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Views of Secondary School Mathematics Pre-Service Teachers about the Field of Assessment

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Abstract. Assessment is one of the factors enabling education programs to reach their aims. Assessment knowledge and skills are among the professional competencies teachers should have. There are assessment courses in the programs of the education faculties aiming to train teachers equipped with professional skills. The aim of this study is to reveal about pre-service teachers having taken the assessment course the importance they attach to the field of assessment, the concepts, methods and techniques they find important in this field, their perceptions of self-efficacy, how they relate the mathematics course with assessment, and their observations on the practices made during their internship experience. Using the case study, a qualitative research method, semi-structured individual and focus group interviews were conducted with eight pre-service teachers. The data were analyzed using descriptive analysis method by dividing into codes and categories. In the light of the findings, it can be said most of the pre-service teachers consider the field of assessment important, but they do not feel sufficient in this field. It has been determined they have recalled generally traditional techniques of the assessment methods; moreover, it has also been determined they superficially touch on the basic concepts of assessment such as validity and reliability. Pre-service teachers have stated they mostly examined national and international exam questions in the lessons in the lessons they taught and studied on preparing such items. They have stated they mostly observed oral and multiple-choice assessment techniques during their internship experiences.

Keywords: Problem based learning, social studies course, attitudes.

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In order to be successful in a profession, it is necessary to have the knowledge, skills, attitudes and values of that profession. One of the four professional skills is expressed as 'assessment' within the scope of the "general qualifications of the teaching profession" determined by the General Directorate of Teacher Training of the Ministry of National Education (MEB, 2017).

At the same time, Ministry of National Education Mathematics Curriculum (2018) underlines that, due to individual differences, "valid and standardized" assessment process is not possible; therefore, it is necessary to act with the understanding of maximum diversity and flexibility in this process. It is specified that teachers must use original and creative assessment practices and that effectiveness is expected to be provided by the teachers as a priority. It is stated in the program that, in terms of the tools and methods that can be used in the assessment process, teachers are not limited strictly. It is also stated that teachers are expected to use original and creative assessment practices in accordance with academic standards (MEB, 2018).

For these reasons, assessment courses are included in teacher training programs. The course content includes subjects such as the place and importance of assessment in education, the basic concepts of assessment, the characteristics of assessment tools, developing and applying achievement tests, interpreting the test results and giving feedback, the analysis of test and item scores, evaluating and grading (YÖK, 2018). Undergraduate students at the department of secondary mathematics teaching take assessment course necessarily within the scope of professional formation (YÖK, 2018).

Generally, it is known that in faculties of education there are assessment courses with 2 credits (ECTS 3) in a semester with a focus on theoretical knowledge and having insufficient assessment tools developing practices. Of the 38 pre-service teachers who participated in the research by Koç and Bulut (2020) with pre-service science teachers, 23 stated that they took the assessment course which was far from practice but had theoretical knowledge in the 3rd grade in a single semester and that they also learned from KPSS courses, but all of them were insufficient. In this case, it can be said that pre-service teachers have graduated without completing their teaching professional knowledge (Kilmen, Akın Kösterelioğlu, & Kösterelioğlu, 2007). It is not possible to say anything clear about to what extent assessment knowledge and practices are included in other educational or math field courses.

When teachers start their career, they realize that teaching is in a structure that maintains its vitality under the influence of various variables. In order to carry out the teaching process effectively, they need to make decisions about teaching and students and determine the steps they will follow

(MEB, 2017). In order to make these decisions, teachers need to know the assessment methods, choose the appropriate assessment tool, develop an assessment tool, score and assess the results. In addition, students, parents, relevant people or institutions expect the teachers to present their assessment results to them in a meaningful way (Semerci, 2015).

The understanding of assessment in secondary school mathematics education went beyond finding the right answer by performing numerical operations. Calculation skills are important in mathematics, which is the basis of positive sciences, but it is not the only expected from mathematics education (Suzuki, 1998, p. 8). With mathematics education, students are expected to develop high-level thinking skills such as mathematical reasoning and communicating, analyzing, connecting, developing problems, creating models, using different solution methods, reaching the simplest solution and presenting the solution (MEB, 2018; Çakmak Gürel, 2018; Uysal & İncikabı, 2018).

