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Assessment Processes in Distance Education: A Delphi Study

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Abstract

Assessment and evaluation in distance education aim to ensure that learning outcomes are determined in a valid, reliable, and fair manner. While the flexibility in time and place offered by distance education allows for diversity in assessment and evaluation, problems such as academic integrity and technical issues, which undermine both validity and reliability, prevent the assessment from being conducted healthily. This research aims to investigate how an effective assessment process can be maintained in distance education. For this purpose, data were collected through Delphi rounds. Consensus was reached on the assessment and evaluation process in distance education through 3 rounds and 1 intermediate round, based on the expert panelists' opinions. As a result of the research findings, it was revealed that this process should be considered as a system. The sub-steps of this system include planning, measurement, and evaluation tools and environments, validity and reliability, protection of personal data, and support.

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Introduction

Distance education is in higher demand due to the rapid development of information and communication technologies, the changing needs and conditions, and the shift in the education and training process from a walled-off learning environment to a model where the teacher acts as a guide and the student's duties and responsibilities change (Çam et al., 2011). Full access to education is not something to be taken lightly, as education is a personal, national, and societal right. There is a delicate balance between the cost of education and access to it, and inequality can result if this balance is not carefully considered. Globally, mega-universities have embraced the principle of education for all, fostering the widespread adoption of distance learning. Simultaneously, the enrollment of hundreds of thousands of students in many of these institutions, coupled with the extensive use of technology, ensures the continuation of the distance learning tradition (Simpson & Anderson, 2012).

In distance education, students are expected to learn autonomously. Personal and environmental factors motivate learners to work independently, enabling them to complete their learning process. To successfully complete distance education, students must meet assessment requirements, and these assessment methods must be valid and reliable. Effective distance education can promote independent and lasting learning, however the assessment process remains a crucial component of this success (Deperlioğlu & Yıldırım, 2009). Almeida and Monteiro (2021) state that assessment in distance education is both an underexplored and challenging issue. Similarly, Jung (2007) argues that assessment in distance education is often regarded as the final stage and thus receives insufficient attention.

Technologies are widely and multifacetedly used in assessment practices in higher education. They serve key functions, including supporting exam administration, managing assignment submissions, enhancing feedback quality, and securely storing and communicating assessment results (Bearman et al., 2023). Despite these advancements, assessment and evaluation are still often associated with traditional examination practices. Nevertheless, in open and distance education, learner assessment can be conducted without relying on face-to-face examinations. Such examinations do not align with the principle of flexibility that underpins distance education. Moreover, they create financial and human resource burdens and pose practical challenges related to accessibility, logistics, and supervision. Therefore, assessment processes should be supported through flexible and sustainable digital technologies (Yıldırım, 2024).

Without valid and reliable assessment practices, accurate evidence regarding student learning cannot be obtained. Numerous studies have highlighted the challenges associated with assessing student learning in online environments (Liang & Creasy, 2004). To ensure examination security, both the confidentiality of exam questions and the prevention of unauthorized student assistance must be maintained (Council of Higher Education [CoHE], 2022).

During the emergency remote education period, one of the major threats to assessment validity was the direct migration of traditional examinations to online settings, together with an overreliance on outcome-oriented approaches at the expense of purpose-based assessment practices (Bozkurt et al., 2020). Additional challenges included environmental constraints, such as limited computer or internet access and noise, inadequate instructor feedback, and the increased opportunity for academic misconduct during

examinations. Infrastructure limitations, weak alignment between assessment tools and learning outcomes, and concerns regarding assessment quality were also frequently reported in distance education (Yıldırım, 2024).

The transition from traditional examinations to online assessment platforms has generated various technological infrastructure challenges. At the same time, features such as location-independent access to learning platforms, cloud-based examinations, and multimedia integration have expanded assessment possibilities while also raising concerns about data privacy and security. Moreover, digital literacy is essential for the effective use of these technologies (Çetin, 2021). In this context, the recent shift to remote delivery of teaching has further increased the prominence of technologies, as university educators have had to leverage their affordances to enable assessment in online environments (Lee & Fanguy, 2022).

In distance education, assessment is an integral component of the curriculum. Instructors often face difficulties in selecting appropriate methods for evaluating learning outcomes. Furthermore, evolving technologies have intensified these uncertainties, creating significant challenges (Agtarap et al., 2024). Online multiple-choice tests, written exams, oral exams, and matching or fill in the blank formats provide flexibility in terms of location however, the development of artificial intelligence technologies has created new monitoring and proctoring challenges. Furthermore, reliability issues have been reported in time-flexible assessment tasks involving individual or group work, such as assignments and projects. Although flexibility is a major advantage, legal uncertainties and weaknesses in detecting cheating prevent the collection of sufficient evidence regarding students' actual knowledge levels within the intended cognitive domains. These problems contribute to negative perceptions of online examinations (Çelik & Lancaster, 2021).

While digital assessment practices in distance education have been widely criticized for ethical concerns as well as issues of validity and reliability, face-to-face assessment has presented its own limitations in terms of flexibility and sustainability. These contrasting challenges underscore the need for developing new learner-centered assessment approaches. In this regard, learner-centered and AI-resilient methods that emphasize authentic and individualized tasks are considered effective in mitigating emerging risks while supporting valid and reliable assessment processes (Holmes & Miao, 2023). However, the growing integration of advanced AI tools such as ChatGPT, along with the proliferation of online

exam and assignment support platforms, has introduced unprecedented challenges to traditional assessment practices (Stanoyevitch, 2024). As Klein and Málik (2026) point out, unsupervised online exams, in particular, may result in artificially inflated scores due to the unauthorized use of AI, raising serious concerns about the validity of assessment outcomes.

