



TEACHER'S OPINIONS ON USING WEB-BASED E-ASSESSMENT AND EVALUATION APPLICATIONS IN EDUCATION

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Abstract

Whether assessment-evaluation, which is one of the most critical elements of the teaching process, is carried out according to the requirements and conditions of the age poses an important problem for both teachers and students. How digitalization is reflected in the assessment and evaluation part of teachers' lessons in today's schools is a question that needs to be answered in the light of this problem. This research aims to examine the opinions of teachers about web-based e-assessment and evaluation applications based on digitalization. The research was carried out with a phenomenological design within the framework of qualitative research approach. The study group consists of 44 teachers working in state high schools in Hatay, Turkey. The data were collected face to face through a semi-structured interview form consisting of 5 questions. Data analysis was performed with content analysis method, which includes coding, categorization, and theming processes. As a result of the analysis, 4 different themes (advantages, disadvantages, teacher efficacy, suitability of the program) were obtained. As a result of the research, it was concluded that digital e-assessment evaluation applications, which are web-based e-assessment evaluation tools, have advantages such as being time-independent and practical, and storing, as well as disadvantages such as technical problems, preliminary preparation and not being suitable for every course. In addition, results were obtained in the research, such as that the curricula are suitable for web-based e-assessments and evaluations and that various technological or hardware deficiencies in the school make digital e-assessments and evaluations difficult. It was revealed that eliminating the inadequacies of high school teachers in e-assessment and evaluation practices is also related to eliminating the deficiencies in the dimension of schools and students. Suggestions were made for practitioners and researchers to identify and remedy these deficiencies.

Keywords: e-assessment and evaluation, digital assessment, digital evaluation, web-based assessment-evaluation

Introduction

As the importance of information increases day by day, the developments in the fields of information transfer, technology and communication have put countries in a compulsory competition, thus keeping up with the technological changes has become a necessity today (Aktürk & Delen, 2020; Ministry of National Education, 2020; Taşdemir, 2018). With the FATİH (Movement of Enhancing Opportunities and Improving Technology) Project initiated by the Ministry of National Education in 2010 within the scope of the integration of technological developments in the field of education, smart boards, multi-functional or 3D printers were installed in many schools in our country, the internet infrastructure of the schools was improved and tablet computers were distributed to many students (Bozkuş & Karacabey, 2019; Gökmen & Akgün, 2016; Keser & Yayla, 2021). In addition, the EBA (Educational Information Network) educational content network was established by the Innovation and Educational Technologies General Directorate (YEGİTEK) in order to facilitate the studies of teachers and students, where

educational materials can be accessed free of charge via the web (EBA, 2020). In some studies, conducted on the subject, it has been concluded that the majority of teachers and students will facilitate and enrich the learning and teaching process by inclusion of technological tools in the teaching process (Alkış & Fındık-Coşkunçay, 2018; Coşkun & Yürektürk, 2020; Lai & Bower, 2019; Spiteri & Chang-Rundgren, 2018; Yılmaz, 2020).

Considering the effects of the digital age on the field of education, it is possible to come across examples of educational programs in developed countries where science and technology are integrated into innovative learning and teaching methods (Almeida et al., 2020; Reimers, 2021). When the aims of education in these countries are examined, it can be seen that it is to raise generations who adapt to the digital transformation brought about by the era and who not only use but also produce information and technology (Bayrak & Erden, 2007; Hasim, 2018). In Turkey, which is one of the countries that aim to raise entrepreneurial and creative individuals who can meet the changing needs of society, think critically, solve problems, have digital competencies, and evaluate whether students have these competencies and complete the deficiencies according to the results obtained, it has become an important situation (Alsaleh, 2020; Kalemkuş, 2021). In the Turkish National Education System, it has been emphasized that it is necessary to provide diversity and flexibility in the assessment and evaluation practices of all courses based on the understanding that every student is different from each other (Ministry of National Education, 2018). Therefore, as a result of the developments and changes in the field of information and communication technologies and education, assessment and evaluation methods have been greatly improved and changed in the country (Kaya & Tan, 2014; Odabaşı, 2018). In addition to the exams that are traditionally conducted with paper and pencil, as an alternative, new generation exam types, which are held over the web via technological devices such as computers and telephones, have also started to be effectively implemented in schools in the country (Donovan et al., 2007; Kulik & Kulik, 1991).

