

Examining the Use of Lesson Analysis to Improve Teacher Candidates' Knowledge of Teaching

Öğretmen Adaylarının Öğretme Bilgisini Geliştirmek İçin Ders Analizi Kullanımının İncelenmesi

Müjgan BAKI*, Neslihan SÖNMEZ**

• Received: 07.07.2017 • Accepted: 24.09.2018 • Published: 31.07.2019

Kaynakça Bilgisi: Baki, M., & Sönmez, N. (2019). Öğretmen adaylarının öğretme bilgisini geliştirmek için ders analizi kullanımının incelenmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 34(3), 750-768. doi: 10.16986/HUJE.2018043641

Citation Information: Baki, M., & Sönmez, N. (2019). Examining the use of lesson analysis to improve teacher candidates' knowledge of teaching. *Hacettepe University Journal of Education*, 34(3), 750-768. doi: 10.16986/HUJE.2018043641

ABSTRACT: One of the goals of this research is to investigate how lesson analysis activities for the School Experience course supported the development of teacher candidates' knowledge of teaching. The second goal of this research is to reveal how applications involving lesson analysis reflected on the teacher candidates' teaching practices. Designed as qualitative research, the study was conducted with elementary mathematics teacher candidates. The data collection tools were the candidates' lesson analysis reports and end-of-term assessment reports, video recordings of the candidates' teaching practices, classroom observation, field notes, and interviews conducted with the candidates. The data were analyzed by means of content analysis method. The study concluded that the lesson analysis activities supported the creation of a consciousness that teacher candidates should consider a lesson in mathematics teaching from the point of view of the student. Besides, it was observed that the candidates started noticing when the learners understood easily, or had difficulty, and to what should pay attention when teaching. Suggestions have been made to make the School Experience course more effective in the teacher training process.

Keywords: Lesson analysis, School Experience course, teacher candidate

ÖZ: Bu çalışmanın amaçlarından biri Okul Deneyimi dersindeki ders analizi etkinliklerinin öğretmen adaylarının öğretme bilgilerinin gelişimini nasıl desteklediğini incelemektir. Çalışmanın ikinci amacı ise ders analizi içeren uygulamaların öğretmen adaylarının öğretme pratiklerine nasıl yansıdığını ortaya çıkarmaktır. Nitel araştırma desenini yansıtan bu araştırma ortaokul matematik öğretmeni adayları ile yürütülmüştür. Veri toplama araçları, adayların ders analizi ve dönem sonu değerlendirme raporları; adayların öğretme pratiklerinin video kayıtları, gözlem, alan notları ve adaylarla yapılan mülakatlardır. Veriler içerik analizi yoluyla analiz edilmiştir. Çalışma sonucunda ders analizi aktivitelerinin matematik öğretiminde bir dersin öğrenci açısından düşünülmesi gerektiği bilinci oluşturulmasını desteklediği görülmüştür. Bunun yanı sıra, öğrencilerin hangi durumlarda kolaylıkla anladıklarını veya zorlandıklarını ve öğretim sırasında dikkat edilmesi gerekenleri öğretmen adaylarının fark etmeye başladıkları belirlenmiştir. Öğretmen eğitimi sürecinde Okul Deneyimi dersinin daha etkili bir şekilde yürütülmesine dair önerilerde bulunulmuştur.

Anahtar Sözcükler: Ders analizi, Okul Deneyimi dersi, öğretmen adayı

1. INTRODUCTION

In recent years, there has been a shift from the traditional to a practice-based approach in teacher education (Ball & Forzani, 2009; Gitomer & Zisk, 2015) and researchers debate how

* Dr. Öğr. Üyesi, Trabzon Üniversitesi, Fatih Eğitim Fakültesi, Matematik ve Fen Bilimleri Eğitimi Bölümü, Matematik Eğitimi A.B.D., Trabzon-TÜRKİYE. e-posta: mujganbaki@gmail.com (ORCID: 0000-0002-0512-303X)

** Arş. Gör., Trabzon Üniversitesi, Fatih Eğitim Fakültesi, Matematik ve Fen Bilimleri Eğitimi Bölümü, Matematik Eğitimi A.B.D., Trabzon-TÜRKİYE. e-posta: nsonmez@ktu.edu.tr (ORCID: 0000-0003-1631-9510)

teacher education can be improved from this perspective (Forzani, 2014; McDonald, Kazemi & Kavanagh, 2013). Teaching activities involving real classroom situations stand out in this context (Ball & Forzani, 2009; McDonald et al., 2013). 'Learning to teach', studying teaching (one's own teaching and the teaching of others), can be seen as a useful approach in this sense. Many researchers consider pre-service teachers' observation and lesson analysis of in-service teachers' teaching practices to be one of the 'learning to teach' activities (Hiebert, Morris, Berk & Jansen, 2007; Santagata, Zannoni & Stigler, 2007).

From the students' learning perspective, the analysis and interpretation of teaching is significant ultimately for more effective teaching (Hiebert et al., 2007). One of the objectives of teacher education is, therefore, to improve teacher candidates' analysis, interpretation, and reflection skills that help them become experts in time (Feimen-Nemser, 2001). Furthermore, teachers need the lesson analysis, noticing, and reflective thinking skills to cope with complex situations that may arise from the application of student-centered teaching activities. Of these skills, lesson analysis aims to improve the ways to capture and interpret the thoughts of students for the evaluation of the efficiency of the teaching (Barnhart & Van Es, 2015). Lesson analysis is based upon the noticing skill according to many researchers who assert that these two skills are quite identical (Santagata & Guarino, 2011; Sherin, Jacobs & Philipp, 2011; Van Es & Sherin, 2002). The lesson analysis and noticing skills present teachers and teacher candidates alike with the opportunity to get to know the student (Ball, 2011) and to improve their practices (Schoenfeld, 2011). Schoenfeld (2011) recommends the use of the noticing skill to bring about a change especially in practice, which points to the importance of teaching settings that improve teacher candidates' lesson analysis skills, and to the need for research in this area. Besides, since teacher candidates lack teaching analysis and observation skills, attempts to encourage them to focus on practical details prove inadequate (Star & Strickland, 2008). When making observations, teacher candidates focus in general on classroom management and student behaviours (Ericson, 2011; Star, Lynch & Perova, 2011) and, when evaluating the efficiency of teaching, they focus on the teacher's strategies rather than the students' answers (Morris, 2006; Santagata et al., 2007). Levin, Hammer and Coffey (2009) propose a framework that helps teacher candidates with what to focus on, how to benefit from their experiences, and what decisions to make when observing teaching practices and making reflections. In order to help them through the lesson analysis process, the candidates were given a lesson analysis framework designed by the first researcher.

1.1. Lesson Analysis

Lesson analysis aims to improve the ways to capture and interpret the thoughts of students for the evaluation of the efficiency of the teaching, involving a process whereby the teacher draws conclusions from his or her own teaching and the students' learning (Sun & Van Es, 2015). This analysis involves seeking answers to such questions as 'What is the student expected to learn?', 'What have the students learnt?', 'In what way did the teaching (not) help the students learn?', 'How can the teaching be made more effective for the students to learn?' (Hiebert et al., 2007; Santagata et al., 2007). As can be seen from these steps, it is important to make observations on the students' learning, to analyze the effectiveness of the teaching from the students' learning perspective, and to put forward suggestions to improve the teaching based on this analysis. Barnhart and Van Es (2015) define lesson analysis as 'seeking to understand the students' way of thinking in teacher-student and student-student interactions, interpreting the students' thoughts in these interactions, and deciding what to do next based on this analysis'. Santagata and Guarino (2011) consider lesson analysis to be a form of reflective thinking and the noticing skill in classroom interaction. Noticing refers to the teacher's ability to identify the relevant parts of the lesson, to use his or her knowledge to interpret situations, and to make the connections between learning situations, general principles, and ideas on teaching and learning (Jacobs, Lamb & Philipp, 2010; Llinares, 2013; Mason, 2002). As can be seen, the crucial

common denominator in both is about having a student-centered approach to the lesson, capturing the important parts of the lesson so that the student can understand, interpreting these situations, and making suggestions on what can be done in such situations the next time.