In traditional education, learners participate in learning activities, while teachers guide the transmission of knowledge. Knowledge can be constructed through three educational models: (1) teacher-led learning, (2) cognitive apprenticeship, and (3) social learning. The last two educational models (Perera-Diltz & Moe, 2014) support the learner's learning through social interaction and cooperation. Across all three learning models, assessment and evaluation are fundamental elements that support the development and measurement of knowledge, skills, and awareness.

In today's world, where work and life are increasingly shaped by technologies, technologies have become indispensable for assessment tasks aimed at preparing university graduates for their future careers and lives (Geertshuis et al., 2024). In this context, assessment includes various methods and approaches used to gather information about learner performance, learning processes, and progress. Furthermore, an effective assessment process encompasses collecting, analyzing, and interpreting data through both formal and informal methods, as well as making judgments about learners' knowledge levels (Eyal, 2012).

The emergence of the accountability paradigm, including the aim of examining all aspects of educational processes by various internal (e.g., budget needs) or external (e.g., accreditation boards, national organizations) entities, has broadened the purpose of assessment. Therefore, sharing frequently and rigorously assessed learning outcomes with learners and other stakeholders ensures that simultaneous assessments are more transparent and accessible (Perera-Diltz & Moe, 2014). In this era of increased expectations for accountability, digitalization, and the continuation of vocational training in online environments, adaptation to these environments is essential.

Effective online assessment techniques promote higher-order thinking. They foster active participation in the course and enable the delivery of diverse and meaningful feedback. In this context, learners require additional support and encouragement (Marshall, 2005).

The flexibility of online learning environments, combined with easy access to instructors, raises learners' expectations for more frequent and timely feedback without such feedback, learners may encounter difficulties in adapting to the learning environment (Perera-Diltz & Moe, 2014).

Some researchers argue that analysis, interpretation, and judgment in assessment processes are influenced by both objective and subjective factors and therefore emphasize the use of quantitative methods (Eyal, 2012). Bennett and Green (2001) suggest that continuously adapting remote assessment tools to the needs of learners or learner groups can lead to the development of shared question banks in online environments that can be used by different instructors. However, relying solely on structured items with predetermined answers may be insufficient, as such approaches often fail to measure higher-order thinking skills.

Clear definitions are needed regarding why assessment and evaluation are carried out in distance learning and how the data will be used. Evaluation is carried out for various purposes. İşman and Eskicumalı (2001) state that 5 different evaluation models are used in education. Among the evaluation models are:

1. Evaluation of the educational program
2. Evaluation of learning activities in terms of their suitability to the teaching objectives
3. Evaluation aimed at revealing the levels of learning after teaching activities
4. Evaluation carried out to determine the interests and abilities of the learner
5. Evaluation models aimed at determining the success of the learner.

In distance education, assessment is a crucial component of both teaching and learning processes. Managing assignments, providing feedback, and evaluating learning outcomes are key components of this process. However, these developments necessitate the adoption of new teaching and learning approaches. Using effective assessment methods is a key component of e-learning environments however, institutional accountability for learning also plays a crucial role in shaping assessment practices (Gaytan & McEven, 2007). However, assessment conducted solely for accountability purposes does not effectively support learning. Before selecting appropriate assessment methods, instructors should clarify the purpose of assessment, the level of learning to be measured, and the intended learning outcomes (Gaytan, 2002).

Despite growing interest in effective assessment methods, significant challenges remain in evaluating learning in e-learning environments. Unlike traditional settings, assessment practices in online learning environments require continuous and systematic implementation. Accordingly, teachers need to adopt more innovative assessment methods beyond traditional approaches to determine the extent to which intended learning outcomes are achieved (Liang & Creasy, 2004).

Purpose of the Study

This study aims to identify strategies for improving assessment and evaluation practices in distance education at the higher education level, based on the opinions of experts in the field. Accordingly, the following research questions were addressed through a Delphi study:

1. Are assessment and evaluation practices in distance education at the higher education level sufficient?

2. What strategies can be used to improve the effectiveness of assessment and evaluation processes in distance education?

Method

This study aims to identify strategies and recommendations for conducting assessment and evaluation processes more effectively in distance education at the higher education level. Accordingly, the study adopts a descriptive research model.

Within the descriptive research model, answers are typically sought to questions such as "what was it, what is it, what is it related to, and what does it consist of?" This approach requires describing the observed situation as it exists, without attempting to alter it. In addition to the examination of individuals or objects, written documents, statistical data, and audio and video recordings may also serve as data sources in survey research (Karasar, 2011).

Participants

In this study, where data were collected using the Delphi technique, the study group was determined through purposive sampling. This is because the successful conduct of the research is directly dependent on the selection of experts. This step, which also enhances the reliability of the technique, does not support the use of random sampling.

Therefore, two main criteria were used in selecting experts who could potentially participate in the study: (i) having national or international scientific publications on distance education and (ii) holding a doctoral degree. In identifying experts to be invited to the research group, the websites of university distance education centers, as well as the databases of the Higher Education Council Academic Search and the National Thesis Center, were utilized. Participation in the study was voluntary therefore, invitations were sent initially, and experts who agreed to participate as panelists were subsequently provided with the survey form. Both the invited panelists and those participating in the Delphi rounds were ensured anonymity. In the surveys, which served both to elicit opinions and to facilitate consensus, responses were collected anonymously, without face-to-face interaction and without panelists being aware of one another. In this way, the potential influence of dominant opinions was minimized by preserving participants' anonymity.

Accordingly, the experts participating in this study were divided into two groups:

1. Theorists: Researchers who conduct academic studies in the field of distance education.
2. Distance Education Research Team: Academics working in distance education centers.