In particular, at the end of 2019, in the pandemic process experienced around the world, many countries decided to close schools for a certain period of time, and an urgent distance education process was launched. All teachers working in private and public schools in Turkey also had to apply the assessment and evaluation processes online (Ada et al., 2021; Altunçekiç, 2021; Sezgin, 2021). The transition to the urgent distance education process in the country increased the importance of analyzing the readiness and habits of teachers and students, especially regarding e-assessment and evaluation (Bozkurt, 2020; Shraim, 2019; Telli & Altun, 2020). Some studies conducted during and after the pandemic period tried to reveal data on how the assessment and evaluation carried out in digital environments are perceived by the planners and users of the teaching process (Akin & Bostan, 2022; Tanhan & Özok, 2020). In a study conducted by Pekcan and Toraman (2022), it was concluded that although teachers feel partially competent in online assessments, it is easier to identify students' deficiencies through online e-assessment and evaluation applications compared to traditional exams, and that such electronic assessments increase the quality of learning.

In some studies, it has been determined that the most important aspect of e-assessments and evaluations carried out on the web is that they are carried out quickly, error-free and easily, and that they provide the opportunity to create a data pool as a source for subsequent evaluations (Baran, 2020; Bobde et al., 2017; Korkmaz et al., 2019; Yagci, 2012). Security vulnerabilities and technical problems that may occur during the exam, and problems arising from the lack of basic technology literacy of the users are determined as the disadvantages of web-based e-assessments and evaluations (Arslan & Yetgin, 2020). In order for e-assessment and evaluation applications implemented via digital environments to be of higher quality and more efficient, students and teachers must have the necessary background knowledge and competence to use digital platforms (Koç et al., 2022; Pekcan & Toraman, 2022).

With the expansion of technological developments and the rapid spread of distance education, a quest has begun in the field of education, especially in assessment and evaluation methods, and, as an alternative, new generation web-based e-assessment evaluation techniques

have begun to be used in education. However, since the research studies in the field are limited, the opinions of the teachers about the new generation e-assessment and evaluation practices in education are not known. For this reason, it was decided to conduct this research in order to examine and evaluate the opinions of teachers about web-based e-assessment and evaluation applications and to offer solutions to the problems faced by teachers in this regard.

Research Aim

The aim of this research was to examine the opinions of teachers about the new generation web-based e-assessment and evaluation applications and to provide solutions to the problems encountered during the implementation. Although teachers have sufficient knowledge about e-assessment and evaluation, they may not have the same knowledge and experience in the new generation web-based e-assessment and evaluation methods. For this reason, revealing the current situation of the teachers, identifying problems, if any, and being able to propose solutions to problems experienced were the other purposes of the research. In line with these purposes, answers were sought to the following questions.

Research Questions

1. What are the advantages of new generation web-based e-assessment and evaluation applications according to teachers?
2. What are the disadvantages of new generation web-based e-assessment and evaluation applications according to teachers?
3. At what level do teachers consider themselves competent in relation to web-based e-assessment and evaluation applications?
4. What are the students' needs for new generation web-based e-assessment and evaluation applications according to teachers?
5. What is the suitability of new generation web-based e-assessment and evaluation applications to the curriculum according to teachers?

Research Methodology

Design

Phenomenological research design was used in this qualitative research in order to determine the opinions of teachers about the new generation web-based e-assessment and evaluation applications and to offer solutions for the problems encountered during the implementation. Qualitative research method is an approach that prioritizes the research of social phenomena in their environment with a perspective based on theory building (Yıldırım & Şimşek, 2021). Qualitative research is a research approach in which the researcher analyzes an action, event, process or people in depth with the aim of providing in-depth information and developing understanding about a situation (Creswell, 2014). Phenomenological research design is a follow-up of questioning in which the researcher defines the meaning, structure, and essence of human experiences about a phenomenon described by the participants (Creswell, 2009; Patton, 2002). In the phenomenological research design, it is aimed to reveal the experiences and the meanings attributed to these experiences by determining the in-depth experiences and thoughts of the participants about a subject (Smith & Fowler, 2009). In this research, the opinions of upper-secondary school teachers about e-assessment and evaluation applications were discussed as a phenomenon.

Participants

The participants of the research consisted of 44 volunteer university lecturers working in public schools in the city center of Hatay Province, Turkey. A purposive sampling method, one of the sampling methods, was used in the research. This method is preferred when it is desired to study one or more special cases that meet certain criteria or have certain characteristics (Büyüköztürk et al., 2021, p. 92-93). For the sample group, especially the upper-secondary school level was preferred. Since high school students are thought to be more conscious about using technology than other levels, high school teachers were preferred as participants. Some demographic characteristics of the teachers participating in the research are given in Table 1.

