

Examining the Contributions of the Reflective Thinking Skills Support Program (RTSSP) to Teacher Candidates*

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Abstract

This study focused on “reflective thinking” skills, which refer to teacher candidates’ in-depth thinking at a metacognitive level about various actions and situations. By implementing the Reflective Thinking Skills Support Program (RTSSP), it was aimed to determine teacher candidates’ views through monitoring and evaluation studies. Mixed methods case study design was used. Ten primary school teacher candidates participated in the RTSSP, which was delivered over six weeks. At the beginning and end of the program, focus group interviews were conducted with teacher candidates concurrently, and the Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE) was administered. Throughout the training process, the researchers took notes during the monitoring and evaluation meetings held after each training session. In the analysis of the data, the Wilcoxon signed-rank test was used for quantitative data, while descriptive analysis and content analysis were used for qualitative data. Teacher candidates stated that the program contributed to their reflective thinking processes; the qualitative findings showed changes in terms of making sense of reflective thinking and transferring it to instructional practices. It was observed that, when defining reflective thinking, teacher candidates emphasized self-discovery, questioning, being open to criticism, putting into practice, and the development of awareness. They expressed the importance of collaboration among students when using reflective thinking skills in instructional processes. It is anticipated that these results will serve as a resource for future studies aiming to develop reflective thinking skills.

Keywords: Mixed methods design, reflective thinking, skills training, teacher candidate

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Introduction

Rapid advances and changes occurring at national and transnational levels make it necessary to view the concepts of education, teacher, and student from different perspectives. Since teachers have moved beyond the role of merely transmitting knowledge, the subject-matter knowledge they possess is no longer sufficient on its own; how they transmit knowledge, how they guide students' learning and sense of curiosity, and from what standpoint they approach concepts such as society, nature, the student, education, teaching, and learning have become much more important. For this reason, countries attempt to determine the competencies that teachers should possess at both national and international levels and establish various indicators (Ministry of National Education, 2017). From a contemporary perspective, teachers are expected to educate students who can plan their own learning, take responsibility for it, and reflect on it (Gürkan, 2021). Compared with the past, teachers are required to think much more deeply about how they can structure the instructional process in the most effective way and to continuously update their practices according to the requirements of the age. Students are expected to employ metacognitive processes while questioning their learning processes, and teachers are likewise expected to do so while evaluating their practices. At this point, reflective thinking is of great importance for the professional development of teachers and teacher candidates. At its most basic level, reflective thinking refers to the process of thinking deeply about a person, situation, or practice. While thinking deeply about their instructional practices, teachers should examine many variables, such as every action and activity they carry out in the process, the environment they create, and the forms of communication they establish, by considering new knowledge and alternative perspectives; that is, by reflecting, or in other words, by thinking reflectively (Ersözülü & Kuzu, 2011; Sünbül, 2011). Reflective thinking is a process that supports teachers in evaluating the teaching-learning process, solving problems, drawing on previous experiences when planning new experiences, and looking at themselves critically. In order to develop professional competencies, faculties of education offer teacher candidates courses intended to provide professional knowledge, subject-matter knowledge, and pedagogical formation knowledge. Their ability to apply these courses effectively in the classroom when they become teachers will be possible through gaining experience and evaluating themselves, their preparation, the process, and the dynamics within the classroom after each practice. Based on this point, the Reflective Thinking Skills Support Program (RTSSP), which is anticipated to contribute to "reflective thinking" skills, meaning teacher candidates' in-depth thinking at a metacognitive level about various actions and situations, was implemented in this study. Monitoring and evaluation studies were conducted. The effect of this six-week training on teacher candidates' development was determined through quantitative and qualitative methods. The study was conducted with 10 volunteer teacher candidates studying in the Department of Primary School Teaching. At the beginning and end of the study, focus group interviews were conducted with teacher candidates concurrently, and the Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE) was administered. Throughout the training process, during the exchanges

in the monitoring and evaluation meetings held after each training session (group discussions, examples of practices and plans shared by teacher candidates, etc.), the researchers recorded the data through the notes they took. The qualitative data obtained were analyzed using content and descriptive analysis, while the quantitative data were evaluated using appropriate nonparametric statistics.

Reflective Thinking

Although what first comes to mind when reflective thinking is mentioned is seeing what exists as it is, the concept has been defined in many different ways. In particular, Dewey's (1933) definition of it as an active, careful, and persistent thinking process carried out by individuals concerning a belief or fact has been widely accepted. This process, which plays a critical role for educational stakeholders, is regarded as challenging. When individuals encounter information for the first time, they experience confusion in their minds. They want to resolve this confusion by bringing it into balance. New information is examined in light of previous experiences and accumulated knowledge. This process goes far beyond placing thoughts one after another. Rather, it refers to thoughts forming a basis for one another and serving as a basis for new knowledge. Emotions and beliefs are not denied in the process, and bringing them into a positive form is also considered important. Ünver (2003) states that reflective thinking is important in terms of making decisions related to education and investigating the outcomes of those decisions.

