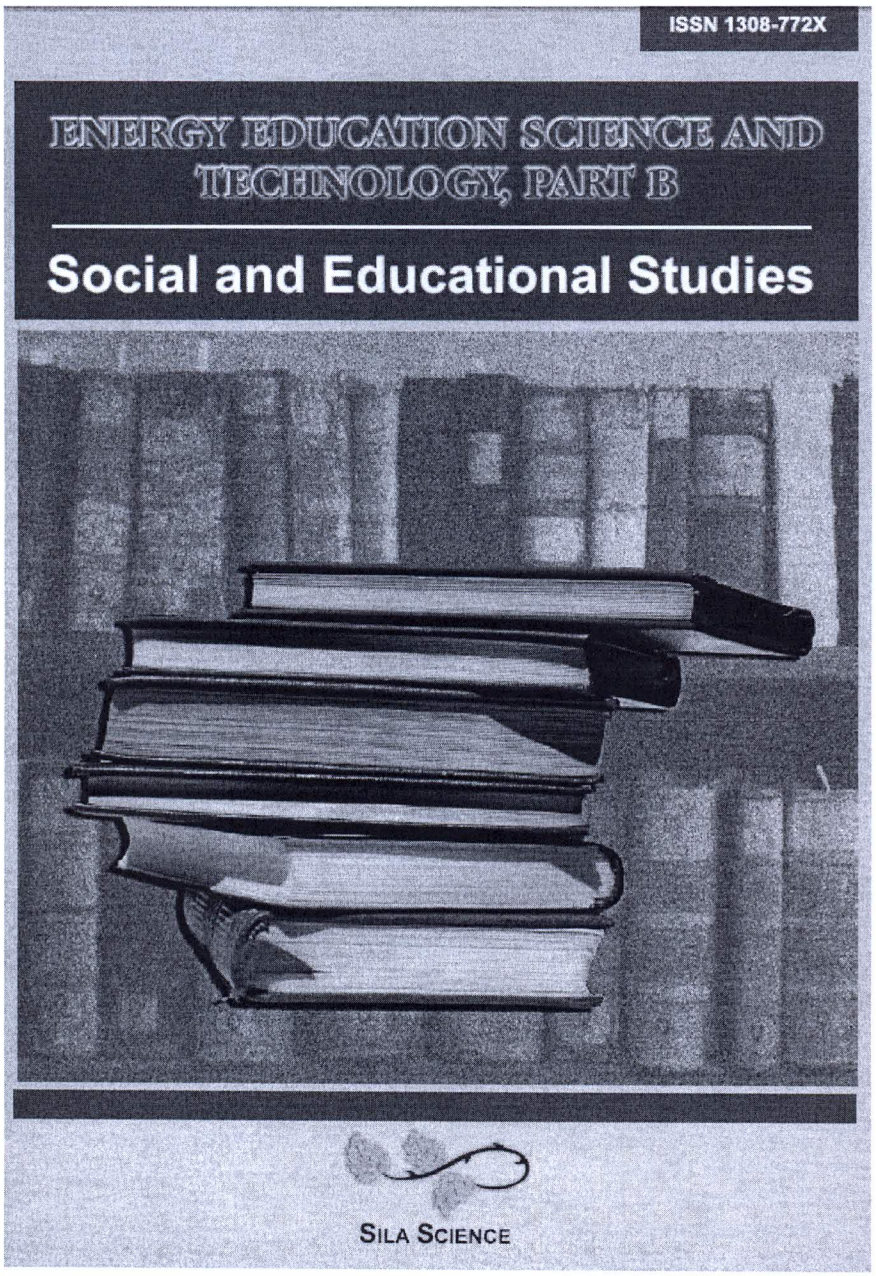
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ISSN 1308-7711

ENERGY EDUCATION SCIENCE AND TECHNOLOGY, PART B

Social and Educational Studies



ENERGY EDUCATION SCIENCE & TECHNOLOGY, PART B
Social and Educational Studies
An International Journal

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Frequency: Energy Education Science and Technology Part B (ISSN 1308-7711) is published 4 times per year.

Abstracted and / or Indexed In: Chemical Abstracts, Science Citation Index Expanded, Scopus, Journal Citation Reports/Science Edition.

Aims and scope: Energy Education Science & Technology, Part B is dedicated to detailed and comprehensive investigations and appropriate reviews of the interdisciplinary aspects of energy education, chemical education, physical education, mathematical education, biological education, science and education, environmental education, all social educational topics, and social studies.

Publication information: Please address all your requests regarding orders and subscription queries to: A. Demirbas, P. K. 216, 61035-Trabzon, Turkey. E-mail: ayhandemirbas@hotmail.com

ENERGY EDUCATION SCIENCE & TECHNOLOGY, PART B
Social and Educational Studies

ISSN 1308-7711

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For conferences, symposiums, scientific activities:

[3] Tsagliotis N. Hands-on science activities for the teaching and learning of mechanical energy with 6th grade primary school children in Greece. Hands-on Science: Science in a changing Education, University of Crete campus at Rethymno, Greece, July 13-16, 2005.

