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Identifying Factors Affecting Electronic Learning in Information Retrieval

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Abstract

Purpose: The field of providing information and the method of publishing information has permanently been subject to modification and alteration, and as we know, with the introduction of computer technology in the field of librarianship and the change in the way of providing services, the imperative task of information dissemination has been reserved for librarians. The dissemination of information technology into the education system has led to the emergence of a new concept called e-learning. The task of libraries is to provide infrastructures for information retrieval through the production of integration, organization, and distribution of knowledge. The methods that libraries employ for e-learning include learning collections, tools, and facilities necessary for studying, improving the quality of reference services, and ensuring universal access to books. Therefore, this research aims to identify the factors influencing e-learning in information retrieval.

Method: This current research is developmental was conducted using a qualitative approach and grounded theory. The population of the study consisted of 20 experts in the field of information technology in public libraries across the country, who were selected through purposive non-

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probability sampling. Data were collected through interviews and analyzed through three stages of open, axial, and selective coding, based on which the research model was designed.

Findings: The findings showed that e-learning in information retrieval contains of six main dimensions, 45 sub-dimensions, and 85 concepts, which are presented in a paradigm model including causal factors (quality of e-learning website design, quality of education in e-learning environments, employees' enthusiasm for developing knowledge capabilities, employees' belief in continuous training), contextual factors (suitable technical equipment (hardware, software, and network), availability of necessary infrastructure, high accessibility, periodic purchase of required equipment, ease of learning and simplicity of teaching platforms (instructors)), interveners (competence of instructors in course delivery, course development based on indigenous data, organizational culture and atmosphere), central factors (strategies for enhancing the quality of e-learning in information retrieval, processes for improving the quality of e-learning in information retrieval, infrastructures for improving the quality of e-learning in information retrieval), strategic factors (existence of an appropriate incentive system for promoting knowledge sharing (systemic strategy), security of software used (educational approach), efficient support and feedback mechanisms (responsiveness strategy)), and consequences (consistency of goals and plans, adequate understanding of e-learning, formulation of standards, capability in information retrieval).

Conclusion: Based on the dimensions, main factors, and sub-factors, the impacts of e-learning in information retrieval can be measured and managed in the studied community.

Keywords: Electronic Learning, Information Retrieval, Educational System, Effective Factors.

Introduction

Information has become a vital tool in relationship between people and organizations, this tool that has affected all human activities from the most basic to the most complex as a collaborative activity (Shahbazi, Norouzi & Alipour-Hafezi, 2014). Extensive research has been conducted so far with the assistance of information scientists and other researchers in various fields, among which information retrieval can be mentioned. The term "information retrieval" was first proposed by Mooers in 1951 (Ehsanifar, 2016). Information retrieval refers to a process in which a set of information is processed, stored, retrieved, and disseminated to meet the user's information needs. Although information retrieval can be a manual and non-electronic process (for example, using an index to retrieve information from a book), this term is generally used when a set of information is electronically stored, and the collation process and searching are carried out by computer (Seyyeddokht & Emami, 2021).

The provision of information and it's dissimination have always been subject to change and transformation. With the introduction of computer technology to the library, the field of librarianship, and the changing way of providing services, the critical task of disseminating information has been reserved for librarians (Shirazi et al., 2016). With the emergence of new information technologies and the challenges of information societies, the traditional role of libraries has changed, and functions such as teaching and creating computer skills have become more prominent. Therefore, librarians especially public librarians should first be equipped with these skills. People's lack of ability to retrieve information and their low computer literacy cause them to be unsuccessful in information retrieval (Abtahi, 2017). Due to the nature of their job, librarians must be interested in changes and adapt their services delivery methods in harmony with the changes. This enables them to respond to the information needs of citizens effectively (Mohammadi Fard, 2015).