The teaching approach has changed in a way that allows students to construct complex high-level mental skills that include a lot of knowledge and behaviors beyond acquiring certain knowledge and behaviors one by one (Ersoy, 2012). The traditional assessment tools such as written and oral exams and multiple-choice tests are insufficient to determine high-level skills (Özer & Karaoğlu, 2017). For this reason, in parallel with the teaching methods in the constructivist education program, there have been differences in the assessment methods. In this new assessment approach, which is called alternative assessment, motivating opportunities are created for the lesson, where the student can take an active role and reveal many skills, perceive their own learning and deficiencies, and can be applied in a wide and flexible time (Birgin, 2008; Kuran & Kanatlı, 2009). For an effective assessment, teachers should use alternative assessment applications. Some of these methods called alternative assessment approaches, are as follows: concept maps, grid testing, open-ended question, diagnostic branched tree, word correlate techniques, interview, observation, demonstration, drama, anecdote, oral presentation, portfolio, performance assessment, self-assessment, performance task, rating scales, attitude scales, poster, oral test, project, debate, experiment, written reports, family observation form, peer assessment, group assessment (Bahar, Nartgün, Durmuş, & Bıçak, 2015; Başol, 2019; Alaz & Yarar, 2009)

The proficiency of teachers, who are the implementers of educational programs, is one of the important factors that determine the quality of teaching (Çakan, 2004). Since the courses are mostly given theoretically in education faculties where teacher competencies are gained, teachers cannot use the knowledge they have acquired efficiently in their professional lives.

Baştürk and Dönmez (2011) examined the pedagogical content knowledge of pre-service mathematics teachers in the context of assessment knowledge in their study. Although some of the pre-service teachers expressed their views about process evaluation, identifying learning deficiencies, determining meaningful learning, assigning project-like tasks to be associated with daily life, asking for multiple representations of concepts in accordance with the alternative assessment approach, it was seen that they could not reflect them in their lectures. This situation was interpreted as the pre-service teachers had superficial knowledge about the alternative assessment methods and could not apply their assessment knowledge to mathematics teaching.

In the survey conducted by Uğurlu and Akkoç (2011) on pre-service mathematics teachers, it was seen that most of the pre-service teachers could not write a clear answer to the question of what the purposes of evaluation were. It was determined that the answers mostly aimed to determine the effectiveness of the methods used in the course and their learning levels. After the workshop, the pre-service teachers expressed many aims such as determining readiness, detecting misconceptions, and eliminating the perceived problems. Positive developments were observed in all pre-service teachers' views about assessment.

Güven Akdeniz (2021) examined the criteria and scoring in the rubrics created by 24 pre-service mathematics teachers to assess a math problem. It has been determined that pre-service teachers have deficiencies in defining the criteria for the problem and considering the curriculum and students' age-knowledge levels.

Related studies show that pre-service teachers have deficiencies in their knowledge and skills about alternative assessment methods in classroom. If the deficiencies can be determined correctly with their reasons, regulations can be made to eliminate them. For this reason, the aim of this study is to determine and examine the knowledge, views and thoughts of pre-service teachers about the field of assessment within the framework of the interviews and to contribute to the literature.

Method

Research Model

In this study, a case study was conducted within the scope of qualitative research to reveal the views of pre-service teachers on the field of assessment. In a case study, it is possible to work on one aspect of the problem in depth and in a short time by trying to present the unique situations of real people away from numerical or abstract theoretical expressions (Cohen, Manion, & Morrison, 2021, p. 376).

Study Group

The study group of this qualitative study consists of eight pre-service teachers in the last year of the secondary mathematics teaching undergraduate program at a state university in the Black Sea Region in the 2019-2020 academic year.

There are two main reasons why the pre-service teachers in our study group were selected from the last year. The first is that assessment courses are taken in the 3rd year (in the 6th semester) in the secondary mathematics teaching undergraduate program. It is accepted that the pre-service teachers who is successful in this course have sufficient assessment knowledge and skills in the professional field.

Secondly, pre-service teachers are given their 4th grade (7th and 8th semesters) Teaching Practice I and II courses and internship experiences. These courses include all experiences in the school and classroom environment such as observation to special teaching methods and techniques, micro-teaching practices, lesson plan, classroom management, assessment, activity and material development (Saritaş, 2007).