Reflective thinking is based on the acceptance of some basic teachings of constructivism. An individual who thinks reflectively takes responsibility for his or her actions. The individual acquires self-regulation skills. The individual gains the ability to make decisions. Mentally, the individual pushes himself or herself to go beyond personal limits (Eğmir & Ocak, 2018). The reflective thinking process requires action; in this respect, it goes beyond an ordinary process of remembering. When individual effort and guidance are combined in the process, reaching meaningful outcomes becomes easier (Mewborn, 1999). For this reason, individuals need to be at a certain level in order to think reflectively. Rogers (2002) stated that, for reflection, it is important for the individual to have experience and to be able to evaluate those experiences objectively. According to him, the individual should also be able to recognize situations and problems in which he or she has no experience, propose appropriate solutions to the identified problems, and group and test these solutions.

Many models of reflective thinking have been proposed. The most widely known of these models belong to Dewey, Rodgers, and Schön. Dewey (1933) explains the reflection process as a process that passes through two sub-stages: "perplexity" and "clarification-inquiry." In the first stage, perplexity and doubt, the individual feels a need to think when faced with a situation, problem, or event. In the second stage of thinking, clarification-inquiry, the individual engages in research and inquiry in order to verify or falsify a thought or belief that has not yet reached equilibrium in his or her mind.

Rodgers (2002) built on the views of Dewey, who had worked on reflective thinking before her, and attempted to advance the theoretical foundation related to reflective thinking. According to her, the

reflection process is more advanced than other, less structured thinking processes. This type of thinking differs from others through its use of the scientific method. Reflection, in her view, is a complex concept. She considers it valuable for reflection to be defined and thought through. Determining the purpose of reflection and explaining each step of this process are important. She believes that scale applications gain meaning through observations, detailed explanations, and the sharing and evaluation of experiences.

Although Schön based his views on Dewey's work, he considered the concept of reflective thinking more from the perspective of practitioners. According to him, inquiry plays a very important role in the reflection process. He believes that practitioners can take serious steps toward improving processes by asking themselves questions such as: Did this practice work in the work they carried out? What were the points that worked and did not work? What steps can be taken to make the process more effective? (Schön, 1983; 1987; as cited in Sünbül, 2011).

Reflective Thinking and the Teacher Candidate

Educating learners who take responsibility for learning, demonstrate determination and willingness in their actions, are disciplined and persistent, and can not only acquire knowledge but also use it to develop practical applications is one of the main points emphasized by the contemporary educational approach. Teachers who educate students with these characteristics, and teacher candidates who will do so, are also expected to experience awareness of their own actions, to think about what they do while planning, during implementation, and after implementation, what their actions lead to, what is highly effective in the process, and what does not create the expected effects, and to plan each new step more strongly in line with these answers (Weber, 2013). For this reason, reflective thinking skills are an area of skill that needs to be developed for both students and teachers.

At a time when considerable effort is devoted to defining professional competencies, one of the purposes of determining these competency indicators is to help shape pre-service teacher education activities and programs in line with these indicators. Many activities can be carried out to develop teacher candidates' reflective thinking skills, such as examining together the lesson and activity plans they prepare, having them think aloud about these documents, conducting group discussions, having them complete self-evaluation forms, providing feedback on their practices, and asking them to keep journals.

Teacher candidates begin to come into direct contact with students in their classroom practices during teaching practice courses. This process, in which they directly affect students, continues throughout their professional lives. Teaching is a profession that requires making many decisions and choices during the day. Teachers have to act quickly in these decision-making processes. Remembering what did and did not work in their previous experiences, rapidly reviewing the situation, phenomenon, and environment, and putting practices into action become important. Developing reflective thinking

skills becomes important so that teacher candidates can act effectively and decisively while putting into practice the theoretical knowledge they have acquired in faculties of education.

The aim of this study is to contribute to teacher candidates' reflective thinking skills through the prepared Reflective Thinking Skills Support Program (RTSSP). The main research question is, "How has teacher candidates' use of reflective thinking in their instructional practices developed after participating in the Reflective Thinking Skills Support Program (RTSSP)?" Considering this main question, answers were sought to the following subproblems.

1. What are the reflective thinking tendencies of teacher candidates participating in the Reflective Thinking Skills Support Program (RTSSP) before and after instructional practice?
2. What are teacher candidates' views regarding reflective thinking in their instructional practices before the RTSSP?
3. What are the views of teacher candidates participating in the RTSSP monitoring-support study regarding reflective thinking practices?

Method

This section presents information regarding the method to be used in the study, the introduction of the reflective thinking training program to be prepared for teacher candidates, the groups included in the study and their characteristics, the data collection tools, how the data collection process was carried out, and how the data were analyzed.

Research Design

A mixed methods case study design will be used in this study. A mixed methods case study design refers to the intersection of a case study with one of the basic mixed designs known as convergent, exploratory, or explanatory (Creswell & Plano Clark, 2018, p. 172). For this reason, quantitative and qualitative data were collected concurrently and combined to explain the relevant case. The research process is presented in Figure 1.