On the other hand, with the increasing development in fields related to information and communication technology, tools have been created that can play an influential role in knowledge transfer. One of these tools is electronic learning. The capablities of the electronic environment have now proposed a new approach in the area of education, which can cause tremendous changes for educational methods and styles (Rafiei et al.,

2017). Web-based learning is usually known as e-learning or virtual learning, which includes online learning through training courses generally provided in the virtual education system. With the help of the virtual education system, learning processes can be done electronically (Ghalyan & Zalpour, 2019). Currently, virtual education has become a growing tool to improve education due to the advantages of cost savings, reusability, and flexibility for the learner (Dinari & Andishmand, 2021). This type of learning provides learners with a virtual environment to participate in different courses. These courses include research activities and audio-visual interaction with varous topics (Amado-Salvatierra et al., 2016).

Virtual education has created a new paradigm and has provided the possibility of learning in any field, for any person, at any time, and at any place (Khan, 2017). One of the tasks of libraries in the present era is to provide infrastructure to integration, organization, and distribution of knowledge. The way libraries use e-learning includes learning collections, tools, and facilities necessary for studying, increasing the quality of reference services, and universal accessibility of books. Public libraries, on the other hand, help learners by providing resources and copies. Therefore, for the flourishing of services as much as possible, librarians should cooperate with the producers of educational programs increase their understanding of education and learning theories, and actively participate in academic structures. Librarians should be aware of the trends and approaches to change in teaching and learning in today's world and the impact of such policies and trends on the evolution of library services. On the other hand, they should guide the learner in expressing his real needs and ensure his needs are met. It should be kept in mind that empowering learners in learning and acquiring knowledge depends on the capability of information specialists (Daneshvar, 2014). Based on the problem stated, this study was conducted to identify the factors that have an impact on e-learning in the field of information retrieval. Therefore, the following research questions were raised to achieve the above goal:

- What are the factors influencing electronic learning in library information retrieval?
- What are the causal components of the model of factors influencing electronic learning in library information retrieval?
- What are the contextual components of the model of factors influencing electronic learning in library information retrieval?
- What are the intervention components (environmental) of the model of factors influencing electronic learning in library information retrieval?
- What are the main issue components (phenomenon) of the model of factors influencing electronic learning in library information retrieval?
- What are the strategic components of the model of factors influencing electronic learning in library information retrieval?
- What are the consequences of the components of the model of factors influencing electronic learning in library information retrieval?

E-Learning

The concept of e-learning is more than what we call online learning, virtual learning, distributed learning, network learning, or web-based learning. Considering that the letter E in e-learning means electronics, e-learning should include all educational activities carried out by people in and outside the network, simultaneously or asynchronously from computers connected to the network or separately. It has what is done from the network and other electronic tools. According to what was said, electronic learning can be defined in two general and specific meanings. E-learning in its broad sense can be defined as follows (Ghasemi et al., 2018):

0 E-learning is a form of learning that utilizes various electronic tools (such as the web, intranet, extranet, satellite networks, audio and video tapes, interactive television, and CDs) to deliver content, which can be controlled through different methods (self-directed or instructor-led) and executed using different structures (courses, modules, small

learning activities). It is not limited by geographical or temporal constraints (synchronous/asynchronous).

0 Based on the above definition, using electronic tools in learning can be considered e-learning. However, in a more specific sense, e-learning refers to using web-based technologies such as synchronous and asynchronous communication technologies, online databases, digital libraries, etc. Sometimes, similar concepts like online learning and virtual classrooms are used interchangeably with web-based learning.

Information retrieval

Information retrieval refers to the process in which a set of information is processed, stored, retrieved, and disseminated to meet the information needs of users (Seyyeddokht & Emami, 2021). The field of information dissemination and the method of distributing information has always been subject to change and evolution, as we know, with the introduction of computer technology into libraries and changes in the way services are provided, the vital duty of information dissemination for librarians has remained intact (Shirazi et al. ,2016). In other words, in an era where information formats and retrieval methods are constantly changing, it is only through acquiring new skills that we can keep up with emerging technologies and changes in users' information behavior and respond to new user expectations (Tavakoli, 2011).