With the coordination of the Faculty and the Provincial Directorate of National Education, students are divided into groups and assigned to different schools and teachers for internship. It is thought that pre-service teachers' internship experiences increase their awareness of the field of assessment, thus strengthening the possibility of our study to reach a deeper and richer content.

Eight pre-service teachers are members of two different groups who voluntarily participated in the research from students attending Teaching Practice I and II courses. With the convenience sampling technique, the researcher can collect data from volunteers, which is easily accessible, and the motivation of the volunteers creates an advantage for the research (Gezer, 2021). The researchers confirmed that during the study, no adverse events were encountered in the ordinary course of the internship processes of the pre-service teachers.

Data Collection Tools

Obtaining data from multiple sources in qualitative studies is important in terms of accurate due diligence, clarification of perceptions, and validity and reliability of data (Işık & Semerci, 2019). For this reason, the data in our study were obtained in two stages. Pre-service teachers' views were obtained through individual semi-structured interviews in the first stage. In the second stage, focus group interviews were conducted by forming two separate groups.

Interview is a verbal communication process with the relevant people in order to find an answer to the research question (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2020, p. 158). In individual interviews, it is aimed to reach the perspective of the person on the situation or events (Kartal, 2021, p. 151). On the other hand, in focus group interviews, the dynamics of discussion, which occurs when participants influence each other, support each other, and express opposing views, can provide an advantage in terms of obtaining more diverse data than individual interviews (Cohen, Manion, & Morrison, 2021, p. 527). The researcher tries to keep the participants focused on the topic via moderating the discussion (Cohen, Manion, & Morrison, 2021, p. 532). Participants can structure their own responses based on the answers of other group members (Işık & Semerci, 2019). Thus, the ideas and views of the participants can be obtained in more regular and renewed forms.

Semi-structured interviews are conducted with questions whose answer area is expected to be within certain limits in order to collect in-depth data on a particular area of interest (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2020, p. 159). Since the semi-structured individual and focus group interview questions were open-ended in the study, reliability analysis could not be made, and content validity was tried to be ensured by taking the opinions of academicians who are experts in the field of mathematics education and assessment.

The initial questions of the individual interview are about the concepts and assessment tools they remember from the assessment course, and the other questions are about the importance of assessment in education, the contribution to their career success and their perceptions of competence in this field.

The focus group interviews consist of questions aiming to learn about pre-service teachers' thoughts on the relationship between mathematics education and assessment, their observations about what kind of assessment approaches are used in school experience lessons, and their knowledge on alternative assessment approaches.

Process

Due to the Covid-19 pandemic, primary, secondary and higher education programs had to continue their educational activities online. For this reason, individual and focus group interviews were done on an online application and recorded. The conversations were made descriptive analysis by transcribed the video recordings.

Data Analysis

The answers given to each question of the individual and focus group interviews conducted with eight pre-service teachers studying at a state university secondary mathematics teaching department have been examined in detail and are respectively presented below.

Individual Interview Findings

1- After the answers given to the question directed to learn what the pre-service teachers remembered from the assessment course were coded, they were grouped under two separate categories in Table 1.

The answers given to this question were coded and the categories of ‘item types preparation and analysis’ and ‘field-specific theoretical information’ were formed. It is seen that only the rubric is included once, among the alternative assessment tools, in the item types of preparation and examination category. As seen in the table, traditional measurement tools were used 11 times in total. It is seen in the table that the most frequently repeated assessment tools are multiple-choice and open-ended item types.

It is understood from the data in Table 1 that in the assessment course taken by the pre-service teachers the types of items in the national and international exams are examined rather than in-class applications. Five of the eight pre-service teachers stated that they examined the PISA and TIMMS questions in the assessment and evaluation course they took. Only one pre-service teacher stated that they studied the national exam questions. As it is understood from the data obtained, the complementary measurement and evaluation courses, which are numerous and diverse, are given very little and superficial place in the assessment courses.

Table 1.