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Tarananlar: {'energ'}@Anahtar; {'2011'}@Yayın Yılı, Sayfa: 1

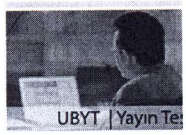
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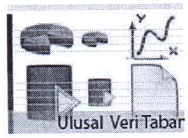
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Energy Education Science and Technology Part B: Social and Educational Studies
2011 Volume (issue) 3**(3):** 387-402

Determining the reflective thinking skills of pre-service teachers in learning and teaching process

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Received: 24 July 2010; accepted: 29 August 2010

Abstract

In today's education process the mode of thinking which would be used in solving the vital problems is the reflective thinking for both teachers and students. In this study it is aimed to determine the reflective thinking skills of pre-service teachers in learning and teaching process. The study is configured in depictive and survey model. Two hundred and thirty tree pre-service teachers, one hundred of them women and one hundred and thirty three of them pre-service teachers, participated in the study. As a result of the study, it emerges that the reflective thinking is an indispensable mode of thinking for the education of the teacher. Besides it is determined that the pre-service teachers often act according to the reflective thinking.

Keywords: Critical thinking; Learning; Reflective thinking
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1. Introduction

One of the important problems of today's education systems is individuals not conveying their school education to their normal lives. This situation shows the school just a place which prepares students for the life. However, in modern education systems this situation changed as the school is the life itself. This principle underlies the constructionist education model. The teachers want the students to reflect the issues they learn in the school to the life. That situation shows that the learning process is completed. The Reflective thinking and its teaching method is a mode of thinking which would be used correspondingly with modes of thinking like metacognition, critical thinking, analytical thinking, creative thinking among modern education approaches during education process. The most important factor which separates the reflective thinking from all these thinking types is that it presents as a solution interpreting, deferring, translating, arrogating to the individual, comprehending the issues thought in the school and making predictions for the future.

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When the best known history of the reflective thinking is surveyed, Vilhelm von Humboldt becomes the first person who used "the reflective learning" concept asserting the explanation of learning how being learned besides learning 200 years ago. However, the reflection took its base from John Dewey (1933)'s learning by doing and living approach [1, 2].

When the definition of the reflective thinking is regarded, Dewey who propounds the reflective thinking theory accepts the reflective thinking; reflective (reflective education, reflective research, reflection on practice) education, as one of the important concepts for the education of the individuals. Basically the reflection concept is presented by Dewey in 1933 for the purpose of explaining the education subjects profoundly and directing these subjects and means that an effective, purposeful and consistent thinking process which deals with the practical problems of the executors and tries to find proper and realistic solutions for them. Dewey (1933) indicates that the most important necessity of the society is the learning of the students reflecting the issues they learn at school to the real life. The reflection is defined as cognitive inquisition including analyzing of the experiences by producing new information basing on the old information and trying to find the ways pioneering the development of the alternative ways [3].

Starting out all the definitions about the reflective thinking, it can be defined as purposeful and proper activity process which the individual realizes to follow, analyze and evaluate his/her own learning in view of reaching learning targets, persistence of his/her motivation, gaining deep meanings, using proper learning strategies, making contact with his/her peers and teachers to reach learning targets to generate new learning approaches impacting directly to the advanced learning processes and performance. The reflective thinking, one of modes of the thinking, is developed with learning essays, concept maps, questioning, contractual learning and self assessment activities [4].

The process which pre-service teachers and students can use the reflective thinking is the teaching and learning process. The reflective education is an approach that the best and the professional teachers prefer. In fact our learnings implicate the journal that we keep in the class everyday and it is an important point for reading knowledge. Some teachers would prefer to record into the cassette player the issues which they listen and say in the class and on the way of home, reviewing important information and using information, critical judgement and the reflective thinking a process about our teaching, practice and developments are mostly used in the foreign language classes.

Some records, videos, journals we keep, our observations are very effective ways for concentrating and developing teaching [5]. According to another definition, the reflective teaching is the whole of the creative problem solving activities and an inquisition approach basing on the constructivism in education and featuring giving importance to the others [6].

In the reflective teaching it is important to respect the opinions of the person you communicate; fulfill the responsibilities, consider the differences in education, measure the learning eagerness. Aids with weekly observations and co-operation force the teacher research like the student and generate important concepts. Besides, the performance of the teacher is so important in the reflective teaching performance. By defining and analyzing these skills and practices, the success of the students increases in the course of the learning [7]. At this point some set of tools gain importance for learning and teaching process and these are teacher journals, course records, observations and surveys, auditory and video records, observation and motion inquisition. In learning and teaching process, a teacher who wants to use the reflective thinking effectively should also benefit from the education strategies. These education strategies;

- Memory Strategies; regaining the knowledge and helping the student stocks.

- Co-operation Strategies; avouching of the knowledge to understand the new knowledge.
- Recompense Strategies, students' being aware of their deficiencies.
- Organizing; Planning and evaluating strategies.
- Emotional Strategies; learning control of motivation, emotions and the other behaviors.
- Social Strategies; other people's affecting each other while learning [8].