Today, with the emergence of novel information technologies and the challenges of information societies, the traditional role of public libraries has changed, and functions such as education and creating computer literacy skills have become more prominent. Therefore, librarians of public libraries should equip themselves with these skills first and foremost. A librarian who lacks computer literacy can never be an appropriate guide for library users. The inability of individuals to retrieve information and their low level of computer literacy make them unsuccessful in retrieving report (Abtahi, 2017). Librarians, due to the nature of their profession, must not only be receptive to changes and adapt their services and service delivery methods in harmony with these

changes, but also need to be able to meet the information needs of citizens (Ziaei et al., 2017).

The relationship between e-learning and information retrieval

With the increasing development in the fields related to information technology and communications, tools have been created that can play an influential role in transferring human knowledge, one of these tools being e-learning. The facilities of the web-based electronic environment have now introduced a new approach in the field of education that can lead to significant changes in teaching methods and styles (Rafiei, Ghaffari & Khorami, 2017). Web-based learning is usually known as e-learning or virtual learning, which essentially involves online learning through educational courses offered in virtual learning environments. With the help of a virtual learning environment, learning processes can be conducted electronically (Ghalyan & Zalpour, 2019).

Currently, virtual learning has become a growing tool for enhancing education due to its cost-effectiveness, reusability, and flexibility for learners (Dinari & Andishmand, 2021). This type of learning provides a virtual environment for learners to participate in various courses, including research activities and audio-visual interactions on different topics (Amado-Salvatierra et al., 2016). In other words, virtual learning is using the internet for learning, which can be accessed through online communication and a web browser at any time or place (Pahlavi Farahani, 2017). In the information age, human knowledge and skills must continuously develop and improve to keep up with the rapid growth of new technologies. Information technology and computer networks have significantly impacted the enhancement of learning and the provision of opportunities for improving educational systems, particularly at different levels. Virtual learning, supported by advancements in the IT industry, is considered a modern solution for developing academic fairness in the contemporary world (Yarmohamadzadeh et al., 2021).

Regarding e-learning and information retrieval, the review of research backgrounds shows that using e-learning leads to better information retrieval. In the following research, various fields have been explored in relation to electronic learning and information retrieval.

In 2023, Kiyaei, Shirzad Kebria, & Hamidi Far conducted a research study entitled: "Identification and Validation of Dimensions and Components of Electronic Training Model for Bank Tejarat Managers." The study revealed that the electronic training model for Tejarat Bank managers is comprised of underlying factors such as cultural preparation, technical preparation, educational preparation, environmental preparation, causal factors (including human factors, academic structure, and policies, and management), intervening factors (including individual approaches, managerial approaches, strategies, academic approaches, pedagogic and pedagogical approaches, educational measurement and evaluation, ease of access, targeted educational quality, innovation and creativity, integrated management), and results (including educational success and forward-looking meritocracy, increasing effectiveness, and improving organizational performance).

In a study conducted in 2022 by Ohani Zonouz et.al, the primary objective was to develop a suitable model for evaluating the quality of lectronic curricula in the country's higher education system. The results showed that the four main factors for the model for assessing the quality of electronic curriculum are: management and organization, pedagogy factor, technology factor, and evaluation factor. Additionally, eight main factors were obtained for the electronic curriculum quality evaluation model, including evaluation, pedagogical, organizational and managerial, individual, technological and electronic, environmental, learning, and ethical. Furthermore, Ghanbari et al. (2019) used exploratory and confirmatory factor analysis in 2019 to present the e-learning evaluation model in the electronic unit of Islamic Azad University. The study highlighted that the most essential components of e-learning evaluation include system quality, information quality, and content. The effectiveness of e-learning is influenced by several key factors, as highlighted in various studies and articles. These factors include the quality of the professor, the

interaction between the professor and the student, the willingness of the user, and the success of virtual education.

