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Synthesis of Research Identifying Components of a Native Model for Electronic Evaluation Systems in the Islamic Azad University of Iran

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A B S T R A C T

Objective: With the entry of the digital generation (a generation born and raised in the presence of technology) into universities, which demands a different method and style of learning from the past generation, the higher education system is compelled to move towards creating educational infrastructures that meet the needs of this generation. The current research aims to identify the components of a native model for electronic evaluation systems based on the capabilities and facilities available in our country's higher education system, specifically at the Islamic Azad University of Iran.

Methodology: The research approach is qualitative, utilizing a research synthesis strategy. The research population includes all printed and digital documents in our country's information resources, of which 16 documents were selected based on defined criteria and by purposive sampling until data saturation was reached.

Findings: The analysis of the collected data was conducted using thematic analysis, resulting in the extraction of 10 categories and 59 components for creating a native electronic evaluation system that can be used as a guide in educational settings.

Conclusion: Based on this research, it is possible to evaluate electronic learning courses in the evaluation section.

Keywords: *Electronic Evaluation, Islamic Azad University, Research Synthesis, Electronic Learning.*

1 Introduction

Evaluation is a subsystem of distance education and is considered one of the methods of quality assurance in learning. It ensures the provision of quality education by identifying weaknesses in the electronic learning system and rectifying them (Fathi Vajargah et al., 2011). The Islamic Azad University, a non-profit educational institution established after the Islamic Revolution, allocates about half of the country's higher education capacity to itself. With

approximately four hundred and thirty active university branches across the country and about one million and three hundred thousand students, the university primarily offers its courses in-person (Paripour et al., 2020).

Research history shows that the use of electronic evaluation programs is rapidly increasing and has an impact on students' learning behavior (Sahebzadeh & Mehri, 2021). Evaluation of electronic learning emphasizes the use of question-based tools, which ultimately leads to the assessment of lower levels of learning (Sahebzadeh & Mehri, 2021). Creating an appropriate electronic evaluation tool that provides and receives feedback well from students encourages students to correct mistakes and increases participation in learning (Sulaiman et al., 2021).

One of the disadvantages of such exams is that, instead of measuring the knowledge of solving complex and unstructured problems, they are based on measuring lower levels of knowledge, namely, the memorization of separate and scattered facts (Al-Emran & Salloum, 2017; Barari et al., 2019; Roshani Ali bena see et al., 2017). It seems that suitable tests for assessing learners' performance and problem-solving skills are not widely used in the final evaluations of electronic learning.

Research in this field can be broadly classified into three categories. One category of research has examined the tools used in an electronic learning evaluation system, describing and analyzing the popularity of these tools and the conventional methods of using them. These studies have examined tools such as portfolios, objective question constructors, discussion forums, course blogs, exit slips, social networks, and similar items (Barari et al., 2019; Sulaiman et al., 2021; Toofaninejad et al., 2018).

The second category of research related to electronic evaluation has focused more on the theoretical aspect, considering its importance and efficiency. These studies have addressed the alignment of course learning objectives with final evaluation questions or the topic of validation and ensuring the authenticity of results, authentication methods, and preventing cheating, as well as examining the educational philosophy of new technologies in evaluation, such as the use of augmented and virtual reality technologies.

Finally, the third category can be considered as comparative research. Most of these studies, which are primarily international, have examined both free and rental e-learning delivery systems, comparing them in terms of the limitations and advantages of these systems in the evaluation dimension. Examples of such research (Sahebzadeh & Mehri, 2021) in domestic studies, which examined the efficiency of evaluation tools in the Ministry of Education's electronic learning system (Shad), and in international studies (Margienė et al., 2022).

Furthermore, it should be acknowledged that findings indicate the most important social characteristics of elementary students in six core codes and seventeen open codes, including the concept of others, understanding differences, responsibility, rights and duties, interaction skills, and performance avoidance. The results show a decrease in the characteristics of responsibility, awareness of rights, and interaction skills among students, and an increase in students' understanding of the concept of others, differences, and performance avoidance compared to the past (Yegane & Arefi, 2023).

With an understanding of the importance of this topic, the current research attempts to find suitable answers to the following questions:

What are the influential components on the quality of evaluation in the electronic learning system of the Islamic Azad University?

What is the status of the extracted components in terms of causality and importance?

2 Methods and Materials

The current research was conducted using a qualitative approach and employing the research synthesis method. This study utilized the seven-step process proposed by Sandelowski and Barroso (2006).