2. Literature review

Crotty and Allyn made a research in which the pre-service teachers' reflections were evaluated. In the research five pre-service teachers' teaching experiences are recorded by using videotapes and it is demanded from the pre-service teachers to make reflection on how they can change and develop their teaching and what they can do for their career development. At the turn of the research, according to Bloom's taxonomy, a rubric consisting of tree levels, low, middle and high, is developed by evaluating the pre-service teachers' reflections [1].

Basile, Olson and Nathenson-Mej carry on a research on the pre-service teachers starting out that the learning based on problem is sufficient ambient for reflection, problem solving and discussion. In this study which is made on twenty people and takes six hundred and fifty hours, they aim to determine the patterns in the types of the problem and solutions, reveal how teacher help pre-service teachers to make self-reflection and determine the stages of the reflection which is done. It is demanded from the pre-service teachers to write weekly reflection reports about the subjects they learn and practice during the lesson. The qualitative data obtained from these reflection reports are evaluated with qualitative analysis program and consequently it is determined that pre-service teachers reflect on tree stages. The reflection development stages are found as micro-reflection, self-reflection and macro-reflection, respectively. In the micro-reflection pre-service teachers made reflection about the teacher of the course and in the self-reflection they made reflection about their own experiences and learning process. In macro-reflection they made reflection from a large perspective considering all the problems of the class and the school. Besides the reflection stages are determined, in the study it is tried to being observed how the pre-service teachers develop in these stages [1].

Sahin conduct a research in which science teachers' journals are analyzed in terms of their reflective thinking skills. In the study the reflective thinking is analyzed in two different skill fields as descriptive reflective thinking and critical reflective thinking. In the study conducted six weeks with twenty pre-service teachers, one hundred and twenty journals are looked over using document searching method. As a result of searching the journals of the pre-service teachers, it is determined that the pre-service teachers' descriptive reflective thinking skills are on the front burner but they realize critical reflective thinking less [1].

When the researches about the reflective thinking are checked out, it is seen that the reflection is considered in view of many fields like metacognition, effective learning, its place in teacher training, its relation with epistemological faiths and transfer skills [1].

Dolapcioğlu evaluates the primary school teachers' practice level of the reflective thinking skills. The general aim of this descriptive study is to describe how the teacher attitudes including the reflective thinking skills are practiced by the primary school teachers and determine if the opinions of the teachers differ in terms of gender, vocational seniority and the type of the school they graduated. The class teachers working in the school in Antakya in Hatay comprise the study population of the research. Three hundred and twenty eight class teachers working in 2006-2007 academic year in schools in Antakya in Hatay comprise the

research paradigm. At the end of the study giving a proper education to the teachers about this issue in pre-service and in-service training courses and practicing the approaches that develops the reflective thinking in the class atmosphere are suggested. It emerges that there is some defects about problem solving and giving importance to the critics in the observation made by the researcher. In the reflective journal keeping practice about being receptive to the career development, it emerges from both observation and answers given for the scale that most of the teachers "never" realize this attitude [9].

In his study named "An Examination of Journals of Prospective Science Teachers According to Their Reflective Thinking Skills", Sahin takes one hundred and twenty journals throughout six weeks from the teaching practice files of twenty individuals being the senior year students of the science teaching. Some journals are examined and analyzed descriptively. When the statements written by pre-service teachers are examined, it is seen that the definitive reflective thinking skills of the pre-service teachers are on the front burner mostly but their reflective thinking skills are less even many of the pre-service teachers are deprived of critical thinking skills [10].

In his study named "The Impact of Reflective Thinking Activities on Student Teachers' Attitudes towards Teaching Profession, Performance and Reflections", Tok expresses that the activities improving reflective thinking can be used for pre-service teachers to improve positive attitudes towards teaching profession and increase their performances. On the other hand he indicates momentously that it would be useful giving an education showing the importance of the reflective thinking and teaching how it is practiced because the pre-service teachers do not find the reflections boring [11].

Erginel, performed Ph.D thesis that called "Developing Reflective Teachers: A Study on Perception and Improvement of Reflection in Pre-Service Teacher Education" over 30 teacher candidate which are students at the last term of English Teaching Education. Data collection consisted of weekly guided journal entries, tape-recorded reflective interactions and interviews, assignment on videotaped microteaching, questionnaires and observations.

The findings of the study indicated that the pre-service teachers perceived that the collaboration had an important role in the promotion of reflection. The reflective process enhanced their self-awareness towards their teaching, which contributed to their professional identity development as teachers. It was found out that the pre-service teachers felt enthusiastic about reflection and that they valued guidance within the reflective process.

It was indicated that the pre-service teachers focused primarily on the instructional processes, motivation, and on classroom management while reflecting on their experiences, while having emphasis on effective teaching so that desired objectives are achieved. The study revealed that there was a developmental process in pre-service teachers' reflectivity in this course. Towards the end of the course, they incorporated their theoretical background and considered contextual factors in reflecting on their experiences, while these factors were limited to learners' ages, language levels, and learning styles. Despite the fact that journals attracted reservations from some pre-service teachers, the findings indicated that they distinctively promoted reflectivity throughout the process [12].

