Iranian Journal of Educational Sociology

Identification and Analysis of Effective Factors on the Maturity Management Model of Educational Technology in Iranian Schools

Seddigheh Zohreh Nazari Ardabili[1], Parinaz Banisi[2*], Hamidreza Vatankhah[3]

1. PhD student in educational management, Tehran West Branch, Islamic Azad University, Tehran, Iran
2. Assistant Professor, Department of Psychology, West Tehran Branch, Islamic Azad University, Tehran, Iran (Corresponding Author)
3. Assistant Professor, Department of Psychology, West Tehran Branch, Islamic Azad University, Tehran, Iran

Purpose: The main purpose of this article is to identify and analyze the factors affecting the maturity management of educational technology in Iranian schools.

Methodology: The research method is mixed (qualitative-quantitative). To conduct this research, in addition to document study, thematic analysis technique with MAXQDA12 software was used to identify factors and components. The statistical population in this research were all experts in the field of educational management and educational technology, as well as regional managers with high experience and work experience in education, which was done after 14 theoretical saturation interviews. The interviews lasted between 75 and 120 minutes. Finally, the basic, organizing, and inclusive themes are extracted and in the quantitative part, the Dimtel technique is used to determine the effectiveness of the dimensions of educational technology.

Findings: According to semi-structured interviews, 4 dimensions (educational technology knowledge management, educational technology resources and facilities, control and coordination on educational technology and educational technology infrastructure), 15 components (organizing themes) and 55 indicators (basic themes) In order to manage the maturity of educational technology in Iranian schools, it was extracted. After that, according to the questionnaire of paired comparisons to identify the influential and influential dimensions, it was determined that the dimensions of educational technology infrastructure, knowledge management of educational technology, control and coordination of educational technology, and resources and facilities of educational technology are respectively more influential.

Conclusion: The findings of this study have many practical implications for managers and officials of the education system, and they based on the results of this study can take an effective step towards improving the maturity management of educational technology in Iranian schools.

1. Corresponding Author: p-banisi@yahoo.com

1. Introduction

The personality of an individual is a natural part of their social entity that constantly interacts with their environment. Today, it is recognized as a scientific fact that this interaction affects all of their behaviors. In an educational process, the learning environment (school) is planned and organized based on its interaction with its needs and in accordance with the requirements and goals of education. The predetermined goal in education and training can only be implemented in an environment that is suitable for practicing educational programs (Saracoglu, 2020). The environment in which educational activities are created and the individual interacts and communicates, and is formed by components such as staff, equipment, establishment, and organization, is defined as the learning environment. Some studies emphasize the interaction between physical, social, and psychological educational environments. Studies also emphasize that the physical environment in which learning takes place and organizations and designs play an important role in the emotions, thoughts, and behaviors of the individual (Astuti et al., 2021). Analysts believe that the learning environment and its designs may have positive or negative effects on the body and spirit of the individual. Research shows that the learning environment (schools) must be well organized to strengthen positive aspects and eliminate negative aspects (Sharkey and Gash, 2020).

One of the logical and rational ways to deal with the information and communication revolution is to pay attention to education and training, which first needs to enhance human ability and teach them in a way that adapts to their speed with constant changes and prepares them for active, effective, and ready-to-face changes by creating transformation in insight, knowledge, and attitude, and increasing individual and social skills (Mirzaei & Sepahpanah, 2020). Science and knowledge are expanding rapidly in today's world, and at the same time, integrating this knowledge into new skills and professions is required. If technology is integrated into current educational processes, it can have a significant role in educational environments. The integration of electronic technologies in the process of education and learning is essential and inevitable, as learners must learn how to live and work in a society where electronic media constantly confronts them with cultures and values different from their native culture and values (Alipour, Nowrozi, and Nooryan, 2021). One of these steps is the "smart schools" project and the use of educational technologies in schools, which has been implemented experimentally in some cities in our country. In the definition and description of a smart school, it can be said that a smart school is a physical and real educational organization where students learn in a novel way. In a smart school, management is based on computer and network technology, and most of its lessons are electronic, and its evaluation and monitoring system is smart. In other words, "smart schools" refer to those educational units that, using electronic learning in a physical school environment, with a smart educational system and a comprehensive and integrated approach to providing educational and training services to active students, operate with the presence of teachers and students (Ahmadigol, Dehghanzadeh, and Rezaei, 2021).