Activities and Concepts Pre-Service Teachers Remember from the Assessment Course

<i>Categories</i>	<i>Subcategories</i>	<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Item Types Preparation and Analysis	Preparation	Short answer items				x				x	2
		Multiple choice items	x		x	x				x	4
		Open-ended items	x		x	x					3

		Fill-in-the-blank items	x						1	
		True-false items	x						1	
		Rubrics			x				1	
Field-Specific Theoretical Information	Analysis	PISA and TIMMS questions	x	x	x		x	x	5	
		Questions in national exams						x	1	
		Taxonomy / Level classifications				x	x	x	x	4
			Reliability	x			x			2
			Standard deviation	x	x					2
		Statistical	Variance		x					1
			Chi-square test		x					1
			Item difficulty index				x			1
			Scoring	x	x				x	3
		Conceptual	Validity	x			x		x	3
	Evaluation		x		x	x			x	4
	Bloom's taxonomy		x		x	x	x		x	5
	Types of assessment and scale					x	x			2

The codes in the second category, "field-specific theoretical information" in Table 1, are divided into "statistical" and "conceptual" sub-categories. The fact that the pre-service teachers could not express the theoretical concepts they remembered from the assessment courses well attracted the attention of the researchers. Instead of the meaning of the concept, the expressions that it evokes were said. Below are examples of how pre-service teachers refer to theoretical concepts.

S2: "There were theoretical tests, I think the chi-square test, there were such assessment tools, but for now, they are very theoretical. I remember homework more than these. I guess there was variance, standard deviation."

S3: “I remember he did something about the item difficulty index as well. We created a random table with one zero. Then he had its item difficulty index and item discrimination index researched, and he had us find them.”

From the answers given by the pre-service teachers, it was seen that the validity and reliability issues, which are the most basic features that should be found in assessment tools, were mentioned very little and superficially, and examples are given below.

S1: “I think we talked about assessment, reliability. We talked about passability of exams (he meant validity), scoring methods, etc... But I don't remember much, frankly...”

S6: “There was validity, in these test exams, you know, the validity of the questions was important. You know, they were separated, there was content validity, construct validity and such things. You had to adjust things accordingly. I don't know very well...”

2- Pre-service teachers' views on the importance of assessment in education were analyzed in two categories as 'student-oriented' and 'teaching-oriented' and presented in Table 2.

Table 2.

Pre-service Teachers' Views on the Importance of Assessment

<i>Categories</i>	<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Student-oriented	Developing higher-order thinking skills					x				1
	Getting to know the student			x	x				x	3
	Determining student success						x	x	x	3
Teaching-oriented	Diagnostic assessments	x								1
	Formative assessment	x		x	x					3
	Summative assessment	x	x	x						3

In this question, only one pre-service teacher stated that they consider assessment and evaluation important in terms of developing high-level skills. In this context, it is remarkable that assessment and evaluation for the mathematics course, where cognitive skills are at the forefront, is expressed very little and superficially. Regarding this code, S5 expressed their opinion as “Currently, the education system is different, and it wants us to develop different perspectives on questions. For this, we need to go as far as the synthesizing step... In fact, I believe that I can firstly get it and then improve myself mostly with asking questions to students. Because I think that gaining different perspectives may be related to the mathematics and questions that they can see.”.

Three of the eight pre-service teachers stated that assessment is important in terms of getting to know the student. Getting to know students includes the teacher's knowing the current level of knowledge of the student on the subject, understanding the difficulties experienced in the lesson and following the necessary paths accordingly (Baki, Çelik, Güler, & Sönmez, 2018). S4 expressed their opinions as “It can be used to get to know the student. It can also be used to see if the process is working. The teaching process... It has various scopes. It is not just for giving grades or seeing if they have learned”.

For this question, three pre-service teachers stated that they consider assessment important to determine the success of the student. S8 said that it is important to determine the success of the students since their success in the course is considered more important in the education system in Turkey, and S6 and S7 said assessment is important because it is necessary to create a success order due to the effect of the national exams. The answers given show the importance of exams which are called high stakes exams (Van De Walle, Karp, & Bay-Williams, 2016, p. 89) for pre-service teachers.

Three pre-service teachers related assessment with formative and summative assessment in teaching. The fact that only one pre-service teacher expresses the readiness is an indication that a necessary and important step in the planning of instruction can be neglected. Only S1 expressed the importance of diagnose assessment and said “For example, we will start a new subject. First of all, do the students have the basic knowledge to start this subject? We use assessment for this. These are not only for grading purposes...”