In the first step of executing research synthesis, the primary research question must be defined. In the second and third steps, the selection and identification of credible sources are carried out. In the fourth step, sources are categorized and evaluated, and in the fifth step, data extraction from the selected sources is conducted. The sixth step involves examining the validity of the data, and finally, in the last step, the results are prepared and presented.

The statistical population includes research studies related to evaluation in electronic learning management systems published between 2015 and 2022 in Iranian databases such as Jihad University's www.sid.ir, Noor Specialized Magazines Database www.noormags.ir, and Iran's Journal Database www.magiran.ir. A search in these sources yielded 136 related documents, from which 16 were selected after monitoring and narrowing the results.

After searching all domestic databases with keyword searches, 136 articles were selected. Subsequently, 46

IJIMOB
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duplicate articles were eliminated due to their repetition across different databases for indexing purposes. Ninety articles were chosen for further review, and after examining the title and abstract of all articles, 53 were excluded from the review process. Then, 37 articles were selected for text review, and after content examination, 21 articles were chosen. Finally, 16 articles qualified for review and analysis.

To validate the constructed concepts and discovered categories, the method of reliability between two coders was used. One of the experts in the field of electronic learning (the second advisor) was asked to extract the necessary concepts by studying the transcribed interview files (3 interviews randomly); the agreement and disagreement percentages were calculated by matching their created concepts with those of the researcher, and the extracted concepts were reviewed and corrected.

Table 1

Calculation of Inter-Coder Reliability Percentage in Interview Coding

Interview Number	Extracted Concepts	Agreed-upon Concepts	Inter-Coder Reliability
12	43	17	79%
8	35	12	68%
2	64	23	71%
Total	142	52	72%

As seen in Table 1, the total number of codes registered by the researcher is 142, with 52 total agreements between these codes. To calculate the reliability between coders, the number of agreed-upon codes is multiplied by 2 and the result is divided by the total number of codes obtained. Based on this, the reliability rate is 72%. Since this reliability rate is above 60%, it can be said that the reliability percentage between coders in this research is accepted.

For qualitative data analysis in this study, MAXQDA software version 18 was used. The strategy considered in this research for data analysis is the use of thematic analysis for this type of data. The research documents were embedded in MAXQDA software, and data analysis was conducted using this software, with some parts also manually. Accordingly, all interviews were transcribed in detail. Sections that were responses to our research questions were selected, and a title or code was assigned to them, similar concepts were compared and grouped together, and a category encompassing the meaning of all concepts in that group was chosen. In this way, categories related to the research question were identified.

3 Findings and Results

For analyzing the data obtained from the document study in relation to the first research question, 16 documents were reviewed, and the analysis was conducted in three main steps as previously mentioned. In the first step, verbal evidence was identified and primary concepts were extracted, categorizing all verbal evidence related to the research question for each document.

In the second step, categories were derived from the primary concepts after reviewing the research documents and considering the research questions. Each piece of verbal evidence was reflected upon, assigning a concept or concepts to each. Table number 3, in three columns, shows the address of the concepts extracted from the research literature, along with the primary concepts and the main categories extracted. Accordingly, the weaknesses of evaluation in the learning management system as related to this research question were placed in 59 primary concepts and 10 main categories.

To define the category "Use of Various Evaluation Tools," it can be said that every educational situation requires specific evaluation tools for that situation. As the interviewees and even the research literature have stated, the evaluation in the learning management system of the Islamic Azad University of Iran is limited to a few tools. In fact, the interviewees and research literature believe that during the teaching process, a set of evaluation tools is not used, and only a few specific tools are utilized, which may not alone measure students' learning. In this regard, interviewee code 4 students states that:

"During these three academic terms, our grades included class presentations, end-of-term exams, and our practical work."

The opinion of interviewee code 4 professors, which was also of interest to interviewees code 9, 11, and 12, was that:

"The problem in this case is that your method is limited to oral exams and maybe just the final exam."

IJIMOB
E-ISSN: 3041-8992

The research literature also emphasized that evaluation tools, especially in electronic environments, do not have sufficient variety and are similar to in-person teaching environments. Regarding the same topic, document number 15 states:

"In electronic education evaluations, a variety of tools such as electronic portfolios, student participation, peer assessment, self-assessment, writing scientific papers, etc., should be used. This is while electronic education students have mentioned descriptive exams, multiple-choice questions, and projects as methods of academic progress evaluation."

