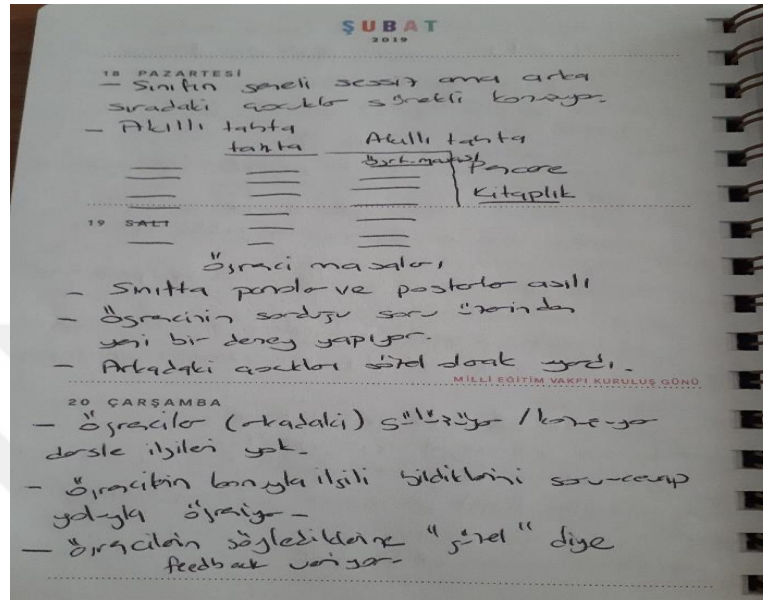
- i. Bu derste öğrencilerden ne öğrenmelerini bekliyorsunuz?
 - ii. Dersin sonunda öğrenciler ne biliyor, ne yapabiliyor ve neyi yapmayı öğreniyorlar?
 - iii. Bu derste öğrencilerin öğrenmesi gereken en önemli kavramlar nedir?
 - c. Dersi nasıl işlediğinizi anlatır mısınız?
 - a. Öğrencilerin öğrenmesi için hangi öğretim yöntem ve teknikleri kullandınız?
 - i. Öğrenme ortamını nasıl düzenlediniz?
 - b. Öğrencilerin öğrendiklerini nasıl değerlendirdiniz?
 - i. Öğrencilere geribildirim verdiğiniz durumlar nelerdir?
 - ii. Bu değerlendirme süreci sizin bir sonraki derslerinizi planlamada nasıl etkili olacaktır?
2. Sizce dersinizin en güçlü yönleri neler oldu?
 - a. Derste ulaşmayı hedeflediğiniz sonuçlara ne derece ulaşabildiğinizi düşünüyorsunuz?
 - b. Dersin hedeflerine ulaşılmasında hangi unsurların ne tür katkı sağladığını düşünüyorsunuz? (Öğretim yöntem ve teknikleri, sınıf yönetimi, geribildirim/değerlendirme, etkinlik/durumlar/materyaller)?
 - c. Sizce konu öğrencileriniz açısından önemli mi?
 - i. Öğrenciler konuyu öğrenmeye değer buldu mu?
 - ii. Bunu size hissettiren bir olay/durum oldu mu?
 - iii. Öğrencilerin konuya ilgisi beklediğiniz şekilde miydi? Nasıl?
 - iv. Öğrencilerin motivasyon düzeyleri nasıldı? Açıklar mısınız?
 - d. Sizce ders genel olarak başarılı mıydı? Neden?
3. Eğer varsa, dersinizde değiştirmeyi düşündüğünüz şeyler nelerdir?
 - e. Öğrenme sürecini geliştirmek açısından dersi başka şekilde işlemeyi düşünür müsünüz? Nasıl?
4. Dersinizde herhangi öngöremediğiniz bir öğrenme sonucuyla karşılaştınız mı? Nedir? Neden?
5. Sizce öğrenci davranışları ders boyunca nasıldı? Açıklar mısınız?
 - f. Öğrencilerin katılımı beklediğiniz yönde miydi? Nasıl?
 - g. Öğrenciler arasındaki etkileşim nasıldı? Açıklar mısınız?
 - h. Sizin öğrencilerle etkileşiminiz nasıldı? Açıklar mısınız?
6. Ders boyunca herhangi ahlaki/etik bir durumla karşılaştınız mı?
 - a. Sizce bu durum dersin bir parçası mı? Neden / Neden değil?
 - b. Sizce öğrenciler bu derste herhangi ahlaki/ etik bir şey öğrendiler mi? Neden? / Neden değil?

Değerlendirme Görüşme Soruları

1. Yansıtıcı öğretim uygulamalarını nasıl tanımlarsınız?
2. Sizce yansıtıcı bir öğretmen nasıl olmalıdır? Yansıtıcı öğretmenin özellikleri neler olmalıdır?
3. Dönem boyunca dahil olduğunuz yansıtıcı öğretim uygulamalarını düşündüğünüzde, sizce hangi uygulama yansıtıcı becerilerinizi geliştirmede en etkili oldu?

4. Yansıtıcı öğretim uygulamaları sizin öğretmenlik uygulamalarınızı nasıl etkiledi?
 - a. Yansıtıcı öğretim uygulamaları öğretme ve öğrenme ile ilgili düşüncelerinizi degistirdi mi? Nasıl? Hangi konularda deęiřtirdi?
 - b. Yansıtıcı öğretim uygulamaları sonucu öğretmenliğiniz hakkında ne öğrendiniz?
 - c. Gelecekteki öğretim uygulamalarınızla alakalı deęiřtirmek istedięiniz yönler nelerdir? Örneklerle açıklar mısınız?
 - d. Videoları analiz ederken sizin gerçek performansınız ile size göre olması gereken ideal öğretim durumunu karşılaştırır mısınız? Kendinizi nasıl görüyorsunuz? Video analizi size nasıl katkıda bulundu?
 - e. Yansıtıcı günlük tutmanın sizin mesleki gelişiminize nasıl etkisi oldu?
 - f. Kritik olay analiz uygulamasının sizin mesleki gelişiminize ne gibi etkileri oldu?
5. Yansıtıcı öğretim uygulamalarının size göre avantajları nelerdir?
6. Yansıtıcı öğretim uygulamalarının size göre dezavantajları nelerdir?
7. Yansıtıcı öğretim uygulamalarından sizin için yararlı olmadığını düşündüğünüz bir etkinlik var mı? Nedenleriyle açıklar mısınız?
8. Yansıtıcı öğretim uygulamalarını yapmadan önce ve yaptıktan sonra kendinizi nasıl değerlendiriyorsunuz?
9. Bu çalışmaya katılmadan önce ve katıldıktan sonra yansıtıcı öğretim uygulamalarına yönelik tutumunuzu nasıl değerlendiriyorsunuz?
10. Gelecekteki meslek hayatınızda yansıtıcı öğretim uygulamalarını sürdürmeyi düşünür müsünüz? Ne yapmayı planlıyorsunuz?

F: SAMPLE FIELD NOTES AND MEMOS



G: A SAMPLE RESPONSE TO A VIGNETTE IN VBAQTRI

10. 1. Hilal Öğretmenin bu sınıf içi uygulaması ile ilgili problem(ler)i açıklayınız. Bu problem oluşmasının nedenleri nelerdir? *

Hilal Öğretmen grup çalışmalarını etkili bir şekilde yönetmemiş
Grup içinde herkesin söz hakkı vermemiş
Değerlendirmeyi adil ve objektif yapmamış
Grup çalışması iyi planlama gerektirir. Kalkışta sınıfı da
uygun değildir.

11. 2. Siz olsaydınız bu problem(ler)i çözmek için nasıl bir strateji izlerdiniz? Nedenleriyle açıklayınız. *

Grup çalışması yapmayı becermeliyim.
Ya da öğrencilere ek süre veririm.
Herkesin ne kadar katkı sağladığına bakayım.
Herkesin ayrı bir görevi olsun.

12. 3. Bu durumla ilgili bir öğretmen olarak ne hissettiğinizi birkaç cümle ile açıklayınız.

Öğretmen böyle bir durumda yetersiz hissediyor.
Öğrencilerin öğretmenine bakıyor değil.
Öğretmen olabilir ama öğrencileri de
görmeli, dinlemeli.

H. CURRICULUM VITAE

ELANUR YILMAZ

Faculty of Education Educational Sciences Department

Middle East Technical University

06800, Cankaya, Ankara, Turkey

Profile

I am an early career academic with research interests in especially “Reflective Practice for Teacher Empowerment” and “Disaster Preparedness Education”. I am looking to secure a teaching/academic role aligned to the research area in the field of curriculum and instruction and science education particularly teacher empowerment for providing equal educational opportunity.

Educational Background

2014 – 2021 Middle East Technical University

PhD Curriculum and Instruction

Dissertation: Investigating the quality of teacher reflection and the nature of changes in the quality of teacher reflection through critical incidents analysis

Advisor: Prof. Dr. Hanife Akar

2011 – 2014 Middle East Technical University

MS Curriculum and Instruction

Dissertation: School-based disaster education through curricular and extra-curricular activities: A comparative case study

Advisor: Prof. Dr. Ali Yildirim

2004 – 2009 Middle East Technical University

BA Elementary Science Education

Research and Teaching Interests

Science Education, Culturally Responsive Teaching, Reflective Practices for Teacher Empowerment, Disaster Preparedness Education to Reduce Vulnerability

Career History

2010 – Present Research and Teaching Assistant, Middle East Technical University

2009 – 2010 Elementary Science Teacher, Turkey

Publications

Yildirim-Tasti, O., **Yilmaz, E.**, Engin-Demir, C., & Aksu, M. (2020). A qualitative evaluation of a non-thesis graduate program of human resources development in education. *Kastamonu Education Journal*, 29 (1), 13-24. DOI: 10.24106/kefdergi.4109

Yilmaz, E. (2019). *School-Based Disaster Education Activity Book*. In-Service Teacher Training Department of Ministry of National Education.

Erdur-Baker, O., Kasapoglu, K., & **Yilmaz, E.** (2015). The objectives of disaster education from teachers' perspectives. *International Journal of Human Sciences*, 12(1), 975-990.

Research Activity and Projects

School-Based Disaster Education Project, Measurement and Evaluation, 2013-2014 (Funded by Japon International Cooperation Agency and Ministry of National Education).

Evaluation of Non-Thesis Graduate Program of Human Resources Development in Education: A Case Study, 2015-2016 (Scientific Research Project Funded by Higher Education Institution).

