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The technology of criterion assessment of students' knowledge in geography lessons

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Abstract

The study aims to get the views of teachers about the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology. This research was designed in the qualitative research method and the data were evaluated following the qualitative method. The sample group of the research consisted of 80 geography teachers who teach geography at various high schools in Almaty, Kazakhstan. The researchers developed a semi-structured interview form to consult the opinions of teachers about the difficulties encountered in online education. As a result of the research, Geography teachers found measurement and evaluation opportunities in face-to-face education more advantageous than in online education. In line with the findings obtained from the research, it has emerged that it is necessary to make improvements for the healthy application of criterion evaluation technology in online measurement and evaluation.

Keywords: Assessment; criterion assessment; evaluation; online learning.

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1. Introduction

Distance education or online education has become increasingly widespread in recent years with the increasing use of technology in education and has taken its place as an indispensable element in our lives (Brem, Viardot & Nylund, 2021). In the age we live in, information technologies are constantly changing and developing. These developments and changes have also manifested themselves in distance education practices and have almost allowed the formation of a new understanding of education. At the same time, countries have come to benefit from information technologies in solving the problems that arise in the field of education.

Thanks to information technologies, fundamental structural changes can be made in education systems (İşman, 2011 as cited in Taner et al., 2021). In addition, due to the global epidemic disaster that affected the whole world, distance education applications have turned into a compulsory education approach in the world and Kazakhstan. This transformation has brought the advantages and disadvantages of the new educational approach.

1.1. Theoretical and conceptual framework

Distance education is the transmission of teaching originating from one place to students in one or more distant places (Schunk, 2012). Distance education itself is not a learning environment, but a method dependent on the environment used in terms of teaching delivery and communication. It can be used in two different ways, synchronous or asynchronous. Measurement and evaluation activities carried out in the online teaching-learning process should have a different structure than those carried out in the face-to-face education environment (Koç et al., 2022). Online Assessment and Evaluation; It is all kinds of measurement and evaluation processes carried out in a virtual environment using information and communication technologies (Balta and Türel, 2013).

Jordan (2013) explained the importance of online evaluation by listing them in items. These are: • The quality of feedback provided on time in assessments is key to student progress. • Even mass exams are evaluated in a short time. • At any time, resources can be used repeatedly. • Online assessment can motivate students and help them speed up their studies. • Multiple choice tests are powerful in assessing broad content. • Students can have the opportunity to access more tests in the computer environment.

One of the most important shortcomings encountered in online distance education, whose effectiveness and efficiency have increased with the technological developments in all areas of life, is that measurement and evaluation methods are not used efficiently enough (Palloff & Pratt, 2007). It is necessary to be aware of the benefits and limitations of distance education applications. In the field of assessment and evaluation, instead of face-to-face exams, there is a need to be enriched with homework that can be evaluated in a wide range of time, videos prepared by students, audio recordings or content to be created with other tools (Sayan, 2020).

It is known that when online learning is reinforced by the assignments given to the students and the application of correct assessment methods, the performance and learning needs of the students will be positively affected (Buzzetto-More & Alade, 2006). The measurement and evaluation process in open and distance education, where learning and teaching practices are put into practice between educators and students who are far from each other and by using various communication technologies, includes various limitations compared to traditional education practices due to the existence of different types of interaction between educators and students. As in the face-to-face learning environment, the educator does not have the opportunity to evaluate students according to their participation in the lesson and the quality of the questions they ask, as well as their written work. Accordingly, written assignments and tests have a decisive role in measuring student knowledge (Lee et al., 2010). In today's education approach, geographers are expected to provide higher quality vocational education in higher education by using the potential of distance education technologies

(Solem et al., 2006). It is possible to say that the sustainability of education in the online education environment is as important for geography teachers as it is for all teachers, as well as ensuring the maximum efficiency of the student in the learning process.

1.2. Related research

To determine the students' views on online assessment, Sorensen (2013) made online assessment practices through the exams in Moodle. With these applications, it has been revealed that students have a positive attitude towards online assessment. In this process, students' approaches were tried to be determined through an online survey. It has been revealed that quizzes allow focusing on the important aspects of the materials in their own time, especially for students with low average success rates. It was determined that students with high success averages approached online learning more positively than students with low success averages.