In the literature, some researchers propose a theoretical framework so that teacher candidates can systematically analyze their own practices (Hiebert et al., 2007; Santagata et al., 2007). Others, however, focus on improving teacher candidates' lesson analysis skills (Barnhart & Van Es, 2015; Santagata & Yeh, 2014). Sun and Van Es (2015) investigate the reflections of the learning settings that involve lesson analysis on pre-service teachers' own teaching practices. Baş (2013), for instance, aims to detect changes in teachers' noticing skills regarding their students' mathematical thinking patterns in the context of a professional development program. Osmanoğlu (2010), on the other hand, studies change in pre-service mathematics teachers' noticing skills watching the videos of sample situations and in the context of a lesson that includes online discussions. Most recently, Taylan (2016) investigated the relationship between mathematics teachers' lesson planning skills and lesson analysis skills. In this study, the teacher candidates were asked to do observation-based lesson analysis for 30 class hours as part of the School Experience course. From their lesson analysis practices, the teacher candidates concluded that lesson planning with a focus on student thinking had positive effects. A look at the studies cited above reveals that video-recording was frequently used as a tool during the analysis process. The present study differs from other research in that lesson analysis applications were investigated in real classroom settings without the use of video recording and is considered to be significant in that it presents the details of a practice that could be used in teacher education.

1.2. The School Experience Course

The School Experience course is defined as a process that prepares candidates for actual teaching and involves activities as an introduction to the teaching profession based on the observation of teaching practices and skills (Higher Education Council [YÖK], 1998). In the context of teacher education, the School Experience course can be seen as the first step for teacher candidates to go out on the field, observe mathematics teaching practices, and gain new ideas. This course presents pre-service teachers with the opportunity to observe teachers at various class levels. As these teachers are a kind of role model for teacher candidates, the School Experience course is critical for the improvement of teacher candidates' teaching knowledge. The assignments given throughout the School Experience course are of a nature that allows teacher candidates to familiarize themselves with the school system and understand the roles of teachers and students within this system (Koç & Yıldız, 2012). Studies on the effectiveness of the School Experience course in Turkey usually point to its shortcomings in practical terms (Dönmez-Usta & Turan-Güntepe, 2016; Kırksekiz et al., 2015). These studies conclude that the course assignments prove inadequate to equip teacher candidates with professional competence and personal skills, and to raise their interest in the teaching profession. This suggests that the School Experience course requires new arrangements that will contribute to the development of teaching knowledge for practical use by prospective teachers. This in turn highlights the need for research to guide through the revision of the School Experience course content based on new reforms. In this study, the teacher educator (first researcher) conducting the School Experience course redesigned the course assignments so that it would include the lesson analysis tasks as well. During these lesson analyses, the teacher candidates were expected to identify what the teacher did based on students' understanding, to interpret the situations identified, and to think about what could be done to further develop the teaching activities.

Based on lesson analysis, this practice is expected to become one of the ways that could be used to improve the candidates' teaching knowledge, and thus to contribute to the field. The

purpose of this study is to examine how School Experience course including lesson analysis activities supports the development of teacher candidates' knowledge of teaching in a teacher education program and how participation in these activities reflected on their teaching practices. Based on these objectives, the following research questions were formulated:

1. How does the School Experience course through lesson analysis support the development of teacher candidates' knowledge of teaching?
2. How does the applications of the School Experience course through lesson analysis reflect on candidate teachers' teaching practices?

2. METHOD

2.1. Study Context

At state universities in Turkey, a total of 240 ECTS courses are taken during a 4-year undergraduate math teacher education program. The courses for the teaching profession have 44 ECTS credits. Of these courses, School Experience has 6 ECTS credits while Teaching Practice has 10. The School Experience and Teaching Practice courses are offered in the fourth year and conducted in collaboration between the faculties and the schools. As part of the School Experience course, the students observe school teachers' classes for four hours on one day a week, do some assignments, and submit a report to their course lecturers, with whom they have weekly meetings for an hour at the university. The assignments are on such topics as a day of a teacher, getting to know the pupils, getting to know the school, lesson conduct and classroom management, preparing lesson plans, and studying pupils' work (YÖK, 1998). As part of the Teaching Practice course, on the other hand, the students plan and conduct their lessons at schools for six hours on one day a week. This course usually involves teaching practices.

The study consists of two stages. The first stage took place in the School Experience course. The researcher enhanced the content of this course with practices involving lesson analysis activities, and the course title was changed into 'School Experience through lesson analysis' (SELA). At the first stage yielded findings on how the SELA course supported the improvement of the teacher candidates' knowledge of teaching. The second stage took place in the Teaching Practice course which teacher candidates took three months after taking the School Experience course. At the second stage, findings have been obtained about how the teacher candidates' participation in the SELA applications reflected on their teaching practices.

2.2. Research Participants

The research sample was composed of the fourth-year elementary mathematics teacher candidates studying at a state university in Turkey. The research participants were the students tutored by the first researcher in the School Experience and Teaching Practice courses. The School Experience course involving lesson analysis activities was taken by 24 teacher candidates (SELA), of whom two were male and the rest were female. The findings relating to the first research problem were reached by means of the data collected from this sample. In this way, the way in which the lesson analysis assisted School Experience course developed teacher candidates' teaching knowledge was examined through 24 prospective teachers. 12 candidates who were volunteers from these candidates were followed up in Teaching Practice course in order to show how the application of the course analysis is reflected in the teaching practices of the candidates, which is the second problem of the research. In addition, a comparison group was determined in order to reveal the reflections of teaching practices of the candidates. In this group, there were 12 candidates who took the School Experience lesson under normal conditions (NSE) according to the content determined by YÖK (1998) and voluntarily participated in the study. This course was not under the supervision of the first researcher.

Therefore, participants in the Teaching Practice course consisted of a total 24 candidates half of whom were SELA candidates and half of whom were NSE candidates.

2.3. Conducting the School Experience Course through Lesson Analysis

The School Experience course lasted a total of 10 weeks. Over the first two weeks of this period, the researcher informed the SELA candidates of the assignment preparation process and assignment contents within the scope of the course. The candidates were also given explanations on what to pay attention to during their school observations and lesson analyses. Over this two-week period, the candidates were also expected to commence their observations and adapt to the school environment. In order to help them through the lesson analysis process, the candidates were given a lesson analysis framework designed by the researcher (Table 1). In designing this framework, the lesson analysis theoretical structures put forward by Hiebert *et al.*, (2007) and Santagata *et al.*, (2007) were made use of. The SELA candidates were asked to pay attention to the points in this framework.