Smart schools consist of interconnected components designed to motivate students' curiosity and active participation in order to coordinate the efforts of students, teachers, and administrators in a comprehensive and integrated environment to meet all educational needs (Rezaei, Yasblaghi, and Khanjani Vashki, 2022). These schools use electronic tools such as computers, the internet, and so on to teach in schools and create suitable conditions for the economic, cultural, and educational development of the country. Important factors in educational technology include human factors (training and educating specialized personnel in the field of information and communication technology in schools, increasing awareness of new educational needs, teaching students how to use computers for educational activities, and training teachers to prepare and produce appropriate educational software), cultural factors (changing the culture of internet use, cultural supervision of electronic education, and promoting awareness of information and communication technology), social factors (public familiarity with electronic education, creating a positive attitude in society towards the use of information technology, and providing suitable learning opportunities for technology in society), economic factors (reducing the initial costs of developing electronic education in schools, low-cost access to information and communication technology, access to the internet and

computers, private sector participation and investment in electronic education), technological factors (strengthening information technology infrastructure, telecommunications infrastructure, producing educational software in Persian, skilled workforce in optimal use of information and communication technology), legal factors (developing a legal framework to support innovative electronic education initiatives, strengthening electronic security, strengthening policies, guidelines, and executive laws), and strategic factors (clear strategies for the country's educational institutions, creating a general vision and strategy in the field of information technology, precise planning in prioritizing) (Ewiss, El-Sherif, and Seif, 2022). The model of educational technology maturity is a roadmap and guide for identifying, designing, implementing, and executing processes related to human resource education that continuously leads to the improvement of human resource educational capabilities (Stachowiak and Pawlyszyn, 2021). Additionally, effective factors in the maturity of educational technology are low risk and strong knowledge, which occurs when education has reached internal stability among its members. Managing this process also occurs when technology maturity has occurred, and now the organization must maintain it through proper management because every maturity also has a point of decline (Jahani et al., 2020).

Alipour et al. (2021) stated in their article that they designed a 7-dimensional and 29-subcategory content analysis method for e-learning, with the learner dimension consisting of 6 subcategories, including learner's personal characteristics, cultural considerations, learner-to-learner relationships, learner-teacher relationships, learner's preconceptions, learner's interaction with the physical environment, and the curriculum approach dimension consisting of 5 subcategories, including learner-centered process, social teaching approach, behavioral approach, constructive approach, and building-oriented approach. The teacher dimension consisted of 4 subcategories, including teacher competence, interactive relationship with learners, teacher experiences, and teacher-parent relationship, and the teaching-learning process dimension consisted of 4 subcategories, including teaching and learning styles, curriculum planning, collaborative learning strategies, learner motivation, and the content dimension consisted of 2 subcategories, including content selection and instructional media. The learning environment dimension consisted of 4 subcategories, including physical environment, environmental layout, light-space-sound, and safety in the learning environment, and the evaluation dimension consisted of 4 subcategories, including self-assessment, homework, teacher observation, and evaluation criteria. Despite the great efforts to achieve national curriculum goals, there is no special design for e-learning environments. Therefore, considering the pattern proposed in this study, the components of the pattern can be taken into account and the e-learning environment can be designed according to the desired curriculum approach.