Internationalization in Turkish Higher Education: A Case Study, 2016-2018 (Scientific Research Project Funded by Higher Education Institution).

Prepared Turkey Against Disasters, Measurement and Evaluation Process, 2017-2018 (Funded by Disaster and Emergency Management Presidency)

Examination of Science Teachers' Reflection Through Critical Incidents Analysis: A Case Study, 2018-2019 (1002 - Short Term Funding Program of Scientific and Technological Research Council of Turkey).

Conference Papers and Presentations

Yilmaz, E. & Sönmez, E. (2021, Apr 07-10). "I wasn't aware, until I was aware": *Reflective practices through critical incident analysis as a tool for teacher empowerment*. Paper is accepted to present at Strand 7 for the 2021 NARST Annual International Virtual Conference, USA.

Yilmaz, E. & Akar, H. (2019, June 19-22). *Science teachers' reflections with the use of critical incidents*. Paper is accepted to present at International Eurasian Educational Research, Ankara, Turkey.

Yilmaz, E. & Yildirim, A. (2017, October 26-28). *What difference do extra-curricular activities make in earthquake preparedness education? A comparative case study of two schools*. Paper is accepted to present at 5th International Curriculum and Instruction Congress, Marmaris, Turkey.

Akar, H., **Yilmaz, E.** & Gülmez-Dağ, G. (2017, May 21-22). *A case study on stakeholders' definitions, experiences, and expectations of internationalization of higher education*. Paper is accepted to present at International Higher Education Congress, Antalya, Turkey.

Akar, H., Çalık, B., **Yilmaz, E.** & Gülmez-Dağ, G. (2017, October 12-14). *A survey on how faculty perceive and quest for modes of internationalization in a private higher education institution*. Paper is accepted to present at World of Science, Engineering and Technology Conference, Berlin, Germany.

Akar, H., Gülmez-Dağ, G. & **Yilmaz, E.** (2017, April 27- May 01). *Beneath the promise of equalized internationalization: The institutionalization of internationalization from the faculty perspective*. Paper is accepted to present at American Educational Research Association, San Antonio, USA.

Akar, H., **Yilmaz, E.** & Gülmez-Dağ, G. (2017, April 27- May 01). *Faculty visions of internationalization in higher education and realities*. Paper is accepted to present at American Educational Research Association, San Antonio, USA.

Yilmaz, E. & Yildirim, A. (2016, August 22-24). *School-based Disaster Education through Extra-Curricular Activities and Curricular Activities*. Paper is accepted to present at the European Conference on Educational Research, Dublin, Ireland.

Yilmaz, E. & Yildirim, A. (2016, August 22-24). *Impacts of Additional Teacher Training on Teachers' Approaches to Disaster Education: A Case Study*. Paper is accepted to present at The European Conference on Educational Research, Dublin, Ireland.

Yilmaz, E., Yildirim, O., Engin-Demir, C., & Aksu, M. (2016, August 22-24). *Perceptions of Students, Graduates, and Instructors on a Graduate Program* Paper is accepted to present at The European Conference on Educational Research, Dublin, Ireland.

Yilmaz, E. & Aksu, M. (2016, May 30-June 02). *The Relationship between Pre-Service Teachers' Epistemological Beliefs and Their Views on Critical Pedagogy*. Paper is accepted to present at the International Congress of International of Amse-Amce-Waer, Eskisehir, Turkey.

Yilmaz, E. (2015, September 8-11). *Disaster risk reduction in the primary and elementary curricula in Turkey*. Paper presented at European Conference on Educational Research, Budapest, Hungary.

Ay, Y. & **Yilmaz, E.** (2015, October 22-24). *Designing a geometry and spatial sense curriculum*. Paper presented at 3rd International Conference on Curriculum and Instruction, Adana, Turkey.

Yilmaz, E. & Ay, Y. (2015, October 22-24). *Evaluation of 6th grade mathematics curriculum through Provus' discrepancy evaluation model*. Paper presented at 3rd International Conference on Curriculum and Instruction, Adana, Turkey.

Aksu, M., Engin-Demir, C., **Yilmaz, E.**, & Yildirim, Ö. (2015, November 9-11 Kasım). *Evaluating a Graduate Program of Human Resources Development in Education: The METU Case*. Paper presented at London International Conference on Education, London, United Kingdom.

Yildirim, O. F., **Yilmaz, E.**, Cilsalar, H. & Oden-Acar, A. (2012, September 13-15). *Evaluation of Educational Science Courses at METU: A case study*. Paper presented at 1st Applied Education Congress, Ankara, Turkey.

Invited Seminars

Throughout my career, I deliver seminars in various area related to my field.

In-Service Teacher Training on School-Based Disaster Education (2019, June 10-21). Organized by In-service Teacher Training Department of Ministry of National Education in Yalova, Turkey.

Reflective Practices for Professional Development of Teachers (2019, June 25 & November 11). Invited by two different public schools located in Ankara, Turkey.

International Experience

Visiting Student, Malta, (July-October, 2011)

- Enhanced English language skills through both classroom and cultural experiences
- Established rapport with peers in classroom as well as within an English-speaking host family
- Visited three other neighboring countries (France, Italy and Spain)
- Developed additional sensitivity and awareness of global educational issues

Visiting Scholar, University of California, Santa Barbara, USA (February-May, 2013)

- Performed data analysis of my master's thesis under the supervision of Dr. Julie Bianchini.
- Reviewed related literature through using the university library and databases
- Consulted the major points of my master thesis in such as organizing the literature review part and reporting the results

Research Techniques

I am experienced and competent in research design and the collection, analysis and reporting of primary and secondary data sources. I have extensive experience of case study as a qualitative method, and quantitative methods, including quasi-experimental design and correlational design.

Interests and Additional Skills

Teaching:

As a teaching assistant on four undergraduate programs, namely "*Introduction to Education*", "*Educational Philosophies*", "*Classroom Management*", "*Learning Out of School Context*", I have useful experience in this area and I have qualified as a higher education teaching fellow. Pedagogical considerations, learning outcomes and experiences with students and assessment of students' learning are important roles to this position, as is effective communication and presentation. Also, I assisted the aforementioned courses in the development of new materials.

Administration:

Throughout my career I have taken responsibility for a range of administrative duties. As research assistant, my role included collecting, analyzing and summarizing data from various sources, in which organization and effective administrative processes were critical.

IT/Technology:

I have extensive knowledge of Microsoft Office programs and I am confident in the use of technology for research, administrative and teaching purposes. Throughout my studies I have become competent in SPSS software packages. In my teaching role, I use multi-media as part of the delivery of instruction. I also administer student marks and messages via the university's virtual portal (Metu class).

Language:

I am fluent in English; written and oral.

I. TURKISH SUMMARY / TRKE ZET

Giriř

Son zamanlarda “yansıtıcı olma” ve “yansıtma” terimleri pek ok lkede eęitimciler, arařtırmacılar ve ęretmenler tarafından sıka dile gelmektedir. zellikle bu kavram mesleki hazırlık programları ve mesleki geliřime dair eęitim programları gibi programların iinde yer alan bir kavram haline gelmiřtir (Taggart & Wilson, 2005). Bu yaygın kullanıma raęmen, kavramla ilgili en byk problem kavramın herkes tarafından kabul gren ortak bir tanımlamasının yapılmamıř olmasıdır. Dolayısıyla yansıtıcı olma farklı řekillerde ifade edilmiřtir.

Yansıtıcı olma kavramı ilk olarak Dewey (1933) tarafından bir dřnce biimi olarak aktif, srekli ve dikkat gerektiren herhangi bir inanıř ya da varsayılan bilgi formu olarak tanımlanmıřtır. Dewey’in ortaya atmıř olduęu bu kavram Schn (1983, 1987) tarafından geliřtirilerek eylemin getięi zaman ve yansıtma davranıřı arasındaki iliřkiden bahsedilmiřtir. Alanın nde gelen kuramcılarından olan Schn’e (1987) gre yansıtma yaparken bireyler sezgisel bilgilerini eylemleri zerine yansıtabilir ve bu yansıtmaları benzersiz, belirsiz ve eliřkili durumlara uygulayabilirler. Bylelikle, yansıtıcı olma ve yansıtma yapma mesleki bilgi ve tecrbe iin anahtar faktr olduęu anlařılmaktadır. ęretmenler iin sadece bařarılı ęretim uygulamaları deęil ayrıca uygulamalarda yařanılan aksaklıklar da mesleki daęarcıęı oluřturur (Calderhead, 1989). Bu aıdan bakıldıęında, bir ęretmenin basite bir problemi veya beklenmedik bir durumu, neyin iyiye gidebileceęine dair bir anlayıřla ereveledięinde yansıtma yapmıř olduęunu akılda tutmak nemlidir (Valli, 1997; Zeichner, 1996). Bu alıřmayla ilgili olarak, ęretmenin yansıtıcı olması genel olarak, zlmesi

gereken sorunları içeren geçmiş ve/veya mevcut öğretim deneyimlerinin incelenmesi sonucunda gelecekteki kararlara ve eylemlere rehberlik eden bilinçli bir düşünme süreci olarak tanımlanmaktadır.

Bu anlayışla paralel olarak, Williams ve Grudnoff (2011) uygulama üzerine yansıtma yapmanın deneyim sahibi olmaktan daha üstün olduğunu belirtmektedir. Bunun sebebi, bireyin deneyimi yaşamasının yanı sıra bu deneyim üzerinde düşünmesinin öğrenmeye daha fazla katkı sağlayacak olmasıdır. Örneğin, bir öğretmen ne kadar deneyimli ise meslekte o oranda iyi olduğu düşünülmektedir. Fakat bazı öğretmenler vardır ki yıllar geçtikçe öğretmenlik mesleğinden soğumakta, öğrencilere olan faydaları giderek azalmaktadır. Bu o öğretmenlerin deneyimlerinden ders çıkarmadıkları, bir diğer anlamıyla deneyimleri üzerine yansıtma yapmadıklarının da bir göstergesi olmaktadır. Öğretmenlere yansıtıcı olmayı öğretmek ve mesleki çalışmalarında yansıtma yapmaları öğrenmeleri konusunda onları motive etmek çok önemlidir. Teorik anlamda, öğretmen yetiştirme programlarda “yansıtıcı düşünebilen öğretmen yetiştirme” becerisi yer almasına rağmen eğitim fakültelerinde bu beceriye yönelik teori ve uygulamaların eksik kaldığı görülmektedir. Bununla ilgili olarak, öğretmenlerin sınıf içi öğretim uygulamalarında değişiklik yapmaktan ziyade, yıldan yıla öğretmenlerin aynı sıra ve türü düzenli olarak kullandığının görülmesi hizmet öncesi eğitimin yansıtıcı düşünebilen öğretmen yetiştirme konusunda eksik olduğu iddiayı destekler niteliktedir. Dahası, öğretmenler kendi öğretim inanış ve tutumlarının üzerine düşünmemekle beraber onları değişim ve gelişim için dahi olsa değerlendirmemektedir. Bununla birlikte, aynı dersi yıllarca veren öğretmenler, öğrenci grupları farklılık gösterse dahi sürekli aynı öğretim yöntem ve stratejilerini kullanmakta ısrarcı olduklarını belirtmektedir. Bütün bu çalışmalar, öğretim uygulamalarının öğrencilerin öğrenmesi için daha canlı ve üretken olmasının önemli olduğunu ve ayrıca küresel öğretim yaklaşımlarıyla güncel olmasını sağlayabilmek için sınıf deneyimlerinin sürekli olarak değerlendirilmesi gerektiğini savunmaktadır.