Table 1. Number of experts invited during the research process

Experts Invited to the Study	Total	74
	Accepted	16
	Response Rate	%21,6
First Round Delphi Questionnaire (Number of Experts Sent)	Total	16
	Accepted	0
	Response Rate	%100
Interim Round	Accepted	15
	Rejected	1
	Response Rate	%93,3
Second Round Delphi Questionnaire (Number of Experts Sent)	Accepted	15
	Rejected	0
	Response Rate	%100
Third Round Delphi Questionnaire (Number of Experts Sent)	Accepted	15
	Rejected	0
	Response Rate	%100

According to the data presented in Table 1, of the 74 experts invited to participate in the first phase of the study, 16 volunteered to serve as Delphi panelists and provided their opinions in the first round Delphi survey. In the interim round, 15 of the 16 experts continued to participate in the study. One expert was unable to continue in the research process therefore, the Delphi study proceeded with 15 experts in the following rounds. At

each stage of the research process, information regarding the purpose and procedures of the study was shared, and the importance of the process was emphasized. The experts participating in the study were selected based on the criteria outlined above, as Delphi panelists are expected to possess sufficient knowledge of the problem under investigation, demonstrate expertise in their field, and exhibit rational and objective judgment.

Table 2. Demographic characteristics of Delphi panelists

Variables		N	%
Gender	Female	5	31,25
	Male	11	68,75
Age	30-34	2	12,5
	35-39	5	31,25
	40-44	6	37,5
	45-49	1	6,25
	50 and above	2	12,5
Experience in Distance Education Centers	Yes	11	68,75
	No	5	31,25
Role in Distance Education Centers	Administrator	2	12,5
	Academic Staff	5	31,25
	Administrator & Academic Staff	4	25
Academic Title	Professor	3	18,75
	Associate Professor	4	25
	Assistant Professor	5	31,25
	Lecturer (PhD)	2	12,5
	Research Assistant (PhD)	2	12,5
Years of Professional Experience	1-5 years	2	12,5
	6-10 years	4	25
	11-15 years	3	18,75
	16-20 years	2	12,5
	21-25 years	3	18,75
	26 Yıl and above years	2	12,5

According to Table 2, 16 experts participated in the study. The table shows that the proportion of male experts (68.75%) is higher than that of female experts (31.25%). The highest number of participants were experts in the "40-44 years" and "35-39 years" age ranges. When examining the employment status of the experts in distance education centers, it was observed that 68.75% worked in a distance education center. Participants working in distance education centers were observed to hold positions as "managers" (12.5%), "academic staff" (31.25%), and both managerial and academic staff (25%). Looking at the distribution of experts according to their academic titles, the most common titles were "Assoc. Prof." (31.25%) and "Associate Professor" (25%). Regarding the distribution of participating experts

according to their seniority, the most common was "6-10 years" (25%), while the least common was "1-5 years" and the least common was "26 years and over". The institutions where the experts are currently employed are listed in Table 3.

Table 3. Distribution of Delphi panelists by university

University	N
Anadolu University; Ankara University; Balıkesir University; Georgia Southern University; Hacettepe University; Middle East Technical University; Sakarya University; Siirt University; Trabzon University; Van Yüzüncü Yıl University	1
Bartın University; Manisa Celal Bayar University; Uşak University	2
Total	16

Table 3 shows that experts from 13 different universities participated in the research, 12 of which were from Türkiye and 1 from the United States of America.

Data Collection and Analysis

Research on decision-making and future-oriented predictions related to educational processes is of critical importance. The Delphi technique can be employed to elicit expert opinions on decision-making and forecasting processes across various disciplines, including education, health, technology, environment, and politics (Yakar, 2019). In this study, which aims to enhance the effectiveness of assessment processes in distance education at the higher education level, data were collected using the Delphi technique. First, a pool of experts who met the specified criteria was established. Subsequently, an invitation letter outlining the purpose, scope, and procedures of the study was sent to these experts. The first round of the Delphi questionnaire was then administered online to those who agreed to participate, thereby initiating the data collection process (Appendix 1). The first-round Delphi questionnaire consisted of two sections. The first section included personal information such as gender, age, institution of employment, academic title, years of professional experience, and e-mail address, as well as questions regarding whether the participants had worked in distance education centers and, if so, what type of role they had undertaken. In the second section of the questionnaire, participants were asked the Likert-type question: “Do you think the assessment and evaluation methods used in distance education at the higher education level in are sufficient?” Responses ranged from “Completely insufficient” (1) to “Completely sufficient” (5). Participants who considered these methods insufficient were subsequently asked an open-ended question regarding how their effectiveness could be improved. The first-round Delphi questionnaire was completed by 16 experts who had agreed to participate

in the study. The questionnaire was administered electronically while 15 experts submitted their responses online, one expert completed it via videoconferencing. The responses obtained were subjected to content analysis and organized into items under specific components and sub-components.

The data collection process was completed by reaching a consensus among the panelists in a total of four rounds: three main rounds and one intermediate round. The purpose of conducting an interim round was to determine whether the experts had any additional suggestions they wished to add before proceeding to the content analysis stage. This was because the questionnaire items in this study were not collected from the literature. Since the data source of the questionnaire consisted of open-ended questions asked directly to the experts, the aim was to allow for the possibility of revising or refining the experts' views expressed in the first round. Fifteen days later, the responses that the panelists had provided to the first-round Delphi questionnaire were sent back to them. In the interim round, experts confirmed their previous answers, and additionally, only 2 experts made very minor changes to their responses. The panelists' responses to the open-ended questions, including their opinions and suggestions, were analyzed through content analysis and categorized into codes and themes. The data collection process is summarized in the table below.

Table 4. Data collection process of the study

Data Collection Tool	1st Round Delphi Questionnaire	Interim Round	2nd Round Delphi Questionnaire	3rd Round Delphi Questionnaire
Number of responses included in the study	16	15	15	15
Data	The adequacy of the assessment and evaluation process in distance education in higher education is assessed through open-ended questions on how the effectiveness of evaluation processes can be improved.		Seeking consensus on the effectiveness of assessment processes in distance education in higher education (5-point Likert scale)	
Data Analysis	Content analysis of opinions and their separation into themes and categories (components and sub-components)		Mean, standard deviation, median, interquartile range of responses to components and subcomponents, percentage of responses to items 4 (required) and 5 (definitely required).	