Amro (2022) stated in a research article that Al-Quds Open University (QOU) is one of the leading organizations in Arab countries in blended and open learning models. The university has proven its pioneering role in serving Palestine over 30 years through more than 120,000 graduates from its programs. The university has played a pioneering role in Palestine for 14 years in adapting the components of the blended learning model. In this research, we worked on implementing the eMM e-learning maturity model on the blended learning e-learning component of Al-Quds Open University. All dimensions of the eMM model were considered and reviewed, and it was found that it is applicable in most aspects of e-learning at QOU. The dimensions presented by eMM in this study were covered in terms of delivery, program management, and optimization. The process followed in dealing with the model's aspects was done through eMM standard recommendations. This research also discussed the process of implementing the eMM, which depended on dividing the questionnaire according to stakeholders in the university. Stakeholders were considered based on their functional responsibilities in their organizational units. Then, participants were questioned based on standard questionnaire points. The responses were then reflected in a case study for Al-Quds Open University. Recommendations were made based on the organizational gaps found, and suggestions were made to address the reflected gaps from eMM, including reflecting the model that reflects the severe organizational issues related to education, organizational units, documenting core creativity, implementation methods, mentors, and student support. In addition, the university demonstrated highly

reliable and mature e-learning infrastructure and technical capabilities, but the main shortcomings found require the creation of an independent strategic planning program for e-learning and the need to increase documentation of procedures and workflows beyond the core e-learning processes to cover all aspects of e-learning.

DePryck, Kaptijn, Chapel, and Buunk (2022) stated in a research article that collaboration is part of the strategic agenda of higher education institutions. Often, joint research and the movement of staff and students are mentioned as indicators of collaboration. Within the framework of the European Consortium of Innovative Universities (ECIU), Challenge-Based Learning (CBL) adaptation may create added value for educational staff at 12 partner universities. The CBL maturity model is a promising model for supporting innovation in education through implementation. All 12 ECIU-U partner universities have accepted challenge-based learning. It promotes transparency and harmony but allows each university and level within the university to choose its own focus and pace. Specifically, we focus on using the CBL maturity model when evaluating the development of a micro-module through university collaboration.

One of the important organizations in society is the education and school system, which is related to other organizations and is influenced by its performance. Therefore, the education and school system is one of the most important and effective organizations in any society, and the need for it based on the changing and evolving world is a global necessity that drives officials and planners towards changing policies, management styles, changing and modifying goals and missions, and restructuring (Asheghi, Imani, and Sharifi, 2022). Additionally, education and schooling is one of the institutions that has a significant role in the growth and development of a country, such that it plays a vital role in creating desirable changes in societies that lead to national development (Ebrahimi Tabar, Satari, and Soleimani, 2023). One of the important topics in Iranian schools today is the discussion of managing the maturity of educational technology, which has been the subject of few studies in this field, and no research has been found on the maturity management model of educational technology in Iranian schools. Conducting this study can have many practical implications for experts and planners in the education system and can help them improve the current situation in the field of educational technology. Therefore, this article aims to answer the question of what are the dimensions, components, and indicators of the maturity management model of educational technology in Iranian schools. Moreover, what are the influential and affected dimensions of the maturity management model of educational technology in Iranian schools?

2. Methodology

In terms of objective, this research was an applied study and in terms of methodology, it was a mixed study (qualitative and quantitative). The statistical population of the present study consisted of experts in educational management and educational technology, as well as managers of educational regions in Tehran in 2021. The sample of this study consisted of 14 individuals who were selected based on the theoretical saturation principle and purposive sampling method. In this sampling method, cases are selected in a non-random and completely purposive manner. The participants in the study were experienced individuals in the fields of educational management and educational technology, as well as managers of educational regions with relevant academic degrees or articles, books, authorship, and teaching in this field. The inclusion criteria for the study were experts with at least three years of active experience in the university in the field of educational management and educational technology, as well as managers of educational regions with university degrees, specialists with at least a PhD in educational technology, educational management, and related research titles.