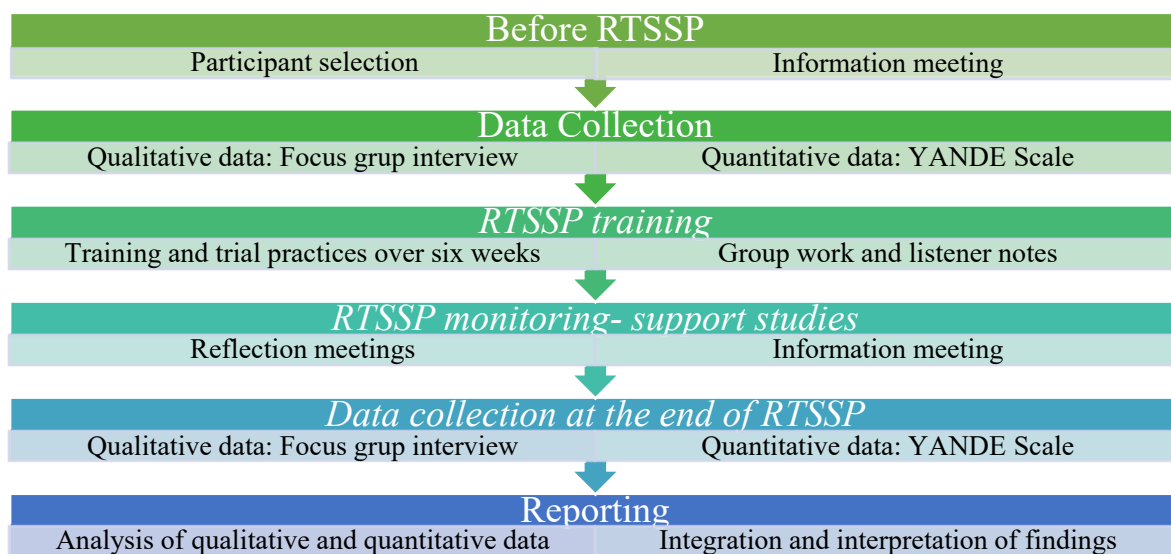


Figure 1. Detailed representation of the research process

In this study, the participating teacher candidates were first selected. The Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE) was administered and focus group interviews were conducted, followed by RTSSP training. After each training session, teacher candidates were expected to carry out practices in their own learning lives related to that week's topic. Reflections were made on these practices, and the process was supported through group discussions. At the end of the process, administration of the Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE) and the focus group interviews were repeated; the qualitative and quantitative findings were integrated, interpreted, and reported.

Participants

This study was conducted with a total of 10 teacher candidates studying in the fourth year at the Faculty of Education of a public university. The reason for preferring teacher candidates studying in the fourth year was that they had taken courses in the lower years of their undergraduate program that prepared them for teaching courses and, at the third-year level, had taken courses such as "Teaching Turkish, Teaching Mathematics, and Initial Reading and Writing Instruction," through which they had studied the teaching of these subjects in primary schools in detail. At the fourth-year level, this group conducts observations and teaches lessons in primary schools for 12 weeks in both semesters (fall and spring) within the scope of the teaching practice course in order to demonstrate their teaching skills. Because of both the teaching experiences they had in the fall semester and the fact that their teaching experiences would continue in schools within the scope of teaching practice in the spring semester, and because this provided an area in which the candidates could apply the training they received in the RTSSP, 10 teacher candidates who volunteered to participate in the study constituted the study group. The training content of the RTSSP conducted with teacher candidates is presented in Figure 2.

Course 1	•What is reflective thinking?
Course 2	•Self-Assessment and Self-Awareness
Course 3	•Critical Inquiry
Course 4	•Peer Feedback and Collaborative Reflection
Course 5	•Emotional Connection and Communication
Course 6	•Constructive Self-Assessment

Figure 2. RTSSP training content

After a presentation on the content of each week was made by the researchers, the views and experiences of the teacher candidates were discussed with them. An attempt was made to understand the topic in depth and to clarify how it could be applied in the teaching-learning process.

Data Collection Tools

Data triangulation was employed in the study. Data were collected from teacher candidates at the beginning and end of the training through a semi-structured interview form and the Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE), while during the training process, researcher notes were taken by the researchers during group discussions conducted as part of the monitoring-support studies.

1. Teacher Candidate Semi-Structured Interview Form: The semi-structured interview form, developed by the researchers to obtain teacher candidates' views on reflective thinking and the application of reflective thinking skills to instructional activities and to learn how they evaluated themselves in this respect, consists of 8 open-ended questions. After the questions were prepared, they were submitted for the opinions of three experts working in the field of curriculum and instruction who held at least a doctoral degree, and the final form was developed by taking their suggestions into consideration.