Table 1
Demographic Characteristics of the Teachers Participating in the Research

Variables		Absolute frequency	Relative frequency
Gender	Female	21	47.8
	Male	23	52.2
Branch	Maths	6	13.6
	Biology	3	6.8
	Geography	2	4.6
	English	7	15.9
	German	1	2.2
	Literature	8	18.1
	Chemistry	2	4.6
	Physical Education	2	4.6
Branch	PCG	3	6.8
	History	3	6.8
	CIT	2	4.6
	Electronic	1	2.2
	Philosophy	2	4.6
	Physics	2	4.6
Graduation degree	Bachelor's degree	34	77.2
	Master's degree	10	22.8
	PhD	0	0
Professional seniority	1-5 years	5	11.3
	6-10 years	13	29.5
	10-15 years	15	34.1
	15 over	11	25
Total		44	100

47.8% of the teachers participating in the research are female and 52.2% are male. According to Table 1, most of the teachers who participated in the research have a seniority of 10-15 years and most of them have a bachelor's degree.

Data Collection Tool

Semi-structured interview questions were used as data collection tools in this research, which aim to provide solutions for the problems encountered during the implementation by

determining the opinions of teachers about the new generation web-based e-assessment and evaluation applications. In the semi-structured interview form prepared for the purpose of obtaining the same type of information from the participants, the interviewer has the freedom to ask additional questions as well as asking the questions s/he has prepared beforehand (Patton, 1987). For this purpose, an interview form (appendix 1) consisting of 5 questions for web-based e-assessment and evaluation applications was prepared by the researchers. The interview questions were prepared by considering the research questions. For each research question, a critical question was specified.

In order to receive the opinions of the teachers about the research, the teachers were contacted before the interviews, the days and hours that were suitable for both parties were determined, the necessary information about the research was given, the process was clarified, and the reason for the recordings was explained. Each interview with the teachers lasted approximately 15-20 minutes. The interviews and data collection phase lasted about 4 weeks.

Data Collection and Analysis

The research data were obtained from the answers given by the teachers, who were taken as a sample, to the 'interview form for web-based e-assessment evaluation applications'. The opinions of each of the 44 volunteer teachers working in public schools in the city center of Hatay Province, who constituted the study group of the research, were taken, and the content analysis method, one of the qualitative research methods, was used to analyze the data obtained from the interviews. Content analysis is an analysis method that aims to reach concepts and relationships that can explain the collected data (Yıldırım & Şimşek, 2021). As a result of the content analysis, the relevant codes and the most appropriate themes for the codes were determined. The findings of the research are presented in tables for clarity. Each teacher interviewed is named as T1, T2... T44.

In the research, the data obtained about web-based e-assessment and evaluation were examined and described in terms of the advantages and disadvantages of the new generation web-based e-assessment and evaluation, teacher competencies, student needs, and the suitability of the curriculum. In order to ensure the reliability of the research, the data obtained were coded and analyzed by 4 faculty members experienced both in the field of assessment and evaluation and in the field of coding and analysis. Comparing the coding and analysis of the faculty members, it was determined that the compliance was 85%. In addition, in order to increase the validity and reliability of the research, direct quotations about teachers' opinions were also included in the research.

Research Results

As a result of the analysis of the answers obtained from the interviews with the teachers by the content analysis method, the themes of "advantages of the new generation web-based e-assessment and evaluation", "disadvantages of the new generation web-based e-assessment and evaluation", "teacher competencies in the new generation web-based e-assessment and evaluation", "student needs regarding the new generation web-based e-assessment and evaluation process" and "the suitability of the curricula for the new generation web-based e-assessment and evaluation process" were reached.

Table 2
Opinions on the Advantages of New Generation Web-Based E-Assessment and Evaluation

Themes	Categories	Number of opinions	Sample opinions
Advantages of new gen web-based e-assessment and evaluation apps	Independent of time	32	T1: "I think that new generation web-based e-assessment and evaluation tools can be applied regardless of time." T8: "It is a good thing to be able to assess and evaluate whenever you want."
	Storage	17	T5: "Exams are easy to store." T41: "We can access other teachers' exams."
	Being practical	29	T12: "Evaluation of questions can be done very quickly." T19: "Correct and incorrect answers can be checked in seconds."
	Contemporary	22	T14: "I think that the use of technology for teachers and students is more appropriate for the era in the long run."

In the context of the first theme, when teachers' opinions are analyzed, it can be counted among the advantages that the online assessment exams can be carried out independently of time, are easy to store, are practical to prepare and evaluate, and are suitable for the requirements of the digital age.