The Scale

In this study, validity and reliability were addressed using different strategies in accordance with the nature of the Delphi method. In Delphi studies, content validity is closely associated with the selection of expert panelists (Yakar, 2019). Since the panelists were experts in the field of distance education, the data obtained from them were corroborated through comparison with the relevant literature. Before being redistributed to the panelists, the items were reviewed by a total of five experts, including three subject-matter experts, one assessment and evaluation expert, and one language expert. Through this process, content validity was strengthened. In line with the recommendation of Linstone and Turoff (2002) that Delphi studies should include at least ten experts, a sufficient number of panelists participated in the study. Furthermore, the consistency of the panel was maintained throughout the process, and the items were revised in each round based on expert feedback.

The reliability of the study should be supported by the level of agreement achieved at the end of each Delphi round (Fish & Busby, 2005). In the second round, a consensus rate of 72% was obtained, while in the third round, the overall consensus rate increased to 86% when combined with the results of the previous round. In addition, the concept of credibility, defined as the extent to which a study yields consistent results under similar conditions and maintains procedural is also essential in Delphi research. In this regard, repeated confirmations were obtained from the participants, and the process was conducted with the same panelists to ensure consistency. To enhance generalizability, experts with varying levels of seniority and experience were included, and purposeful sampling was employed to ensure diversity. Ensuring external validity requires a detailed description of the data and the research process. Accordingly, transparency was achieved by providing a comprehensive account of the research procedures, the questionnaires used, and the analysis results.

In this study, both qualitative and quantitative methods were employed in the data analysis process. In Delphi studies, when data are collected in the first round through open-ended questions directed to panelists, content analysis is typically used to structure the survey instrument. Accordingly, in this study, the survey items were developed by identifying themes (components) and sub-themes (sub-components) based on the responses

obtained in the first and interim rounds. Subsequent rounds were conducted using quantitative analysis, in line with the iterative nature of the Delphi method (Powell, 2003). To establish consensus on the items, measures of central tendency and dispersion were employed (Hasson et al., 2000).

Table 5. Criteria for inter-item consensus

Statistic	Criterion
Median	≥ 4
IQR (Interquartile Range: Q1–Q3)	≤ 1
Percentage of ratings of 4 and 5	≥75

When Table 5 is examined, for consensus to be reached on the quantitative data of the research, the median value must be "4 or greater", the interquartile range must be "1 or less", and the frequency of responses of "4 and 5" for each item must be "75% or higher". In this study, where responses were obtained using a 5-point Likert scale, the responses "4 (necessary)" and "5 (definitely necessary)" indicate the degree of agreement. According to Vernon (2009), this range should be between 55% and 100%, while Myezwa et al. (2012) emphasized the 60%-80% range. Yakar (2019) used a range of 75% and above in his research. For this study to provide reliable results, the degree of agreement criterion was determined as "75% and above".

Findings

This study, which examines how assessment methods in distance education processes can be implemented more effectively based on the opinions of subject-matter experts, revealed that in the first round of the Delphi survey, 68.75% of the experts rated the assessment methods used in distance education as “insufficient.” In addition, 18.75% of the participants indicated that these methods were “partially sufficient,” while both “completely insufficient” and “completely sufficient” responses accounted for 6.25% each. Moreover, based on the qualitative responses obtained from the open-ended questions in the first round, the overall findings suggest that assessment and evaluation processes in higher education distance education in Türkiye are generally considered insufficient.

In the first round of the Delphi questionnaire, which focused on examining how assessment processes in distance education at the higher education level could be implemented more effectively, panelists were asked to provide their responses in bullet-point format. Fifteen days after all responses had been collected, the compiled feedback was

returned to the panelists for review. During this interim round, two panelists made minor revisions to their initial responses.

The responses provided by the subject-matter experts were subsequently analyzed and organized through coding and categorization. Based on these analyses, the identified categories and codes were systematically structured into overarching components and sub-components, which formed the basis for the development of the second-round Delphi questionnaire.

Following the completion of the second round, the items were re-evaluated and revised. Items for which consensus had not been reached, as well as selected items that had achieved consensus but required refinement, were presented to the panelists for further evaluation in the third round of the Delphi process. At the conclusion of the third round, items that still failed to achieve consensus were excluded, and the questionnaire was finalized.

Table 6. 1st round Delphi survey assessment and evaluation dimension codes and themes

Theme	Association Reason	Codes
Planning	Before starting distance learning, plan the assessment and evaluation processes and share them with the learners.	➢ *Evaluation criteria* ➢ *Evaluation objectives* ➢ *Determining evaluation methods and strategies* ➢ *Deciding on the content-based evaluation format* ➢ *Determining a sustainable distance education process* ➢ *Learning tasks*
Assessment and evaluation Tools and Methods	Including assessment and evaluation tools and methods that can be used in assessment and evaluation processes.	➢ *Different techniques* ➢ *Feedback* ➢ *Use of process-oriented and outcome-oriented approaches together* ➢ *Use of learning analytics and educational data mining in evaluation processes* ➢ *Collaborative group work* ➢ *Performance tasks* ➢ *Peer assessment* ➢ *Self-assessment* ➢ *Assessment of individualized learning tasks* ➢ *Multiple choice* ➢ *Homework* ➢ *Quiz* ➢ *Anxiety reduction techniques*
Assessment and	Suggestions about assessment and	➢ *Adaptive*