3- Pre-service teachers were asked for their views on how effective their assessment knowledge and skills would be on their professional success.

Table 3.

Professional Benefits of Assessment Knowledge and Skills

<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Getting to know students	x		x						2
Determining learning			x						1
Planning the teaching				x					1
Drawing attention to the lesson								x	1
Pedagogical using					x	x	x		3
Providing feedback						x			1
Evaluating objectively		x							1

As can be seen in Table 3, the most repeated codes were 'pedagogical using' with three frequencies and 'getting to know students' with two frequencies. Except these answers, they mentioned less frequently its contributions such as getting to know students, attracting attention to the lesson, providing feedback, planning teaching and making objective assessments.

S7: "... I would like to say that it is important not because of the grade, not because of giving points to the student, but because of the way the question is prepared and the way it is addressed to the student. For example, what do I want to ask the child at that moment? What do I expect from the child at that moment? If you look at it with an assessment logic in this way, I can say that it is necessary. So, I can say that it is a major factor."

From the data obtained, it is seen that pre-service teachers expressed their opinions under two codes at most on the contribution of assessment knowledge and skills to their professional success. It can be said that assessment is not described with their multi-faceted effects.

4- Teacher candidates were asked about their perceptions of competence in the field of assessment, and the answers given are shown in Table 4.

Table 4.

Competence Perceptions of Pre-service Teachers in the Field of Assessment

<i>Responses</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>F</i>
Evet			x						1
Partly					x	x	x		3
No	x	x		x				x	4

Four of the eight pre-service teachers said they felt insufficient and three said they felt partially sufficient. The pre-service teacher, who felt self-sufficient, also stated that they are tutoring math secondary school students privately. Examples of the expressions that reflect the views of the pre-teachers are as follows.

S4: “No, I think that I am very lacking in this field at the moment... Yes, I have theoretical knowledge about assessment, but I cannot apply it. So, I cannot and I think it is very very important after all, because our aim is to teach. Naturally, we need to understand whether the student is learning or not. That's why assessment is important to me...”

S8: “I don't have enough knowledge now. When my career starts, I think that I will be very tired in the first years and I will not have much time. Because I will always go to lesson prepared on these subjects. Because I don't know much. I think that I will always look and examine the books I used in the assessment course while preparing the exam questions. I am very insufficient right now. But I know how to use books, so I think these would be helpful to me.”

S7: “I learned much more detailed in the assessment course I took. They wanted us to study hard and gave a lot of homework. I think it's really helpful. The subjects we studied were always about mathematics. They tried to talk about how we will approach the child, what we want in the questions, and the types of preparing questions.”

5- Pre-service teachers were asked to say what they remember about assessment methods.

As seen in Table 5, mostly traditional methods were repeated. The number of alternative assessment methods is remarkable. When the total number of frequencies is evaluated, it is seen that traditional methods are said 31 times and alternative methods are said 4 times.

It is remarkable that the most frequently repeated 'written examination' and 'multiple-choice items' are among the traditional assessment methods. It was observed that S3 and S7 among the eight pre-service teachers did not mention any alternative assessment methods. It was determined that only one pre-service teacher said the affective factors of the assessment methods.

Table 5.

Assessment Methods that Pre-service Teachers Remember

<i>Categories</i>	<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Traditional Assessment Methods <i>f=34</i>	Written examination	x		x	x	x	x	x	x	7
	Oral examination				x		x	x		3
	Homework			x		x			x	3
	Question-answer technique			x						1
	Long-answered items					x	x			2
	Short-answered items				x	x	x			3
	Multiple-choice items	x		x	x	x	x		x	6
	Fill-in-the-blank items	x	x			x	x			4
	True-false items	x	x			x				3
Matching items		x			x				2	
Alternative Assessment Methods <i>f=9</i>	Open-ended items		x		x		x			3
	Performance tasks					x			x	2
	Project								x	1
	Composition	x								1
	Curiosity / Attitude scales				x					1
	Psychological tests				x					1

Group Interview Findings

1- The pre-service teachers were asked about the importance of having assessment knowledge and skills as a mathematics teacher.