Research on e-learning and information retrieval has also been conducted outside of Iran. For example, Thongmak (2021) believes that game elements, along with the readiness of the organization for online learning (resource readiness, instructional readiness, and environmental readiness), indirectly affect employees' lifelong learning intentions through their self-determinants (autonomy, relatedness, competence). The results of Al-Fraihat et al. (2020), validated the model empirically through a partial least squares structural equation modeling (PLS-SEM) approach by examining the model using data collected from 563 students who used e-learning systems in one of the universities in England. Determinants of perceived satisfaction with e-learning include: technical system quality, information quality, service quality, support system quality, learner quality, instructor quality, and perceived usefulness, which explain 4.71% of the variance in perceived satisfaction. Technical system quality, information quality, support system quality, learner quality, and instructor quality are the determinants of perceived usefulness, which explain 2.54% of the variance in perceived usefulness. Four influential factors on e-learning usage, namely instructional system quality, support system quality, learner quality, and perceived effectiveness, account for a total of 34.1% of the variance. Finally, 64.7% of the variance in e-learning benefits is explained by perceived effectiveness, perceived satisfaction, and satisfaction, and usefulness application.

A review of articles and studies conducted in Iran on the topics of e-learning and information retrieval shows that many studies focus on the subject of e-learning. This highlights the efforts and serious attention of researchers and theorists to provide valuable solutions for improving the relationship and effectiveness of these two variables while emphasizing the importance of e-learning in information retrieval. Most studies on e-learning have reached comparative conclusions, despite focusing on different aspects. Based on the research background, it can be stated that increased access to education,

improved quality of learning, reduced training costs, and increased cost-effectiveness of education are the most important reasons for using technology in organizations.

The use of information and communication technology makes the learning process accessible through a variety of resources and formats, allowing learners to choose their preferred time, location, and design of instructional tools according to their particular needs and circumstances. The flexibility of e-learning allows individuals with work, personal, or social commitments to access learning opportunities, as highlighted in various studies and articles. Additionally, there is no need to spend high costs on providing teachers, educational spaces, and other physical facilities for training in this educational model. Therefore, individuals can communicate with each other and their instructors from anywhere in the world, discuss their perspectives and questions continuously, and be evaluated accordingly. Thus, the importance of e-learning features is undeniable.

Method

This research was conducted using a qualitative approach and drawing on the grounded theory. The study population consisted of experts in the field of information technology who have executive records for decision-making (Table 1). The data collection tool was semi-structured interviews. The interviewees included 20 experts and active individuals in the field of information technology who were purposively selected using a non-probability sampling method. During the data collection period, the interview questions were sent electronically to the selected sample due to the COVID-19 pandemic and individuals' lack of willingness for direct contact. This method allowed participants to express their opinions and experiences regarding the subject while maintaining social distancing and avoiding face-to-face interactions. Data analysis in this study was performed based on the theoretical coding method derived from Corbin and Straus's grounded theory (2008). This method consists of three main stages: open coding, axial coding, and selective coding:

In the first stage, appropriate codes were assigned to different parts of the data. The process of determining codes in the form of concepts is known as open coding. Then, by thinking about the various dimensions of these concepts and finding the links between them, the researcher proceeded to axial coding. It should be noted that during these coding processes, the researcher paid attention to individuals, events, and various situations by using theoretical sampling, which provides a richer image of the resulting concepts and categories. Finally, through selective coding, the classes were refined and, by going through these processes, the theoretical framework of the research emerged. After identifying the dimensions and components, the relationships between the specified features and dimensions were categorized into the central category (the concept label that is considered in the research). other dimensions in the layers of conditions (these are conditions that create and develop the central phenomenon), intervening conditions (these conditions are called general conditions that, along with contextual factors, affect the strategies), contextual factors (broad and extensive conditions that affect the development or threat of the phenomenon and the importance of the phenomenon), strategies (are interactions and activities that are taken in response to the central phenomenon and under the influence of intervening conditions and contextual factors), and consequences (refers to the implications of the strategies and actions taken by the organization) were placed in the model (Beiraghipanah et al., 2020).