2. Reflective Thinking Tendency Scale for Teachers and Teacher Candidates (YANDE): Developed by Semerci (2007), the scale is a Likert-type scale consisting of a total of 35 items, 15 negative and 20 positive. According to the results of the factor analysis of the scale, the KMO value is 0.909 and the Bartlett test value is 6811.461 ($p < 0.05$). This scale consists of 7 factors. The names of the factors are: continuous and purposeful thinking, open-mindedness, questioning and effective teaching, teaching responsibility and scientificity, researcher, being foresighted and sincere, and professional outlook. The item-total correlations of the scale range between 0.308 and 0.607. The test-retest correlation was found to be 0.742 ($p < 0.01$), and the correlation coefficient between the two half scores was found to be 0.77 ($p < 0.01$). The Cronbach Alpha coefficient of the YANDE scale is 0.908. The scale is at a level that can be administered to teachers and teacher candidates.

3. Researcher Note Form: While discussing the instructional activities they carried out within the scope of the monitoring-support studies conducted with teacher candidates, the researchers took notes on the practices they identified as supporting reflective thinking and the views expressed.

Data Analysis

The data obtained within the scope of the study were analyzed in accordance with the research questions. For the first research question, the Wilcoxon signed-rank test, one of the quantitative analysis methods, was used. For the second and third research questions, descriptive analysis and content analysis, which are qualitative analysis methods, were used. Themes and codes were identified and supported with quotations.

Validity and Reliability of the Study

Some precautions were considered to ensure that the study was valid and reliable. These are listed below:

1. Quantitative and qualitative data were collected approximately concurrently, and care was taken not to allow one to affect the other.

2. Creswell and Plano Clark (2018) emphasize that the number of people from whom quantitative and qualitative data are collected should be equal. This criterion was taken into consideration in the study.

3. Quantitative and qualitative data will be analyzed separately; however, they were presented in an integrated manner. It is thought that this practice also contributes to validity.

4. Measures were also taken to ensure that the study was credible, transferable, confirmable, and consistent. The data were entered as they were and stored so that they could be accessed when requested.

5. Data triangulation was also employed in the study in order to ensure credibility (Miles & Huberman, 1994).

6. The interview records were submitted to the participants for confirmation.

Role of the researchers: The researchers were involved in every stage of the process. They were active in the planning, implementation, evaluation, and reporting stages. Both researchers have served as academic staff members in a faculty of education for more than 15 years. They are knowledgeable about both the research topic and the tradition of scientific research. They personally carried out each implementation. Both researchers participated in the training sessions and the monitoring and evaluation meetings.

Findings

Reflective thinking tendencies in the instructional practices of teacher candidates participating in the RTSSP

The mean scores for the reflective learning skill and its subdimensions of primary school teacher candidates before and after the RTSSP program are presented in Table 1.

Table 1. Pretest and posttest results for reflective learning skill

Scale / Subdimension	Test	n	$\bar{X}$	sd
Continuous and Purposeful Thinking	Pretest	10	4.50	0.39
	Posttest	10	4.40	0.35
Open-Mindedness	Pretest	10	4.36	0.44
	Posttest	10	4.20	0.33
Questioning and Effective Teaching	Pretest	10	3.60	0.46
	Posttest	10	3.20	0.47
Teaching Responsibility and Scientificity	Pretest	10	4.31	0.31
	Posttest	10	4.43	0.60
Researcher	Pretest	10	4.68	0.41

	Posttest	10	4.56	0.61
	Pretest	10	4.34	0.34
Being Foresighted and Sincere	Posttest	10	4.35	0.39
	Pretest	10	3.70	0.26
Professional Outlook	Posttest	10	3.25	0.26
	Pretest	10	4.22	0.26
Overall Mean	Posttest	10	4.43	0.32

It is observed that the mean reflective thinking skill score of primary school teacher candidates before the RTSSP program was $\bar{X}=4.22$ and increased to $\bar{X}=4.43$ afterward. When examined in terms of the subdimensions, it is seen that the score increased in the dimension of being foresighted and sincere, while it decreased in the dimensions of a) continuous and purposeful thinking, b) open-mindedness, c) questioning and effective teaching, d) teaching responsibility and scientificity, e) researcher, and g) professional outlook.

The Wilcoxon signed-rank test was used to evaluate whether there was a statistically significant difference between the reflective thinking tendencies of primary school teacher candidates before and after the reflective learning skills support program. The values are presented in Table2.

Table 2. Wilcoxon signed-rank analysis results for pretest and posttest reflective thinking tendency and its subdimensions

Scale / Subdimension	n	T	z	p
Continuous and Purposeful Thinking	10	18.00	0.000	1.000
Open-Mindedness	10	10.50	-1.433	.152
Questioning and Effective Teaching	10	5.50	-0.985	.325
Teaching Responsibility and Scientificity	10	18.50	-0.071	.943
Researcher	10	15.00	-0.89	.373
Being Foresighted and Sincere	10	13.00	-0.711	.477
Professional Outlook	10	6.00	-0.447	.655
Overall Mean	10	17.50	-1.023	.306

Accordingly, there is no statistically significant difference between the reflective thinking tendencies of primary school teacher candidates before and after the reflective learning skills support program ($T=17.50$, $p=0.306>0.05$, $z=-1.023$). There is also no significant difference in terms of the subdimensions.