Schultz (2012) conducted a study called “A critical evaluation of teaching methods related to Distance Education in geography education: Andragogy in an adult online certificate program”. In his study, Schultz concluded that adults bring their life experiences to the learning environment, are responsible for their own decisions, participate directly in the planning, and learn problem-centered rather than content-oriented.

Sarıbaş and Meydan (2020) evaluated the geography department students' attitudes towards online learning in their study. It was determined that the statement that geography students showed the least participation in the online learning attitude scale was the statement "most students prefer online learning face-to-face". In addition, it was concluded in the study that students do not prefer online learning over face-to-face education.

Dermo (2009) sought the opinions of undergraduate students in his study to reveal the effects of online assessment practices. According to student opinions, it has been determined that the most positive aspect of online assessment is the benefits it will provide to their teaching and learning approaches. In addition to this result, it was understood that the age and gender variables of the students did not make any difference in their perceptions of an online assessment.

Gipps (2005), on the other hand, discussed in detail the validity, adequacy, response type, and scoring issues regarding the dissemination of assessment based on information and communication technologies at the university level. In the research, it has been put forward that multimedia applications will increase with the spread of online learning environments. In addition, it has been stated that technology will be used more in terms of keeping student records, storing student products, and providing feedback. McCann (2010) used a central online assessment method in his study. He stated that in the process of applying this method, the instructors showed resistance and that the spread of the online assessment system would not be quick and easy.

When the studies in the field are examined, it is seen that the opinions of teachers and students are sought in the measurement and evaluation practices applied in both online learning environments and online learning environments. In this study, unlike the studies in the field, the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology were evaluated with the opinions of teachers.

1.3. Purpose of the research

The purpose of this research is to get the views of teachers about the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology. In this direction, the following sub-objectives have been established.

1. How do teachers evaluate assessment and evaluation opportunities in geography education in terms of online education and face-to-face education?

2. Do teachers find it advantageous to evaluate students' knowledge with criterion-assessment technology in online education?

3. What kind of difficulties do teachers encounter in evaluating students' knowledge with criterion assessment technology in online education?

2. Materials and Method

This section contains information about the research method, participant group, and data collection tools.

2.1. Research method

This research was designed in the qualitative research method and the data were evaluated following the qualitative method. Qualitative research is a method that inquires about the problem it examines, interprets, and tries to understand the form of the problem in its natural environment (Klenke, 2016). Accordingly, in this study, teachers' views on the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology were handled following the qualitative research method.

2.2. Participants

The sample group of the research consists of teachers who teach geography at various high schools in Almaty, Kazakhstan. Information about the sample group of the study is given in Table 1.

In Table 1, demographic information about the gender and experience distribution of teachers who voluntarily accepted to participate in the research is given.

Table 1
Demographic distribution of teachers

Professional experience	**Gender**		**Sum**
	Female	Male	
1-5 Years	2	5	7
6-10 Years	5	26	31
11-15Years	22	10	32
16 Years and above	4	6	10
Sum	33	47	80

In Table 1, the age and professional experience distributions of the teachers participating in the research are given. 7 of the teachers have 1-5 years, 31 6-10 years, 32 11-15 years, and 10 16 years or more of experience. 33 of the teachers participating in the research are female and 47 are male. A total of 80 geography teachers participated in the study.

2.3. Data collection tools

To collect the data, the researchers primarily conducted a literature review. Studies on assessment and evaluation activities in the online education process of geography teachers were examined. After the examination, the researchers developed a semi-structured interview form to consult the opinions of the teachers about the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology. While developing the semi-structured interview form, care was taken to ensure that the questions were one-dimensional, easy to understand, and not directive. To determine whether the prepared semi-structured interview form serves the purpose and its applicability, the opinions of 3 experts were consulted. The form was rearranged in line with the suggestions received from the experts. In the next stage, the semi-structured interview form was applied to 3 geography teachers, and it was determined

that there was no problem after the pre-application. The semi-structured interview form is included at the end of the research in the form of Annex-1.