Table 1: Lesson analysis framework

| |
|---|
| Clearly note down what the teacher does throughout the lesson. What activity did the teacher use to start the lesson, what questions did s/he ask the students, what methods and techniques did s/he use, how did s/he explain the topic, what visuals did s/he use model, table, figure? |
| Were the teacher's examples, questions, illustrations, teaching techniques, etc. effective for the students? What would you have done differently? |
| What facilitates students' understanding? What strategies made it possible? What made the students understand more easily? etc. |
| Determine the points that the students have difficulty with, the questions that they ask the teacher when they do not understand, the situations leading to misunderstanding, students' misunderstandings |
| Why do you think the students had this difficulty? What could be the reasons making comprehension a challenge? |
| What would <i>you</i> have done to spare the students these difficulties and make their learning easier? |

The SELA candidates analyzed the lessons that they observed for two hours every week, and then submitted their analysis reports by e-mail to their educator who in turn returned them to the candidates providing feedback for four weeks. The objective here was to improve the candidates' lesson analysis skills and to identify the sample cases that they could bring up for debate at academic meetings. Every week, academic meetings were held, with parts of the candidates' analysis samples demonstrated and feedback provided on the points that needed improving in their analyses. Furthermore, the candidates' views were elicited on the significant points that they had noticed during their classroom observations. These could be the mistakes that the students made in a teaching-learning process, the difficulties that they had understanding certain points, or the special cases that facilitated their understanding. Discussions were made on the reasons underlying the students' mistakes and misunderstandings, and what could be done to correct them. The focus of these discussions was on what teaching behaviours of the teacher made it easier or more difficult for the students to understand, and what could be done in such contexts. In this way, the teacher candidates were made aware of different teachers' approaches as well as the special teaching situations in different classroom settings. At the end of the term, the teacher candidates were asked to write up an evaluation report on how all this work contributed to their own development.

2.4. Conducting the Teaching Practice Course

Teaching Practice course presents teacher candidates with their first opportunity to experience teaching as the actual teachers of their classes. The teacher candidates received no interference whatsoever during the course which was implemented in the same way for both groups. A one-hour slot of teaching practice by each participant was observed and video-recorded by the researcher. In addition, the participants were asked to keep reflective diaries, and academic meetings were held once a week. The observations were made to witness how the teacher candidates realized their mathematics teaching practices. During these observations, the

researcher was able to take extensive field notes and to capture the candidates' and students' behaviours in the classroom. Video-recording during the observations allowed the researcher to watch the candidates' teaching behaviours again when necessary. In addition, five to six-minute interviews were conducted with all participants at the end of the term. These interviews were conducted to reveal the candidates' awareness of their teaching practices and to corroborate the findings yielded by the observations. The interview questions were about the difficulties the candidates met during the mathematics teaching process and contributions of the School Experience course assignments on Teaching Practice course.

2.5. Data Collection Instruments

For the first research problem, the data collection tools were the candidates' lesson analysis reports and end-of-term evaluation reports all used during the School Experience course. For the second research problem, the data collection tools used were the video recordings of the candidates' teaching practices, classroom observations, field notes, and interviews.

2.6. Data Analysis

Primarily, the end-of-term evaluation reports written up by the teacher candidates for the School Experience course were made use of for the first research problem. Content analysis was used for analyzing the data. In content analysis, inductive and deductive approaches are used together. In this process, first the teacher candidates' evaluation reports were read in a holistic manner. Then, coding was done to reveal the ways in which the teacher candidates most benefited from the School Experience course. These codes were examined for the links between them and themes covering these links were formed. For example, in deductive coding approach it was aimed to capture the candidates' views about knowledge of student. Frequency calculations were made to reveal the category frequencies for ease of comparison of the teacher candidates' opinions. The findings were presented in a table and corroborated by the participants' explanations and lesson analysis diaries.

For the second research problem, the interviews and the video recordings were studied separately. The teacher candidates' answers to the interview questions were subjected to content analysis to reveal how their School Experience course acquisitions were reflected by their teaching during the Teaching Practice course. For this purpose, first the codes were identified and then the themes were formed around the links between them. The data was examined again to identify the participants who had referred to these themes. The findings were supported by the field notes taken during the observations. The video recordings of the participants were viewed repeatedly in order to get a clearer picture of their approaches during their teaching practices. In addition, the analyses for both groups were subjected to time triangulation, which increases the reliability of a study by later showing the consistency (Dündar, 2013) and accuracy (Hanson, Creswell, Clark, Petska & Creswell, 2005; Jick, 1979) of the judgments obtained during the data analysis process: the analysis process of the study was revisited by the researcher (first author) at three different points in time.

3. FINDINGS

3.1. Findings on the First Problem of the Research

The themes that most benefited the SELA candidates during the School Experience course through lesson analysis, the categories, and the number of SELA candidates voicing opinions on these themes are presented in Table 2. These themes are: *understanding the student*, *self-development for teaching various topics*, *active participation in the lesson observed*, *contribution of discussions*, *critical thinking skills*, and *course motivator*. The findings pertaining to these themes will be presented based on the explanations of some SELA candidate.

Table 2: The views of the teacher candidates on SELA course

| Themes | Subthemes | f |
|--|---|----|
| Understanding the Student | Noticing where the students have difficulty learning, make mistakes, and misunderstand Noticing what points the students fail to understand Determining the questions that the students find challenging Noticing the difficulties in reflecting students' levels Learning to see and evaluate the lessons through the students' eyes Noticing where and how the students ask questions Noticing the importance of students' prior knowledge for comprehension Suggesting solutions on how to cope with students' difficulties and what can be done about this | 18 |
| Self-Development for Teaching Various Topics | What points to pay attention to in explaining topics Noticing what methods for what topics serve best to enable students to understand Noticing the effective teaching strategies enabling students to understand Noticing the teaching activities that students find challenging | 15 |
| Active Participation in the Lesson Observed | Observing the teacher and students in detail, focusing on the lesson as a result of this observation Being part of the process as an active observer, actively following all that is done in this process, actively evaluating the notes taken during these observations Putting oneself in both the teacher's and the students' shoes, and thinking about what could have been done differently Putting oneself in the teacher's shoes and starting to behave like the teacher of the class Analyzing the teacher's answers to students' questions and thinking about different strategies and solutions Thinking about different ways to do the lessons, and where the students may face difficulties and ask questions Attention shifting away when no lesson analysis is done | 17 |
| Critical Thinking Skills | Brainstorming on how the lessons observed could keep the minds more active and what could have been better explained Investigating possible causes, presenting solutions, evaluating the strategies used, rather than just criticizing Developing reflective and critical thinking, having the opportunity to hear different ideas | 11 |
| Contribution of Discussions | Noticing where students have difficulties in mathematical learning, analyzing the causes, and suggesting solutions Investigating the reasons why students fail to understand a particular topic and coming up with solution ideas Witnessing the differences in students' understanding the same topic explained by different teachers with different behaviours Realizing the best strategies and methods for students' comprehension in the explanation of the same topic by different teachers Noticing students' understanding in terms of different attainments Preparing for the next training session and doing better analyses, noticing what needs to be paid attention to in these analyses | 23 |
| Course motivator | Benefits for professional development Getting closer to the teaching profession | 9 |

f: frequency

3.1.1. Understanding the student

A great majority of the SELA candidates share their opinions on what points of lesson analysis helped understand the students. Hande, in her end-of-term report, explains as follows the increase in her awareness of understanding students:

“These observations have helped me anticipate where the students are more likely to make mistakes. I do not realize that when doing a lesson with my own

classmates. With the practice, however, I have been able to see even the slightest errors that the students made. This will help me with my teaching career in the future; I'll remember to be extra careful when those topics come up."

She underlines that the students can make slight mistakes easily overlooked, and that she will be mindful of them in her future career. In her fifth lesson analysis diary, Hande recalls noticing a challenge that the students face:

"If $\frac{5a}{7} + 10 = 25$ then $a=?$ The students found this problem challenging.