Views on reflective thinking in the instructional practices of teacher candidates participating in the RTSSP

The views of the teacher candidates were addressed under two headings: views before the RTSSP and views after participating in the RTSSP monitoring and support studies. Data obtained from focus group interviews and researcher listener notes were interpreted through descriptive analysis and content analysis. The results reached were supported by the statements and quotations of the teacher candidates.

Teacher candidates' views before the RTSSP

Before the RTSSP training, teacher candidates defined reflective thinking skill through self-evaluation ($f=3$), renewal ($f=2$), and critical thinking ($f=1$). In addition, teacher candidates described the use of reflective thinking skill as self-improvement ($f=3$), producing solutions ($f=2$), expression skills ($f=1$), diversifying the teaching method ($f=1$), and individual evaluation ($f=1$). Some views are as follows:

"I think it is kind of like evaluating yourself. Becoming aware of your own behaviors, what you have done, and evaluating yourself." [O2, self-evaluation]

"I mean, I think this way of thinking is associated with learning from our past mistakes and actually constantly improving ourselves." [O10, renewal]

"I also see reflective thinking as critical thinking." [O1, critical thinking]

"...we prepare a textbook to teach the lesson but the plan may not go the way we prepared it. At this point we need to make a quick change because our time is limited. I think reflective thinking also has a very important place here in how events develop spontaneously. That is what I think." [O3, producing solutions]

"...we can criticize, self-criticize. I think it contributes in this regard." [O6, individual evaluation]

Before the RTSSP training, teacher candidates shared their ideas about what kinds of activities and practices they should carry out to develop primary school students' reflective thinking skills. These were: active learning techniques ($f=4$), learning to criticize ($f=4$), problem solving ($f=3$), annual task schedule ($f=1$), and obtaining students' ideas ($f=1$). Some views are as follows:

"I think a debate environment could also be created. Children could be asked about problems from their daily life or problems they have experienced, and taking that problem as an example, what could the solution be..." [O3, Problem solving]

"What would you do if you were in this situation? They can think about themselves critically. They can become aware of their shortcomings by getting help from their friends. A different idea would come from everyone. In this way they can improve themselves." [O8, learning to criticize]

Before the RTSSP training, teacher candidates shared the points they paid attention to regarding the learning and teaching process while preparing a lesson plan. These were: finding activities ($f=8$), learner characteristics ($f=4$), time ($f=3$), attracting attention ($f=3$), learning outcome ($f=3$), correct transmission of concepts ($f=1$), and class size ($f=1$). Some views are as follows:

“In lessons I try to use more materials, activities so that I can make the lesson fun. So the students have fun. They can be more active along with a game.” [O5, finding activities]

“I find the most appropriate alternative depending on the time, the person, and the student profile and apply it.” [O4, learner characteristics]

Before the RTSSP training, teacher candidates shared various thoughts about valuing the ideas of others. These were: friend's idea ($f=8$), teacher's idea ($f=5$), family member's idea ($f=1$), and I do not ask for ideas ($f=1$). In addition, teacher candidates stated what they did to follow a different thought and reactions. These were: correcting deficiencies ($f=3$), evaluating ideas ($f=3$), improving myself ($f=3$), and finding an alternative ($f=1$). Some views are as follows:

“...because I stay in a dormitory I also really like telling that process to my roommates. First of course I send it to my friends, my teacher friends, about how it is, how can I improve it...” [O6, friend's idea]

“...I consult my teachers, saying ‘do you think it would work?’ I still see my primary school teacher very often and I definitely consult him/her too...” [O3, teacher's idea]

“...actually the important thing, I think, is the learning-teaching process, the techniques, the activities you use. So surely my friends see something I cannot see, like a more creative idea, and tell me...” [O10, evaluating ideas]

“...if they have a better idea or if they find the notes I made incomplete then I find a better alternative from them...” [O4, finding an alternative]

Before the RTSSP training, teacher candidates explained how they followed different views and reactions while in the classroom. These were: eye contact with the cooperating teacher ($f=4$), the cooperating teacher making an addition ($f=4$), student support ($f=3$), and end-of-lesson feedback ($f=2$). Some views are as follows:

“...Our teacher was also helping a lot during the lesson, you know, when a problem came up. You know, even when the teacher looked at us with his/her eyes in classroom management it encouraged us. So I proceeded like this.” [O9, eye contact with the cooperating teacher]

“...it is not only teachers who criticize us, especially children criticize a lot. For example, during internship I was writing sentences on the board apart from teaching the lesson. Then suddenly, ‘you wrote very small,’ oh yes I wrote a little small I say and I correct it.” [O7, end-of-lesson feedback]