Table 2

Results of Qualitative Data Analysis

Concepts	Categories
Use of traditional evaluation methods	Utilization of various evaluation tools
Alignment of evaluation methods with the nature of virtual education	
Use of diverse evaluation methods in electronic learning environments	
Use of peer reviews and evaluations	
Possibility of self-evaluation	
Not limiting evaluation to final assessment	
Providing rapid and timely feedback	Feedback provision and reception
Preventing incorrect feedback from instructors	
Preventing the feedback process from being prolonged	
No delay in sending responses	
Sufficient opportunity for instructors to provide feedback	
Ensuring the authentication of participants in evaluations	Authentication of students' identities
Existence of appropriate supervisory methods	
Careful attention to class presentations and using them as a criterion in evaluation	The impact of class presentations on evaluation
Preventing the congestion of class presentations	
Attention to academic integrity in class presentations	
Informing about students' learning levels with the help of class presentations	
Attention to group cooperation in class presentations	
Attention from instructors and students to class presentations	
Easy access to the content of class presentations	
Time limitation of class presentations	
Organizing and documenting class presentation schedules	
Control over purchasing projects and papers	Scientific design of exercises and projects
Providing sufficient exercises by instructors	
Effort to complete class exercises	
Encouraging students to undertake projects	
Attention to the purposefulness of class exercises	
Considering sufficient time for online exams	Proper execution of online exams
Assessing all high levels of learning in online exams	
Regular conduct of online exams	
Preventing the possibility of cheating in online exams	
Lack of diverse software for designing online exams in the learning management system	
Providing a complete report of evaluation results	
Ensuring the validity and reliability of online exams	
Managing class discussions	Attention to class discussions and exchanges
Student participation in class discussions	
Allocating time for class discussions	
Instructors' use of class discussions for evaluation	
Continuous participation of instructors in discussions	
Summarizing discussions	
Measuring the extent of student participation in discussions	
Ability to simultaneously use various media in discussions	
Reporting based on individual activities	Control tools, analysis, and appropriate presentation
Integrated reporting	
Reporting on student participation	