Table 3
Opinions on the Disadvantages of New Generation Web-Based E-Assessment and Evaluation

Themes	Categories	Number of opinions	Sample opinions
Disadvantages of new generation web-based e-assessment and evaluation	Technical problems	41	T1: "Internet-related problems may occur during the exam." T8: "There may be technical problems."
	Suitability	17	T5: "Electronic assessment is not very suitable because my course is abstract." T41: "Practical exams are difficult to apply."
	Too much time for preliminary preparation	28	T12: "Planning should be done more carefully." T19: "The preliminary preparation phase is more time-consuming than the traditional exam."
	Misunderstanding of questions	23	T14: "If the instructions are not expressed correctly, the student will have difficulty understanding the questions." T33: "No opportunity to explain misunderstood questions."

When the opinions of the teachers are analyzed, in the context of the second theme, the teachers stated that there may be technical problems arising from technological devices or internet connections during the implementation phase of the exams for online assessments, that the scope of each course is not suitable for online assessments, that the preliminary preparation time for such assessments is too long, and that the exam questions can be misunderstood if the instructions are not clearly written.

Table 4
Opinions on Teacher Competencies in New Generation Web-Based E-Assessment and Evaluation

Themes	Categories	Number of opinions	Sample opinions
Teacher competencies in new generation web-based e-assessment and evaluation	Technology literacy	42	T7: "I feel competent about using technology." T37: "In-service training on EBA is insufficient on exam preparation."
	Being open-minded to developments	34	T28: "I am used to traditional assessment tools." T38: "I follow and implement the new generation e-assessment tools."

When the teachers' opinions are analyzed in the context of the third theme, some of the teachers stated that they felt competent in the new generation web-based e-assessment and evaluation tools and that they followed the new methods. Some teachers, whose opinions were received within the scope of the research, said that they preferred the traditional assessment and evaluation methods.

Table 5
Opinions on Student Needs in New Generation Web-Based E-Assessment and Evaluation

Themes	Categories	Number of opinions	Sample opinions
Student needs in new generation web-based e-assessment and evaluation	Readiness	39	T1: "Students quickly adapted to new e-assessment and evaluation methods." T11: "Children's technology aptitude is higher than that of ours."
	Equality of opportunity	42	T5: "Unfortunately, not every student has equal opportunities. There are students who do not have a computer or a phone." T40: "It would be better if the state provided technological support."
	Motivation	27	T12: "Evaluation of students with different techniques increases motivation." T19: "Students feel more comfortable in assessments made using technology."

When the opinions of the teachers are analyzed in the context of the fourth theme, the teachers stated that the students' level of readiness for digital assessments is generally appropriate; however, that not every student has the equal opportunity for the necessary infrastructure or hardware tools, and that the new generation web-based e-assessment and evaluation tools positively affect the motivation of the students.

Table 6
Opinions on the Suitability of Curricula for New Generation Web-Based E-Assessment and Evaluation

Themes	Categories	Number of opinions	Sample opinions
Suitability of curricula for new generation web-based e-assessment and evaluation	Not suitable for applied courses	21	T22: "I do applied assessment in my class. Electronic evaluation is a problem in this sense." T16: "In my opinion, it is not suitable for applied courses."
	Suitable	29	T5: "I think online exams are as suitable as traditional exams." T35: "New curricula have been designed to allow for digital e-assessment and evaluation."

When the teachers' opinions are analyzed in the context of the fifth theme, the applied course teachers who participated in the research stated that the curriculum is not suitable for electronic assessments. However, it is seen that some teachers stated that it is possible to make electronic assessments in accordance with the current curriculum.

Discussion

As a consequence of the reflections of the digitalized world on the field of education, web-based e-assessment and evaluation tools have recently been used more and more as an alternative to the traditional evaluation methods. Therefore, electronic evaluations performed synchronously or asynchronously through technological devices have begun to take on ever-increasing importance in the field of education. In this study, the opinions of teachers on the application of web-based exams, one of the web-based e-assessment evaluation methods, were taken and solutions were tried to be developed for the problems that may arise during the applications.