Öğretmenlerin mesleki gelişiminde yansıtıcı olmanın esas olduğu düşünüldüğünde, öğretmenlerin yansıtıcı yazılar yazması ve mesleki tartışmalara katılması çok önemlidir. Bu görüş, yansıtıcı olmanın sosyal bir eylem olduğunu vurgulamaktadır (Zeichner & Liston, 2013). İç ve dış diyaloglar aracılığıyla öğretmenlerin deneyimlerinin ve mesleki görüşlerinin paylaşmaları, eleştirel analiz yapma ve analitik düşünme gibi üst düzey düşünme becerilerini geliştirdiği vurgulanmaktadır (Hatton & Smith, 1995). Bu durumun öğretim uygulamalarını iyileştirmek açısından mesleki gelişimde etkili olduğu öne sürülmektedir (Meijer, de Graaf & Meirink, 2011; Thijs & Van den Berg, 2002; Tigelaar, et al., 2008). İlgili alan yazında, bu durum Ancak, öğretmenlerin mesleki gelişimlerine katkı sağlamak için katıldıkları bu tür yansıtıcı uygulamalar için yeterli zaman, fırsat, diyalog, destek gibi şartların sağlanması önem arz etmektedir. Bunun yanı sıra, öğretmenlerin öğretim uygulamaları ile ilgili yansıtıcı olmaları için meslektaşlarıyla sıklıkla buluşma fırsatına sahip olmadıkları ortaya çıkmaktadır (MacDougall & Drummond, 2005). Bu sebeple, öğretmenlerin mesleki toplantılarında yansıtıcı olma durumları üzerine yapılan sınırlı sayıda çalışmalara rastlanmaktadır (Admiraal, Lockhorst, & Van der Pol, 2012; Horn & Little, 2010). Bu çalışmalardan yola çıkarak, öğretmenlerin yansıtıcı olmalarının önündeki engel olarak bazı faktörler belirlenmiştir: (1) zaman kısıtlamaları, (2) yargılanma korkusu (Bishop, vd., 2010), (3) yansıtma ile ilgili olarak neyin nasıl olduğuna dair öğretmenlerin bilgi beceri ve deneyim eksikliği, (Calderhead, 1989), (4) öğretmenlerin yansıtıcı olma durumlarını olumsuz etkileyecek belirli kişisel özellikleri (Calderhead, 1989; Hatton ve Smith, 1995) ve (5) öğretmenlik mesleğinin mevcut özellikleri ve yansıtıcı davranışı baltalayan okul kültürü (Brookfield, 1995; Hogarth, 2001; Laboskey, 1994). Bütün bu faktörler incelendiğinde, yansıtıcı olmanın doğal olarak gerçekleşmeyeceği sonucuna varılabilir (Etscheidt, Curran, & Sawyer, 2012; Husu, Toom, & Patrikainen, 2008; Williams & Grudnoff, 2011). Dahası, tüm öğretmenler yansıtıcı düşünmeye yatkın olmayabilir ve doğuştan yeterli destek ve eğitim olmadan etkili bir şekilde yansıtma yapmaları beklenemez (Kreber &

Castleden 2009). Dolayısıyla, öğretmenlerin yansıtıcı olma kapasitelerini geliştirmek için dışardan desteğe ihtiyaçları vardır. Bu nedenle, yansıtıcı olmanın bilinçli ve açık bir şekilde öğretilmesi önemlidir (Russell, 2005). Böylelikle, bahsi geçen engellerin azaltılabileceği ve aynı zamanda yansıtma içeriğinin ve süreçlerinin de öğretmenler için sistematik olarak destekleyici bir ortam oluşturarak geliştirilebileceği öne sürülmüştür (Russell, 2005; Shoffner, 2011; Ward & McCotter, 2004; Zeichner, 1996). Bu süreç, destek temelli yansıtma uygulamaları olarak da algılanabilir (Husu, Toom & Patrikainen, 2006).

Destek temelli yansıtma uygulamalarının en iyi şekilde nasıl yürütüleceğine dair öneriler önceki çalışmalarla desteklenmektedir. Örneğin, öğretmenlerin öğretim deneyimlerini başkalarıyla etkileşimli olarak paylaşmaları önem arz etmektedir (Husu Toom & Patrikainen, 2006; Leijen vd., 2009; Sööt ve Leijen, 2012). Özellikle, öğretmenlerin yansıtıcı olma durumlarını geliştirmeyi amaçlayan bu çalışmanın, bu alanda yapılabilecek diğer araştırmalara yol gösterebileceği düşünülmektedir. Dolayısıyla, öğretmenlerin bilgi ve deneyimlerinin öğrencileri ve öğretim sonuçları nasıl etkilediğinin farkına varabilmeleri için fırsat tanınmalıdır. Bu nedenle bu çalışmada, öğretmenlerin yansıtma durumlarını geliştirecek etkinliklerin uygulanmasının yanı sıra, bu uygulamaların öğretmenlik mesleğine yönelik performanslarına ve öğretmenlerin yansıtmalarının derinliğine ve içeriğine yönelik etkileri de incelenmektedir.

Ayrıca, çalışma kapsamında öğretmenler yansıtıcı öğretim süreçlerine aktif olarak katılarak eylem sırasında yaptıkları yansıtmaları detaylı bir şekilde inceleme fırsatı bulmaktadır. Bununla beraber, farklı öğretmen yeterlilik alanlarında belirlenecek olan durumlar karşısında katılımcı öğretmenler ile bir eylem planı oluşturulmaktadır. Araştırmacının desteğiyle katılımcı öğretmenlerin oluşturduğu eylem planları ile öğretmenlerin belirledikleri kritik durumlar karşısında daha olumlu sonuçlar ortaya çıkmaktadır.

Dahası, öğretmenlerin ne düzeyde ve hangi konularda nasıl yansıtma yaptıklarının değerlendirilmesi mesleki gelişim için çok önemli bir belirleyici olarak görülmektedir. Bu durumda, öğretmen yansıtıcı olma durumlarının nasıl değerlendirileceğini açıklayan çok sayıda yayınlanmış çalışma olmasına rağmen (örn. Loughran, 2002; Sparks-Langer, 1992; Zeichner ve Liston, 1990; Zeichner ve Tabachnick, 1991), daha önce bahsedildiği üzere, ilgili alan yazında öğretmenlerin yansıtıcı olma durumlarının neyi gerektirdiği konusunda çok az fikir birliğine varılmıştır. Mevcut çerçeveler yazında öğretmenlerin yansıtıcı olma durumlarını değerlendirmek için yol gösterici esasları oluşturmak için yararlı bulunsa da, bu çerçevelerin öğretmenlerin yansıtmasını değerlendirmek için sistematik ve kasıtlı bir yaklaşım sağlayamaması eleştirilmektedir (Orland-Barak, 2005).

Ayrıca, uzun yıllardır bu alana hâkim olan en önemli teorik anlayış, rasyonel, tarafsız ve bilinçli analiz yapabilmeyi kapsamaktadır (Oven & Tinning, 2009). Diğer yandan, son zamanlarda öğretmen yansıtma durumları ile ilgili olarak, yansıtıcı olma sosyal olarak konumlandırılmış bir uygulama olarak algılanması tartışmaya yeni bir önem kazandırmıştır (Rovegno, 2006). Aslında, tüm öğretmenlerin bir anlamda yansıtıcı olduğu (El-Dib, 2007; Pedro, 2005) ve yansıtıcı olmalarının bulundukları bağlamdan etkilendiği kabul edilmektedir (Boud, 2010). Son zamanlarda, yansıtıcı olmanın sosyal olarak konumlandırılmış çok yönlü bir doğaya sahip olduğu kabul edilmektedir. (Macdonald & Tinning, 2003; Malthouse, 2012; Malthouse ve Roffey-Barentsen, 2013; Malthouse, Roffey-Barentsen & Watts, 2013). Buna paralel olarak, yansıtıcı olma durumlarının kişisel doğası (Thorsen & DeVore, 2013), öğretim uygulamalarının karmaşıklığı ve öngörülemesiz olması (Campbell, 2006) nedeniyle öğretmen yansıtma durumlarını belirlemek ve değerlendirmek için yaygın olarak kabul edilen bir yöntem henüz mevcut değildir. Bu çalışmada öğretmenlerin yansıtıcı olma durumlarının değerlendirilmesinde, bütünsel ve çok boyutlu bir yaklaşım kullanmak amaçlanmaktadır. Bu amaçla, (1) öğretmenlerin ne hakkında yansıtma yaptıkları (genişlik), (2) öğretmenlerin nasıl yansıtma

yaptıkları (derinlik), (3) öğretmenlerin yansıtma yaparken dili nasıl kullandığı (diyalog olarak yansıtıcı olma) ve (4) öğretmenlerin belirli bir öğretim deneyimi üzerine derinlemesine düşünürken sahip olduğu duygusal endişeler (yansıtıcı olma duyumsallığı) olarak dört boyut ele alınmaktadır. Nihayetinde, bu değerlendirme çerçevesi, dönüştürücü ve sosyal / bilişsel teorilerin yanı sıra mevcut çerçevelerin ana hatlarını çizerek geliştirilmiştir (Dewey, 1933, Laboskey, 1994; Lane, vd., 2014; Luttenberg ve Bergen, 2008; Taggart ve Wilson, 2005; Zembylas , 2014).