$\frac{5a}{7} = \frac{10}{1}$ $a=14$, were some of the answers. The students looked to see if they could do cross multiplications. First, some of them tried to solve the problem by ignoring the 25. Few of them found the correct answer. This made me wonder if it was wrong to do cross multiplications earlier on: the students find that method simple and attempt to apply it to all problems. Perhaps the cross multiplications would be better taught once the equations are fully understood: they will have fully grasped the equations and can then be taught cross multiplications for further practice."

3.1.2. Self-Development for teaching various topics

Most teacher candidates admit to being impressed with the teachers' approaches, adopting their effective strategies, or noticing the methods that the students found difficult. Emine is another teacher candidate who admits making use of many strategies employed by the teacher that she was observing:

"I have noticed how the students discover for themselves. This practice makes permanent learning possible. Besides, making the students find the error and questions like 'Is there anything wrong with this question or answer?' are effective ways to teach mathematics. Throughout the term, we did certain units. We were able to see the introductions to and illustrations of these units. There were some introductions that we really admired and others that we felt we would have done differently."

3.1.3. Active participation in the lesson observed

About two thirds of the SELA candidates declare that making observations through lesson analysis enables them to actively participate in the lesson that they observe. Derya, for instance, elaborates on this as follows:

"We tried to observe how the teachers did their lessons from the start to the end. In these observations, there were good points that I would gladly adopt as well as not so good ones that I definitely would've done differently. I noted down the good points in the introductions to the topics. There were times when I got so carried away that I almost asked for permission to explain the topic myself. If I had just been observing, without doing any analysis, I would have drifted away after a while and missed the points that the students found difficult to grasp. I also would've missed the good and not so good tactics employed by the teacher. I don't think I would've benefited as much as this from mere observations. Analyzing allowed me to find answers to most of my questions. I put myself in both the teacher's and the students' shoes and thought about how I would go about it."

3.1.4. Contribution of discussions

Almost all the SELA candidates expressed their feeling that the academic meetings held were supportive of their professional development. Nursel, for instance, opens this up as follows:

“The discussions we had in our meetings were a bonus for us. We could not always find the reasons for everything by ourselves. That’s where you came in, with your feedback and experience.”

3.1.5. Critical thinking skill

About half the SELA candidates have declared that they have gained the reflective and critical thinking skill. They have stressed that constant mental activity throughout the lessons observed has been helpful in finding answers to the question ‘How could I explain it better?’ Ayşe elaborates on this as follows:

“I think everyone should have a critical approach during school experience. Mentally, we keep our minds active during our observations, constantly seeking answers to questions like ‘How could I explain it better?’”

3.1.6. Course motivator

Some SELA candidates have stated that the contribution of the School Experience coursework to their professional development has motivated them. Nazlı, for instance, links her motivation to being in a position that is both inquisitive and critical, and opens it up as follows:

“From this perspective, I can say that the diaries we have been keeping for eight weeks have given us the role of both active observer and questioning critic. This way I was motivated to take maximum advantage of the teacher, rather than just going into the classroom to complete the observation requirement.”

3.2. Findings on the Second Problem of the Research

The teacher candidates’ views on what they found challenging during their mathematics teaching practices as part of the Teaching Practice course are presented in Table 3 and Table 4. The findings of this problem were acquired by analyzing the data obtained from the interviews conducted with the candidates. In addition, candidates’ video recordings of the teaching practices and the first researcher’s observations notes were considered during the analysis process. As can be seen from Table 3, the SELA candidates indicated that they had difficulty with understanding the students, classroom management, lesson organization and presentation during their teaching practices.

Table 3: Challenges faced by SELA teacher candidates during teaching practices

| Themes | Subthemes | Teacher Candidates |
|--------------------------------------|--|---|
| Understanding the Students | Not knowing what to do with unexpected questions and behaviours from students Reflecting students’ levels Not knowing whether the students have understood or not Guessing what the students already know | Nazlı, Şengül, Gül, Hande, Nur |
| Lesson Organization and Presentation | Student-centered teaching Topics requiring rote learning Preparing materials Preparing lesson plans Making mathematical explanations | Huriye, Figen, Fikret, Hande, Nilgün, Derya, Sibel, |
| Pedagogical Knowledge | Classroom management | Figen, Nazlı, Sibel, Gül, Derya |
| No Challenge | | Emine |

A large majority of them had difficulty with the preparation of student-centered teaching. Nearly half of them admitted that they had difficulty with classroom management and

understanding the students. Derya found preparing student-centered lesson plans challenging and explained it as follows:

“I had difficulty preparing lesson plans: ‘How do I do the lesson? What information do I give them first? Is this an appropriate example? Is it too difficult? It’s explained in one way in this book and in another way in that. What materials can I use? How can I explain the subject any differently?’ I didn’t see these as problems but as building upon my existing knowledge. I sometimes had difficulty keeping the class quiet.

Derya expresses difficulty with preparing lesson plans and classroom management. In a similar vein, Nazlı expressed her difficulty with understanding the students during the interviews:

Researcher: *Did you have any difficulty teaching maths? In what ways, if any, did you feel inadequate?*

Nazlı: *When I do a lesson plan, I always think it’ll work perfectly – the students can only give such and such answers. But then, I get unexpected answers, too.*

Researcher: *How do you mean?*

Nazlı: *Well, you have to stick to the plan. But when the students give me an answer other than the one I was expecting, I need to tell them the correct answer myself, which feels like memorization.*

Nazlı says that she prepares her lesson plans anticipating the possible answers from students. It can be said that she tries to plan her lessons according to her students. However, even though she does her planning anticipating all possible answers, when something unexpected comes up, she has to give the information directly. Unexpected behaviours or statements from students present a challenge to teacher candidates and make them feel inadequate.

In contrast, as can be seen in Table 4, only one of the NSE candidates course expressed having difficulties. Four had no difficulties whatsoever, and three had difficulty teaching certain topics.

Table 4: Challenges faced by NSE teacher candidates during teaching practices

| Themes | Teacher Candidates |
|--------------------------------|------------------------------|
| No difficulties | Kısmet, Meral, Nurten, Şenay |
| Difficulty with certain topics | Canan, Anıl, Şule |
| Reflecting students’ levels | Ahmet, Yasin, Lale |
| Classroom management | Melih |
| Difficulties overall | Ebru |

Four of the NSE candidates referred to no challenges in particular. Kısmet is one of them and she describes her situation as follows:

“I was just over excited. I had no problems with the kids – not me. But there were points that I forgot about because of the excitement.”

Kısmet only recalls forgetting about a few points because of her excitement. Table 5 and Table 6 present the School Experience course themes that were beneficial to the teacher candidates in their teaching practices.

Table 5: SELA teacher candidates' views on the benefits of the school experience course to their teaching practices

| Themes | Subthemes | Teacher Candidates |
|--|---|---|
| Designing Lessons That Correspond to Students' Levels | Finding students' comprehension important Preparing lesson plans keeping the students in mind Thinking about what the students know Wondering if the students understood | Huriye, Nur, Fikret, Hande, Nazlı, Figen, Gül, Şengül |
| Preparing Lesson Plans | | Huriye, Nilgün, Derya |
| Teaching Mathematics Topics | | Sibel, Hande, Sena, Figen, Sena, Derya |
| Reflecting on Our Own Practices | Explained but wondered if it was understood Critical thinking | Nur, Hande, Nazlı, Şengül |
| Feeling Prepared for The Upcoming Term | | Huriye, Derya, Sibel |
| More Detailed Observation and Interpretation in Mentor Teachers' and Other Teacher Candidates' Lessons | More conscious observations. | Nilgün, Şengül, Sibel |

Eight of the SELA candidates agreed that lessons should be so designed as to correspond to the students' levels. Some from this group also touched upon preparing lesson plans and teaching mathematics topics. Fikret, for instance, explains this as follows:

"We have been keeping detailed diaries since the beginning of the term and discussing the teachers' methods and how we can see things from the students' eyes. Before, I only took a cursory look at what needed to be done prior to the training sessions. But now I consider everything in detail: can the kids understand this or that? I try to go one step at a time, and I try to think like the students. It has been of great advantage in this respect."