Inonu used survey model in the research named "History Teachers" Possessive Level of the Reflective Teachers' Features Van Sample". A scale, including 30 items, developed by the researcher is generated. According to the results obtained from the research, it can be said that the teachers agreed to join the different activities and adopt the reflective teaching and have the reflective features. After that result, it is obtained that the teachers are active not passive, can overcome the problems come up in the future, come to a conclusion that he/she know what and how a student can understand, keep up with the new situations and conditions in the

light of their past lives and move on the way of improving new methods and strategies [13].

In many researches it is seen that the reflection is a process of thinking and putting that thought into practice. The reflective thinking process requires that the teacher should move systematically in education, question permanently, make research and produce solutions. The reflective thinking is a process that helps people to improve current practices starting out their past acts and plan their future thoughts and events [14].

Hotton and Smith say that a lot of techniques such as journal keeping, group discussions, action research projects, case studies and micro teaching support each other. That's why they should be used together in terms of improving the reflective thinking. Pollard and Tann express that the reflective thinking improves the skill of perceiving and questioning the social and political agenda of the environment thanks to the usage of the strategies such as video records, journal writing and guiding by observation [12].

Reflective thinking can be used effectively with many models, theories and techniques. The most frequently used technique is micro-teaching by pre-service teachers. Yiğit investigate the development of student teachers' skills in preparing and using overhead transparencies (OHTs) through micro-teaching activities in his study. The study was carried out with 48 student teachers in the Primary Science Teacher Education After being split into groups, the student teachers were instructed to prepare OHTs on predetermined science curriculum topics. Groups were required to give 10-minute presentations. Their presentations were recorded using a video camera. The study revealed that the student teachers' skills in using drawings, arranging relationship between headings and text, providing figure-text interpretation and presenting stimuli in question form were improved. They also showed better skills in delivering the subject matter [15].

3. Method

3. 1. Research model

In this study the survey model, accepted as a descriptive model, is used. The survey model is a research model that aims to describe a situation existed in the past or still existing, as it is [16]. This study aims to describe the viewpoints of the pre-service teachers who are in the senior year and will work in the primary schools towards the reflective thinking starting out their own statements. Hereby, the viewpoints of the pre-service teachers about their practices in learning and teaching process will be evaluated and their opinions about which aspects of the reflective thinking they use will be revealed.

In the study a scale generated by Alp [14] and whose reliability coefficient is counted approximately as 0.93 is used. However, our study is towards the pre-service teachers so the reliability coefficient is counted again and found as Cronbha alpha: 0.892 and KMO: 0.848. These accounts prove that the scale is highly reliable.

3. 2. The universe and sample of the study

In 2009-2010 academic year the pre-service teachers educated in Faculty of Education in Fırat University comprise the population. The students of the Faculty of Education comprise the population. The paradigm is comprised by the senior year students of Art Education (AE), Computer and Instructional Technologies Education (CITE),Primary School Education (PSE), Science Education (SE), Social Studies Education (SSE), Turkish Language Education (TLE). The paradigm of the study consists of two hundred and thirty three individuals who are the

pre-service teachers and the senior year students in the Faculty of Education in Fırat University.

3. 3. Data collection and analysis

The scale generated by (Alp, 2007) is applied to the individuals who are the pre-service teachers and the senior year students in the Faculty of Education in Fırat University in Fall Semester of 2009-2010 academic year. Then the scale data obtained from the students are analyzed in electronic environment with the statistics program using percentage, frequency, arithmetic mean, T-test and variance analysis techniques. The score intervals stated below are based to indicate the realization level of the items in the scale.
1.00–1.75 "**None**" Never
1.76–2.50 "**Sometimes**" changes from case to case
2.51–3.25 "**Often**" generally
3.26–4.00 "**Always**" every time

4. Findings and comments

In this part of the study, personal choices and types of departments of the individuals who answer the survey and statistical comparisons depending on gender are presented.

Table 1. Digital data of the pre-service teachers participating in the study

Variable	Variable Choices	f	%
Gender	Man	133	57.1
	Woman	100	42.9
Total		**233**	**100**
Department	Art Education (AE)	24	10.3
	Computer and Instructional Technologies Education (CITE)	42	18
	Primary School Education (PSE)	44	18.9
	Science Education (SE)	43	18.5
	Social Studies Education (SSE)	39	16.7
	Turkish Language Education (TLE)	41	17,6
Total		**233**	**100**

Table 2. The reflective thinking profiles of the pre-service teachers

	Yes		No		N	Mean	SD
	f	%	f	%			
Do you have any information about the reflective thinking?	181	77.7	52	22.3	233	1.2232	0.41727
Do you get any in-service education toward the reflective thinking?	80	34.3	153	65.7	233	1.6567	0.47585
Do you think that the reflective thinking process is necessary?	185	79.4	48	20.6	233	1.2060	0.40531
Do you think that the approaches improving the reflective thinking should be used?	189	81.1	44	28.9	233	1.1888	0.39223

SD: Standard Deviation.