Öğretmenlerin yansıtıcı olma durumlarının değerlendirilmesi araştırmanın odağı haline geldiğinden beri, öğretmenlerin yansıtımalarının kalitesini ve farklı boyutlarını geçerli bir şekilde göstermek için yeterli sayıda ölçüm araçları incelenmiştir. Bu araçların çoğu derecelendirmeye dayalı bir formatla öğretmenlerden bağlamsal bir yapı olmadan soruları doğrudan yanıtlamalarını istemektedir (Murphy & Ermeling, 2016). Ancak, bu yapı öğretimin karmaşıklığını yansıtmaya imkân verme açısından bu çalışmanın amacına uygun değildir (Hatton & Smith, 1995). Buna karşın, bu amaç doğrultusunda, derecelendirmeye dayalı araçlara alternatif bir yaklaşım olarak, yanıtlarını konumlandırmak için gerçek bir sınıf bağlamının sağlandığı metin tabanlı araçlar benimsenmektedir (Lee, 2005; Stecher, vd., 2006). Sonuç olarak, öğretmen yansıtıcı olma durumlarına ilişkin bakış açımızdan yola çıkarak, metin tabanlı ölçümler, yalnızca öğretmenlerin hayali ve sorunlu durumlara ilişkin düşünceleri hakkında değil, aynı zamanda analiz ettikleri belirli olaylarda ne yapacakları hakkında bilgi ortaya çıkarmak için yansıtıcı bir araç olarak kullanılabilir (Schön, 1987). Bu nedenle, mevcut çalışmada, farklı eğitim geçmişlerine sahip öğretmenlerinin yansıtıcı olma durumlarını değerlendirmek için vinyet tabanlı bir ölçüm aracı geliştirilmiştir.

Yöntem

Karma yöntem araştırma deseni kullanılan bu çalışmada, öğretmenlerin yansıtıcı olma durumlarını değerlendirmek ve araştırmacı rehberliğinde

yansıtıcı uygulamaların öğretmenlerin yansıtıcı olma durumlarına ve öğretim karar ve süreçlerine etkisini incelemek amaçlanmaktadır. Bu çalışmada yansıtıcı olma çok boyutlu ve durumlara bağlı sosyokültürel bir yapıya sahip olduğu kabul edilmiştir. Bu çalışmanın birinci amacı, araştırmacı tarafından geliştirilen vinyet tabanlı bir araç kullanarak fen bilimleri öğretimiyle ilgili önceden belirlenmiş kritik olaylar hakkında öğretmenlerinin yansıtıcı olma durumlarını araştırmaktır. Bu çalışmanın ikincil amacı ise, öğretmenlerinin kritik gördükleri olayların analizi de dâhil olmak üzere araştırmacının rehberliğinde yansıtma süreçleriyle deneyimlerini incelemektir. Çalışmanın amacı doğrultusunda aşağıdaki araştırma soruları ortaya çıkmaktadır:

1. İlköğretim fen bilgisi öğretmenlerinin yansıtıcı olma durumları nelerdir?

- a) Öğretmenlerin yansıtıcı olma durumlarının derinliği nedir?
- b) Öğretmenler yansıtımalarında neye odaklanırlar?
- c) Öğretmenlerin yansıtımları hangi diyalog biçimini içerir?
- d) Öğretmenlerin belirtilen yansıtımalarında hangi duygular tespit edilir?

2. İlköğretim fen bilgisi öğretmenlerinin araştırmacı rehberliğinde yansıtıcı uygulamalar boyunca yansıtıcı olma durumlarındaki değişikliklerin doğası nedir?

- a) Öğretmenlerin yansıtıcı olma durumlarının derinliği nasıl değişti?
- b) Öğretmenler yansıtımalarında odak noktaları nasıl değişti?
- c) Öğretmenlerin yansıtımlarındaki diyalog biçimi nasıl değişti?

d) Öğretmenlerin belirtilen yansıtımalarındaki duygular nasıl değişti?

3. İlköğretim fen bilgisi öğretmenlerinin araştırmacı rehberliğinde uygulanan yansıtıcı etkinlikler hakkındaki deneyimleri nelerdir?

Araştırmanın Katılımcıları

İki farklı araştırma yönteminin aşamalı olarak kullanıldığı bu çalışmada tarama ve çoklu bütüncül durum çalışmalarında farklı katılımcılar rol almaktadır. Tarama çalışmasında yer alan katılımcılar Ankara ili merkez ilçeleri devlet ortaokullarında görev yapan fen bilimleri öğretmenleridir. Bu çalışmada örneklem belirlenirken bölgelerin sosyoekonomik ve kültürel farklılıklar göz önünde bulundurulmaktadır. İnsan Gelişim Endeksi (IGE)'ne (2016) göre Ankara ili merkez ilçelerinden Çankaya, Yenimahalle ve Keçiören çok yüksek sosyoekonomik düzeye sahip ilçeler arasında yer alırken, Gölbaşı ve Etimesgut yüksek ve Sincan orta düzeyde sosyoekonomik düzeyde yer almaktadır. Bu çalışma için, orta, yüksek ve çok yüksek sosyoekonomik düzeyleri temsil eden sırasıyla Yenimahalle, Gölbaşı ve Sincan ilçeleri rastgele seçilmiştir. Bu ilçelerde bulunan 94 devlet ortaokulundan 66 (62.04 %) okulda görev yapmakta olan fen bilimleri öğretmenlerine ulaşılmıştır. Bu okullarda görev yapan ve çalışmaya katılan öğretmenler ($n = 236$) arasında kadın fen bilimleri öğretmenleri ağırlıktadır ($n = 176$, 74.6%). Farklı eğitim derecelerine sahip olan katılımcıların çoğunluğu ($n = 196$, 83.1%) eğitim fakültesinden mezun olmuştur. Bunlar arasından lisansüstü eğitime devam eden öğretmen sayısı 18 olup katılan öğretmenlerin 7.6% sını oluşturmaktadır. Katılımcı öğretmenlerin yarısından fazlası ($n = 146$, 61.9%) fen öğretiminde eğitim görmüş olup ortalama öğretmenlik deneyimi 15.83 yıl ($SD = 7.91$) olarak hesaplanmıştır.

Çoklu bütüncül durum çalışmasının katılımcıları çalışmanın birinci aşamasındaki yapılandırılmamış resmi olmayan görüşmeler aracılığıyla çalışmanın ikinci aşaması ile ilgili bilgilendirmeler yapılmıştır. Çalışmanın

bu boyutunda, kendini mesleki olarak geliřtirmek isteyen ve yenilięe açık olan fen bilimleri öğretmenleri çalışmaya davet edilmiştir. Çalışmaya katılmaya gönüllü olan katılımcılar arasından, Dewey'nin belirledięi yansıtıcı olma ön kořulu olan üç tutum (açık fikirlilik, sorumluluk sahibi olma ve samimiyet) dikkate alınarak ölçüt örnekleme yöntemi ile 10 kadın fen bilimleri öğretmen belirlenen ölçütlere göre seçilmiştir. Bu durumda her bir öğretmenin yansıtıcı öğretim uygulamaları, geçirdikleri süreç, deęişim ve gelişim çalışma kapsamında geliştirilen veri toplama araçlarıyla karşılaştırılmaktadır. Katılımcı öğretmenlerin deneyimleri 10 ile 26 yıl arasında deęişmekte olan katılımcı öğretmenlerin hepsi ($n = 10$) fen eğitimine ilişkin lisans ve iki tanesi yüksek lisans mezunudur. Fen bilimleri öğretmeni olarak ders verdikleri sınıfların mevcudu 22 ile 45 arasında deęişmektedir. Verilen bilgiler ışığında, çalıştıkları okulların bulunduğu bölgede ya düşük ya da orta düzeyde sosyoekonomik düzeylerde aileler bulunmaktadır.

Veri Toplama Araçları ve Süreci

Açık uçlu sorulardan oluşan vinyet tabanlı ölçme aracı, çalışmanın birinci aşamasında fen bilimleri öğretmenlerin yansıtma düzeylerini belirlemek amacıyla kullanılmıştır. Araç, Millî Eğitim Bakanlığı tarafından geliştirilen “Öğretmen Mesleki Yeterlilikler” çerçevesinde öğretmenlerin meslek hayatlarında karşılaşılabilecekleri olası 8 kritik durumdan oluşmaktadır. Öğretmenlerin her bir kritik durumla ilgili problem durumları belirlemeleri, her bir durum için ne hissettikleri belirtmeleri ve siz olsaydınız ne yapardınız şeklinde 3 açık uçlu soru cevaplamaları beklenmektedir. Katılımcıların cevapları, araştırmacı tarafından ilgili alan yazın ve pilot çalışmasından elde edilen veriler göz önüne alınarak oluşturulacak olan “Öğretmen Yansıtıcı Olma Durumlarını Deęerlendirme Anahtarı” aracılığıyla belirlenmiştir. Yansıtıcı düzeyler ilgili alan yazın ve pilot çalışması sonucunda elde edilen veriler ışığında 4 boyuta ait davranış göstergeleri belirlenmiştir göstergeler geliştirilmiştir. Araçtaki sorulara verilen cevaplar, bu 4 boyut göz önünde bulundurularak deęerlendirilmekte

ve katılımcı öğretmenlerin hangi düzeyde olduğu nicel olarak anlaşılabilmektedir.

Araştırmanın bir diğer boyutu olan çoklu durum çalışmasında katılımcılarla yapılan yarı yapılandırılmış görüşmeler, araştırmacı tarafından yapılan gözlemler, saha notları ve araştırmacı memoları ile tartışma oturum gözlemleri ve video kayıtları ve katılımcıların tuttukları yansıtma günlükleri aracılığıyla veri toplanmıştır.

Araştırmanın tarama çalışması veri toplama araçlarının pilot çalışması ile beraber 2017-2018 Sonbahar Ders Döneminde itibaren yapılırken, durum çalışması, 2018-2019 Bahar Ders Dönemi boyunca sürmektedir.