2.4. Data collection process

Research data were collected using a semi-structured interview form. The teacher information form, in which the ethical dimension of the research was explained and information about the content of the research was given, was sent to the teachers who were teaching geography in Almaty and whose e-mail addresses were reached. In addition to the teacher information form sent via e-mail, a teacher research participation form has also been added. 80 geography teachers, who responded positively to the teacher research participation form and reached the researchers via e-mail, formed the participant group of the research. An appointment was made with the teachers who constituted the study group of the research, and interviews were made via skype.

At the beginning of the interview, all the teachers were informed that the interviews would be recorded and their permission was obtained. Interview questions were asked to the teachers in the same order. As a result of the interviews, the records were analyzed and written down. The two researchers independently converted the data into text and then compared them with each other's transcripts. It took about 2 months to make all the interviews with the teachers and collect all the data.

2.5. Data analysis

Descriptive analysis and content analysis were used together in transforming the research data into findings. Descriptive analysis or content analysis is commonly used in the analysis of data obtained in qualitative research. Content analysis is the careful, detailed, and systematic examination and interpretation of data to identify patterns, themes, biases, and meanings related to the content of the research. The purpose of content analysis is to reach the concepts and relationships that can explain the data obtained through the opinions of the participants and the file and document analysis. The data, summarized and interpreted by descriptive analysis, are subjected to in-depth processing with content analysis, and new concepts or relations between concepts are determined.

In content analysis, it is essential to bring together similar data within the framework of certain concepts and themes and organize them in a way that the reader can understand (Maxwell, 2009). In this direction, the research data were arranged by the researchers. The comments of the geography teachers, who formed the study group research, were added to the research findings given by creating frequency and percentage tables. While the answers given by the teachers to the questions in the semi-structured interview form were used in the research, a code was determined for each teacher and used. Thus, an attitude was displayed following the principle of confidentiality of the participants.

3. Results

In this section, the answers given by the teachers to the semi-structured interview form used in the research were evaluated.

In Table 2, the opinions of the teachers who voluntarily participated in the research on the assessment and evaluation possibilities in geography education, in terms of online education and face-to-face education are given.

Table 2

Teachers' evaluation of measurement and evaluation opportunities in geography education in terms of online education and face-to-face education

Themes	Categories	F	%
Assessment and evaluation are more advantageous in face-to-face education	Allowing method diversity Safe exam environment Quick feedback Considering individual differences	71	88,75
Measurement and evaluation are equally advantageous in face-to-face and online education	Measuring learning Measuring information	7	8,75
Measurement and evaluation in online education are more advantageous	Developing a sense of responsibility	2	2,5

In Table 2, the evaluations of the geography teachers participating in the research in terms of online education and face-to-face education are given. 88.75% of geography teachers stated that measurement and evaluation are more advantageous in face-to-face education. Teachers who stated that measurement and evaluation are more advantageous in face-to-face education stated that this situation allows for a variety of methods, provides a safe exam environment, provides quick feedback, and takes individual differences into account. 8.75 of the teachers answered that measurement and evaluation in face-to-face and online education are equally advantageous. Teachers who said that measurement and evaluation are equally advantageous in face-to-face and online education evaluated this situation with the dimensions of measuring learning and measuring knowledge. 2.5% of the teachers stated that they found measurement and evaluation in online education more advantageous than face-to-face education. Developing a sense of responsibility has been shown by teachers as the reason why measurement and evaluation in online education are more advantageous. Based on this, the majority of geography teachers found measurement and evaluation more advantageous in face-to-face education.

The answers of some geography teachers participating in the research regarding the evaluation of assessment and evaluation opportunities in education in terms of online education and face-to-face education are as follows;

32. Teacher: I find assessment and evaluation practices more advantageous in face-to-face education. It allows the teacher to apply different methods in assessment and evaluation. It also provides a safer exam environment.

9. Teacher: I do not see measurement and evaluation opportunities different from each other in face-to-face and online education. I think that there are similar possibilities in terms of measuring the student's knowledge.

47. Teacher: I find measurement and evaluation opportunities more advantageous in online education. Because it creates a sense of responsibility in the student. Students can show their individual effort and responsibility awareness more in online education exams.

Table 3 shows that the teachers who participated in the research voluntarily answered the question “Do the teachers find it advantageous to evaluate students' knowledge in online education using criterion assessment technology?” their answers to the question are evaluated.