evaluation Environment	evaluation environments.	➢ *Interactive exam tools* ➢ *AI-based* ➢ *Includinggamification elements* ➢ *Assessment tools available in the LMS* ➢ *Virtual reality*
Validity and Reliability	Suggestions for making assessment and evaluation processes more valid and reliable.	➢ *Having the assessment tool evaluated by another expert* ➢ *Questions requiring interpretation rather than rote memorization* ➢ *Different question types* ➢ *Originality check in assignments/projects* ➢ *Secure exam software* ➢ *Screen monitoring* ➢ *Facial recognition program* ➢ *Open-book/open-resource exams* ➢ *On-camera* ➢ *On-microphone* ➢ *Exam duration* ➢ *Taking security measures according to the purpose of the assessment* ➢ *Item reliability analysis in the test*
Protection of Personal Data	Including recommendations to ensure the protection of personal data in the assessment and evaluation process.	➢ *University decisions regarding personal data* ➢ *Information texts* ➢ *Use of personal data in accordance with the purpose for which it is processed* ➢ *Consent of the parties in the use of data*
Support	Suggestions for support services to be provided to learners and teachers before and after assessment and evaluation.	➢ *Software support before exams* ➢ *Support for teachers* ➢ *Distance learning exam center*

Table 6 presents the analysis of the panelists' responses obtained at the end of the first round regarding ways to enhance the effectiveness of assessment and evaluation methods in distance education within higher education. The findings indicate that the themes emerging under the assessment and evaluation dimension are "planning," "assessment and evaluation tools and methods," "assessment and evaluation environment," "validity and reliability," "protection of personal data," and "support".

The "Planning" theme encompasses the structuring of assessment and evaluation processes prior to the commencement of distance education, as well as the clear communication of relevant information about these processes to learners at the outset of instruction. The "Assessment and Evaluation Tools and Methods" theme includes

recommendations regarding appropriate tools and methods to be employed in the assessment process. The "Assessment and Evaluation Environment" theme refers to suggestions concerning the environments in which learners' knowledge and skills are evaluated. The "Validity and Reliability" theme relates to recommendations aimed at ensuring that assessment and evaluation processes are conducted in a more valid and reliable manner. The "Protection of Personal Data" theme involves suggestions for safeguarding learners' personal data through legal and institutional mechanisms during the assessment process. Finally, the "Support" theme encompasses recommendations related to support services provided to both learners and instructors before and after the assessment process.

Table 7. Findings regarding agreed-up items in the assessment and evaluation component of the 2nd round Delphi survey

Subcomponents	Total Number of Items	Number of Agreed Items	Agreement Rate
Planning	11	9	%82
Assessment and Evaluation Tools and Methods	22	18	%82
Assessment and Evaluation Environment	7	5	%71
Validity and Reliability	20	9	%45
Protection of Personal Data	5	5	%100
Support	4	4	%100
Total	69	50	%72

According to Table 7, an examination of the number of items and agreement rates across sub-components following the second round of the Delphi application indicates that consensus was achieved on 50 of the 69 items in the assessment and evaluation questionnaire, whereas no agreement was reached on 19 items. The overall consensus rate was calculated as 72%. Full consensus was observed in the "Personal Data Protection" and "Support" sub-components. The agreement rates in the "Planning" and "Assessment and Evaluation Tools and Methods" sub-components were identical, at 82%. By contrast, lower consensus rates were obtained in the "Assessment and Evaluation Environment" (71%) and "Validity and Reliability" (45%) sub-components compared to the others. Except for the "Validity and Reliability" sub-component, all other sub-components achieved consensus rates of 70% or higher.

In the second round of the Delphi study, panelists also provided feedback on several items for which consensus had not yet been reached, and these items were subsequently

included in the third round in accordance with their suggestions. In addition, revisions were proposed for two items within the "Assessment and Evaluation Tools and Methods" sub-component that had already achieved consensus, and these items were reintroduced into the third round with the suggested modifications.

Table 8. Findings regarding agreed-up items in the assessment and evaluation component of the 3rd round Delphi survey

Subcomponents	Total Number of Items	Number of Agreed Items	Agreement Rate
Planning	2	2	%100
Assessment and Evaluation Tools and Methods	4+2*	2+1*	%50
Assessment and Evaluation Environment	2	1	%50
Validity and Reliability	11	3	%45
Total	22	9	%41

*Items suggested for revision

According to Table 8, the results of the third round of the Delphi study indicate that consensus was achieved only for the "Planning" sub-component, leading to the inclusion of its corresponding items in the questionnaire. The agreement rate was 50% for both the "Assessment and Evaluation Tools and Methods" and "Assessment and Evaluation Environment" sub-components, while the "Validity and Reliability" sub-component recorded an agreement rate of 45%. In this round, a total of nine items were approved, twelve items were excluded from the questionnaire, and no revisions were accepted for one item.

Table 9. Statistics of agreed-upon items in the 2rd and 3rd Delphi tools rounds

Delphi Rounds	Items	Number of Agreed Items	Total Number of Agreed Items	Agreement Rate
2rd round of Delphi Tool	69	50	50	%72
3rd round of Delphi Tool	22	9	59	%86

In conclusion, according to Table 9, the results of the Delphi rounds indicate that 50 of the 69 items in the Assessment and Evaluation component were accepted in the second round, while an additional 9 items were accepted in the third round, resulting in consensus on a total of 59 items. The overall agreement rate for the items was calculated as 86%.

Discussion, Conclusion and Recommendations

The panelists' views indicate that the assessment and evaluation methods employed in distance education are largely inadequate. This finding is consistent with the existing

literature. Özalkan (2021) emphasizes that a fair, reliable, comprehensive, and multidimensional assessment and evaluation framework is essential for the effective functioning of the education system. Similarly, Tonbuloğlu (2017) argues that the lack of standardized practices in distance education programs creates significant challenges for evaluation processes. The limited scope of current assessment systems restricts the accurate measurement of learners' achievement levels, thereby reducing the overall quality of education and hindering the realization of individual potential. Supporting these findings, Bakioğlu and Can (2011) suggest that assessment methods in distance education should be diversified, while Gül and Doğan (2011) underscore the importance of ensuring validity and reliability in assessment and evaluation practices.