The present research tool was a semi-structured interview, in which experts were first interviewed and then asked to determine the importance of the codes. In the qualitative stage, using research literature and semi-structured interviews, primary components were identified using thematic analysis. In addition, in the quantitative stage, a matrix questionnaire was used to examine the influential and affected variables using the decision-making method of pairwise comparisons (Dematel). After conducting the interviews, the data

were analyzed using the thematic analysis method and simultaneously collecting the data. Thus, after conducting the interviews, the text of the tapes was transcribed. Then, a version of the extracted codes was sent to the interviewees for confirmation. To familiarize with the data and immerse in them, the data were read several times, and the primary themes were placed in adjacent categories, and the primary categories were formed. These categories were merged and formed the content. In addition, to ensure the accuracy of the collected data, there was a long and deep involvement with the data. Furthermore, two other researchers, in addition to the main researchers, participated in data analysis. The researcher read the handwritten notes for coding and categorization confirmation, and to increase the reliability, the participants were consulted again. Having maximum diversity in sampling and long meetings were other ways to increase the credibility of the data. The primary themes and subcategories were formed from the initial interviews, and then the reduction of data continued in all analysis units (themes) until they appeared in the content. The interviews continued until the theoretical saturation of the data. The interviews were conducted in the fall and winter of 2021, and their average time was 73 minutes.

The data obtained from the interviews were analyzed using MAXQDA-12 software, and for this purpose, the thematic analysis method was used to identify the factors, and the pairwise comparison method was used to explore the influential and affected factors. The decision-making or pairwise comparison model can determine the relationship between indicators that are individually or collectively dependent on each other. Dematel deals with the analysis of the relationship between indicators by dividing the criteria into two parts: influential and affected. In this study, informed consent, preservation of identity information, and observance of confidentiality in the implementation of interview content were considered ethical considerations.

3. Findings

In total, 14 experts participated in this research, including 8 members of the academic faculty in educational management and educational technology fields, and 6 managers of educational districts in Tehran. The results of content analysis were extracted in Table 1 to identify the basic, organizing, and comprehensive themes affecting the maturity model of educational technology management in Iranian schools.

Table 1. Results of content analysis to identify basic themes, organizing and comperehensive themes, and factors affecting the model of technology maturity management in Iranian schools

Comprehensive theme	Organizing theme	Basic theme
Knowledge management in educational	Learning educational technology knowledge	Primary information of teachers and school administrators about educational technology knowledge
		How to use modern technologies in education by teachers and administrators
		Recognition of teachers and school administrators of teaching patterns consistent with educational technology
		Acquiring knowledge from world journals and conferences through social networks
	Sharing educational technology knowledge	Ability to transfer educational technology knowledge to students
		Ability to exchange information about modern technologies with colleagues
		Ability to gain knowledge about modern technologies from successful countries
	Application of educational technology knowledge	Using educational aids in teaching
		Using smart boards in education
		Using the internet during lessons
		Using projectors during teaching

		Mastery of computers and acquiring knowledge through them
	Analysis of educational technology knowledge	Ability to analyze and explain knowledge gained through educational technology to students
		Ability to analyze and explain knowledge gained through educational technology to colleagues
		Ability to interpret and explain practical lessons through educational technology tools in the classroom for students' understanding
	Evaluation of educational technology knowledge	Ability to evaluate students' skills using educational technology tools
		Measuring the amount of knowledge learned by students through technology tools
		Self-assessment of performance (teachers and administrators) of familiarity with technology tools
Resources and facilities of educational technology	Human resources	Employment of people proficient in educational technology
		Employment of students in educational technology fields in teaching
		Employment of teachers with educational technology fields
	Physical resources	Creating a computer room for everyone to use
		Creating environments with technological designs (computer game rooms)
		Designing a school environment with modern world technologies (moving advertising boards)
		Creating smart boards connected to the internet
		Providing high-speed internet lines
		Providing tablets and laptops to teachers and students in school
	Educational content	Designing educational content for modern technologies for students
		Designing educational content for modern technologies for teachers and administrators
		Designing presentable syllabuses by information technology tools such as smart boards, etc.
		Designing healthy and specific content for students in virtual space
Control and coordination in educational technology	Coordination between educational policies	Collaboration of teachers with ministry policies to employ technology
		Coordination between students' ethical and belief policies with ministry policies
		Implementation of educational policies based on written laws provided by administrators and teachers
	Coordination between colleagues	Collaboration of teachers in using educational aids with other teachers
		Collaboration of teachers in teaching innovative tools with educational technology experts
		Collaboration of teachers with school administrators in using educational aids
		Collaboration of teachers in maintaining and preserving technology tools in schools
	Supervision and control over implementation	Risk control of using educational technology
		Control over the amount of use of educational technology tools by students
		Control and supervision over the type of presentable content in educational technology tools
Educational technology infrastructures	Technological infrastructure	Internet bandwidth
		Availability of the internet in all educational places
		Workshops equipped with modern technologies
	Financial infrastructure	Students' access to technology at home
		Providing the necessary financial resources for schools to purchase