Fikret considers the School Experience coursework to be beneficial in paying attention to the students' comprehension.

Table 6: NSE candidates' views on the benefits of the school experience course to their teaching practices

| Themes | Teacher Candidates |
|--|---|
| No benefits | Ali, Canan, Kısmet, Ebru, Şenay, Meral, Nurten, Melih |
| Warming up to the school and the students, understanding the students | Leyla, Yasin, Aydın |
| Advantages of observing the teacher for the teaching of certain topics | Leyla, Aydın, Lale |

The majority of NSE candidates were of the opinion that, overall, the School Experience course was not beneficial to teaching mathematics. Ali assert that their observations and experience during the School Experience course made no contribution to their Teaching Practice course:

Ali: It wasn't of much help. We just sat and watched the teacher. We might just as well have watched you here.

He admits to having done the School Experience course assignments only because he had to. The two groups' teaching practices differ in terms of the strategies used by the teacher candidates. The SELA candidates made more effort to help the students to access information, and to create settings conducive to discovery. Furthermore, they also tried to pave the way to

discussions. Of this group, Nilgün made a demonstration on calculating the volume of a cone. She began the lesson by eliciting what the students already knew about cones. She then did the water-filling activity together with the students to demonstrate the relation between the volume of a cylinder and that of a cone. It transpired as follows:

Nilgün: How do we calculate the volume of a cone?

Student: It's related to the volume of the cylinder.

Nilgün: Now we're going to do an experiment together. If I fill up the cylinder with water, what does the volume of the water show us?

Student: The volume of the cylinder.

Nilgün: What you see here in my hand is a cone. I want to fill the volume of the cylinder by means of this cone. Could someone come over here, please?

One of the students went to the blackboard and started filling the cylinder with water. The teacher candidate reminded them that the bottom areas and heights of the cylinder and the cone were equal. The students' guesses varied between 3, 4, and 2.5.

Nilgün: Have you been counting?

Student : Three cones have filled up the cylinder. So, the volume of the cylinder is three times that of the cone.

Nilgün: Anyone else?

Instead of giving the students the formula for the volume of the cone (a third of that of the cylinder), Nilgün chose to demonstrate it through an experiment. She then expected the students to explain what the result meant.

The NSE teacher candidates chose direct input rather than demonstrations for students' accessing information. They first presented the information and then proceeded with examples. Kısmet, for instance, presented first the definition and then some examples for arithmetic averages (Figure 1).

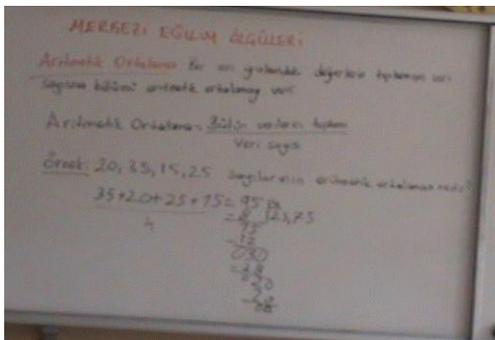


Figure 1. Arithmetic average examples

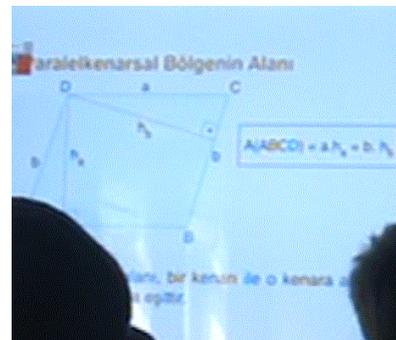


Figure 2. Parallelogram's area formula

Ali made his explanations on the area of the parallelogram on the figure previously drawn on the smartboard. This is shown in Figure 2. His explanations were as follows:

"This is a parallelogram. Look here, everyone. This is the height of the parallelogram for one side and this is the height for the other side. We have two heights in our parallelogram. The area of the parallelogram is calculated by multiplying side A, which is one side, by the height for that side, which equals the other side multiplied by its height. Now, let's turn to the questions."

The NSE teacher candidates chose direct input rather than demonstrations for students' accessing information. They first presented the information and then proceeded with examples. The study concluded that the candidates' involvement in teaching settings that included lesson

analysis supported their awareness of student-centered lesson design and helped them with their teaching practices placing the student in the center.

4. DISCUSSION, CONCLUSION, AND SUGGESTIONS

One of the goals of this research was to study how lesson analysis activities for the School Experience course supported the development of teacher candidates' knowledge of teaching. The SELA candidates analyzed the lessons of the teachers that they were observing as part of the School Experience course. The course educator provided feedback on the SELA candidates' lesson analysis reports, and discussions were held on the issues deemed to be significant for the teaching of mathematics in light of these reports. The practices throughout this process provided the SELA candidates with various acquisitions. The SELA candidates' observations of the teaching activities in a real classroom setting and their note-taking conducive to the analysis of the situations occurring in the classroom enabled them to carefully follow the learning and teaching process. The SELA candidates said that they had the chance to engage in the process and to actively participate in the lessons that they observed, as if they were conducting those classes themselves. In this way, the candidates started realizing when the learners understood easily, or had difficulty, and what they should pay attention to when teaching. Studies conducted with teacher candidates have shown that although candidates have difficulties in learning these skills, they can, in appropriate circumstances, change focus from themselves to students, learn to observe, and reflect on the learning of the students (Morris, 2006; Van Es & Sherin, 2002).

A large majority of the SELA candidates claimed to have knowledge of understanding the students. They asserted that they could capture where students had difficulty understanding and how the teacher's explanations and questions affected the students' understanding. Besides identifying the challenges faced by the students, some of the candidates even claimed to have suggestions on how to eliminate these problems. Nevertheless, the teacher candidates were not always equipped to identify the root causes of the students' difficulties and to propose solutions on how to deal with them. This was where the discussions during the academic meetings and the educator's support came in useful. As a result, it can be argued that teacher candidates' knowledge of mathematics teaching raises their awareness of understanding the student. As noticing requires a link to what the students do, Ball (2011) claims that dealing with their comprehension and making suggestions on how to cope with their difficulties helps understand them better. However, the SELA candidates were not always able to identify the underlying causes of the students' difficulties or to develop coping strategies. The reason for this could be the inadequacies in their pedagogical content knowledge. According to Hiebert *et al.* (2007), teachers' self-development in their pedagogical content knowledge lends support to their lesson analysis. As revealed also by the present study, the candidates noticed where learners had difficulty, but failed to formulate coping strategies. Following the observations and lesson analyses, SELA candidates shared their experiences during the academic meetings, which helped them all to have an idea of the learning difficulties and teaching processes in different classroom levels and topics. Observing different teachers teaching the same topic allowed the candidates to become aware of the situations that best enabled the learners to understand. Van Driel and Berry (2010) hold that, in addition to increasing pedagogical content knowledge, teaching experience makes this knowledge easier to improve as a result of the opportunity that it presents to observe the students' learning, reflect on these observations, and discuss them.