The panelists' experiences emerged as a decisive factor shaping their perception of assessment and evaluation processes as inadequate. In particular, challenges such as the inability to effectively monitor students during online examinations, instances of impersonation, academic dishonesty, and the direct transfer of face-to-face assessment practices to the online environment were identified as major limitations. Furthermore, the findings from the Delphi rounds suggest that assessment and evaluation should not be considered merely as the final stage of the instructional process rather, they should be addressed within a comprehensive systems perspective.

Findings from the planning stage indicate that distance education should be approached differently from face-to-face education, and assessment methods should be adapted accordingly. The sustainability of distance education depends on conceptualizing the system as an ecosystem and recognizing the interrelated nature of its components in assessment processes. The involvement of institutional administrators and higher education policymakers in managing assessment processes, developing strategic plans, and supporting faculty members has been identified as essential. When selecting assessment methods, alignment between assessment objectives and course content should be ensured. Accordingly, assessment methods should be selected in line with specific purposes, such as placement, formative assessment, and level determination. Hooda et al. (2022) similarly stated that while assessment methods can be diversified when deciding on online assessment formats, the choice of assessment should be consistent with specific needs and intended learning outcomes.

Given the nature of distance education, integrating tasks that require practical application typically easier to assess in face-to-face settings can enhance the effectiveness of assessment methods. Clearly defined and purposeful task instructions can further support the development of higher-order thinking skills. Accordingly, evaluation criteria and scoring methods should be planned in advance. Planning assessment methods during the design of learning tasks aligned with course content contributes to an effective evaluation process. Providing students with clear information about assessment methods in course syllabi also enhances the usability of the system. Similarly, Carles (2007) argued that sharing assessment plans in advance enhances the validity and reliability of the process. Furthermore, investing in adaptable assessment systems can improve cost efficiency and support the valid measurement of targeted learning outcomes. Sarı (2020) also suggests that the Graduate Record Examination (GRE), which includes question types similar to the Academic Personnel and Postgraduate Education Entrance Examination and can be adapted to learner performance, may be more widely utilized in Türkiye. Nevertheless, Segbenya and Mensah Minadzi (2022) expressed concern that adaptive systems may lead to confusion.

Based on the Delphi rounds, panelists indicated that learners' problem-solving skills can be enhanced through the use of online examinations (e.g., multiple-choice, short- or long-answer, true/false, and matching questions) as well as process-oriented assessment activities such as assignments, projects, e-portfolios, and blogs. These tools enable students to take an active role in managing their own assessment processes. Tatlı (2024) states that online exams are powerful tools for assessing learning. However, the panelists emphasized that, in addition to traditional methods for assessing cognitive, affective, and psychomotor domains, contemporary assessment techniques should also be incorporated. Martin et al. (2025), in their study on online assessment formats, found that instructional designers identified case study analysis as the most effective assessment type, followed by electronic portfolios, design projects, and multimedia projects. In contrast, unsupervised exams, supervised exams, and asynchronous participation were rated as the least effective assessment methods. Furthermore, grading rubrics emerged as the most effective assessment strategy, whereas ungraded assignments and automatically graded tasks were perceived as the least effective practices.

Benson and Brack (2010) argue that reliance on traditional assessment approaches in distance education may reduce assessment quality, while Wilson (2013) proposes alternative

methods to address these limitations. According to the panelists, process-oriented assessment techniques should be integrated into the course flow and applied at regular intervals to enhance student engagement. When determining assessment techniques, learning objectives and the level of the learner group should be carefully considered. When process-based assessment techniques are employed, asynchronous discussion activities distributed throughout the week can be implemented. In addition to traditional methods such as written tests, assignments, and multiple-choice exams, formative assessment can be supported through interactive digital tools. Steer et al. (2016) suggest that the lack of direct observation in distance education can be mitigated through structured assignments. In online courses, weekly learning progress can be monitored regularly, and activities such as quizzes, workshops, and group work can be incorporated. Such formative activities can contribute at least 10% to assessment grades. This approach can enhance both motivation and participation. After sharing evaluation results, feedback should be provided through dedicated feedback sessions. Altan and Seferoğlu (2009) also emphasize the importance of providing frequent feedback on assignments. Similarly, Simonson et al. (2019) highlight the importance of feedback in promoting learner motivation and participation.

A teacher who provides feedback on learners' competencies, performance, and achievements can offer motivational support. Eyal (2012) emphasize that teachers who develop a deeper understanding of their learners can tailor their feedback based on assessment results. This approach strengthens teacher–learner interaction by fostering more personalized communication.

Individualizing the distance learning process and providing students with methods tailored to their learning needs is easier than in face-to-face learning environments. The use of educational data mining and learning analytics can enhance the effectiveness of individualized assessment processes. Similarly, Eyal (2012) states that systematically recording and aggregating learner assessment data in online environments benefits both learners and teachers. These benefits include providing information on learner performance, task completion, class participation, and progress relative to peers. Administrators can also benefit from these data. Digital assessment data enable the analysis of individual learner profiles and comparisons across classes. Thus, administrators can develop strategies to enhance learner success while also encouraging parental involvement.

Peer and self-assessment, which require students to take active responsibility, contribute to learning and enhance self-regulation skills. Students who take responsibility for their learning processes become more aware of their strengths and weaknesses; consequently, this enables them to make informed decisions about their futures. In addition, peer assessment can reveal aspects that may be overlooked by individual evaluators. Furthermore, the use of rubrics can enhance the reliability of assessments.