Table 3

Opinions of teachers on the evaluation of students' knowledge in online education using criterion assessment technology

Themes	F	%
I do not find it advantageous	68	85
I find it somewhat advantageous	9	11,25
I find it advantageous	3	3,75

In Table 3, the situation of teachers finding it advantageous to evaluate students' knowledge in online education using criterion assessment technology is evaluated. 85% of the geography teachers stated that they do not find it advantageous to evaluate students' knowledge with criterion assessment technology in online education, 11.25% find it partially advantageous and 3.75% find it advantageous.

The answers of some geography teachers participating in the research regarding the evaluation of students' knowledge in online education with criterion assessment technology are as follows;

19. Teacher: In my opinion, online education is not an appropriate assessment environment for the healthy use of criterion-assessment technology.

34. Teacher: I find it somewhat advantageous. The student plays an active role in the process. But at the same time, it is a difficult situation for the teacher as it restricts the evaluation of the student's process.

57. Teacher: I think it is quite advantageous in terms of providing the student with the opportunity to be motivated throughout the process.

Table 4 shows that the teachers who participated in the research voluntarily answered the question "What kind of difficulties do teachers encounter in evaluating students' knowledge with criterion assessment technology in online education?" Their answers to the question are evaluated.

Table 4

Difficulties faced by teachers in assessing students' knowledge in online education using criterion assessment technology

Themes	Categories	F	%
Low reliability	Possibility of cheating	6	82,5
	Difficulty in controlling	6	
	Student reluctance	3	43,75
Lack of motivation in the student	Student instability	5	
Miscommunication	Difficulty following the process due to communication	2	27,25
	Student-teacher miscommunication	2	
Technical issues	Internet connection problems	1	21,25
	Lack of computer knowledge	7	

In Table 4, the difficulties faced by geography teachers in evaluating students' knowledge in online education using criterion assessment technology are evaluated. 82.5% of the teachers answered low

reliability, 43.75% of students lack motivation, 27.25% of miscommunication, and 21.25% of technical problems. Teachers who answered low reliability explained this situation with the possibility of cheating and difficulty in supervision.

The lack of motivation in the student was categorized by the teachers as unwillingness in the student and instability in the student. Geography teachers defined miscommunication as difficulty in following the process due to communication and student-teacher miscommunication. Teachers stated that technical problems, internet connection problems, and lack of computer knowledge are among the difficulties they encountered in the evaluation of students' knowledge in online education using criterion assessment technology.

The answers of some geography teachers participating in the research regarding the difficulties they encounter in evaluating students' knowledge in online education using criterion assessment technology are as follows;

Teacher 21: I think that the reliability of the evaluation is low when evaluating the criteria in online education. It is very difficult to prevent students from cheating and to control this.

39. Teacher: Students' motivation towards assessment practices in online education is very low. In addition, experiencing technical problems is another source of stress. In my opinion, ignorance towards information and communication technologies and inadequacy of internet infrastructures are important problems.

58. Teacher: I think that the lack of healthy communication between the student and the teacher negatively affects the assessment practices in online education. In addition, it is an important problem to experience difficulties in-process evaluations and criteria evaluations during the follow-up phase due to communication.

4. Discussion

Geography teachers participating in the research found the measurement and evaluation opportunities in face-to-face education more advantageous than online education. Enabling method diversity, a safe exam environment, rapid feedback, and taking into account individual differences are shown as reasons why teachers find measurement and evaluation opportunities in face-to-face education more advantageous than online education. In his study, McCann (2010) revealed that teachers gave negative opinions about the online assessment process and that there is a long way to go in the dissemination and adoption of online assessment practices. A small part of the teachers found the measurement and evaluation opportunities in face-to-face and online education equally advantageous and stated that they offer equal opportunities in measuring learning and knowledge. Few of the geography teachers found measurement and evaluation opportunities in online education more advantageous than face-to-face education and stated that they developed a sense of responsibility in students. Oliver (2008) also revealed in his research that online learning and assessment have a positive effect on students' success levels, encourage students to learn, and support learning activities.