When all the profiles of the pre-service teachers who participate in the study about the reflective thinking is checked out, as it is seen in table 2, %77.7 percent of the students have information about the reflective thinking, many of them have this information not having a private in-service education about the reflective thinking and this pre-service teachers have %65.7 percent, %79.4 percent of the all pre-service teachers find the reflective thinking process necessary. This situation proves how much the pre-service teachers give importance to the reflective thinking. Moreover, %81.1 percent of the pre-service teachers also agree that the approaches improving the reflective thinking should use. In table 2, the pre-service teachers state that the reflective thinking is an inevitable mode of thinking among modern approaches based on progressive education philosophy.

When it is looked at the Table 3, we see that the reflective thinking often fulfill the pre-service teachers' attitudes they are required to do when not only encountering a problem but also planning, practicing and evaluating a lesson. This result shows that the reflective thinking is usually used in both learning by living and doing and the school is life itself approaches of the modern education activities.

When it is looked at Table 4, as a result of the t-test analysis, a significant difference is seen at the level of $p<0,05$ in thirteen of the attitudes in the scale consisting of thirty questions about the reflective thinking in view of variable of gender. When it is looked into the attitudes in the thirteen subtitles in Table 4, it is understood from the arithmetic mean that female pre-service teachers display the behaviors towards the reflective thinking attitudes more often and effectively that male pre-service teachers do.

- Considering students' learning-development levels while planning learning-teaching process,
- Getting students' opinions about learning-teaching process,
- Giving opportunity to the students to evaluate themselves,
- Giving opportunity to the students to find solution offers for the problems,
- Giving opportunity to the students to study independently,
- I use the activities in the class intended for my students can discover their own interests and abilities,
- Making students realize their weak and strong sides,
- Carrying out evaluation at the end of the class,
- Using open-ended questions on evaluations,
- Detecting long-termed targets,
- I can check over my own teaching,
- Being open for innovative thoughts,
- Focusing on the target of the course.

In these attitudes indicated above and seen significant difference in terms of variable of gender, while the female pre-service teachers perform these behaviors often, the male pre-service teachers perform these behaviors as long as they are suitable for the situation. It is determined that female pre-service teachers are more sensible about the reflective thinking.

When it is looked into the Table 5, as a result of variance analysis performed between "department" variable and "I consider my experiences while planning learning-teaching process" variable, a significant difference is determined at the level of $p<0.05$. While Computer and Instructional Technologies Education (CITE) department pre-service teachers "often" consider their experiences while planning learning and teaching process, Art Education (AE) department ($\bar{x} = 3.2917$), Primary School Education (PSE) department

Table 3. The arithmetic mean and the standard deviation results of the pre-service teachers relating to the survey

	N	Mean	SD
When encountered a problem			
1. I consider my students' learning-development levels while planning learning-teaching process.	233	2.9828	0.75410
2. I consider my experiences while planning learning-teaching process.	233	3.1288	0.73149
3. I get my students' opinions about learning-teaching process	233	3.0215	0.70982
4. I consider my students' individualistic differences during learning-teaching process.	233	3.0815	0.73535
5. I give opportunity to my students to evaluate themselves.	233	3.0730	0.74787
6. I give opportunity to my students to express themselves.	233	3.0086	0.74851
7. I give opportunity to my students to find solution offers for the problems.	233	2.9957	0.71618
8. I give responsibility to my students during the learning-teaching process.	233	3.0815	0.72353
9. I give opportunity to my students to study independently.	233	3.0472	0.73836
10. I use the activities in the class intended for my students can discover their own interests and abilities.	233	2.9785	0.79028
11. I make my students realize their weak and strong sides.	233	2.9313	0.78483
12. I revise my personal objectives and thoughts.	233	3.0644	0.71930
13. I make a decision based on intuition.	233	2.9142	0.82075
14. I can interpret the cases creatively.	233	3.0472	0.72063
15. I use a well-planned approach to solve the problem.	233	3.0472	0.70857
While planning, practicing and evaluating a lesson,			
1. I arrange my students' activities as product file.	233	2.9270	0.77058
2. I carry out evaluation at the end of the class.	233	3.0258	0.68180
3. I use open-ended questions on evaluations.	233	2.9742	0.72470
4. I get my students' opinions about my teaching at the end of the class.	233	2.9227	0.69670
5. I determine the problems arising from my teaching method at the end of my evaluations.	233	2.9657	0.70627
6. I think the social aspects of the best practices.	233	2.9013	0.77329
7. I change my teaching style deliberately to fulfill the needs of my students.	233	2.9185	0.77529
8. I have sufficient vocational knowledge to be a successful teacher.	233	3.0043	0.74566
9. I keep a journal regularly.	233	2.8283	0.85886
10. I can detect long-termed targets.	233	2.8970	0.68710
11. I can check over my own teaching.	233	3.0086	0.73691
12. There is not only one best way to teach a lesson.	233	3.0730	0.78169
13. I am open for innovative thoughts.	233	3.1159	0.78749
14. I focus on the target of the course.	233	3.1288	0.70753
15. I have sufficient abilities to be a successful teacher.	233	3.0815	0.70543
$\sum \bar{x}$	233	3.0058	0.742962

Table 4. Analysis of the reflective thinking scale with t-test in terms of variable of gender