Veri Analiz Süreci

Araştırmada elde edilen veriler nitel ve nicel veri analiz teknikleri kullanılarak analiz edilmektedir. Nitel verilerin analizi tümevarım analizi ve betimsel analiz teknikleriyle gerçekleşmiştir. Araştırmanın farklı aşamalarında toplanan nicel verilerin analizinde yüzde, frekans, aritmetik ortalama gibi betimsel istatistiklerden yararlanılmıştır. Nicel verilerin istatistiksel analizinde SPSS 25.0 (ODTÜ Sürüm_Statistical Package for the Social Sciences) paket programı ve nitel verilerin analizinde “NVIVO: Qualitative Data Analysis Software (Öğrenci Sürümü)” paket programı kullanılmaktadır.

Güvenirlilik ve Geçerlik

Nitel araştırma desenlerinde en çok dikkat edilecek hususlardan biri de elde edilen verilerin doğru olması ve raporlamanın doğru bir şekilde yapılmasıdır. Bu araştırmada iç geçerliliği (inandırıcılığı) artırmak için birden fazla veri toplama yöntemi kullanılmış yani veri toplamada çeşitleme yoluna gidilmiştir. Farklı yöntemlerle toplanan verilerin birbirini destekleme düzeyine bakılmıştır. Bir akademik dönem boyunca toplanan yansıtıcı günlükler, yansıtıcı tartışma toplantı videoları, gözlem notları, kayıt altına alınan görüşmeler gibi verilerin birbirlerini destekleme

düzeyine bakılmıştır. Bu araştırmada üçgenleme, hem yöntem hem de veri kaynaklarının çeşitlendirilmesiyle uygulanmış, araştırma nicel ve nitel yöntemlerin bir arada kullanıldığı karma yapıda tasarlanmıştır. Bu bağlamda kullanılan farklı veri kaynaklarıyla (günlükler, görüşmeler gözlem notları ve tartışma oturumları video kayıtları) derinlemesine ve zengin verilere ulaşılmıştır. Ulaşılan sonuçların geçerliğini ve güvenilirliğini artırmak için görüşmelerde ortaya çıkan bulgular günlüklerle teyit edilmiş ya da ortaya çıkan bulgular video kayıtları ile desteklenmiştir. Veri toplama araçlarının geliştirilmesinde ilgili alan yazın incelenerek zengin veri toplanmasını sağlayabilecek kavramsal çerçeve oluşturulmuştur. Veri toplama araçlarının geliştirilmesinde uzmanlardan görüş alınmıştır. İçerik analizinde temalar ve temaları oluşturan alt temaların kendi aralarındaki ilişkisi ile her bir temanın diğerleriyle ilişkisi kontrol edilerek bütünlük sağlanmıştır. Bunun dışında bu araştırmada elde edilecek verilerin geçerliğini teyit etmek için öncelikle “katılımcı teyidi” yapılmıştır. Veri toplamadan hemen sonra ulaşılan sonuçlar ve yorumlar veri kaynakları ile teyit edilerek katılımcı teyidi sağlanmıştır. Elde edilen bulgular katılımcılarla paylaşılmış ve çalışmada elde edilen bulgular için geri bildirimler sağlanmıştır. Kayda alınan videoların ve seslerin sadece bilimsel amaçlı kullanılacağı ve gizliliği konusunda karşılıklı anlaşmaya varıldı ve güven ortamı sağlanmıştır. Bu araştırmanın her aşamasında, araştırmacı nitel araştırma konusunda uzman birine danışmıştır. Bu araştırmanın uygulama ve analiz süreci detaylı bir şekilde tartışılmıştır. Bu araştırmada, araştırmanın niteliğine uygun olarak, araştırmacı bir akademik dönem boyunca zamanını katılımcılar arasında geçirmiş ve uzun süreli bir etkileşim içinde olmuştur. Veri toplama sürecinin başı ile sonu karşılaştırıldığında araştırmacının öğretmeler üzerindeki etkisinin zamanla azalmış olduğu gözlemlenmiş ve süreç kendi doğal ortamında devam etmiştir. Araştırmacı ile öğretmenler arasında bir güven ortamı oluşmasına da fırsat sağlanmıştır. Öğretmenlerin yansıtmalarında daha içten olma eğilimi göstermişler ve görüşmelerin süresi ilk haftalara kıyasla uzamıştır. Görüşmelerin süresinin ve sayısının uzaması verilerin gerçeği yansıtması

ve inandırıcı olması bakımından daha güçlü olmasında katkı sağlamıştır. Tüm bu nedenlerle araştırmacı ile veri kaynakları arasındaki iletişim mümkün olduğunca geniş zamana yayıldığında araştırma verilerinin geçerliliğine önemli katkı sağlanır.

Araştırmanın dış geçerliliğini (aktarılabılır olma) artırmak için araştırma süreci ve bu süreçte yapılanlar ayrıntılı bir şekilde açıklanmaya çalışılmıştır. Araştırmanın modeli, çalışma grubu, veri toplama araçları, veri toplama süreci, verilerin çözümlenmesi ve bulguların nasıl düzenlendiği ayrıntılı bir biçimde tanımlanmıştır. Araştırmanın geçerliği için ayrıntılı betimleme yoluna gidilmiş, ham verilerin ortaya çıkan kavram ve temalara göre yorum katmadan verinin doğasına mümkün olduğunca sadık kalınarak ayrıntılı betimlemesi yapılmıştır. Böylelikle hiçbir ayrıntı gözden kaçırılmamıştır. Sonuçların sunumunda direkt alıntılara ve ham verilerden örneklerle yer verildi.

Bu çalışmada veri toplama sürecinin yanı sıra veri analizi sürecinde de güvenilirliğin sağlanmasına büyük önem verilmiştir. Araştırmanın iç güvenilirliğini (tutarlılığını) artırmak amacıyla bulguların tamamı yorum yapılmadan doğrudan verilmiştir. Ayrıca veriler üzerinde araştırmacı ve nitel araştırma konusunda deneyimli bir öğretim üyesi tarafından ayrı ayrı kodlamalar (en az toplanan verilerin %25'i) yapılmış ve kodlamalar karşılaştırılarak tutarlılık oranı (Alpha değeri) SPSS 25 programı kullanılarak hesaplanmıştır. Kodlanan veriler bir araya getirip gözden geçirilmiştir. Farklı biçimlerde kodlanan anlamlı veri birimlerinde uzlaşılan noktalar temalara ulaşmada temel alınmış, diğer kodlar ise göz ardı edilmiştir. Bağımsız kodlanmış veriler arasında % 80 üzerinde uyum olduğu görülmüş ve kodlama anahtarının güvenilir olduğuna karar verilmiştir. Böylelikle araştırmada değerlendiriciler arasında mükemmel bir uyum olup olmadığına ve kodlamanın güvenilir olduğuna karar verilmiştir. Uzman görüşü, katılımcı teyidi ve ayrıntılı betimleme yöntemleriyle araştırmanın geçerliği; teyit ve tutarlık incelemesiyle de araştırmanın güvenilirliği sağlanmıştır.

Sınırlılıklar

Bu çalışmada, ilköğretim fen bilgisi öğretmenlerinin yansıtıcı olma durumlarının vinyet temelli bir araç aracılığıyla derinlemesine incelenmesini önermiştir ve öğretmenlerden fikirlerini ve duygularını dışarıdan yönlendirme olmaksızın bağımsız olarak yazmaları istenmiştir. İlk bakışta, bu çalışma için katılımcıların sahip oldukları yazı yeteneği yaptıkları yansıtıcıları sınırlandırdığı söylenebilir. Ancak, araştırmacı katılımcıların soruları rahatlıkla cevaplayabilmeleri için istedikleri süreyi onlara sağlamış ve randevu usulüyle anketleri toplamıştır.

Diğer bir potansiyel sınırlılık, sosyal istenirliğe bağlı olarak öğretmenlerin, belirtilen kritik olaylar karşısında ne yapacakları veya öz bildirim aracı aracılığıyla onlar hakkında nasıl hissedecekleri hakkında yanlış bilgi vermeleri olasılığı ile ilgili olabilir. Ancak, açık uçlu soru formatlarının kullanılmasıyla sağlanan bilgilerin, kapalı formdaki sorulara göre sistematik olarak daha yüksek düzeyde raporlama doğruluğuna sahip olma olasılığı daha yüksektir. Araştırmacı, bu sınırlamanın üstesinden gelmek için katılımcılarla yakınlık kurmaya çalışmış ve soruları yanıtlarken katılımcı öğretmenlere gizlilik vermiştir. Araştırmacının katılımcılar ile sosyal teması olmamasından kaynaklı olarak katılımcılar sorulara sosyal olarak kabul edilemez veya daha doğru yanıtları verirken kendilerini daha rahat hissetmişlerdir

Ayrıca çalışma, katılımcıların vinyette yer alan fen derslerinde meydana gelen sekiz kısa hikâyeye verdikleri yanıtlarla sınırlıdır. Yine de, açık uçlu sorular aracılığıyla, katılımcıların her bir vinyette belirlenen sorunlu konuları nasıl algıladıkları hakkında daha ayrıntılı veriler elde edildi. Bu durumda, vinyetler gerçek durumlara benzeyen açıklayıcı bir özet sunularak oluşturuldu. Katılımcıların kendi inanışlarına, varsayımlarına ve mesleki deneyimlerine dayalı olarak her bir kritik durum hakkında farklı bakış açılarına sahip oldukları varsayılarak, katılımcılar arasında yanıt çeşitliliği sağlanmış oldu.

Dahası, Öğretmen yansıtıcı olma durumları konusunda henüz fikir birliğine varılamadığından, çalışmadan elde edilen veriler, ancak bu çalışma için ifade edilen öğretmenlerin yansıtıcı olma durumlarının işlemsel tanımının benimsenmesi halinde doğru yorumlanabilir.

Ayrıca, araştırmacı rehberliğinde yansıtıcı olma süreciyle ilgili bu çoklu vaka çalışmasıyla, çalışmanın sonuçlarını yorumlarken bazı sınırlamaların kabul edilmesi gerekir. İlk olarak, bu araştırmaya katılımcılar Ankara'da merkez ilçelerde bulunan devlet ilköğretim okullarında görev yapan on kadın fen bilimleri öğretmenidir. Araştırma sırasında bu öğretmenler tarafından derin ve zengin veriler sağlanmasına rağmen, katılımcılar arasında cinsiyet, öğretim deneyimleri ve coğrafi koşullar açısından küçük bir katılımcı boyutu ve sınırlı çeşitlilik ile daha geniş kapsamlı sonuçlar çıkarmak için çalışmanın aktarılabilirliği ile ilgili bulgular sınırlıdır (Creswell, 2013, Yin, 2009). Bu çalışmanın kapsamı, süresi ve toplantılarda katılımcılar arasında tartışılan konular açısından sınırlıdır. Bu nedenle bulguların dikkatli bir şekilde yorumlanması gerekir.