It could be suggested that the SELA candidates' evaluation of the effectiveness of various teaching strategies in terms of students' comprehension and proposals for improvement provide opportunities to capture the situations that are significant for the teaching of mathematics. A rise is noticed in the SELA candidates' awareness of which examples prove more effective in introducing a given topic and how the teaching explanations should be made. In some cases, the

teacher candidates even made criticisms of the practices of the teachers at their schools. Although some of the SELA candidates thought that all was well during the first few weeks, after a while, they started seeing the teachers' shortcomings. Their criticisms mostly focused on the choice of examples, student-teacher interaction, and the ways to make the students think.

Conducting the School Experience course in this manner resulted in an increase in the SELA candidates' motivation from an affective point of view. The SELA candidates attributed their increased motivation to this practice bringing them closer to the teaching profession and contributing to their professional development. During the first few weeks of the practice, the SELA candidates complained that the course assignments were too hard and time-consuming. As time passed, however, they started witnessing the effects of the practice and became more and more willing to participate in the course. The perception of learning a lot about the teaching profession was the major reason for their raised interest in the course. The existing research suggests that the School Experience course is inadequate in familiarizing candidates with the teaching profession and increasing their professional competence (Dönmez-Usta & Turan-Güntep, 2016). This study concludes, however, that complementing the course with lesson analyses can make candidates have a more positive attitude. It could therefore be suggested that teacher educators implement observation-based lesson analysis activities in real classroom settings in order to contribute to the teacher candidates' professional development building on their teaching knowledge. This implementation taking place in the first term that the candidates enter a real classroom is important in that the candidates are professionally motivated and can prepare for their upcoming teaching practices. Future studies could investigate quantitatively the effects of such a teaching setting on the candidates' knowledge of mathematics teaching.

The second goal of this research was to reveal how applications involving lesson analysis reflected on the teacher candidates' teaching practices. A large majority of the SELA candidates were seen to make an effort to put the student-centered lesson in their mathematics teaching practices during the Teaching Practice course. Most SELA candidates said that they attached importance to the students' understanding when planning the learning-teaching process, and voiced their concerns about the process. Some SELA candidate were seen to make more profound explanations to the students, develop lesson plans in anticipation of unexpected questions from the students, and ask themselves 'I have explained but has the student understood?'. NSE candidates did not seem to have much concern about students' comprehension or consider this point in their planning. There were NSE candidates who expressed having difficulty with teaching according to the students' levels but made clear that this was a difficulty for their teaching rather than the students' understanding. In short, the most salient difference between the two groups was in regards their awareness of the necessity to organize and present the lessons in a student-centered. We can say that the lesson analysis activities supported the creation of a consciousness that teacher candidates should consider a lesson in mathematics teaching from the point of view of the student. This awareness could be due to the teacher candidates examining and interpreting every action of the teacher during the lesson analyses, and reflecting on what they would do in the same situation. Sun & Van Es (2015) hold that teacher candidates who learn to do systematic analyses can then focus on the students' way of thinking and reflect this in their practices. In a similar vein, Taylan (2016) concludes that lesson analyses by mathematics teachers make them prepare student-focused lesson plans.

The SELA candidates had more difficulty with classroom management than the other group. This could be due to failure to keep the students under control while letting them discover for themselves. It is noteworthy that, of all the NSE candidates, only one reported problems with classroom management. This could be due to the NSE candidates preferring direct narration and making less time for classroom discussions. Again, the NSE candidates overall reported no problems with their teaching practices during the Teaching Practice course.

This could be due to them being closer to the traditional teaching approach adopted by the teachers who taught them throughout their educational lives as well as those currently under their observation. The SELA candidates' participation in the learning environment by doing lesson analysis can also be considered conducive to awareness-raising in student-centered lesson organization. The academic discussions held with the educator after the lesson analyses on what the mentor teachers did to reach out to the students and how the students' discovery process could be prioritized, and critique of the effectiveness of the modelling used, could have been further incentive for the candidates' growing awareness. Although the discussions may seem to have more weight in this context, the SELA candidates' idea that they cannot fully contribute to them without any experience in lesson analysis points to the fact that real significance lies again with lesson analysis.

Although the SELA candidates were more conscious of the teaching trends based on the recent reforms, they were seen to have many shortcomings in teaching mathematics. They were witnessed to have difficulty in doing the activities, making connections between the topics, and making mathematical explanations. From this point of view, it can be argued that more practice may be needed on how to make mathematical explanations following the contents of courses such as Special Teaching Methods. In addition, video-recording of the teacher candidates' teaching practices as part of the Teaching Practice course could allow them to do self-analysis, have group discussions on one another's inadequate points, and receive feedback from the educator, which could all guide them through the challenges and support their development. Future research could well focus on lesson analysis practices in support of the development of the candidates' knowledge of mathematics teaching as part of the Teaching Practice course where they practice teaching in front of the students for the first time.

The experiences gained throughout the School Experience course have critical importance in training teacher candidates considering the new approaches. These are the first instances for pre-service teachers in encountering the profound realities of the teaching profession and observing student behaviour in a real setting. Therefore, the experiences gained through the observation of the practices in such settings can be much more meaningful for the candidates. University courses on student-centered practices are usually theoretical and isolated from real classroom settings, and can consequently be of limited significance for the teacher candidates. For this reason, teacher candidates often consider their mentor teachers as role models serving as guides in real situations. This, however, is not completely free of risk. Seeing their mentor teachers constantly engage in direct narration can lead the teacher candidates to adopt the same approach later in their teaching practices. This clearly highlights the need to increase the support lent by the university in work carried out in real classrooms in the context of teacher training. University lecturers should serve as a bridge between school teachers' practices and the qualifications that student teachers are expected to gain. Enhancing first-time courses like School Experience with lesson analysis assignments and holding discussions focusing on the actual situation and the ideal situation should further support the development of the candidates' awareness. Besides, receiving feedback on the lesson analyses especially over the first few weeks would be useful for the candidates to learn to do lesson analysis properly. It all starts with making the teacher candidates experience lesson analysis; however, the situations that emerge also highlight the importance of the discussions as the teacher candidates' pedagogical content knowledge may not always prove adequate in finding the causes of the situations that they notice. These discussions are expected to contribute to the development of their pedagogical content knowledge.