Internet	N	X̄	SD	Df	t	p
1. The results of T-test performed between variable of "*Gender*" and "I consider my students' learning-development levels while planning learning-teaching process"						
Man	133	2.8496	0.71240	231	-3.170	0.002
Woman	100	3.1600	0.77486			
2. The results of T-test performed between variable of "*Gender*" and "I get my students' opinions about learning-teaching process"						
Man	133	2.9173	0.69680	231	-2.616	0.009
Woman	100	3.1600	0.70668			
3. The results of T-test performed between variable of "*Gender*" and "I give opportunity to my students to evaluate themselves. "						
Man	133	2.9474	0.75192	231	-3.007	0.003
Woman	100	3.2400	0.71237			
4. The results of T-test performed between variable of "*Gender*" and "I give opportunity to my students to find solution offers for the problems."						
Man	133	2.8571	0.71925	231	-3.487	0.001
Woman	100	3.1800	0.67240			
5. The results of T-test performed between variable of "*Gender*" and "I give opportunity to my students to study independently"						
Man	133	2.9398	0.75638	231	-2.591	0.010
Woman	100	3.1900	0.69187			
6. The results of T-test performed between variable of "*Gender*" and "I use the activities in the class intended for my students can discover their own interests and abilities."						
Man	133	2.8722	0.79213	231	-2.393	0.018
Woman	100	3.1200	0.76910			
7. The results of T-test performed between variable of "*Gender*" and "I make my students realize their weak and strong sides."						
Man	133	2.8346	.78025	231	-2.188	.030
Woman	100	3.0600	.77616			
8. The results of T-test performed between variable of "*Gender*" and "I carry out evaluation at the end of the class."						
Man	133	2.9398	0.64853	231	-2.237	0.026
Woman	100	3.1400	0.71095			
9. The results of T-test performed between variable of "*Gender*" and "I use open-ended questions on evaluations."						
Man	133	2.8872	0.71408	231	-2.130	0.034
Woman	100	3.0900	0.72607			
10. The results of T-test performed between variable of "*Gender*" and "I can detect long-termed targets."						
Man	133	2.7970	0.68268	231	-2.594	0.010
Woman	100	3.0300	0.67353			
11. The results of T-test performed between variable of "*Gender*" and ".I can check over my own teaching."						
Man	133	2.8947	0.74124	231	-2.758	0.006
Woman	100	3.1600	0.70668			
12. The results of T-test performed between variable of "*Gender*" and "I am open for innovative thoughts."						
Man	133	2.9925	0.81181	231	-2.799	0.006
Woman	100	3.2800	0.72586			
13. The results of T-test performed between variable of "*Gender*" and "I focus on the target of the course."						
Man	133	3.0451	0.71631	231	-2.096	0.037
Woman	100	3.2400	0.68343			

Table 5. Variance analysis result performed between department variable and I consider my experiences while planning learning-teaching process variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	6.575	1.315			
Within groups	117.563	0.518	0.73149	2.539	0.029
Total	124.137				

($\bar{x}$=3.2273), and Turkish Language Education ($\bar{x}$=3.3659) pre-service teachers always perform this activity. While School Education (PSE) department pre-service teachers ($\bar{x}$=2.9767) also "often" consider this case, Turkish Language Education (TLE) department pre-service teachers' answer is "always." When all departments' arithmetic means are checked, it is determined that pre-service teachers "often" consider their experiences ($\sum\bar{x}$=3.1288) while planning learning-teaching process.

Table 6. Variance analysis result performed between department variable and I get my students' opinions about learning-teaching process variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	10.568	2.114			
Within groups	106.325	0.468	.70982	4.512	0.001
Total	116.893				

When is looked at Table 6, as a result of variance analysis performed between "department variable" and "I get my students' opinions about learning-teaching process variable", a significant difference is determined at the level of $p<0.05$. While CITE ($\bar{x}$=2.7857) pre-service teachers "often" consider their experiences while planning learning and teaching process, TLE department pre-service teachers ($\bar{x}$=3.2683) and PSE department pre-service teachers ($\bar{x}$=3.2045) pre-service teachers show a tendency to perform this activity every time. At the same time while SE department pre-service teachers ($\bar{x}$=2.7209) "often" consider this case, AE department pre-service teachers ($\bar{x}$=3.1250), PSE department pre-service teachers ($\bar{x}$=3.2045), SSE department pre-service teachers ($\bar{x}$=3.0769), TLE department pre-service teachers ($\bar{x}$=3.2683) give an answer that they perform this activity almost "every time." When all departments' general arithmetic means are checked, it is determined that pre-service teachers often consider their students' opinions ($\sum\bar{x}$=3.0215) about learning-teaching process.