Bu çalışmanın zamanlamasıyla ilgili olarak tartışılabilir başka bir konuya dikkat edilmesi gerekiyor. Ülke çapında lise giriş sınavı bahar döneminin sonunda yapıldığından, katılımcılar eğitim programındaki tüm konuları işlemekle daha çok meşgul oldular. Bu nedenle, mevcut çalışma yalnızca öğretmenlerin çoğunlukla içeriğe özel ve genel öğretim uygulamalarının geliştirilmesini teşvik etmeye yönelik düşüncelerini inceleyebilmiştir. Zamanlama sorunlarıyla ilgili olarak, katılımcıların diğer ani ve aşırı yüklü sınıf sorunları nedeniyle haftalık günlüklerini son dakikaya bıraktıkları bazı durumlar gerçekleşmiştir, bu da onların tam olarak ne öğrettiklerini ve öğretim performansları sırasında neler olduğunu hatırlama yeteneklerini sınırlayabilir. Diğer yandan, yansıtıcı tartışmalar ve kritik olay analizi, öğretmenin gerçek sınıf durumunu olabildiğince açık bir şekilde akla getirmesine ve sınıftaki eylemlerle bağlantılı olarak düşünce süreçlerini sözlü hale getirmesine izin verebilmiştir.

Son olarak, bu çalışma, yansıtıcı uygulamalarının bir sonucu olarak ilköğretim fen bilgisi öğretmenlerinin zaman içindeki yansıtımlarındaki değişikliklerin doğasını keşfetmek için özel olarak tasarlanmış olsa da, mevcut çalışma, öğretmen yansıtımların kalıcı etkilerini değerlendirmemiştir.

Bulgular

Bu çalışmada Vinyet Tabanlı Değerlendirme Aracı, görüşmeler, yansıtıcı günlükler, gözlem notları, video kayıtları ve saha notları ve araştırmacı memolarından elde edilen nicel ve nitel veriler birbirini desteklemek için kullanılmıştır. İlk boyut olarak, fen bilimleri öğretmenlerinin fen öğretimi ile ilgili durumlara yaptıkları yansıtma derinliklerinin düzeyleri vinyet temelli aritmetik ortalaması 1.45 ile 2.22 arasında değişmektedir. Bu sonuca bakıldığında fen bilimleri öğretmenleri fen öğretimine dair durumlarla ilgili genel olarak Rutin ve Teknik arasında geçiş düzeyinde yansıtma gerçekleştirdikleri anlaşılmaktadır. Vinyet odaklı yansıtıcı derinlik ortalamalarına bakıldığında ise, sadece üç vinyet (2, 3 & 6) Rutin olarak kodlanmıştır. Sadece vinyet 8 için yapılan yansıtımlar Teknik düzey olarak değerlendirilirken, diğer dört vinyet (1, 4, 5 & 7) Rutin ve Teknik arasında geçiş düzeyinde kodlanmıştır. Bu yansıtımlar çoğunlukla öğrencilerin davranışları ve öğrencilerin katılımı ile ilgili sorunları içermeye eğilimindedir. Belirlenen yansıtıcı derinliği düzeyindeki yazılar genellikle başkalarını suçlamaya odaklı olarak okul bağlamı ve kalabalık sınıf ortamı, kaynak eksikliği ve kısıtlı zamanla ilgili endişelere yer verilmiştir.

Detaylı inceleme sonucunda, öğretmenlerinin çoğunluğu ($n = 152$, % 64,41) Tanımlayıcı Yazılar (Descriptive Writing) ve Tanımlayıcı Yansıtıcı (Descriptive Reflection) olarak kodlanmıştır. Diğer yandan, yansıtımların % 25'i ($n = 59$) Düşük Yansıtıcı Diyalog (Lowly Reflective Dialogue) olarak kodlanırken, geri kalan öğretmenlerin yaptığı yansıtımlar ($n = 25$, % 10,5) Yüksek Yansıtıcı Diyalog (Highly Reflective Dialogue) olarak belirlenmiştir. Sonuç olarak, öğretmenlerin yansıtıcı yazıların çoğunluğu,

analiz yapılmadan sadece tanımlayıcı cümlelerden oluşmaktadır. Diğer yandan, yansıtıcı diyalog olarak kodlanan cümleler durumlara ilişkin değerlendirmeler varken, düşük yansıtıcı diyalog olarak adlandırılan ifadeler nedensellik içermektedir. Ancak, doğru bir şekilde yüksek yansıtıcı diyalog olarak kabul edilebilecek çok az yazılı ifade belirlenmiştir. Fen bilimleri öğretmenlerinin yansıtıcı yazıları içerik odağı açısından incelendiğinde, Değerlendirme ve Bağlam odakları ile ilgili temalar ile ilgili olarak kullanılan yansıtıcı diyaloglar Öğretmen, Öğrenciler ve Öğretim odaklarından daha derin bir yansıtıcı diyalog biçimine ulaştıkları ortaya çıkmaktadır.

Yansıtıcı duyumsallığı boyutu kapsamında değerlendirmeler yapıldığında, 1.888 yansıtıcı birimde toplam 1.991 kez kullanılan 34 farklı duygu ifadesi belirlenmiştir. Duygu ifadeleri, belirtilen her kritik olay için yansıtıcı birimlerdeki tüm duygu sözcükleri olumlu duygular, olumsuz duygular, tarafsız duygular ve şaşırtıcı duygular olarak dört ana tema altında kodlanmıştır. Genel olarak, en sık kullanılan duygu kelimeleri şunlardır: yorgun (162), kaygılı (132), kızgın (110), sinirli (108), stresli (95), endişeli (79), tarafsız (78), şefkatli (75)) ve şaşırmış (75). Kodlanmış belirli duygu kelimelerinin (örn. Yorgun, şefkatli, tarafsız ve şaşırmış) yaklaşık iki katı olumsuz duygu kategorisinde yer alırken, 10 farklı olumlu duygu kelimesine kıyasla 15 benzersiz olumsuz duygu kelimesi kullanılmıştır. En yaygın olarak kullanılan olumsuz duygu kelimesi yorgun, ardından kaygılı, kızgın, sinirli, stresli ve endişeli kelimeleridir. En yaygın olumlu duygu şefkatli, ardından anlayış, sabır ve sempati duyguları izlemektedir. Şaşkınlık duygularıyla ilgili olarak, sürpriz olumsuz olarak tanımlanırken ve öğretmenler bu duygularını kaynak eksikliği, kalabalık sınıflar ve aşırı yüklü eğitim programları gibi belirli durumlar veya bağlamlarla ilişkilendirmektedir. Genel olarak, fen bilimleri öğretmenleri, duygu tartışmalarını ağırlıklı olarak öğrencilerle etkileşimler, öğrencilerin öğrenmelerinin değerlendirilmesi, sınıf yönetimi, dersin düzenlenmesi vb. ile belirli durumlara veya bağlamlara bağlamaktadır.

Yansıtımaların genişliği ile ilgili olarak, 10 fen bilimleri öğretmeni, öğretmen, öğrenciler, öğretim, değerlendirme ve bağlamla ilgili öğretim deneyimleri beş ana kategoride incelenmektedir. Perspektiflerdeki farklılıklar, odaklandıkları konuların da farklılığını belirlediği söylenebilir. Tüm katılımcı öğretmenler, öğrencilerin öğretim süresinde öğretim uygulamalarının merkezinde olduklarını vurgulamaktadır. Bu nedenle, yansıtımalar çoğunlukla sınıf ve zaman yönetimi, öğrenci davranışları, öğretim tercihleri ve ders hazırlığı ile ilgili konuları içermektedir. Bu temalar arasında, tüm katılımcılar mevcut araştırma boyunca sınıf yönetimi konusunda en büyük endişeyi gösterdiği anlaşılmaktadır. Özellikle çalışmanın başında öğrencilerin yanlış davranışlarından duydukları hayal kırıklığı çoğunluklu dile getirilmektedir.

Genellikle katılımcılar, öğrencilerinin derslerine veya kendilerine yönelik tutumları hakkında öfke ve hayal kırıklığı gibi olumsuz duyguları ifade etmektedir. Öte yandan, yansıtıcı uygulamalara katıldıklarında öğrencilerle olumlu bir ilişki kurmanın, onlara karşı anlayışlı olmanın, olumlu ve cesaret verici bir sınıf atmosferine sahip olmanın önemini fark ettiklerini ve bu endişelerin açıkça azaldığını belirtmişlerdir. Bu nedenle, öncelikli endişeleri sınıf yönetimi sorunları ve öğrenci olumsuz davranışlardan öğretim tercihlerine ve ders planlama ve hazırlığa doğru değişmektedir. Katılımcıların tümü, her ders için hazırlıklı olmanın ve yalnızca daha iyi öğrenme sonuçları için değil, aynı zamanda hem sözlü hem de yazılı yansıtımalarında gösterildiği gibi beklenmedik durumlarla başa çıkmak için ayrıntılı bir plana sahip olmanın önemi konusunda farkındalık göstermektedir.

Yansıtıcı derinliği tüm katılımcıların mevcut araştırma boyunca sözlü ve yazılı yansıtımalarında dört kategori (Rutin, Teknik, Bağlamsal ve Kritik) olarak belirlenmiştir. Katılımcıların yansıtıcı derinliği farklı bağlam değişkenlerine, zamana ve yansıtma aracına göre (yazılı ve sözlü) farklılık göstermektedir. Öğretmenlerin yansıtıcı olma durumları zaman içinde gelişme göstermiştir. Çoğunlukla süreç içerisinde öğretmenlerin yansıtıcı

derinlik açısından Rutin ve Teknik kategorilerinde azalma ve Bağlamsal ve Kritik kategorilerde gelişme belirlenmiştir. Tüm öğretmenler sözlü yansıtma çalışmalarında yazılı olanlardan daha derin düzeyde yansıtıcı oldukları belirlenmiştir. Özellikle günlük girişlerindeki yansıtma çalışmaları daha çok Teknik kategorisinde gerçekleşirken, sözlü formattaki yansıtma çalışmaları Bağlamsal veya Kritik kategorisinde yer almaktadır. Katılımcıların yansıtıcı derinliği, odaklandıkları konular açısından farklılık göstermektedir. Örneğin, öğrenciler ve öğretim hakkındaki yansıtma çalışmaları zamanla diğer konulara göre daha derin hale gelmektedir. Buna karşılık, yansıtıcı uygulamalarla katıldıkları süre boyunca, öğretmen ve bağlamsal konulara ilişkin yansıtma çalışmaları her kategoride kademeli olarak derinleşmektedir.