		educational technology tools
		Providing high-speed internet to schools without restrictions
	Knowledge infrastructure	The possibility of using educational spaces outside the school with technological facilities for practical and theoretical lessons
		Teachers' mastery of teaching methods used in educational technology
		Designing teaching patterns related to educational aids
		Supporting teachers to learn about modern technologies
	Cultural and social infrastructure	Teaching lessons using radio and television programs
		Teaching parents how to use technology properly
		Teaching students how to select healthy content
		Teaching parents how to select healthy content

The findings showed that 55 basic themes, 15 organizing themes, and 4 comprehensive themes were identified for the factors affecting the maturity model of educational technology management in Iranian schools. These themes included comprehensive themes of managing educational technology knowledge (with 5 organizing themes of learning educational technology knowledge, sharing educational technology knowledge, applying educational technology knowledge, analyzing educational technology knowledge, and evaluating educational technology knowledge), educational technology resources and facilities (with 3 organizing themes of human resources, physical resources, and educational content), control and coordination over educational technology (with 3 organizing themes of coordination between educational policies, coordination between colleagues, and monitoring and control over implementation), and educational technology infrastructure (with 4 organizing themes of technology infrastructure, financial infrastructure, knowledge infrastructure, and cultural and social infrastructure). The results of the direct matrix of comprehensive themes affecting the maturity model of educational technology management in Iranian schools were extracted in Table 2.

Table 2. Results of direct matrix of comprehensive themes and influential factors on the model of technology maturity management in Iranian schools

0 = No effect 1 = Very low effect 2 = Low effect 3 = High effect 4 = Very high effect	Knowledge management in educational	Resources and facilities of educational technology	Control and coordination in educational technology	Educational technology infrastructure
Knowledge management in educational	0.000	2.833	2.764	2.454
Resources and facilities of educational technology	1.286	0.000	2.675	2.675
Control and coordination in educational technology	1.767	2.536	0.000	2.564
Educational technology infrastructure	2.876	3.019	2.565	0.000

The results of normalizing the direct matrix of comprehensive themes affecting the maturity model of educational technology management in Iranian schools were extracted in Table 3.

Table 3. Results of normalization of direct matrix of comprehensive themes and influential factors on the model of technology maturity management in Iranian schools

Normalization of direct matrix	Knowledge management in educational	Resources and facilities of educational technology	Control and coordination in educational technology	Educational technology infrastructure
Knowledge management in educational	0	0.334915	0.326665	0.290049
Resources and facilities of educational technology	0.151978	0	0.316146	0.316159
Control and coordination in educational technology	0.208912	0.29982	0	0.303024
Educational technology infrastructure	0.340003	0.356855	0.303142	0

The results of the overall relationship matrix of comprehensive themes affecting the maturity model of educational technology management in Iranian schools were extracted in Table 4.

Table 4. Results of the overall relationship matrix of comprehensive themes and influential factors on the model of technology maturity management in Iranian schools

Normalization of direct matrix	Knowledge management in educational	Resources and facilities of educational technology	Control and coordination in educational technology	Educational technology infrastructure
Knowledge management in educational	-0.6149	0.385099	0.385099	0.385099
Resources and facilities of educational technology	0.201992	-0.79801	0.201992	0.201992
Control and coordination in educational technology	0.242339	0.242339	-0.75766	0.242339
Educational technology infrastructure	0.44705	0.44705	0.44705	-0.55295

The causal diagram of comprehensive themes affecting the maturity model of educational technology management in Iranian schools was extracted in Table 5.