Table 7. Variance analysis result performed between department variable and I give opportunity to my students to evaluate themselves variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	10.795	2.159			
Within groups	118.965	0.524	.74787	4.119	0.001
Total	129.760				

When it is looked into Table 7, as a result of variance analysis performed between "department variable" and "I give opportunity to my students to evaluate themselves variable", a significant difference is determined at the level of $p<0.05$. While CITE ($\bar{x}$=2.8333) pre-service teachers "often" give opportunity to their students to evaluate themselves, TLE department pre-service teachers ($\bar{x}$=3.3415), PSE department pre-service teachers ($\bar{x}$=3.1818), and Social Studies Education (SSE) department pre-service teachers ($\bar{x}$=3.2051) show a tendency to practice this activity "every time." At the same time, while SE ($\bar{x}$=2.7674) pre-service teachers also "often" give opportunity to their students to evaluate themselves, AE department pre-service teachers ($\bar{x}$=3.1667), PSE department pre-service teachers ($\bar{x}$=3.1818), SSE department pre-service teachers ($\bar{x}$=3.2051) and TLE pre-service teachers ($\bar{x}$=3.3415) give an answer that they perform this activity almost "every time." When all departments' general arithmetic means are checked, it is determined that pre-service teachers "often" give opportunity to their students to evaluate themselves ($\sum\bar{x}$=3.0730).

Table 8. Variance analysis result performed between department variable and I make my students realize their weak and strong sides variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	9.245	1.849			
Within groups	133.656	0.589	.78483	3.140	0.009
Total	142.901				

When it is looked into Table 8, as a result of variance analysis performed between "department variable" and "I make my students realize their weak and strong sides variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are examined; while PSE department ($\bar{x}$=3.1818) and AE pre-service teachers ($\bar{x}$=3.2083) give an answer that they perform this activity almost "every time", CITE department ($\bar{x}$=2.8333), SSE department ($\bar{x}$=2.6667) and SE department pre-service teachers ($\bar{x}$=2.8372) express an opinion that they frequently make their students realize their weak and strong sides. When all departments' general arithmetic means are checked, it is determined that pre-service teachers "often" give opportunity to their students to realize their weak and strong sides ($\sum\bar{x}$=2.9313).

Table 9. Variance analysis result performed between department variable and I can interpret the cases creatively variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	12.834	2.567			
Within groups	107.647	0.474	0.72063	5.413	0.000
Total	120.481				

When it is looked into Table 9, as a result of variance analysis performed between "department variable" and "I can interpret the cases creatively variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are examined; while CITE ($\bar{x}$=2.8333) pre-service teachers "often" interpret the cases during the teaching process creatively, TLE department pre-service teachers ($\bar{x}$=3.1463), PSE department pre-service teachers ($\bar{x}$=3.2727) and Social Studies Education (SSE) department pre-service teachers ($\bar{x}$=3.2821) "always" interpret the cases during the teaching process creatively. At the same time, while SE department pre-service teachers ($\bar{x}$=2.6744) "often" interpret the cases during the teaching process creatively, AE department pre-service teachers ($\bar{x}$=3.1250), PSE department pre-service teachers ($\bar{x}$=3.2727), SSE department pre-service teachers ($\bar{x}$=3.2821) and TLE department pre-service teachers ($\bar{x}$=3.1463) give an answer that they perform this activity almost "every time". When all departments' general arithmetic means are checked, it is seen that pre-service teachers "often" interpret the cases during the teaching process creatively ($\sum\bar{x}$=3.0472).

Table 10. Variance analysis result performed between department variable and I carry out evaluation at the end of the class variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	5.451	1.090			
Within groups	102.395	0.451	0.68180	2.417	0.037
Total	107.845				

When it is looked into Table 10, as a result of variance analysis performed between "department variable" and "I carry out evaluation at the end of the class variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are examined; while CITE ($\bar{x}$=2.8333) pre-service teachers "often" carry out evaluation at the end of the class, TLE department pre-service teachers ($\bar{x}$=3.2683) "always" carry out evaluation at the end of the class. Besides, while SE department pre-service teachers ($\bar{x}$=2.7907) also "often" carry out evaluation at the end of the class, PSE department pre-service teachers ($\bar{x}$=3.0909) and TLE department pre-service teachers ($\bar{x}$=3.2683) carry out evaluation at the end of the class almost "every time". When all departments' general arithmetic means are checked, it is seen that pre-service teachers "often" carry out evaluation at the end of the class ($\sum\bar{x}$=3.0258).

Table 11. Variance analysis result performed between department variable and I get my students' opinions about my teaching at the end of the class variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	6.141	1.228			
Within groups	106.468	0.469	0.69670	2.619	0.025
Total	112.609				

When it is looked into Table 11, as a result of variance analysis performed between "department variable" and "I get my students' opinions about my teaching at the end of the class variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are examined; while SE department pre-service teachers ($\bar{x}$=2.7209) "often" get their students' opinions about their teaching at the end of the class, PSE department pre-service teachers ($\bar{x}$=3.1136) and SSE department pre-service teachers ($\bar{x}$=3.0256) get their students' opinions about their teaching at the end of the class almost "every time". At the same time, while AE department pre-service teachers ($\bar{x}$=2.6250) "often" get their students' opinions about their teaching at the end of the class, PSE department pre-service teachers ($\bar{x}$=3.1136), TLE department pre-service teachers ($\bar{x}$=3,0000) and SSE department pre-service teachers ($\bar{x}$=3.0256) get their students' opinions about their teaching at the end of the class almost "every time". When all departments' general arithmetic means are checked, it is determined that pre-service teachers "often" get their students' opinions about their teaching at the end of the class ($\sum\bar{x}$=2.9227).