Yazılı ve sözlü yansıtma çalışmada yansıtıcı diyalog biçimine göre bireysel farklılıklar ortaya çıksa da, yansıtıcı uygulamalar birkaç ortak yön ortaya çıkarmaktadır. Katılımcıların yansıtıcı diyalog boyutunda odaklanılan konular zamana ve yansıtma şekline göre (yazılı ve sözlü) değişiklik göstermektedir. Öğretmenlerin yansıtma çalışmaları, yansıtıcı diyalog biçimine göre zaman içinde gelişme göstermektedir. Daha önce kanıtlandığı gibi, öğretmenlerin yansıtma çalışmalarının çoğu, Tanımlayıcı Yazılar ve Tanımlayıcı Yansıtma kategorisinde azalma eğilimi gösterirken, Düşük ve Yüksek Yansıtıcı Diyalog kategorilerindeki yansıtma çalışmaları zamanla gelişme göstermektedir. Bununla birlikte, katılımcıların özellikle günlükleri incelendiğinde, daha çok Tanımlayıcı Yansıtma kategorisinde yansıtma gerçekleşirken, sözlü formattaki yansıtma çalışmaları Düşük ve Yüksek Yansıtıcı Diyalog kategorisinde yer almaktadır. Bu anlamda, yansıtıcı tartışmalar, öğretmenlerin yansıtıcı diyalogunu derinleştirmek için yeterli bir uyarıcı olarak kabul edilebilir. Ayrıca, katılımcıların öğrenciler ve öğretim üzerindeki yansıtma çalışmaları eleştirel bir analizinin ötesine geçerken, özellikle bağlam, konu ve olası etkileyici faktörlerin gelecekteki eylemlerine daha fazla vurgu söz konusudur. Bunun tersine, öğretmen ve bağlamsal konular hakkındaki yansıtma çalışmaları başlangıçta en temel yansıtıcı diyalog düzeylere yerleştirilirken, zaman içinde tanımlayıcı yansıtma çalışmaları birlikte geleceğe yönelik stratejiler önerdikleri için gelişme göstermiştir

Son olarak, bu araştırma aynı zamanda yaptıkları yansıtma uygulamaları boyunca duyumsal yansıtıcı olma durumlarını açıklamaya çalışmıştır. Genel olarak, katılımcıların mesleki yaşamlarında yaşadıkları duygulardaki değişimler incelendiğinde, tüm katılımcı öğretmenlerin duygularını ikili terimlerle ifade ettikleri söylenebilir: neşe, umut ve tatmin duyguları ve üzüntü, öfke ve hayal kırıklığı duyguları. Özellikle olumsuz duygularla ilgili duygusal söylemleri, yansıtıcı uygulamalarda deneyim kazandıkları boyunca nispeten azalmaktadır. Tüm katılımcı öğretmenler başlangıçta duygusal olarak çarpıcı olayları daha olumsuz duygularla tanımlarken, çalışmanın sonunda sunulan kritik olaylarda olumlu duygular yer almaktadır. Çalışma süresince, öğretmenler öğrencilerle etkileşimi memnuniyet ve neşe kaynağı olduğu belirtilmektedir. Bu konu ile ilgili olumsuz duygu sayısı giderek azalmaktadır. Katılımcıların en çok dikkat ettiği konu öğrencilerin sınıftaki davranışları ile ilgili olmakla beraber, özellikle öğretmenlerin öfkesi, öğrencilerin sınıftaki disiplinsizliğiyle bağlantılı olduğu söylenebilir. İlginç bir şekilde, öğretmenler zaman içinde söylemlerinde kendi kişisel duygularından daha fazla profesyonel duygulardan bahsetmektedir. Neredeyse tüm öğretmenler, mesleki yaşamlarında karşılaştıkları durumlara tepki verdiklerinde daha derin duygularını fark etmeden başlangıçta yüzeysel duygularını ifade ettiler. Araştırma boyunca öğretmenler duyguları ve sınıflarda karşılaştıkları duygusal durumlarla nasıl başa çıkacakları hakkında tartışmalarında, öğretmenler sınıftaki durumlar için gerçek motive edici duyguları tanımlamakta ve ortaya çıkarmasını sağlayan stratejiler ile ilgili konuşmalar yapmaktadır. Bu durumda, daha derinlemesine yansıtma yapmaya başladıkça ve yansıtıcı uygulamalarla meşgul olduklarında, sınıf içi uygulamaları ayarlamaya ve duygusal durumlara karşı daha duyarlı olmaya başladılar.

Tartışma ve Sonuç

Yansıtmanın odak noktalarına ilişkin genel sonuçlara bakıldığında, öğretmenlerin temel endişelerinin öğretim ve öğretmenlik olduğunu

anlaşılmaktadır. Bu iki temanın her ikisi de öğretmen eylemleriyle yakından ilişkilidir. Sonraki en sık kategoriler öğrenciler ve bağlam olarak belirlenmektedir. Buna karşılık, değerlendirme en az tartışılan konudur. Bu sonuçların, daha önceki çalışmalarda gözlemlenenlerle eşleştiği söylenebilir (örn. Cavanagh & McMaster, 2015; Star & Strickland, 2008) ve bu durum öğretmenlerin öğrencilerle ilgili konulardan daha çok öğretmen eylemlerine odaklanma olasılığının daha yüksek olduğunu göstermektedir.

Öğretmen yansıtıcı olmaların derinliği ile ilgili olarak, bu çalışmaya katılan tüm fen bilimleri öğretmenleri “Eleştirel (Critical)” kategori hariç tüm kategorilerde yansıtıcılar yapmaktadır. Ancak, “Bağlamsal (Contextual)” kategoride yapılan yansıtıcılar sınırlı sayıda olduğu düşünülürse, öğretmenlerin geneli temel düzeyde yansıtıcılar yapmaktadır. Bununla ilgili olarak, ilgili alan yazında temel düzeyde yansıtıcı yapan öğretmen belli bir hedefe ulaşmak için pedagojik bilgisi ışığında birtakım uygulamalar yaptığı ve bu uygulamalarda programın kazanımlarını sorgulamadan yansıtıcılar yapmaya çalıştığı vurgulanmaktadır (Dinkelmann, 2000; Erginel, 2006; Harrington, Quinn-Leering, & Hodson, 1996; Kayapınar, 2010). Bu sonuç ile ilgili olarak, çalışmaya katılan öğretmenlerden neredeyse tümü varsayımlara meydan okumak ve mevcut uygulamalarını sorgulamak için herhangi bir yansıtıcı aracı veya yöntemi kullanmadıklarını belirtmektedir. Bu bilgilere dayanarak, bu, öğretmenlerin öğretim deneyimlerini ve sınıfta neler olduğunu eleştirel bir şekilde analiz etmedikleri ve yansıtıcı olmaktan çok teknisyen olma olasılıklarının daha yüksek olduğu anlamına gelebilir. Bu sonucun, yansıtıcı olmanın doğal olarak meydana gelmemesinden kaynaklanması mümkün görünüyor. Russell’ın (2005) öne sürdüğü gibi, öğretmenlerin yansıtıcı uygulamaları devreye almak için gerekli becerilerden ve deneyimlerden yoksun oldukları ve buna bağlı olarak bazı öğretmenlerin bu konu ile ilgili desteğe ihtiyacı oldukları sonucuna varılabilir.

Yansıtıcı diyalog boyutu ile ilgili olarak, yansıtıcıların odakları arasında bazı belirgin farklılıklar olduğu anlaşılmaktadır. Genel olarak, çalışmanın sonuçlarında katılımcıların, öncelikle Tanımlayıcı Yansıma ve Düşük Yansıtıcı Diyalog arasındaki geçişe yerleştirilen yansımalarla sahip olduğu belirtilmektedir. Bununla birlikte, mevcut çalışmanın bulguları önceki araştırma bulgularını desteklememektedir (örn. Hatton & Smith, 1994; Dinkelman, 2000; Harrington ve diğerleri, 1996). Bu çalışmaların aksine, bu çalışmaya katılan deneyimli öğretmenlerin olayların açıklamanın ötesine geçemedikleri ve olayları betimlemenin dışında gerekçelere yer vermedikleri anlaşılmaktadır. Bu sonuç, öğretmenlerin öğretmenlik mesleğinde daha fazla deneyim kazandıkça daha analitik ve yorumlayıcı olmaları gerektiği fikrine meydan okumaktadır.

Öğretmenlerin yansıtıcıları duyumsal yansıtıcı olma boyutu ile ele alındığında, bu çalışmanın bulguları öğretmenlerin duygularının duruma göre değişebileceğinin kanıtlamaktadır. Bu, öğretmenlerin farklı öğrencilerle etkileşime girmesi ve farklı okullarda çalışması nedeniyle öğretmenlerin sergilediği duyguların bağlam özgüllüğü ile bağlantılı olabileceği anlamına gelebilir. Bağlamla ilgili farklılıkların, öğretmenlerin öğretim deneyimleri hakkında ne düşündüklerini etkileme olasılığı daha yüksektir.