Table 5. Results of the causal diagram of comprehensive themes and influential factors on the model of technology maturity management in Iranian schools

Variable	Symbol	Sum of rows	Sum of columns	Sum of rows+sum of columns	Sum of rows – sum of columns
Knowledge management in educational	C1	0.540397	0.27648	0.816877	0.459
Resources and facilities of educational technology	C2	-0.19203	0.3023	0.084447	0.771
Control and coordination in educational technology	C3	-0.03064	0.2945	0.245835	-1.040
Educational technology infrastructure	C4	0.7882	0.2522	1.06468	0.219

The results of the impact and susceptibility of comprehensive themes affecting the maturity model of educational technology management in Iranian schools were extracted in Table 6.

Table 6. Results of the impact and influence of comprehensive themes and influential factors on the model of technology maturity management in Iranian schools

Variable	Symbol	Sum of rows	Ranking	Sum of columns	Ranking
Knowledge management in educational	C1	0.540397	2	0.27648	3
Resources and facilities of educational technology	C2	-0.19203	4	0.3023	1
Control and coordination in educational technology	C3	-0.03064	3	0.2945	2
Educational technology infrastructure	C4	0.7882	1	0.2522	4

The findings showed that two comprehensive themes of educational technology infrastructure and managing educational technology knowledge were influential due to the higher sum of variable rows, while two comprehensive themes of educational technology resources and facilities and control and coordination over educational technology were susceptible due to the higher sum of variable columns. Therefore, the causal diagram of influential and susceptible comprehensive themes affecting the maturity model of educational technology management in Iranian schools was extracted in Figure 1.
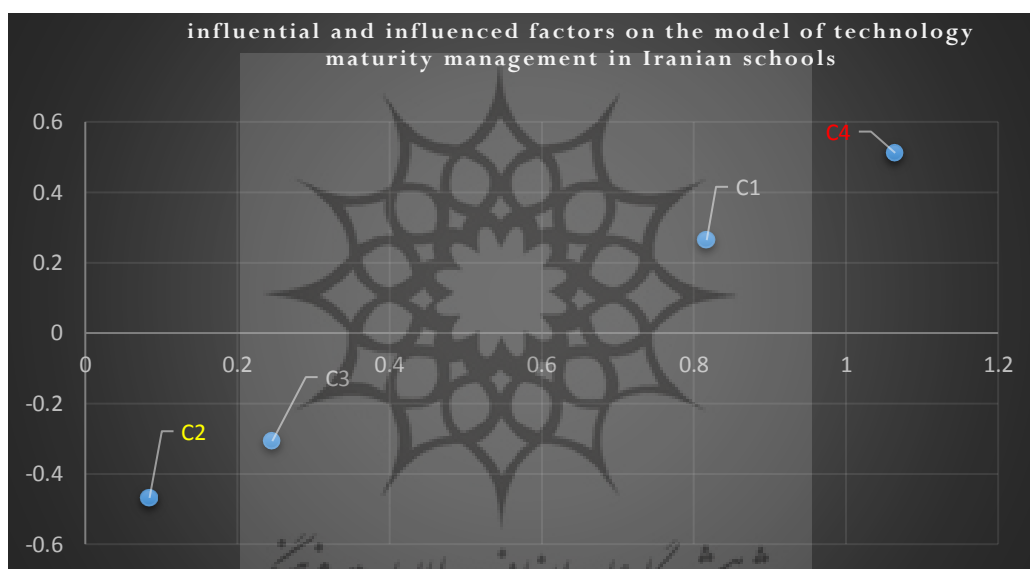

Figure 1. Comprehensive themes of influential and influenced factors on the model of technology maturity management in Iranian schools