Before the RTSSP training, teacher candidates expressed, under the theme of scientificity, what they paid attention to in order to take responsibility for teaching and not move away from scientificity. These were: detailed examination ($f=6$), using a teaching technique ($f=2$), using technology ($f=2$), proceeding according to the curriculum ($f=1$), and studying from the textbook ($f=1$). Some views are as follows:

“...I pay a lot of attention to the concepts in the learning outcome I will teach. I study these concepts beforehand, I try to teach a lesson in a way that gives students ready answers, you know.” [O5, detailed examination]

“I like using the techniques...I mean I want to use those techniques throughout my teaching career. Because it supports a lot.” [O7, using a teaching technique]

Before the RTSSP training, teacher candidates shared what they did to strengthen the emotional bond in the classroom. These were: chatting ($f=8$), caring ($f=7$), doing activities together ($f=4$), and effective listening ($f=1$). Some views are as follows:

“I try to chat with the children often. Because, as people get to know each other, the emotional bond becomes even stronger. So whenever I get the chance I catch the children and try to talk.” [O2, chatting]

“They also, for example, at the end of school their families take them. Then from there they wave like ‘teacher’ like this. And I immediately wave back excitedly, you know. I accompany their emotions. In this way they also feel closer.” [O8, caring]

Before the RTSSP training, teacher candidates evaluated themselves in terms of operating the reflective thinking process. By thinking about what they did while applying it, they expressed various situations. These were: self-criticism ($f=6$), appreciation ($f=3$), and self-evaluation ($f=2$). Some views are as follows:

“When I am teaching a lesson I focus like this on the bad things about myself. Actually when looked at from the outside it does not look that way either...” [O1, self-criticism]

“...But I think we also need to motivate ourselves a little. During the lesson, you know, when you see how happy the students are, the teacher’s good feedback and afterward saying ‘ah yes I did this well,’ I mean I really think that is effective too.” [O6, appreciation]

Finally, before the RTSSP training, teacher candidates stated the activities they carried out to provide reflective thinking skill. These were: obtaining ideas ($f=4$), individual activity ($f=3$), and providing feedback ($f=1$). Some views are as follows:

“...For example, when a student gives a wrong answer, instead of saying no, that is not it, and telling the correct answer, trying to make him/her find it like, what if you think this way? You know, I think you forgot this too...” [O2, obtaining ideas]

“...you know how can we find a solution to this problem situation? Which sentence do you think is problematic here? I encouraged them to find it themselves. They found the problems themselves, they found the solutions themselves.” [O9, individual activity]

Views of teacher candidates participating in the RTSSP monitoring-support study Teacher candidates participating in the RTSSP monitoring and support studies defined reflective thinking skill through self-evaluation ($f=2$) and critical thinking ($f=1$). In addition, teacher candidates described the use of reflective thinking skill as individual evaluation ($f=7$), critical perspective ($f=4$), diversifying the

teaching method ($f=4$), students' peer support ($f=2$), obtaining ideas from students ($f=2$), emotional skills ($f=2$), valuing good practices ($f=2$), putting into practice ($f=2$), expression skills ($f=1$), producing solutions ($f=1$), and collaboration ($f=1$).

Some quotations are as follows.

"When reflective thinking is mentioned, critical thinking comes to my mind..." [O10, critical thinking]

"...I realized that before I did not know reflective thinking completely correctly but now I think it has settled After every lesson and especially when preparing my lesson plan as my friends also said I question myself like I wonder if it is right for me to apply this if I do this will it work I use it very well while preparing the plan" [O2, self-regulation]

"...I realized that in my lesson plan and in implementing this plan, I mostly went through the processes at the technical and contextual levels of reflective thinking, and partly at the dialectical level." [O1, self-evaluation] [A1, listener notes]

"For students too I think we can increase this through some activities. In the form of mirror activities they can be enabled to make a presentation in a way that they can see themselves or by giving some scales we can enable them to evaluate themselves I think they can benefit in this way." [O9, individual evaluation]

"...in the classroom rather than direct lecturing I teach student-centered lessons I get my students' opinions more like do you agree with your friend Before I did not attach this much importance But now I try to pay more attention." [O5, diversifying the teaching method]

Teacher candidates participating in the RTSSP monitoring and support studies shared their ideas about what kinds of activities and practices they should carry out to develop primary school students' reflective thinking skills. These were: collaborative work ($f=2$) and reflective learning journal ($f=2$).

"Group work collaborative work becomes an opportunity to evaluate both the group mate and oneself. In the process because students give feedback like you do this part, I am better at this part The process moves faster and they can use reflective thinking skills." [O4, collaborative work]

"At the end of the day a question can be asked like what knowledge are you going home with today both students think about what they learned they learn from one another and we may also have used reflective thinking." [O8, reflective learning journal]

Teacher candidates participating in the RTSSP monitoring and support studies shared the points they paid attention to regarding the learning and teaching process while preparing a lesson plan. These were: finding activities ($f=4$), classroom environment ($f=4$), learning outcome ($f=3$), research ($f=3$), learner characteristics ($f=3$), process evaluation ($f=2$), method and technique ($f=1$), evaluating myself ($f=1$), economy ($f=1$), and content ($f=1$).