In this research, the finding that the utilizability of e-evaluation in exams or other assessments will increase over time due to being time-independent, convenience of storage facilities, being practical and contemporary is noteworthy. As a result of a study conducted by Cabı (2016), e-assessment and evaluation being time-independent and non-spatial, ease of receiving corrective feedback, less anxiety compared to the traditional evaluation, and being able to make alternative evaluations were determined as positive aspects of e-evaluation. With reference to the opinions of the teachers participating in the research, it was found that the disadvantages such as the insufficient technical infrastructure, inability to apply it in every lesson, time-consuming preliminary preparation period and possibility of misunderstanding the questions asked, make it difficult to use e-evaluation in education and training. Ersoy & Çoklar (2013) also concluded in their research that e-assessments and evaluations carried out using technology are both easier and time saving. Likewise, in the study of Balta and Türel (2013), it was inferred that e-assessments and evaluations facilitate homework and exam processes for both teachers and students. In a study conducted by Naomi (2015), it was concluded that homework given continuously via technological applications increases student motivation, learning and interest in the lesson. Thus, e-assessment and evaluation applications increase the interest and motivation in education and provide convenience in teaching for teachers and students.

It was revealed that some of the teachers participating in the research have an interest in technological tools, and some of them consider themselves inadequate in terms of technological literacy. In a study by Eğri (2006), it was concluded that teachers consider themselves sufficient

for assessment and evaluation. According to a research by Erdoğan and Kurt (2012), it was found out that teachers consider themselves moderately sufficient in terms of assessment and evaluation, and in some studies, it was concluded that teachers do not regard themselves sufficient in assessment and evaluation (Kilmen & Çıkrıkçı-Demirtaşlı, 2009; Çakan, 2004); Ulutaş, 2003).

It was observed that some of the teachers taking part in the research preferred traditional assessment tools, while others preferred web-based e-assessment tools and applied them in teaching. Şimşek and Yazar (2017), in their study, also reached the conclusion that teachers do not benefit from technological opportunities in the field of e-assessment and evaluation at a sufficient level.

In the research, it was stated that the readiness level of the students for web-based e-assessment and evaluation is sufficient, yet there is no equality of opportunity among the students in terms of accessing technology. Again, the teachers expressed that web-based e-assessment and evaluation tools increase students' motivation, enable them to gain experience in taking exams, and contribute to students taking exams with a more relaxed psychology. In a study carried out by Castillo-Merino and Serradell-Lopez (2014), it was put forth that the use of digital technologies in education increases the motivation of students and enhances success. At the same time, while it was determined that most of the curricula are designed in accordance with web-based e-assessment evaluation methods, it was also found out that the curricula of some courses, especially applied courses, were not suitable for e-evaluation.

Conclusions

In this research, it was aimed to examine the opinions of high school teachers about web-based e-assessment and evaluation applications and to offer solutions to the problems encountered in practice. For this purpose, several results have been reached in different dimensions (advantage-disadvantage, use of teachers and students). In conclusion, first of all, web-based e-assessment and evaluation tools have both advantages and disadvantages for high school teachers participating in the research. The advantages of these assessment-evaluation tools are that they are suitable for the requirements of the current age, can increase student motivation, save time, and provide convenience by reducing anxiety in exams. The disadvantages, on the other hand, are features such as the inability of teachers without technological literacy to use it, unsuitability to apply it in all classes, prolonged preliminary preparation time, and possibility of misunderstanding the questions asked. High school teachers use both traditional and web-based e-assessment and evaluation tools. However, it has been revealed that teachers will feel more competent if sufficient infrastructure is provided and training programs are appropriate for web-based e-assessment and evaluation. In addition to the necessity of teachers to keep up with the competencies required by the digital age, the need to give students equal chances and opportunities comes to the fore.

This research presents a perspective on e-assessment and evaluation competencies and deficiencies at the teacher level to identify the deficiencies in the e-assessment and evaluation process in high schools for the digitalized education world.

Recommendations

In the light of the results of this research, some suggestions have been developed. Accordingly, in order to carry out e-assessment and evaluation practices, one of the web-based e-assessment and evaluation methods, the existing hardware and infrastructure deficiencies in the school dimension should be determined and necessary work should be carried out to eliminate the deficiencies.

Students who will take the exams according to web-based e-assessment and evaluation applications should be offered the necessary training in the relevant courses in order to increase

their technology literacy level and to teach them practically how e-assessment and evaluation applications can be used.

As in some of the courses developed, curricula should be developed for e-assessment and evaluation for applied courses, and plans should be made on how to make the e-assessment and evaluation process more efficient in these courses.

This research can be supported by receiving the opinions of students and school administrators about e-assessment and evaluation applications.

Declaration of Interest

The author declares no competing interest.

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Received: October 28, 2022 Revised: January 20, 2023 Accepted: February 03, 2023

Cite as: Sarigoz, O. (2023). Teacher's opinions on using web-based e-assessment and evaluation applications in education. *Problems of Education in the 21st Century*, 81(1), 117-129. <https://doi.org/10.33225/pec/23.81.117>

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