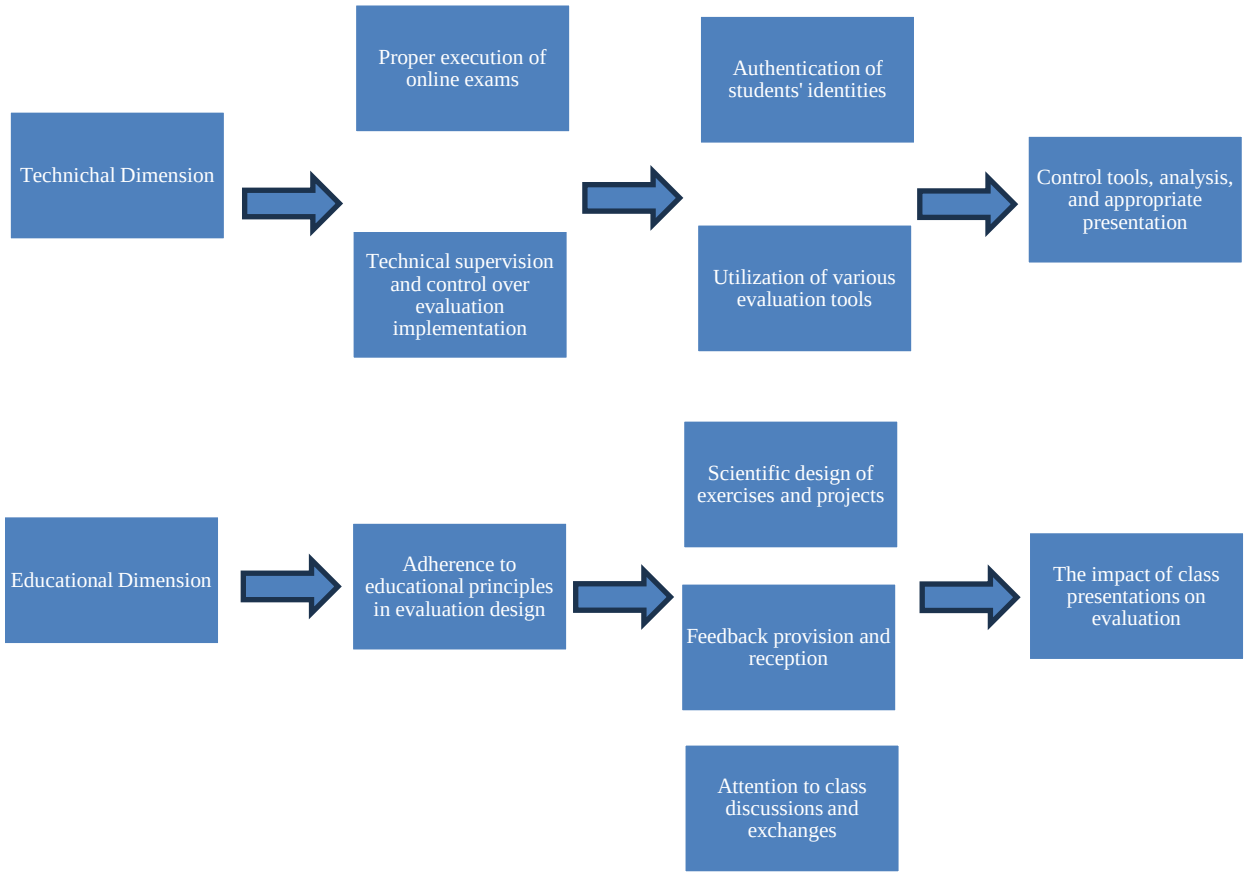
IJIMOB
E-ISSN: 3041-8992

Ability to receive analytical reports	
Ability to record and report on all evaluations	
Alignment of evaluation with the electronic learning curriculum guide	Adherence to educational principles in evaluation design
Alignment of evaluation content with the content presented in class	
Existence of specific standards for educational evaluation	
Designing evaluation processes compatible with electronic education	
Cultivation of the use of electronic evaluation	
Difficulty level of evaluation	Technical supervision and control over evaluation implementation
Control of damages related to supervision of implementation	
Control of damages in the exam execution environment	
Possibility of face-to-face communication	
Ensuring instructors' familiarity with required technologies	
Attention to students' computer and information literacy	
Ensuring the accuracy of evaluation	

Overall, for designing technology-based evaluations in the existing system at the Islamic Azad University of Iran, the existence of at least 50 technical and educational components in the form of 10 main categories appears essential.

Figure 1

Final Conceptual Model of the Study



Based on Figure 1, which shows the model resulting from the research, managers of electronic learning systems at the university should simultaneously review both the technical and educational aspects of the system to enhance the quality of final evaluations in electronic learning systems. In the technical aspect, a priority seems to be focusing on supervisory components, exam implementation methods, and upgrading technologies in this area. In the educational aspect, based on the results obtained, more and more principled use of learning theories in designing exams and

IJIMOB
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electronic learning activities is a fundamental factor in enhancing the quality of electronic evaluation. The results of this research can assist the technical managers of the electronic learning system at the Islamic Azad University in developing plugins for implementing the extracted categories.

4 Discussion and Conclusion

The analysis of the research findings indicates that there are 10 major categories in the field of evaluation in the learning management system of the Islamic Azad University. Considering these categories and the concepts embedded within them ensures the credibility and comprehensiveness of evaluation in the electronic learning domain.

Based on the results obtained from data analysis, to achieve a comprehensive evaluation system based on the capabilities and educational demands in the electronic learning system of the Islamic Azad University, 10 significant categories along with their sub-components must be considered. These derived aspects can be categorized into two groups: educational dimensions and technical dimensions. In the technical dimension of this model, there are two very important categories titled "technical supervision and control over evaluation implementation" and "correct execution of online exams". These two categories can influence each other, and in fact, enhancing the quality level of one will likely improve the desirability and level of the other (shown in the model with a two-way arrow). Observing these two categories becomes the cause for the next level of the model; in other words, authentication and the use of appropriate infrastructure and technologies are the consequences of the two initial categories, which will eventually lead to utilizing control tools and appropriate analysis and presentation in evaluation. Additionally, from a theoretical perspective, the situation regarding barriers to the use of tools and educational technologies in the electronic learning system requires conceptual clarification and modeling. In the practical dimension, addressing this topic can provide a practical guide for stakeholders and implementers (Daneshvar et al., 2021; Ghasemi et al., 2018; Khlifi, 2020; Paripour et al., 2020).

In the educational dimension of the model, it's noteworthy that the very important category of feedback, which is a fundamental principle in the educational aspect of any evaluation, is placed on the left side of the model. This category is the consequence of three preceding categories titled "consideration of group discussions and exchanges in evaluation," "scientific design of exercises and projects," and "consideration of class presentations in evaluation". Simply put, the more we can utilize group works, projects, and discussions in social groups and forums in evaluation, the more we enhance feedback giving and receiving in the teaching process to a satisfactory quality level. According to the derived model, this becomes significant when the most important educational dimension category, namely adherence to educational principles in evaluation design, is considered by the instructor and teacher in the electronic domain. Indeed, adhering to educational principles and considering learning science theories in designing the electronic evaluation process will be the source of creating a comprehensive and high-quality evaluation (Daneshvar et al., 2021; Ghasemi et al., 2018).

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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