Among the recommendations emerging from the Delphi rounds is the integration of interactive assessment tools, alternative assessment practices, and virtual reality applications with gamification elements into learning management systems. These approaches can facilitate both process and outcome-oriented assessment. When gamified interactive applications are used within different scenarios, assessment can take on a formative role in the learning process. The development and use of AI-based assessment tools can enable more stable and multidimensional evaluations through the analysis of complex data sets. Adaptive assessment mechanisms can allow exams to be conducted more efficiently with fewer items, adjusting difficulty levels based on learner performance. By drawing from large item pools and dynamically adapting to responses, these systems can improve both efficiency and usability.

Contrino et al. (2024) compared CogBooks, a system that continuously monitors student performance and adapts content accordingly, with face-to-face education and found that adaptive systems help standardize quality across different instructional formats. Similarly, Daines et al. (2016) reported that adaptive systems increased learner success rates from 76% to 94% while also reducing dropout rates. Building on these findings, Üstün et al. (2026) examined the contributions of artificial intelligence to assessment processes in higher education and found that the strengths of AI-supported systems include feedback, personalization, enhanced assessment, validity and reliability, efficiency, and data-driven decision support. They further emphasize that features such as adaptability, personalization, and data-driven decision-making indicate that AI systems are becoming increasingly advanced both technically and pedagogically. Additionally, adaptive testing, learning analytics, and deep learning models have qualitatively transformed assessment practices by enabling more precise and dynamic evaluation of student performance. The study also notes that AI-based systems are no longer merely measurement tools but have evolved into active

mechanisms that shape learning processes, while continuous feedback contributes to the development of students' self-regulation skills.

Among the recommendations related to the validity and reliability subcategory of assessment and evaluation emerging from the Delphi rounds, cheating identified as the most frequently criticized issue concerning the reliability of the measurement process was prominently emphasized. While Figaredo et al. (2022) suggest that student performance may be inflated due to cheating, Arnold (2016) argues that cheating is not unique to online examinations and is not more prevalent than in face-to-face settings. Numerous studies in the literature have similarly identified the reliability of assessment tools in distance education as a critical concern (Adıgüzel, 2020). Panelists recommended the use of secure assessment software as a measure to prevent cheating. For instance, software capable of detecting when a student accesses applications other than the exam interface during an assessment may be utilized. It was also suggested that restrictions on access to resources during examinations should vary depending on the purpose of the assessment. For high-stakes, outcome-oriented exams that have a substantial impact on final grades, stricter security measures are recommended to prevent students from using pre-prepared answers. Similarly, Balta and Türel (2013) proposed the use of open-book or open-resource examinations as a strategy to mitigate cheating. This perspective supports the panelists' views, as students who cannot rely on ready-made answers are more likely to synthesize their own knowledge and interpretations in their responses. In terms of online exam security, Durmuş and Turgut (2022) suggested that reliable exam software should restrict page navigation and enable IP tracking. Consistent with these findings, the panelists in this study also recommended the use of reliable software in the assessment process.

AI-resistant exams and classroom specific questions can be developed. For example, instead of asking generalizable questions, distinctive questions without standard answers can be designed within the context of the student's own learning process. Such questions, which require reasoning and justification in students' responses, will both support construct validity and enhance reliability. Open-ended questions are more suitable in this context. However, while ensuring the content validity of the topics covered in distance education through specification tables, the time allocated to the assessment process must also be carefully calibrated. In addition to open-ended questions, students can also be given writing assignments. Tasks such as essays, reports, and reflective writing provide important learning

opportunities for students to structure their thoughts and develop their written communication skills. However, the widespread use of generative artificial intelligence tools has made these types of assignments more controversial in terms of their learning value, particularly when students rely on directly generating ready-made texts instead of actively engaging in the writing process (Martin et al., 2025).

In multiple-choice exams, shuffling questions and answer options for each student can limit cheating. Reliability analyses can be conducted more effectively in such exams through item and test statistics. Expert review may also be employed to examine the alignment of the exam with course objectives and scope. In distance learning processes, using different question types appropriate to student levels and organizing exams in multiple sessions rather than a single session can enhance validity and reliability. Panelists also recommend the use of assignments and projects in addition to these types of exams. However, originality and AI-assisted content checks must also be ensured in such student-centered tasks. Altan and Seferoğlu (2009) similarly emphasize the importance of originality checks to prevent plagiarism in assignments. In recent years, software such as Turnitin and iThenticate, which can detect the use of artificial intelligence technologies in assignments and project reports to some extent, have contributed to controlling plagiarism. However, although these tools can identify AI-generated content, they are limited in determining the extent to which the detected content was produced by artificial intelligence. In this respect, further development is needed (Perkins et al., 2023). For this reason, the panelists also suggest that learners should be evaluated through AI-resistant performance tasks. Similarly, Toker and Akgün (2024) emphasize that plagiarism associated with generative AI technologies can only be mitigated through complex task design and methodological strategies.

As a result of the Delphi surveys, various recommendations were developed based on the data obtained within the subcategory of personal data protection in assessment and evaluation processes. In accordance with Law No. 6698 on the Protection of Personal Data, these recommendations suggest that protective measures should be implemented across universities particularly in online invigilated exams to ensure the protection of personal data, privacy, and confidentiality, given that both instructors' and students' data are processed. In distance education exams, there may be instances in which individuals' biometric data, such as camera, screen, microphone, and facial recognition data, are processed.

Authorities must ensure that the consent obtained from individuals for the processing of personal data is based on free will. Data controllers must take adequate measures in the processing and storage of such sensitive data. In this regard, it is necessary to establish systematic policies and procedures for data security, implement confidentiality agreements, and clearly define the scope and duration of access rights for authorized users. Furthermore, periodic access controls and the prompt termination of access rights for individuals whose roles have ended are essential for ensuring data security.