Table 12. Variance analysis result performed between department variable and I determine the problems arising from my teaching method at the end of my evaluations variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	8.392	1.678			
Within groups	107.333	0.473	0.70627	3.550	0.004
Total	115.725				

When it is looked into Table 12, as a result of variance analysis performed between "department variable" and "I determine the problems arising from my teaching method at the end of my evaluations variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are examined; while SE department pre-service teachers ($\bar{x}$=2.6744) "often" determine the problems arising from their teaching method at the end of their evaluations, PSE department pre-service teachers ($\bar{x}$=3.1591), SSE department pre-service teachers ($\bar{x}$=3.1795) and TLE department pre-service teachers ($\bar{x}$=3.0244) determine the problems arising from their teaching method at the end of their evaluations almost "every time." Besides, AE department pre-service teachers ($\bar{x}$=2.7500) "often" determine the problems arising from their teaching method at the end of their evaluations, PSE department pre-service teachers ($\bar{x}$=3.1591) and SSE department pre-service teachers ($\bar{x}$=3.1795) determine the problems arising from their teaching method at the end of their evaluations almost "every time". When all departments' general arithmetic means are checked, it is determined that pre-service teachers "often" determine the problems arising from their teaching method at the end of their evaluations ($\sum\bar{x}$=2.9657).

When it is looked into Table 13, as a result of variance analysis performed between "department" variable and "I keep journal regularly variable", a significant difference is determined at the level of $p<0.05$. When the differences between the departments are

Table 13. Variance analysis result performed between department variable and I keep a journal regularly variable

	Sum of Squares	Mean Square	SD	F	P
Between groups	11.075	2.215			
Within groups	160.058	0.705	0.85886	3.141	0.009
Total	171.133				

examined; while PSE department pre-service teachers keeps journal irregularly ($\bar{x}$=2.4773), AE department pre-service teachers ($\bar{x}$=3.1250), CITE pre-service teachers ($\bar{x}$=2.9286), SSE department pre-service teachers ($\bar{x}$=3.0000) and TLE department pre-service teachers ($\bar{x}$=2.9512) often keep journal regularly. When all departments' general arithmetic means are checked, it is determined that pre-service teachers "often" keep journal regularly ($\sum\bar{x}$=2.9657).

5. Results and discussion

As a consequence of this research, many pre-service teachers express that they have information about the reflective thinking before taking in-service education, the reflective thinking is necessary and at the same time more effective process is presented using the approaches improving the reflective thinking. As a result of the t-test, it is seen that female pre-service teachers are more sensible about the reflective thinking and more often give a place to the activities than male pre-service teachers do in terms gender variable. In data obtained from Table 3, we obtain from the arithmetic means ($\sum\bar{x}$=3.0058) of the answers given by the all individuals for the survey that pre-service teachers often practice the attitudes representing the reflective thinking. As a result of variance analysis result performed between the attitudes representing the reflective thinking in view of the department variable, the attitudes representing the reflective thinking are often used.

When the researches done before are checked, the study made by Crotty and Allyn is recorded with video tapes and it is demanded from pre-service teachers to make reflection on how they can change and improve their teaching and what they can do for their vocational development. In our study pre-service teachers often use the video records for the question about the attitude towards video record. Basile, Olson and Nathenson-Mej want pre-service teachers to write weekly reflection reports about the subjects they learn and practice during the class. The qualitative data obtained from these reflection reports are evaluated with qualitative analysis program and consequently it is determined that pre-service teachers reflect on tree stages. Besides, Sahin examined the journals of the pre-service teachers in his study. In the study we did we also see that the journals are often kept. Dolapcioglu evaluates the primary school teachers' usage level of the reflective thinking skills in his study. The general aim of this descriptive study is to describe how the teacher attitudes including the reflective thinking skills are practiced by the primary school teachers and determine if the opinions of the teachers differ in terms of gender, vocational seniority and the type of the school they graduated. At the end of the study giving a proper education to the teachers about this issue in pre-service and in-service training courses and practicing the approaches that develops the reflective thinking in the class atmosphere are suggested. As a result our study the needs are detected regarding that pre-service teachers should take in-service training about the reflective

thinking before they begin to work. Inonu used survey model in the research named "History Teachers' Possessive Level of the Reflective Teachers' Features Van Sample". According to the results obtained from the research, it can be said that the teachers agreed to join the different activities and adopt the reflective teaching and have the reflective features. In the study we did the pre-service teachers also use the reflective thinking actively and integrate it into their vocational lives.

6. Conclusion

As a conclusion, the reflective thinking gives teachers an opportunity to develop their vocational lives and helps them to overcome the problems encountering in the class much fast. Besides, it enables that pre-service teachers can use the knowledge they get in the faculty in the real life conveniently.

Reflections of educators are assessed from two perspectives: content and depth. The study includes insights into how to measure the quality of reflective thinking and how to enhance reflective thinking and cultivate reflective practitioners, including the kinds of experiences that could be incorporated in a teacher education program. As a result, it emerges that the reflective thinking is an indispensable mode of thinking for the education of the teacher. Besides it is determined that the pre-service teachers often act according to the reflective thinking [17, 18].

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