Table 1. Demographic information of interviewees

Participant ID	Gender	Education Level	Age	Work Experience
1	Male	Master's	35	13
2	Female	Master's	28	4
3	Male	Master's	46	17
4	Male	Master's	33	4
5	Female	Master's	34	12
6	Female	Master's	27	3
7	Male	Master's	36	4

8	Male	Ph.D.	37	7
9	Female	Master's	38	8
10	Female	Master's	36	44
11	Male	Ph.D.	58	14
12	Female	Master's	24	2
13	Male	Master's	38	15
14	Male	Master's	33	4
15	Female	Master's	28	4
16	Male	Ph.D.	43	17
17	Female	Master's	26	3
18	Male	Ph.D.	33	4
19	Male	Master's	39	13
20	Female	Master's	27	5

Table 2. An example of verbal statements identified regarding the factors affecting electronic learning in information retrieval

Interviewee code	Sample Sentences	Conceptualization	Categories
A20, A17, A3, A4, A15	An electronic learning mechanism in information retrieval that can meet information retrieval needs is considered a requirement for an e-learning program.	Attention to user interfaces Schema suitable and compatible with standards	The quality of the design of the educational website
A12 ,A14, A19, A1, A5	The factors that impact e-learning in information retrieval possess the power to motivate and guide productive and favorable actions in individuals, thus enhancing their performance. Conversely, these factors can also impede ineffective behaviors from surfacing. Additionally, aligning goals and strategies toward maximizing the effectiveness of data retrieval is critical.	Alignment of organizational goals with e-learning model strategies in information retrieval Ease of coordinating goals Improving the position of e-learning in information retrieval Alignment of e-learning programs and goals with strategies and structure	Matching goals and strategies

A7, A3, A8, A12, A14, A19, A13	E-learning has been recognized as a significant advantage for organizations in the field of information retrieval. When employed and implemented effectively, it can result in substantial changes in structures and standards, leading to the establishment of new frameworks and standards on the web.	Compliance of inputs, processes, and outputs and consequences of the electronic learning system in information retrieval with standards Applying the electronic learning model in optimal information retrieval Achieving more comprehensive standards in information retrieval	Compilation of standards

It is worth mentioning that Table (2) includes the identified codes and several statements from the interviewees as evidence. Regarding the factors influencing e-learning in information retrieval, it should be noted that during the data coding phase of each interview, participants may have mentioned the same thing multiple times. To prevent repetition and interference with the codes in each interview, only sentences closely related to the target code were considered.

Instead of the term's authenticity and reliability, Lincoln and Gu ba (1985) in qualitative research, the evaluation criteria are based ontrustworthiness, credibility, dependability, conformability, transfera bility, and authenticity (Lincoln & Guba,1985). These four criteria were employed in the present study.

- To ensure credibility, confidence in the 'truth' of the findings. the researcher dedicated sufficient time and sought approval from three experts on the research process. Two codes were used to code various samples of open-ended questions to build confidence among coders. Additionally, objective questions that could be measured were utilized, such as asking participants to provide concrete examples of e-learning in information retrieval, which increased the reliability of the research data to an acceptable level. Overall, continuous involvement,

integration in research, revision, monitoring, and use of evidence are the measures taken to achieve credibility and determine the validity level of the study.