Geography teachers participating in the research did not find it advantageous to evaluate students' knowledge with criterion assessment technology in online education. Moorhouse (2020) evaluated the transition process to online education due to the Covid-19 epidemic in his study and stated that online education can't replace face-to-face education as a result of his study.

The geography teachers who participated in the study categorized the difficulties encountered in evaluating students' knowledge in online education using criterion assessment technology, as low reliability, lack of motivation in students, miscommunication, and technical problems. Teachers' low reliability; the possibility of cheating and difficulty in supervision, lack of motivation in the student; reluctance and instability in the student, lack of communication; In the follow-up of the process, the

difficulties due to communication and the lack of communication between the student and the teacher, and the technical problems; defined as internet connection problems and lack of computer knowledge. In their study, Fengwei and Nan (2020) determined the difficulties experienced in education with online education and stated that technological disruptions are one of the most important difficulties of online education. In addition, it has been observed that in studies on the difficulties experienced in online assessment practices in the field, it has been observed that students tend to cheat frequently (Lanier, 2006; King et al., 2009; Hillier, 2014).

Palloff and Pratt (2007), on the other hand, stated that one of the problems experienced in online exams is that students cheat or have someone else take the exam instead of themselves. However, they stated that this is not always possible and still stated that short evaluation practices should be included in the period to minimize or eliminate this possibility. The study also emphasized that performance-oriented evaluations can increase reliability. In their study, Andrade, and Du (2005), supporting this situation, stated that in learning environments where alternative assessment and evaluation methods are applied, students' anxiety decreases while doing their homework.

5. Conclusion

With the Covid-19 pandemic process, it has come to the fore to support face-to-face education applications with online education, and education and training applications have become remote in many countries in the world. In this compulsory new education approach, education stakeholders tried to overcome the difficulties by passing a tough test. With the development of an innovative perspective on the quality, content, and evaluation processes of education, the advantages and disadvantages of online education have emerged as a newly determined field. Measurement and evaluation processes in online education have emerged as an area that needs to be emphasized and developed in the new understanding of education. In this direction, of this research, the views of the learners regarding the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology are discussed.

As a result of the research, Geography teachers found measurement and evaluation opportunities in face-to-face education more advantageous than in online education. Geography teachers participating in the research did not find it advantageous to evaluate students' knowledge with criterion assessment technology in online education. In addition, the teachers categorized the difficulties encountered in evaluating students' knowledge with criterion assessment technology in online education as low reliability, lack of motivation in students, miscommunication, and technical problems.

6. Recommendations

The following suggestions have been developed to minimize the difficulties encountered in evaluating students' knowledge with criterion assessment technology in online education.

1. A common understanding of measurement and evaluation should be determined to increase the applicability of online measurement and evaluation methods and to make accurate evaluations.

2. Seminars should be given to teachers at regular intervals on the application of criterion-assessment technology in online assessment and evaluation.

3. Measures should be taken to overcome the difficulties faced by students in evaluating their knowledge with criterion assessment technology in online education. It is necessary to provide a safe exam environment and to supervise the exam process.

4. It is necessary to eliminate the technical problems experienced in the measurement and evaluation process in online education and to create online communication platforms to increase teacher-student communication.

5. Student seminars should be organized to eliminate the instability and unwillingness of the students, and information should be given in these seminars to eliminate the problems experienced by the students in the online education measurement and evaluation process.

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Annex 1

Geography Teachers Semi-Structured Interview Form

Dear Teachers;

The purpose of this research; The aim is to get the views of the learners about the difficulties encountered in online education in the evaluation of students' knowledge in geography lessons with criterion assessment technology. Your answers to the following questions will be shared in the research by keeping your personal information confidential. Thank you for your participation.

Teacher;

Gender:	Female (……..) Male (……)
Professional experience:	1-5 Years(…..) 6-10 Years(…..) 11-15 Years(…..) 16 Years and above (…..)

Questions:

1. How would you evaluate the measurement and evaluation opportunities in geography education in terms of online education and face-to-face education?

2. Do you find it advantageous to evaluate students' knowledge with criterion evaluation technology in online education?

I find it advantageous	I find it somewhat advantageous	I do not find it advantageous
( )	( )	( )

Comment:

3. What kind of difficulties do you encounter in evaluating students' knowledge with criterion assessment technology in online education?