"First we look at the learning outcome. then we examine how this learning outcome was covered in the textbook." [O6, learning outcome]

“...I try to choose the one most appropriate to the grade level because when it remains below or above it that lesson never goes efficiently it is also difficult to teach and the students do not enjoy it much.” [O7, learner characteristics]

“...I made additions and removals according to the physical structure of the classroom and student levels. When I moved to the lesson, because some problems occurred in the last 15 minutes in the classroom, I did another activity that I had determined in my mind as an alternative.” [O9, classroom environment] [A1,A2, listener notes]

Teacher candidates participating in the RTSSP monitoring and support studies shared various thoughts about valuing the ideas of others. These varied as: friend’s idea ($f=3$), teacher’s idea ($f=2$), and student’s idea ($f=1$). In addition, what teacher candidates did to follow a different thought and reactions was expressed as correcting deficiencies ($f=1$) and evaluating ideas ($f=1$).

“...I ask the teachers around you after the plan I take the classroom teacher’s ...thoughts into consideration.” [O4, teacher’s idea]

“...after the lesson as I said I like asking the students I get their reactions I evaluate it that way” [O2, student’s idea]

“I care a lot about getting my friends’ positive opinion when it is negative I think why did he/she say that and I try to change it. so I care about getting ideas from the environment.” [O3, correcting deficiencies]

“When I create the lesson plan I am open to criticism. Only there is something like this criticism comes and I still sometimes do it based on what I know I continue with what I know for example...” [O5, evaluating ideas]

Teacher candidates participating in the RTSSP monitoring and support studies expressed, under the theme of scientificity, what they paid attention to in order to take responsibility for teaching and not move away from scientificity. These were: detailed examination ($f=4$), proceeding according to the curriculum ($f=3$), responsibility ($f=3$), and accessing up-to-date information ($f=1$). Some views are as follows:

“...even if I think it is a subject I know I research it I also think about the questions students may ask You know in order to be able to give them appropriate proper answers I do research like that.” [O1, detailed examination]

“I think our responsibility increased Because we were not evaluating ourselves this much At least I was not evaluating myself this much.” [O4, responsibility]

Teacher candidates participating in the RTSSP monitoring and support studies shared what they did to strengthen the emotional bond in the classroom. These were: doing activities together ($f=5$), chatting ($f=3$), caring ($f=1$), and providing feedback ($f=1$). Some views are as follows:

“For example when they were going to write something about a subject or when an opinion was stated about a topic afterward I also made comments like my own idea could have been like this could

have been like that including myself in the matter and I showed them that I was also open to learning.”
[O2, chatting]

“...when the teacher also joins the game together with the students I realized that the teacher’s emotional bond with the students also becomes stronger.” [O5, doing activities together]

Teacher candidates participating in the RTSSP monitoring and support studies evaluated themselves in terms of operating the reflective thinking process. By thinking about what they did while applying it, they expressed various situations. These were: self-evaluation ($f=6$), self-criticism ($f=3$), and appreciation ($f=1$). Some views are as follows:

“I apparently was not evaluating correctly in my own evaluation part. For example if I was evaluating at the beginning while preparing one plan in the other plan I evaluated at the end after doing it. Now in every plan I evaluate both at the beginning and at the end.” [O3, self-evaluation]

“...while preparing the plan I was already using it I was criticizing myself...” [O10, self-criticism]

Finally, teacher candidates participating in the RTSSP monitoring and support studies stated the activities they carried out to provide reflective thinking skill. These were: group activities ($f=7$), obtaining ideas ($f=2$), and taking part in the activity ($f=1$). Some views are as follows:

“...group work was very effective at the point of students individually criticizing themselves and becoming aware of this...” [O6, group activities]

“I realized that I did not know how to guide students so that they would think reflectively after this process you know while teaching I tried more to direct them to questioning I would say. I mean for example when a child gives an answer I ask the class in the classroom.” [O10, obtaining ideas]

“...during activities and experiments I allowed students to reflect their own thoughts in group work. In this way students not only learned the information, but also gained the skill of relating what they learned to daily life...” [O7, group activities] [listener notes]

Conclusion

There is no statistically significant difference in primary school teacher candidates’ reflective thinking tendency and its subdimensions—continuous and purposeful thinking, open-mindedness, questioning and effective teaching, teaching responsibility and scientificity, researcher, being foresighted and sincere, and professional outlook—before and after the RTSSP. Although the quantitative findings did not indicate a significant difference, in the focus group interviews conducted with teacher candidates and in the researcher listener notes, it was stated that the training provided contributed to reflective thinking skills. Although this result may at first suggest that there is a difference between the quantitative and qualitative findings, when the literature is examined, it is seen that these two findings do not exclude each other; on the contrary, they can be explained through the change occurring in the quality and form of use of reflective thinking rather than in the level of scores.