4. Discussion

One of the important topics in Iranian schools today is the management of educational technology maturity. Therefore, this study aimed to identify and examine the factors affecting the model of educational technology maturity management in Iranian schools. The findings of this study showed that 55 basic themes, 15 organizing themes, and 4 learning themes were identified as the factors affecting the model of educational technology maturity management in Iranian schools. These themes included learning themes of educational technology knowledge management (with 5 organizing themes of learning educational technology knowledge, sharing educational technology knowledge, applying educational technology knowledge, analyzing educational technology knowledge, and evaluating educational technology knowledge), educational technology resources and facilities (with 3 organizing themes of human resources, physical resources, and educational content), control and coordination of educational technology (with 3 organizing themes of coordination between educational policies, coordination between colleagues, and supervision and control of implementation), and educational technology infrastructure (with 4 organizing

themes of technology infrastructure, financial infrastructure, knowledge infrastructure, and cultural and social infrastructure). Additionally, two learning themes of educational technology infrastructure and educational technology knowledge management were found to be more influential due to the higher sum of rows of variables, while two learning themes of educational technology resources and facilities and control and coordination of educational technology were found to be more susceptible to influence due to the higher sum of columns of variables. These findings were consistent with the findings of Alipour et al (2021), Amro (2022), and DePryck et al (2022).

In explaining the findings of this study, it should be noted that the new education system seeks to establish better communication between teachers and learners and to have a better impact on the education system in order to achieve its goals. In addition to focusing on educational content, it strives to achieve this through various solutions and greater attention to educational elements, including reviewing the philosophy of education, redefining the roles of schools in education, and the interaction between teachers, school officials, and the student learning environment. Attention to the use of new tools and technologies such as information technology, curriculum planning, and educational management is also important (Alipour et al, 2021). The phenomenon of information technology and its impact on various aspects of life has led to some fundamental changes in human society. This phenomenon has rapidly influenced human needs and created new needs. Therefore, information technology is knowledge, skill, or technical method in utilizing information. The development of software based on these technologies and its rapid adaptation to human needs has led to the creation of a new form of creative, active, and pervasive learning environment (Ahmadigol et al, 2021). In other words, educational policy requires the utilization of potential and providing opportunities to improve talent, which can only be achieved by accelerating the use of information and communication technology and digital media to promote a new culture of lifelong learning in education (Bresolin, DeSa Freire, and Da Silva, 2022).

Development and progress of societies are among the fundamental goals of every community, and its foundations are laid in the period of education and the educational system of each country. One of the most tangible aspects of the educational system is information technology. The goal of information technology in education is to create new educational systems to increase productivity and, as a result, emphasize learning. Optimal use of educational technology during teaching and learning can activate students' attention and make education more practical and realistic. By enriching the quality of teaching and learning, it is even possible to improve the efficiency of education. Educational technology is a set of methods and guidelines used to solve educational problems, including planning, implementation, and evaluation in educational programs, using scientific findings (Lee & Witchel, 2022). Educational technology has been widely used to improve teaching and learning activities in universities. Educational technology began as a "medium" in the 1960s and was considered a "process" in the 1990s (Ewiss et al., 2022). Educational technology goes beyond the use of tools and equipment; in a sense, it is mostly a collection of different components that make up the technology and is a systematic method of designing, implementing, and evaluating the entire process. From the perspective of "branch," educational technology is the study and aesthetic action that facilitates learning and improves performance through the use and management of appropriate technological processes and resources. According to this definition, it is possible to take learning theories and principles from any theory and develop learning programs using any method or approach (McGarr & Johnston, 2021). In general, a society whose goal is progress based on knowledge and technology must first transform its education and training. To this end, educational technology, i.e., the planned design, implementation, and evaluation, must be used and fundamental and applied research must be employed. Educational technology can eliminate barriers between parents and teachers, homes, classrooms, and educational areas across the country and, facilitate interaction between students, parents, and teachers and help expand learning beyond school. In addition, teachers can be trained to teach online, which can easily increase the experience of experienced teachers (Amro, 2022).

Finally, to manage the maturity of educational technology in Iranian schools, it is recommended to:

1- Pay special attention to managers familiar with new technologies in their appointments and select managers familiar with the main and subsidiary themes of educational technology management.

2- Managers should be aware of educational technology in their organizational affairs and decision-making.

3- Using the above research, the evaluation form should be prepared by the evaluation unit based on current technologies in educational areas and made available to managers.