- The Transferability- showing that the findings have applicablity in other contexts, i.e. refers to the ability to apply the findings of a study to other groups and settings. To ensure the transferability of the research results, the authors consulted with three experts. Additionally, the demographic information of the study participants reveals that they were academic staff members and librarians who had long been engaged with the research topic and were also active in their respective fields of study. Throughout the research process, detailed notes were taken to ensure accuracy.
- Dependability - showing that the findings are consistent and could be repeated. Achieving reliability on a specific scale requires a stable procedure for data collection. The proximity and correlation of research findings indicate the adequacy of analysis, allowing readers to follow the researcher's decision-making process. Thus, the scientific accuracy of results is established through reliability. In the current research, all text was noted and converted into propositions for coding to prove the scientific accuracy of results.
- Confirmability-a degree of neutrality or the extent to which the findings of a study are shaped by the respondents and not researcher bias, motivation, or interest. Confirmability is a gradual and ongoing standard that necessitates the step-by-step documentation of data and the time sequence of data collection. In the current research, all findings, analyses, and interpretations were thoroughly documented and reported at each stage to ensure verifiability. Researchers carefully recorded all details at every step to confirm the findings.

Findings

The data analysis of this research was conducted following the Corbin and Straus (2008) guidelines, which encompass three critical stages of open coding, central coding, and selective coding. Ultimately, the qualitative research model is presented as such:

In the process of open coding, six main factors (categories), 45 sub-factors (criteria), and 85 conceptual propositions (identifiers) influencing information learning in information retrieval in public libraries were identified and their characteristics were determined within the surveyed groups. The dimensions of the coding paradigm are structured axially, encompassing six categories: central categories, causal conditions, intervening conditions, background conditions, strategies, and consequences. As such, this research utilized the dimensions of the coding paradigm to analyze the data gathered from the open questionnaire.

Table 3. presents the research findings of the coding conducted in the investigated groups.

Components	Axial coding (category)	Open Coding (Concepts)
Causal components	The quality of the design of the educational website	Attention to user interfaces You are suitable and compatible with the standards Good external structure Facilitating learning from an aesthetic and artistic aspect
	Education quality in electronic learning environments	Providing a suitable model of electronic learning in information retrieval E-learning leads to quality Enrichment of training Continuous evaluation of the quality of education
	The desire of employees to develop knowledge abilities	Employees' enthusiasm for continuous learning Employees' passion for knowledge creation Employees' passion for sharing and applying knowledge

Components	Axial coding (category)	Open Coding (Concepts)
	Employees' belief that there is continuous training	Employees' belief in learning and training Positive attitude to education Managers' belief in e-learning The existence of knowledge sharing between formal and informal employees The potential motivation of employees to learn Belief in up-to-datedness
Background/contextual components	Using suitable technical equipment (hardware, software, network)	Appropriate hardware equipment Advanced information technology Wide communication network Continuous electronic resources professional database Efficient search tools Information storage systems Up-to-date digital programs
	Existence of the required infrastructure	Management and leadership infrastructures (supporting managers from e-learning) Hardware infrastructure Human Infrastructure Organizational infrastructure Financial and economic infrastructure Efficient organizational systems
	High accessibility	Direct web accessibility Accessibility using assistive technology
	Buying the required equipment periodically	Evaluation of required equipment periodically Determining the need for equipment in each course Identifying the best equipment manufacturer Allocation of periodic capital for the purchase of equipment Customize the required equipment

Components	Axial coding (category)	Open Coding (Concepts)
	Ease of learning and simplicity of teaching platforms	Ease of e-learning Simplicity of learning platforms
Intervention components (environment)	Instructors' competence in providing courses	Master management of content and data Use of competent and motivated teachers Changing the role of instructors according to the e-learning needs
	Compilation of courses according to local data	The attention of course designers on local data Adaptation of programs to the needs of society
	Organizational culture and climate	Governance of education-oriented culture in the organization Attention to new education technologies Knowledgeable atmosphere prevailing in the organization Healthy conditions of competition and participation in the organization
Main components	E-learning quality improvement strategies in information retrieval	Accelerating the production of knowledge Attracting audiences in the country's public libraries with culture-building Changing teaching philosophy and paradigm Developing a strategic and operational plan for electronic learning in information retrieval