5. REFERENCES

- Ball, D. L., & Forzani, F. (2009). The work of teaching and challenge for teacher education: Learning from the past. *Journal of Teacher Education, 60*(5), 497-511.
- Ball, D. L. (2011). Foreword. In M. G. Sherin, V. Jacobs, & R. Philipp (Eds.). *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. xx- xxiv). New York, NY: Routledge.
- Barnhart, T., & Van Es, E. (2015). Studying teacher noticing: Examining the relationship among pre-service science teachers' ability to attend, analyse and respond to student thinking. *Teaching and Teacher Education, 45*, 83-93.
- Baş, S. (2013). *An investigation of teachers noticing of students' mathematical thinking in the context of a professional development program* (Unpublished doctoral dissertation). Middle East Technical University, Ankara.
- Dönmez-Usta, N., & Turan-Günteppe, E. (2016). Okul deneyimi ve öğretmenlik uygulaması derslerine ilişkin öğretmen adaylarının görüşleri. *Uluslararası Sosyal Araştırmalar Dergisi, 9*(42), 1214-1224.
- Dündar, S. (2013). Demokratik okulun bir unsuru olarak öğrencilerin karar süreçlerine katılımı. *Kuram ve Uygulamada Eğitim Bilimleri, 13*(2), 853-875.
- Ericson, F. (2011). On noticing teacher noticing. In M. Sherin, V. Jacobs, & R. Philipp (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 17-34). New York, NY: Routledge.
- Feimen-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record, 103*, 1013-1055.
- Forzani, F. M. (2014). Understanding 'core practices' and 'practice-base' teacher education. *Journal of Teacher Education, 65*(4), 357-368.
- Gitomer, D. H., & Zisk, R. C. (2015). Knowing what teachers know. *Review of Research in Education, 39*, 1-53.
- Hanson, W. E., Creswell, J. W., Clark, V. L. P., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research design in counselling psychology. *Journal of Counselling Psychology, 52*(2), 224-235.
- Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education, 58*(1), 47-61.
- Jacobs, V. R., Lamb, L. L. C., & Philipp, R. A. (2010). Professional noticing of children's mathematical thinking. *Journal of Research in Mathematics Education, 41*(2), 169-202.
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly, 24*(4), 602-611.
- Kırksekiz, A., Uysal, M., İşbulan, O., Akgün, Ö. E., Kıyıcı, M., & Horzum, M. B. (2015). Okul deneyimi ve öğretmenlik uygulaması derslerine eleştirel bir bakış: Problemler, beklentiler ve çözüm önerileri. *Bartın Üniversitesi Eğitim Fakültesi Dergisi, 4*(2), 433-451.
- Koç, C., & Yıldız, H. (2012). Öğretmenlik uygulamasının yansıtıcıları: Günlükler. *Eğitim ve Bilim, 37*(164), 223-236.
- Levin, D. M., Hammer, D., & Coffey, J. E. (2009). Novice teachers' attention to student thinking. *Journal of Teacher Education, 60*(2), 142-154.
- Linares, S. (2013). Professional noticing: A component of the mathematics teacher's professional practice. *Sisyphus-Journal of Education, 1*(3), 76-93.
- Mason, J. (2002). *Researching your own practice: The discipline of noticing*. London: Routledge-Falmer.
- McDonald, M., Kazemi, E., & Kavanagh, S. S. (2013). Core practices and pedagogies of teacher education: A call for a common language and collective activity. *Journal of Teacher Education, 64*(5), 378-386.
- Morris, A. K. (2006). Assessing pre-service teachers' skills for analyzing teaching. *Journal of Mathematics Teacher Education, 9*(5), 471-505.
- Osmanoğlu, A. (2010). *Preparing prospective teachers for reform-minded teaching through online video case discussions: Change in noticing* (Unpublished doctoral dissertation). Middle East Technical University, Ankara.
- Santagata, R., Zannoni, C., & Stigler, J. W. (2007). The role lesson analysis in pre-service teacher education. An empirical investigation of teacher learning from a virtual video-based field experience. *Journal of Mathematics Teacher Education, 10*, 123-140.

- Santagata, R., & Yeh, C. (2014). Learning to teach mathematics and to analyse teaching effectiveness: evidence from a video- and practice-based approach. *Journal of Mathematics Teacher Education*, 17, 491-514.
- Santagata, R., & Guarino, J. (2011). Using video to teach future teachers to learn from teaching. *ZDM The International Journal of Mathematics Education*, 43(1), 133-145.
- Schoenfeld, A. H. (2011). Noticing matters. A lot. Now what? In M. G. Sherin, V. Jacobs, & R. Philipp (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 223-238). New York, NY: Routledge.
- Sherin, M. G., Jacobs, V. R., & Philipp, R. A. (Eds.). (2011). *Mathematics teacher noticing: Seeing through teachers' eyes*. New York, NY: Routledge.
- Star, J. R., & Strickland, S. K. (2008). Learning to observe: Using video to improve preservice mathematics teachers' ability to notice. *Journal of Mathematics Teacher Education*, 11, 107-125.
- Star, J. R., Lynch, K. H., & Perova, N. (2011). Using video to improve mathematics teachers' abilities to attend to classroom features: A replication study. In M. G. Sherin, V. R. Jacobs, & R. A. Philipp (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 117-133). New York, NY: Routledge.
- Sun, J., & Van Es, E. A. (2015). An exploratory study of the influence that analysing teaching has on pre-service teachers' classroom practice. *Journal of Teacher Education*, 66(3), 201-214.
- Taylan, R. D. (2016). The relationship between pre-service mathematics teachers' focus on student thinking in lesson analysis and lesson planning tasks. *International Journal of Science and Mathematics Education*. Advance online publication. doi:10.1007/s10763-016-9778-y
- Van Driel, J. H., & Berry, A. (2010). The teacher education knowledge base: Pedagogical content knowledge. In B. McGraw, P. L. Peterson, & E. Baker, (Eds.), *International encyclopedia of education* (pp. 656-661). Oxford: Elsevier.
- Van Es, E. A., & Sherin, M. G. (2002). Learning to notice: Scaffolding new teachers' interpretations of classroom interactions. *Journal of Technology and Teacher Education*, 10(4), 571-596.
- Yüksek Öğretim Kurumu [YÖK]. (1998). *Undergraduate teacher education programs*. Retrieved February 9, 2017 from <http://www.yok.gov.tr>

Uzun Özet

Öğrencinin öğrenmesi açısından öğretimin analiz edilip yorumlanması öğretmenlerin daha etkili bir öğretim yapabilmeleri için önemlidir. Ayrıca öğretmenlerin öğrenci merkezli yaklaşıma dayalı öğretim faaliyetlerinin uygulamasında yaşanan karmaşık durumların üstesinden gelebilmeleri için ders analizi yapma, fark etme ve yansıtıcı düşünebilme gibi becerilere sahip olmaları gerekir. Bu becerilerden ders analizi, yapılan öğretimin etkililiğini değerlendirmek için öğrencinin düşüncesini yakalama ve yorumlama yollarını geliştirmeyi amaçlar. Ders analizi ve fark etme becerisi, öğretmen ve öğretmen adaylarına öğrenciyi tanıma ve uygulamalarını geliştirme fırsatı vermektedir. Özellikle uygulamada değişim yapmak isteniliyorsa fark etme becerisinin kullanılmasını önerilmektedir. Bu durum öğretmen adaylarının ders analizi becerilerini geliştirecek öğrenme ortamlarına katılımlarının önemine işaret ederek, bu doğrultuda yapılacak araştırmalara duyulan ihtiyacı gündeme getirmektedir.

Okul Deneyimi dersi öğretmen adayının öğretim bilgisinin gelişiminde çok kritik bir noktadadır. Türkiye'de Okul Deneyimi dersinin etkililiği üzerine yapılan araştırmalar genelde bu dersin uygulama sürecinde sıkıntılarının olduğu yönündedir. Bu çalışmalar, ders sürecinde yapılan ödevlerin öğretmen adaylarına mesleki yeterlilik ve kişisel beceri kazandırma ve öğretmenliğe olan ilgiyi artırma açısından yeterli olmadığını göstermektedir. Bu durum Okul Deneyimi dersinin öğretmen adaylarının uygulamaya yönelik matematik öğretimine dair bilgilerinin geliştirilmesine katkı sağlayacak şekilde yeni düzenlemelere ihtiyaç duyduğunu göstermektedir. Bu çalışmada, ilköğretim matematik öğretmenliği programında Okul Deneyimi dersini yürüten öğretim elemanı, ortaokul matematik öğretmeni adaylarının matematiği öğretme bilgisinin gelişimini desteklemek amacıyla dersin ödevlerini ders analizi görevlerini de içerecek şekilde yeniden düzenlemiştir. Bu ders analizleri sırasında öğretmen adaylarından öğrencilerin anlamalarına bağlı olarak öğretmenin yaptıklarını belirlemeleri, belirledikleri durumları yorumlamaları ve yapılan öğretim çalışmalarını geliştirmek için ne yapmaları gerektiği noktasında düşünceleri beklenmiştir. Ders analizine dayalı bu yöntemin, adayların öğretim bilgilerinin geliştirilmesinde kullanılabilir yollardan biri olabileceği ve bu şekilde alana katkısı olacağı düşünülmektedir. Bu çalışmanın amacı bir öğretmen eğitimi programının Okul Deneyimi dersinde ders

analizi aktivitelerini içeren uygulamanın öğretmen adaylarının öğretim bilgisindeki gelişimi nasıl desteklediği ve adayların öğretim pratiklerine nasıl yansıdığını incelemektir.