The most frequently repeated code in Table 6 is seen as 'improving higher-order thinking skills'. Pre-service teachers mostly expressed the use of assessment tools for the development of high-level skills in the focus group discussion.

Table 6.

The Importance of Having Assessment Knowledge and Skills

<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Developing higher-order thinking skills	x		x	x	x				4
Planning the teaching				x			x		2
Determining learning				x		x			2
Assessing readiness	x								1
Keeping the student active			x					x	2
Due to the math concepts	x			x					2

S3: “I would like to design activities in which the students will be active and which will keep them actively participating, you know, problems that will make them design or think... Or I want to give such activities, I want to assess it in this way”

S5: “Currently, the education system also wants us to develop different perspectives on different questions. For this, we need to go as far as the synthesis step. But I don't think most of us have that ability right now. It is something that the next generations will need. That's why I believe we need to learn about them.”

Pre-service teachers stated that it was important to have assessment skills in terms of planning teaching, determining learning, assessing readiness, keeping students active and due to the structure of the mathematics subjects.

S7: "... It is important to use these to make the student active, I think. It is important for the student to be active in order to learn."

2- Pre-service teachers were asked about the assessment methods that were applied in the classroom and attracted their attention in the (internship) Teaching Practice-I course.

Teaching Practice I and II courses include educational activities that allow pre-service teachers to get to know the school, the course, the teacher and the students, and provide the opportunity to observe and interview (Saritaş, 2007).

As seen in Table 7, 'multiple choice questions' and 'question-answer technique' are the most repeated assessment methods among those observed by the pre-service teachers.

Table 7.

Observations on the Assessment Practices Done in the Teaching Practice-I Course

<i>Codes</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Open-ended questions			x						1
Fill-in-the-blank questions						x			1
Multiple-choice questions		x	x			x			3
True-false questions		x							1
Short-answered questions					x			x	2
Oral examination	x			x			x		3

S2 reported their observations as "They were opening an example from book Z having multiple-choice questions. They were solving them with the students. There were mostly multiple-choice questions. There were true-false questions when they were lecturing."

3- Pre-service teachers were asked whether they had heard of alternative assessment approaches. As can be seen in Table 8, most of the answers are no.

Table 8.

Pre-service Teachers' Self-Assessment about Alternative Assessment Approach

Responses	S1	S2	S3	S4	S5	S6	S7	S8	f
Yes		x	x						2
No	x			x	x	x	x	x	6

“I did not hear. I didn't know it was divided into alternative and traditional.” S4 answered and S5 said “I don't remember exactly, but, no, I've never heard of it.”

4- In the focus group interview, when the issue of what would happen if traditional assessment methods were used in mathematics education based on the constructivist approach in our country was put forward, the data in Table 9 were obtained.

Table 9.

Views on the Relationship between Constructivist Approach and Traditional Assessment

Codes	S1	S2	S3	S4	S5	S6	S7	S8	f
Student becomes passive in lessons			x				x	x	3
We can't get to know the student in many ways		x		x			x		3
Higher-order thinking skills do not develop	x								1
No comment					x	x			2

S2: “As you said, most of our lessons included either classical questions or multiple-choice questions. Very rarely, we were doing something in some lessons. We were doing presentations. We were demonstrating the skill only by filling out the paper and transferring our knowledge to the paper in other lessons. Instead of just grading on a piece of paper that the student fills out in 40 minutes, it could be group work, something they did there, or performance tasks. Students can be assessed not only on their written paper but also on other things.”

S4: “In the constructivist approach, it is mostly about learning by actively doing something... Individual differences are not taken in account - a little, of course - also in the traditional method, but it is not very distinguishable, so it can be a problem. Of course, traditional should also be used, but it may also be necessary to use alternative assessments. It may be necessary to use alternative assessment tools to consider individual differences or to get to know the student better and make decisions accordingly. Because the aim in constructivism is to get to know the student and follow a way accordingly. That's why I think others should be used as well.”

5- The pre-service teachers were asked whether they had acquired knowledge about the assessment field in other main and vocational courses and the findings in Table 10 were obtained.

Table 10.