The information provided in educational materials should inform learners about these issues. In particular, such materials should use clear and accessible language and avoid unnecessary technical terminology (Kale Özçelik, 2021). The purpose and duration of data retention should be clearly and lawfully specified. Furthermore, assurances should be provided that data recorded in the assessment environment will not be shared with third parties for any purpose, especially in cases involving cross-border data transfer. In learning management systems, issues such as the storage of personal data in cloud-based environments, the sharing of such data with authorized individuals, and the creation of student profiles based on behavioral and achievement data within the scope of learning analytics must be carefully considered. Guarantees should be provided that data with the potential to adversely affect individuals will not be disclosed. Where the processing of such data is necessary, the principles of purpose limitation, data minimization, and proportionality must be observed. Data should not be processed solely on the assumption that it may be needed in the future (Personal Data Protection Law [PDPL], 2018). According to Article 11 of the PDPL, faculty members and students have the right to be informed about the data being processed, to object to the consequences of incomplete or inaccurate data processing, to request the correction or deletion of their data, and to seek compensation for damages arising from unlawful data processing.

In the final category of an effective assessment and evaluation process, namely infrastructure and support, panelists emphasized that camera, microphone, and internet connection checks should be conducted prior to online exams. To prevent potential technical issues, pre-exam tests can be carried out using software specified by either the student or the institution. Institutions should also provide support and training through their distance education centers on the use of assessment and evaluation tools within learning management systems.

Since the full capabilities of the learning management systems (LMS) used by institutions are not always fully understood, their effective use may be limited. Furthermore, distance education centers should provide support for the integration of exams into LMS without compromising exam security. Active support should also be available during the examination process to address potential risks. In addition, institutions may establish dedicated examination centers to conduct assessment and evaluation processes in a professional and systematic manner. Such centers could manage the uploading of exams to the system, the administration of exams, and the transfer of grades to student information systems.

This study has several limitations. The fact that the research was conducted solely with a Turkish sample and that the data were collected through self-report measures limits the generalizability of the findings. Therefore, it is recommended that similar studies be conducted with international participants.

In conclusion, this study suggests that assessment and evaluation processes in distance education should be conceptualized as a system, based on the views of expert panelists in the field. The recommendations presented in this study may serve as a guide or model for updating the distance education policies of higher education institutions. Furthermore, future research directions include conducting comparative studies on validity and reliability, examining the use of artificial intelligence in distance examinations and its implications for academic integrity, investigating the risks associated with these exams from a PDPL perspective, enhancing ethical awareness, and diversifying alternative assessment and evaluation practices.

Author Contribution Statement

Emine Su TONGA: *Conceptualization, literature review, data analysis, findings, conclusion and discussion*

Sami ŞAHİN: *Conceptualization, data analysis*

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Appendix 1

FIRST ROUND OF THE DELPHI SURVEY

PARTICIPANT INVITATION AND INFORMATION LETTER

Dear Faculty Member,

This research is designed to address the question, "What can be done to make the measurement and evaluation process more effective in distance education at the higher education level?" In this context, this study will be prepared based on the opinions of experts working in the field of distance education. Your valuable opinions are crucial in this first step of developing the "Improving Assessment Methods and Proposed Solutions in Distance Education at the Higher Education Level" survey, as the experience and knowledge of you, our esteemed academics who are experts in the field, will be decisive for the structure of this survey.

The Delphi Technique is a technique conducted through sequential surveys, ultimately leading to a consensus. Therefore, the participation of experts in the first round in subsequent rounds is crucial for the continuity of the study. The limitations of the technique have been addressed by providing preliminary information and explanations to the experts who will form the Delphi Panel. The experts forming the Delphi panel are experts and leaders in the field of distance education. The anonymity of the experts during the data collection process, an advantage of the technique, will allow for the emergence of diverse opinions and suggestions. These opinions will be reviewed repeatedly by panel members in successive rounds, ensuring consensus and shared decisions. Keeping your names and opinions anonymous to other experts during the data collection process will contribute to the emergence of diverse and original perspectives. If you wish to contribute to this research as a Delphi Panelist, you need to provide your opinions in the First Round Delphi Questionnaire, which is the first step of this technique. The items you identify in the first round will be combined with the opinions of other participants to form the Second Round Delphi Questionnaire. In the Second Round, the items will be determined and analyzed using a Likert scale based on the experts' level of agreement with the opinions. The analysis will be sent again in the Third Round based on the median, range, first quartile, and third quartile results. In this round, a decision will be made on whether or not to conclude the study based on the consensus reached. Communication will be via email. Thank you very much for your time.

Sincerely…

SECTION I

This section contains questions regarding your personal information, such as age, gender, employment information, title, and years of professional experience.

1. Gender: 1. Female ( ) 2. Male ( )

2. Your Age: ( )

3. Institution You Work For:

4. Have You Worked in Distance Education Centers: 1. Yes ( ) 2. No ( )

5. If so, your role: 1. Manager ( ) 2. Academic Staff ( )

6. Your Academic Title: 1. Prof. Dr. ( ) 2. Assoc. Prof. Dr. ( ) 3. Dr. Lecturer ( ) 4. Dr. ( )

7. Years of Professional Experience: ( )

8. Your Regularly Used Email Address:

SECTION II

This section contains questions related to assesment and evaluation methods in the distance education process at the higher education level. Your answer to question 2 in particular, will determine the subsequent course of the research.

1. Do you think the assesment and evaluation methods used in the distance education process are sufficient?

Completely Insufficient 1( ) 2( ) 3( ) 4( ) Completely Sufficient 5( )

2. If you think the assesment and evaluation methods used in the distance education process are insufficient, what can be done to increase the effectiveness of these methods? (Please, while identifying the items that will increase the effectiveness of the assesment and evaluation methods used in the distance education process, conduct a personal brainstorming session and write down as many suggestions as possible in bullet points. The comprehensive answers you give to this question will shape the rest of the research. The items you identify to increase the effectiveness of measurement and evaluation methods will be combined with those stated by the other panelists to form the Second Round Delphi Questionnaire.)

I. ……...

II. ……....

III. ……...

IV. ……...

V. ……....

Please state your opinions and suggestions if you have any.