Çalışma iki aşamadan oluşmaktadır. İlk aşama Okul Deneyimi dersinde gerçekleşmiştir. Öğretim elemanı Okul Deneyimi dersinin içeriğini ders analizi aktivitelerini içeren uygulamalarla zenginleştirmiştir. Bu ders kapsamında öğretmen adayları her hafta iki ders saati boyunca gözlemledikleri derslerin analizini yapmışlar ve ardından analizlerini öğretim elemanına e-mail aracılığıyla rapor halinde sunmuşlardır. Öğretim elemanı dört hafta boyunca bu raporlara dönüt vererek adaylara geri göndermiştir. Buradaki amaç öğretmen adaylarının ders analizi yapma becerilerini geliştirmek ve üniversite ortamındaki toplantılarda tartışmaya sunabilecekleri örnek durumları belirlemektir. Her hafta üniversite ortamında toplantı yapılmış, adayların analiz örneklerinden bölümler gösterilmiş ve adaylar analizlerde geliştirilmesi gereken noktalardan haberdar edilmiştir. Ayrıca öğretmen adaylarının okul ortamında gözlem altına aldıkları derslerde fark ettikleri önemli durumlar hakkında görüşleri alınmıştır. İkinci aşama Öğretmenlik Uygulaması dersi kapsamında gerçekleşmiştir. Bu ders normal şartlar altında yürütülmüştür. Çalışmanın örneklemini bir devlet üniversitesinde eğitim gören 24 matematik öğretmeni adayı oluşturmaktadır. Bu adaylardan 12'si Okul Deneyimi dersinde yaptıkları uygulamanın Öğretmenlik Uygulaması dersinde öğretim pratiklerini nasıl şekillendirdiğini ortaya koymak için takip edilmiştir. Çalışmaya katılan adaylar, Okul Deneyimi ve Öğretmenlik Uygulaması derslerinde araştırmacı (1. yazar) danışmanlığında olan öğrencilerdir. Ayrıca bu adayların ders analizi etkinliklerine katılmasının öğretim pratiklerini şekillendirmesine etkisini daha net ortaya koymak için bir karşılaştırma grubu belirlenmiştir. Bu karşılaştırma grubu adayları ilk dönem normal şartlar altında Okul Deneyimi dersini almıştır. Veri toplama araçları ilk araştırma problemi için Okul Deneyimi dersinde adayların ders analizi raporları, dönem sonu değerlendirme raporlarıdır. Araştırmanın ikinci problemi için kullanılan veri toplama araçları ise öğretmen adaylarının ders anlatım videoları, sınıf içi gözlem, alan notları ve mülakatlardır. Verilerin analizinde içerik analizi yöntemi kullanılmıştır.

Öğretmen adaylarının gerçek sınıf ortamındaki öğretim faaliyetlerini gözlemleyerek sınıf içerisinde süregelen durumları analiz edecek şekilde not almaları, onlara öğrenme öğretme sürecini dikkatle takip etme fırsatı sağlamıştır. Bu sayede adayların öğrencilerin hangi durumlarda kolay anladıklarını, hangi durumlarda güçlük çektiklerini ve konuları anlatırken hangi noktalara dikkat edilmesi gerektiğinin farkına varmaya başladıkları görülmüştür. Bazı öğretmen adayları, öğrencinin öğrenme güçlüklerini belirlemenin yanında bu güçlükleri nasıl ortadan kaldırdığına dair fikir sahibi olduğunu vurgulamıştır. Fakat öğretmen adayları öğrencinin zorluk çektiği durumların sebebini belirleme ve bu durumla baş edebilmek için çözüm önerisi geliştirme noktasında her zaman yeterli olamamışlardır. Bu durumda adaylar, üniversitede yürütülen tartışma ortamı ve ders hocasının desteği ile çözüm yolu geliştirme fırsatı yakalamışlardır. Böylece öğretmen adaylarının matematiği öğretme bilgilerinin öğrenciyi tanıma boyutunda farkındalıklarını artırdığını söyleyebiliriz. Bunun yanı sıra öğretmen adaylarının öğretmenlerin kullandıkları öğretim stratejilerinin öğrencinin anlaması açısından etkili olup olmadığını değerlendirmelerinin ve geliştirici öneri sunmalarının onlara matematiği öğretme bilgisi adına önemli durumları yakalama fırsatı sağladığı söylenebilir. Öğretmen adaylarının bir konuya dair hangi örnekle başlamanın daha etkili olduğu ve öğretimsel açıklamaların nasıl yapılması gerektiği gibi noktalarda farkındalıklarının arttığı görülmektedir. Ayrıca Okul deneyimi dersinin bu şekilde yürütülmesi, öğretmen adaylarının duyuşsal açıdan derse karşı motive olmalarını sağlamıştır. Öğretmen adayları, bu uygulamanın kendilerini öğretmenliğe daha fazla yaklaştırdığını ve mesleki gelişimlerine katkı sağladığını düşündükleri için motivasyonlarının arttığını ifade etmişlerdir.

Okul Deneyimi dersi kapsamında ders analizi yapan öğretmen adaylarının büyük çoğunluğunun Öğretmenlik Uygulaması dersi kapsamındaki matematiği öğretme pratiklerinde öğrenciyi merkeze alacak şekilde uygulama yapmaya gayret ettikleri görülmüştür. Okul Deneyimi dersi kapsamında ders analizi yapmayan diğer öğretmen adaylarının ise öğretim pratiklerinde öğrencinin anlaması boyutunda bir endişe duymadığı ve planlama sürecinde bu durumu çok fazla göz önünde bulundurma ihtiyacı hissetmediği görülmektedir. Buna bağlı olarak öğretmen adaylarının Okul Deneyimi dersinde ders analizi yapmalarının öğretim sürecinde dersin öğrenciyeye göre hazırlanması ve uygulanması gerektiği noktasında bir farkındalık oluşturduğunu söyleyebiliriz.

Okul Deneyimi dersi sürecinde edinilen deneyimler, öğretmen adaylarının yeni yaklaşımlar doğrultusunda yetiştirilmesinde kritik bir öneme sahiptir. Öğretmen adayları bu süreçte ilk kez öğretmenlik mesleğinin uygulama boyutunun derindeki gerçeklerle karşılaşarak öğretim faaliyetlerini

ve öğrenci davranışlarını gerçek ortamda gözleme fırsatı yakalamaktadır. Dolayısıyla bu ortamda yapılan uygulamaları gözlemleyerek edinilen deneyimler adaylar için çok daha anlamlı hale gelebilmektedir. Okul Deneyimi gibi derslerin ders analiz destekli ödevler ile zenginleştirilmiş öğrenme ortamlarına dönüştürülmesi aracılığıyla öğretme faaliyetlerinde olması gereken ile var olan durumlar dikkate alınarak tartışmalar yapılması, derslerin öğrenciye göre hazırlanması ve uygulanması noktasında adayların gelişimini destekleyecektir. Ayrıca ders analizlerinin yapılması sürecinde adaylara özellikle ilk haftalarda dönütler verilmesi, ders analizinin öğrenilmesi açısından önemlidir.