4- Planning should shift from centralized to semi-centralized.

5- In-service courses should be held to train managers in new technologies.

Ethical considerations

In this study, informed consent was obtained, identity information was preserved, and trustworthiness was observed in implementing the content of the interviews as ethical considerations.

Acknowledgments

The authors would like to thank everyone who contributed to this research.

Authors' contributions

All authors contributed equally to this study.

Conflict of interest

There was no conflict of interest in this study.

References

Ahmadigol J, Dehghanzadeh H, Rezaei I. (2021). Analyzing the situation of educational technology graduates and detecting the effecting factors. *Journal of Management and Planning in Educational Systems*. 14(1): 341-366. [Persian]

Alipour N, Nowrozi D, Nooryan M. (2021). Designing the model of components affecting the quality of electronic learning environments. *Technology of Education Journal*. 15(3): 503-518. [Persian]

Amro IY. (2022). Implementing e-learning maturity model at Al-Quds open university in Palestine. *Palestinian Journal for Open Learning & E-Learning*. 1(16): 10-18.

Asheghi P, Imani MN, Sharifi A. (2022). Identifying the effective normative and behavioral variables in the performance of primary school principals. *Iranian Journal of Educational Society*. 8(1): 352-361. [Persian]

Astuti M, Arifin Z, Mutohhari F, Nurtanto M. (2021). Competency of digital technology: the maturity levels of teachers and students in vocational education in Indonesia. *Journal of Education Technology*. 5(2): 254-262.

Bresolin GG, DeSa Freire P, Da Silva SM. (2022). Maturity criteria of the networked corporate university model to support knowledge and organizational learning governance. *In Knowledge Governance and Learning for Organizational Creativity and Transformation*. 365-384.

DePryck K, Kaptijn R, Chapel L, Buunk L. (2022). Using the challenge based learning maturity model (CBL-MM) as a quick scan to support teaching innovation. Association for the Advancement of Computing in Education (AACE), *In Society for Information Technology & Teacher Education International Conference*. 336-34.

Ebrahimi Tabar R, Satari S, Soleimani T. (2023). Designing an effective management model in third millennium schools (Case study of school principals in Ardabil province). *Iranian Journal of Educational Society*. 9(1): 137-146. [Persian]

Ewiss MAZ, El-Sherif AA, Seif WM. (2022). Educational development in the post-covid-19 Arab world using capability maturity approach. *14th International Conference on Education and New Learning Technologies*. 1700-1709.

Jahani J, Mazaheri R, Mohammadi M, Shafiei Sarostani M. (2020). Development and validation of teaching-learning tools in smart schools in the education system of the Islamic Republic of Iran. *Technology of Education Journal*. 14(3): 493-505. [Persian]

Lee M, Witchel H. (2022). Interntional innovation in educational technology and media to promote students' holistic development. *The FASEB Journal*. 21: 36-47.

McGarr O, Johnston K. (2021). Exploring the evolution of educational technology policy in Ireland: From catching-up to pedagogical maturity. *Educational Policy*. 35(6): 841-865.

Mirzaei Kh, Sepahpanah M. (2020). Study of the effectiveness new educational communication tools in comparison with traditional methods in increasing water recourses users knowledge. *Technology of Education Journal*. 14(2): 405-414. [Persian]

Rezaei A, Yasblaghi B, Khanjani Vashki S. (2022). The application model of educational technologies to improve students' learning: the application of interpretive structural modeling. *Management and Planning in Educational Systems*. 3(2): 132-145. [Persian]

Saracoglu G. (2020). Relationship between high school student's motivation levels and learning strategies. *International Journal of Progressive Education*. 16(3): 67-83.

Sharkey M, Gash H. (2020). Teachers' constructivist and ethical beliefs. *Behavioral Sciences*. 10(96): 1-13.

Stachowiak A, Pawlyszyn I. (2021). From fragility through agility to resilience: The role of sustainable improvement in increasing organizational maturity. *Sustainability*. 13(4991): 1-17.