Bu çalışma, yansıtma derinliğinin öğretmenlerin yansıtma odağından ve öğretmenin düşüncelerini eylemlerle ne ölçüde ilişkilendirmesinden etkilendiğini göstermiştir. Tüm katılımcıların yansıtıcıları dört farklı derinlik kategorisinde kodlanmış olsa da, özellikle öğrencilere ve öğretime odaklandıkları yerlerde, esas olarak Bağlamsal ve Eleştirel yansıtma yaptıkları belirlenmiştir. Aksine, öğretmen ve bağlamsal meseleler hakkındaki yansıtıcıları ise ağırlıklı olarak Teknik veya Rutin kategoride yer almaktadır. Bu ilgi çekici sonuç öğretmenlerin düşüncelerinde çoğunlukla sadece kendileriyle ilgili kaygılara güvendiklerine dair yaygın bir inanış ile açıklanabilir. İlk sonuçlarımız, bu tek taraflı inanca meydan okuyor ve her öğretmenin sorunları farklı gördüğünü doğruluyor, çünkü her

biri kendi kişisel teorik bilgi temellerini ve onlarla birlikte bir dizi öğretim deneyimini beraberinde getiriyor (Boud & Walker 1998; Larrivee 2008; Van Manen 1977). Tüm katılımcı öğretmenler, öğretim deneyimleri hakkındaki yansıtımalarında, sınıf yönetimi, öğretim yöntemleri ve zamanlama, sıralama ve dersin yapılandırılması gibi konulara odaklanmaktadır. Bu sonuçlar diğer çalışmaların sonuçlarıyla uyumludur (örn. Bain, Ballantyne, Packer, & Mills, 1999; Cavanagh & McMaster, 2015; Lee, 2004; Shoffner, 2011; Star & Strickland, 2008) ve bu sonuçlar ışığında çalışmanın başında öğretmenlerin kendi öğrencilerden ziyade esas olarak öğretim eylemlerine odaklandıkları söylenebilir. Bununla birlikte, çalışmadan elde edilen verilerin analizine dayanarak, çalışma boyunca, katılımcıların öğrenci öğrenimi ve öğrencilerin derse katılımı konusundaki birincil endişeleri, yansıtımalarını büyük ölçüde şekillendirdiği söylenebilir. Yansıtıcı uygulamalara katılımlarının katkısıyla, odaklarının kendi yaptıklarından öğrencilerinin yaptıklarına doğru kaydığı anlamına gelmektedir. Bu değişim, farklı öğrencilerin öğrenme ihtiyaçlarını karşılamak ve faaliyetlere katılımlarını artırmak için öğretimlerini düzenlemelerine yol açmaktadır. Katılımcılar çalışma süresince öğrencilerle olumlu bir ilişki kurmaya, öğrencileri anlamaya ve ardından verimli bir sınıf atmosferi yaratmaya başladılar. Bu bağlamda, hizmet içi öğretmenlerin öğretme eylemlerinden ziyade öğrencilerin öğrenme perspektifine göre öğretim deneyimlerini analiz etmeleri için teşvik edildikleri söylenebilir. Bu bulgular, başlangıç niteliğindeyken, öğretmenlerin yansıtıcı olma durumları zaman içinde gelişme göstermiş olmasına rağmen, yansıtıcı olma eğilimlerinin öğretim uygulamalarındaki büyümeyi teşvik etmelerine en büyük katkı olduğunu göstermektedir (Holt-Reynolds, 1992). Dahası, öğretmenler yansıtıcı uygulamaya daha fazla önem verirlerse ve bunun önemli faydalar elde edeceklerini algıarlarsa, bunun yansıtıcı uygulamayı teşvik etmede önemli bir etkiye sahip olma ihtimalinin yüksek olduğunu belirtmek önem arz etmektedir (Bean & Stevens, 2002).

Bu öğretmenlerin yansıtıcı olmaların bir başka boyutu olan yansıtıcı diyaloglarındaki değişikliklerle ilgilidir. Bu çalışmanın genel sonuçları, yazılı ve sözlü yansımalarında bireysel farklılıklar ortaya çıksa da, yansıtıcı uygulamaların yansıtıcı diyalog kategoriler ile ilgili birkaç ortak yön olduğu göstermektedir. Yansıtıcı diyalog biçiminin dört kategorisinin tümü, on hizmet içi öğretmenin tümünün mevcut araştırma boyunca sözlü ve yazılı yansımalarında kanıtlanmıştır. Bu bulgular, öğretmenlerin öğretim deneyimlerini yansıtırken sınıf olaylarının basit tanımlarının ötesine geçebileceklerini gösteren önceki araştırmalar (örn. Cavanagh & McMaster, 2015; Star & Strickland, 2008) tarafından bekleniyordu ve desteklendi. Bu anlamda, bu araştırmanın katılımcı öğretmenleri basitçe fark ettiklerini anlatmakla kalmıyor, aynı zamanda bu olayların nedenlerini anlamaya ve araştırmacının rehberliğinde yansıtıcı uygulamalara girerken daha iyi sonuçlar için alternatif gelecek eylemleri hayal etmeye çalışıyorlardı. Bir başka önemli bulgu ise, iki farklı yansıtma aracı boyunca yansıtıcı diyalog biçimindeki farklılıklardır. Tüm öğretmenler sözlü düşüncelerde yazılı olanlardan daha derin yansıtıcı diyaloglar göstermektedir. Bu anlamda, yansıtıcı tartışmalar, öğretmenlerin yansıtıcı diyalogunu derinleştirmek için yeterli bir uyarıcı olarak kabul edilebilir. Bu, öğretmenlerin yansıtıcı tartışmalarda diğer katılımcılarla görüşlerini paylaşıırken kendi dersleri için alternatif eylemler hayal etmeye daha istekli olduklarını göstermektedir. Bu sonuç, basitçe, öğretmenlerin, Muir ve Beswick (2007) ve Bain vd. (1999) öğretmenlerin diyalog fırsatını takdir ettiklerini ve bunun, hem eleştirel analizlerin hem de öğretimlerinin gelecekteki eylemlerinin yoğun katılımıyla öz bildirimin ötesine geçmek için değerli bir katkı olarak algıladıklarını öne sürmektedir. Katılımcıların diyalog biçimlerinin de düşüncelerinin odağına göre farklılık gösterdiği anlaşılmaktadır. Öğrenciler ve öğretim üzerindeki düşüncelerinin özellikle bağlam, konu ve olası etki faktörlerinin gelecekteki eylemlerine daha fazla vurgu yaparak eleştirel bir analizinin ötesine geçtiğini belirten sonuçlar ortaya çıkmaktadır. Bunun tersine, öğretmen ve bağlamsal konular hakkındaki yansımaları başlangıçta en temel yansıtıcı diyalog düzeylerine

yerleştirilirken, yavaş yavaş daha karmaşık analizlerle karakterize edildi ve zaman içinde tanımlayıcı yansıtımlarla birlikte stratejiler önerdiler. Bu mevcut sonuçlara uygun olarak, önceki çalışmalar (örn. Husu, Toom & Patrikainen, 2008; Lee, 2004), yansıtıcı uygulamaların öğretmenlerin uygulamalarını sorgulamalarına, sosyal ve kültürel sınırlılıkları veya kolaylaştırıcıları belirlemelerine ve ayrıca mesleki çalışmalarının gelişime katkı sağlamasına ortam oluşturduğu söylenebilir.

Son olarak, bu araştırma aynı zamanda on öğretmenin öğretim uygulamalarında deneyimledikleri duyguları açıklamaya çalışmaktadır. Genel olarak, katılımcı öğretmenler arasında hoş ve nahoş duygular yansıtımlarında yer almakta ve neşe ve mutluluktan hayal kırıklığı ve öfkeye kadar her türlü duyguyu içermektedir. Öğretmenlerin olumlu duyguları, çoğunlukla öğrencilerle etkileşim içinde oldukları ve öğrenme çıktılarına ulaşmada başarılı hissettikleri durumlarda uyanırken, öte yandan, olumsuz duygular, sınıfı yönetme eksikliği ve öğrencilerin derse katılımı eksikliği durumları tarafından tetiklenmektedir. Bu bulgular, öğretmenlerin yalnızca öğretim kalitesi için değil, aynı zamanda öğrencilerin başarıları için de sorumluluk duygusu fikrini desteklemektedir (Prosen, Vitulic & Skraban, 2011).

Öneriler

Öğretmenlerin yansıtıcı olma durumlarını olumlu yönde etkileyen faktörleri içeren bir destek ortamı sağlandığında, kendi öğretim uygulamasını değerlendiren, yeniden düzenlemeye ve geliştirmeye önem veren, devamı olarak bir sonraki dersin daha iyi planlanmasına ilişkin tasarım kararları alabilen, bunları uygulayıp yeniden değerlendirmeye giden öğretmenlere sahip olmak mümkün olabilir. Öğretmenlerin belirledikleri kritik olaylar üzerinde yansıtıcı olma düzeylerini nasıl geliştirdiklerini anlamamıza katkıda bulunan düzenli olarak tutulan yansıtıcı günlükler, tartışma oturumları, sınıf içi video kayıtları ve meslektaş önerileri gibi çeşitli faktörlerin bu gelişim sürecine katkıda bulunduğu konusu öğretmenlerin

gelişim sürecine yönelik rehberlik sağlaması açısından önemlidir.

Öğretmenlerin ne gibi durumlarda nasıl yansıtma yaptıklarını ve yansıtma olumlu yönde etkileyen gelişme sürecini daha kapsamlı ortaya koymak için eğitim fakülteleri ve okul işbirliği içerisinde uzun süreli bir çalışma yapılması önem arz etmektedir. Ayrıca, fen bilimleri öğretmenlerin hangi düzeyde yansıtma yaptıklarını ve paralelinde hangi yansıtma temalarına odaklandıkları ve mesleki gelişim ve değişimlerine ve daha etkili öğrenme ve öğretme ortamlarının geliştirilmesine katkıda bulunması açısından yansıtma temaları ve uygulamaları üzerinde düşünerek yansıtma yaptıklarını nasıl geliştirdikleri ortaya konulmaya çalışılmıştır. Bundan sonraki araştırmalarda farklı öğretmenlerin hangi yansıtma düzeyine sahip olduklarına ve bu düzeyleri geliştirmeye ilişkin çalışmalar yapılması önerilmektedir.

Bu çalışma ile düzenli olarak tutulan yansıtıcı günlükler, tartışma oturumları ve kritik olaylar analizi gibi çeşitli yansıtma araçlarının öğretmenlerin mesleki gelişim sürecine nasıl bir katkıda bulunduğu konusunda yeni fikirler sağlayacaktır. Ayrıca, öğretim uygulamalarının yeterli, yetersiz vb. kısımları üzerine yapılan yansıtma ilerdeki mesleki uygulamalarına rehberlik etmesinin öğretmenlerin mesleki gelişimine yönelik araştırmalar yapılması önerilmektedir. Açık fikirli olma, samimiyet ve sorumluluk sahibi olma gibi belirli görüş ve inanışlar öğretmenlerin yansıtıcı olması için hem bir ön koşul hem de yansıtıcı olmanın sonucu olarak belirlenmiştir (Dewey, 1933; LaBoskey, 1994; Van Manen, 1991). Dolayısıyla, öğretmenlerin yansıtıcı olmalarındaki değişime bakılmasının yanı sıra bu tutum ve inanışların nasıl değiştiğini de incelemek faydalı olabilir.

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