Answers Regarding the Teaching of Assessment in Other Courses

<i>Responses</i>	<i>S1</i>	<i>S2</i>	<i>S3</i>	<i>S4</i>	<i>S5</i>	<i>S6</i>	<i>S7</i>	<i>S8</i>	<i>f</i>
Yes	x		x	x					3
Hayır		x			x	x	x	x	5

S3: “It was only in teacher X' s lesson. Teacher X would also want us to lecture. I don't remember the name of their lesson right now, but in teacher A's class, we used to make a presentation in turn single or groups. The teacher used to criticize us. That's why they always said that assessment was not only at the end of the course, you could also do it during the course. They kept saying things like what you wrote in the assessment section should not be just an assignment and we were trying to apply them.”

S5 “No. In general, such a thing did not happen in the lessons because our lessons generally continue with presentations. Our teacher lectured, we wrote it in the notebook. Obviously, things like when you become a teacher you should do this, it would be better if you do it this way didn't happen too much in lessons. Maybe it's because we weren't 4th grade. Because I know that knowledge about such subjects is given more in the 4th grade. Nothing like that happened before.”

Conclusion and Discussion

The data of the study show that pre-service teachers mostly examine and score national and international exam questions, which are called high-risk in assessment courses. In the interviews, it was seen that pre-service teachers talked about traditional assessment methods much more than alternative assessment approaches. It can be concluded that the lack of knowledge of pre-service teachers about alternative assessment tools stems from the fact that less time is allocated to alternative assessment tools in assessment courses. Baştürk and Dönmez (2011) stated that assessing pre-service teachers with alternative methods in mathematics education is important in terms of reconciling their assessment knowledge with mathematics education.

It is seen that more emphasis is placed on summative assessment, which is one of the types of traditional assessment methods, and little attention is paid to diagnose and formative assessment. Baştürk and Dönmez (2011) stated that giving importance to outcome assessing and using traditional assessment methods in the observations of pre-service teachers in Teaching Practice courses may affect them in this direction.

The pre-service teachers who participated in the research expressed the basic concepts of assessment such as validity and reliability incompletely or incorrectly. They stated that they consider assessment professionally necessary and important, but they have little experience in preparing assessment tools. It is possible to say that assessment courses have deficiencies to meet the needs in terms of theory and practice. It can be said that the main reason for this is that there is little time allocated for assessment courses in the program. The fact that pre-service teachers cannot receive assessment skill appropriate in vocational training means that they will not be the best person to assess the success of the students in their classes. (Kilmen, Akın Kösterelioğlu, & Kösterelioğlu, 2007).

Pre-service teachers stated that they considered the field of assessment important in terms of students and teaching. Some of pre-service teachers stated that they would benefit most from professional assessment as a pedagogical mean. This dimension of assessment can be associated with the concept of assessment for learning. This concept refers to formative assessment activities that encourage students to learn and create opportunities (Gardner, 2012). However, the fact that few pre-service teachers touched on this subject superficially supports Uğurlu and Akkoç' s (2011) research and reveals the necessity of focusing on the instructional quality of assessment tools.

When eight pre-service teachers were asked about their perceptions of competence in the field of assessment, only one stated that they felt competent. The others stated that they were partially

sufficient or insufficient. The reason for this may be there are few practices to prepare assessment tools and students do not have the chances to apply and assess them. Similarly, Çelik and Arslan (2012) found that physical education pre-service teachers; Kilmen, Akın Kösterelioğlu, and Kösterelioğlu (2007) determined that primary school pre-service teachers and Turkish pre-service teachers feel inadequate in assessment techniques and practices. They stated that pre-service teachers had educational needs for knowledge and skills in this field. In the study of Koç and Bulut (2020), most of the science pre-service teachers who participated in the interview stated that the information in the assessment course they took during their undergraduate period was not sufficient.

Recommendations

Assessment is a field that includes a wide range of knowledge and skills, both in theory and in practice. Therefore, it is not possible to prepare pre-service teachers in this field with the trainings given in a short time. For this reason, the training to be given to develop assessment knowledge and skills in undergraduate education should be in a sufficient time and in a practical way.

This study contributed to the understanding of pre-service teachers' knowledge, skills and attitudes towards assessment. It is thought that the professional knowledge, skills and attitudes of pre-service teachers should be revealed through similar studies.

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Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

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Ethical Standards

Kastamonu University Ethics Committee approval was obtained for the study. The participants were volunteers, informed consent was obtained.

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