Dewey (1933) considers reflective thinking as a thinking process that involves the systematic examination of evidence and reasons based on a problem or a state of uncertainty. Accordingly, reflection is a dynamic process that develops through recognizing problems emerging within experience, questioning their causes, evaluating alternatives, and transferring the results obtained to subsequent practices. In this respect, the fact that teacher candidates in the study explained reflective thinking before the implementation more in terms of “learning from mistakes,” “recognizing deficiencies,” “conducting self-evaluation,” and “critical perspective” shows that reflection was initially perceived more as an individual evaluation carried out after an experience. After the implementation, however, the prominence of the concepts of “self-discovery,” “questioning,” “being open to criticism,” “putting into practice,” and “awareness” suggests that reflection moved beyond the function of merely evaluating a past practice and became a process guiding future instructional behaviors.

Similarly, Lee (2005) emphasized the importance of teachers and faculty members working collaboratively for the development of teacher candidates in teacher education programs. Courses that provide teacher candidates with teaching experience, particularly school experience and teaching practice, should be regarded as opportunities for the development of this skill. Teacher candidates should be supported in becoming aware of the objectives and in being able to critically evaluate the instructional processes they observe and implement. According to Lee, teacher candidates should have opportunities to try what they have learned. In this study as well, teacher candidates were asked to apply the training they received every week in the teaching practice course, and their experiences were discussed. In this respect, the implementation carried out is consistent with Lee’s (2005) recommendation.

It is seen that, before the implementation, teacher candidates addressed the use of reflective thinking in instructional processes in terms of active learning methods, problem solving, and developing criticism skills, whereas at the end of the implementation they emphasized collaboration and reflection skills. Before the implementation, teacher candidates stated that while preparing a lesson plan they attached importance to learner characteristics, learning outcomes, and time, and that they turned to activities that would attract students’ interest. After the implementation, they focused on the learning outcome, evaluation processes, the classroom environment, and conducting research. They turned toward components of the learning and teaching process. Teacher candidates stated that before the implementation they valued the ideas of others while preparing a lesson plan. In particular, the ideas of teachers and friends became important. They took these ideas into consideration in correcting their deficiencies, improving themselves, and finding alternatives. After the implementation, the view of valuing ideas continued. In this process, they continued to evaluate ideas and correct deficiencies. Before the implementation, teacher candidates addressed following different views and reactions as making eye contact with the cooperating teacher, the cooperating teacher making additions, and student support. At the end of the implementation, they did not express a different view on this matter.

Before the implementation, teacher candidates addressed scientificity in terms of conducting detailed examinations, whereas at the end of the implementation they evaluated it in terms of responsibilities, currency, and compliance with the curriculum. Before the implementation, teacher candidates addressed establishing an emotional bond as chatting and caring, whereas at the end of the implementation they additionally emphasized doing activities together and providing feedback. Before the implementation, teacher candidates emphasized individual activities in the methods they followed to provide their students with reflective thinking, whereas at the end of the term they emphasized the importance of group activities and taking part in activities. Before the implementation, teacher candidates stated that they criticized themselves negatively while applying reflective thinking, whereas by the end of the term this situation evolved toward evaluating themselves objectively. Özden, Önder, and Kabapınar (2015) conducted an experimental study with primary school teacher candidates. They found that reflective thinking practices increased teacher candidates' skills in preparing constructivist learning environments and enabled them to use these skills more frequently during teaching practice. In this study, teacher candidates pointed to the constructivist learning environment by emphasizing issues such as stakeholders working collaboratively, student-centeredness, and the management of emotional processes.

The qualitative findings obtained through focus group interviews and researcher listener notes show that the training created a change in the quality of reflective thinking. Köksal and Demirel (2008) stated that the reflective thinking training they prepared contributed positively to primary school teacher candidates' processes of designing, implementing, and evaluating instruction. In their study, they used observation notes, interviews, self-evaluation forms, journals, and lesson plans together. This was also taken into consideration in this study both to ensure data diversity and to collect detailed data. This approach is important in showing that explaining reflective thinking only through a scale score may remain limited.

Guo (2022) conducted a meta-analysis study with 23 articles. As a result of the moderator analyses in the study, it was found that the effect varied depending on reflective activities, peer interaction, and intervention duration. These results support the idea that a substantial development environment was provided to teacher candidates in this study through the focus group interview and the social interaction environment.

In this respect, the training provided supported teacher candidates' application of reflective thinking by taking into consideration before, during, and after the practice. After the training, teacher candidates became aware of the importance of evaluating their instructional practices from the perspectives of all stakeholders. It is anticipated that the results of the study will form a basis for future research. Based on the results of the study, the following recommendations are offered to researchers:

1. In practice-based courses conducted with teacher candidates, opportunities should be created for them to critically evaluate their instructional planning, implementation, and evaluation.

2. In research processes, teacher candidates' awareness can be increased by using reflective journals, self-evaluation and peer-evaluation forms, etc. that support reflective thinking.
3. Longitudinal studies can be conducted in the field.

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Conflict of Interest

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