Components	Axial coding (category)	Open Coding (Concepts)
	Quality processes of e-learning in information retrieval	Creating the desired content and resources Organization and coordination in the production and compilation of e-learning content in information retrieval Creating collaborative learning processes Integration of educational technologies
Main components	E-learning quality infrastructures in information retrieval	Administrative infrastructure Support and maintenance of infrastructure Economic and financial infrastructure Technology infrastructure systems Appropriate use of e-learning capabilities in information retrieval Management approaches based on technology
Strategic components	The existence of a suitable incentive system to promote knowledge sharing (systemic strategy)	Incentivize knowledge sharing Promote knowledge sharing Use of incentives The better situation of knowledge employees in front of non-knowledge employees Effective motivational plans
	Security of used software (educational strategy)	Existence of software security standards, information security management

Components	Axial coding (category)	Open Coding (Concepts)
	Efficient support and the existence of feedback mechanisms (response strategy)	Existence of effective support systems Existence of feedback mechanisms Existence of feedback mechanisms to the end user
Components of results (consequences)	Alignment of goals and strategies	Alignment of organizational goals with e-learning model strategies in information retrieval Ease of coordinating goals Improving the position of e-learning in information retrieval Alignment of e-learning programs and goals with strategies and structure
	Effective understanding of e-learning	Create an effective understanding of knowledge-sharing Changing the philosophy and paradigm of teaching and information retrieval
	Developing standards	Compliance of inputs, processes, and outputs and consequences of the electronic learning system in information retrieval with standards Application of electronic learning model in optimal information retrieval Achieving more comprehensive standards in information retrieval
	Ability to retrieve information	Looking at information retrieval with a value approach Setting the stage for flawless data recovery Developing a strategic and operational plan for information recovery

During the selective coding phase, a conceptual model was formulated based on the identified dimensions and indicators related to the influences of e-learning on information retrieval. This model encompassed six main categories, which served as the primary elements, and 45 sub-factors, which functioned as the criteria. For this purpose, the approach of Strauss and Corbin was used in foundation data theorizing and the resulting paradigm model is presented in Figure 1:

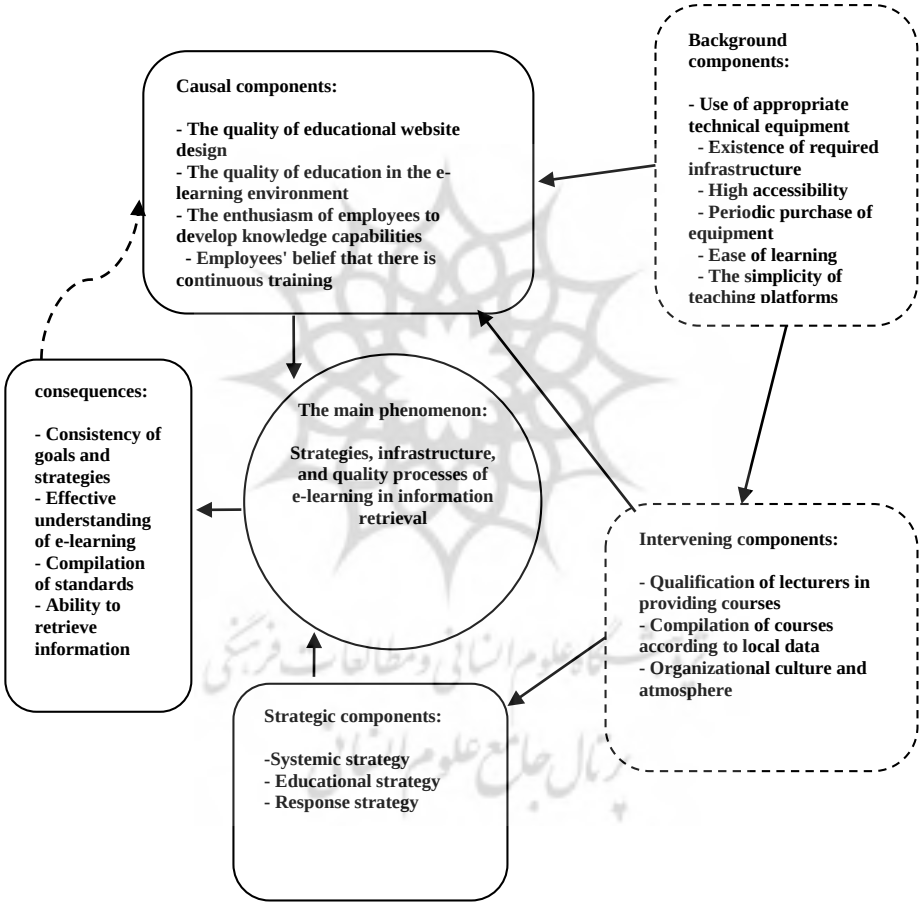

Figure 1. Paradigm model of e-learning in information retrieval

Conclusion

According to the research findings, a model for electronic learning in information retrieval in libraries focused on the primary research category of e-learning in information retrieval. The other identified categories were then examined about the main category based on their underlying characteristics and themes. The categories that had a direct or indirect impact on the phenomenon of e-learning were causal and strategic components. Additionally, more general categories were identified that indirectly influenced the phenomenon through their impact on the main categories. Intervening factors were also identified as categories that indirectly impacted the phenomenon by influencing causal conditions and facilitating the implementation of strategies. Finally, the category of background conditions was identified as another indirect factor that affected the e-learning phenomenon in information retrieval by influencing both the causal conditions and intervening factors.

The results of the research indicate that the categories of causal and strategic components have a direct and immediate impact on the phenomenon of e-learning, leading to its occurrence. Additionally, more general and broad categories were also identified, which indirectly influenced the phenomenon through their influence on the main types. Intervening factors are another category that indirectly impacts the phenomenon by influencing the causal conditions and facilitating the implementation of strategies. The background conditions category is another indirect factor that affects electronic learning in information retrieval by influencing both causal conditions and intervening factors.

Factors such as suitable technical equipment (hardware, software, and network), employee enthusiasm for developing knowledge capabilities, organizational culture and atmosphere, high accessibility, necessary infrastructure, teacher qualifications in providing courses, website design quality, security of software used, employee belief in the existence of continuous education, ease of learning, and simplicity of teaching platforms, course development based on local data, periodic purchase of required equipment, efficient support and feedback mechanisms, quality of education in electronic learning environments, and the presence of appropriate motivational systems to promote knowledge sharing for information retrieval have been identified as critical factors in the success of electronic learning in information

retrieval. These findings are consistent with previous research conducted by Ghanbari et al. (2019), Ghasemi et al. (2018), Al-Fraihat et al. (2020), Landis (2018), Guo et al. (2017), and Najmul Islam (2016) that investigated electronic learning and its influential factors.

Based on the findings from this study, e-learning is an effective tool for retrieving information in public libraries. As knowledge plays a vital role in the progress of a nation, the use of virtual and electronic training can contribute to the enhancement of information and computer skills, as well as the balanced development of organizational activities. Policymakers and education managers are taking steps to design educational systems that are flexible and accessible to cover various levels of organizations and promote empowerment. Virtual space offers the potential to increase the quality of learning through codified programs and changes in education structure and methods. It also allows for the coordination of educational products with societal needs and facilitates the application of efficient training for librarians. E-learning offers individuals the chance to expand their knowledge in science and other areas in a more efficient and cost-effective manner, facilitating the development of diverse skills.The availability of the internet makes it easier for people to access articles and new information for learning and empowerment.

In conclusion, adopting e-learning in information retrieval is a positive step towards library content management. Libraries can use this tool to retrieve information based on location and personal characteristics. In the future, libraries will likely adopt this new method to provide optimal on-site services and achieve the expected goals. Further research should be conducted to measure the impact of e-learning on information retrieval and identify the strengths and weaknesses of electronic learning in libraries.

CONFLICT OF INTEREST: The authors declare that they have no conflicts of interest regarding the publication of this manuscript.

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