# Identifying and prioritizing effective factors of e-learning effectiveness using hierarchical analysis in the Ministry of Education in Iran

## Identificación y énfasis de factores efectivos de efectividad del e-learning mediante análisis jerárquico en el Ministerio de Educación iraní

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**Abstract**

The purpose of present study was to identify and prioritize the effective factors of electronic learning effectiveness in the Ministry of Education of Iran, using a hierarchical analysis and through a descriptive-survey method. The statistical population of present study included managers and experts of Education Organization and a sample of professors with Ph.D. in Educational Sciences as well as experience of teaching in electronic training. Therefore, purposeful non-random sampling method was used to select the sample size. The used tool was a hurricane-thinking questionnaire. Indicators were organized as a questionnaire in the form of 5-point Likert scale and the effective factors of electronic learning effectiveness were identified through implementing subsequent rounds. The reliability of research tool with 28 items was calculated equal to 0.88 using Cronbach's alpha. Data analysis in the section of identifying effective factors of e-learning effectiveness was performed using Delphi method and utilizing from SPSS Software and in the section of prioritizing was performed through AHP method using Expert Choice Software.

**Keywords:** e-learning, individual characteristics, organizational characteristics, infrastructure.

**Resumen**

El propósito del presente estudio fue identificar y priorizar los factores efectivos de efectividad del aprendizaje electrónico en el Ministerio de Educación de Irán, utilizando un análisis jerárquico y mediante un método de encuesta descriptiva. La población estadística del presente estudio incluyó a gerentes y expertos de Organización Educativa y una muestra de profesores con Ph.D. en Ciencias de la Educación así como experiencia en la docencia en formación electrónica. Por lo tanto, se utilizó un método de muestreo intencional no aleatorio para

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seleccionar el tamaño de la muestra. La herramienta utilizada fue un cuestionario de pensamiento sobre huracanes. Los indicadores se organizaron como un cuestionario en forma de escala Likert de 5 puntos y los factores efectivos de la eficacia del aprendizaje electrónico se identificaron mediante la implementación de rondas posteriores. La fiabilidad de la herramienta de investigación con 28 elementos se calculó igual a 0,88 utilizando el alfa de Cronbach. El análisis de datos en la sección de identificación de factores efectivos de la efectividad del e-learning se realizó utilizando el método Delphi y utilizando el software SPSS y en la sección de priorización se realizó a través del método AHP utilizando el software Expert Choice.

## Introduction

Education, in the past and present, is mainly based on focusing the interaction between computer and human resources (Allen, 2016). There are many reasons and requirements for utilizing from technology in education, such as: the need for an integrated training system for work environment, use of an adaptable educational method, provision of a training system with time and spatial flexibility, combination of educational aspects and human factors in the environment to reach final consumers in order to achieve the desired learning outcomes (Brezavšček et al., 2014). Organizations consider investment in their employees' training to develop their performance as a means of identifying skills, knowledge and competence, so that such cases bring some advantages for an organization and it is difficult for its competitors to imitate it (Ibrahim et al., 2011). It should be noted that the use of e-learning can provide the basis for improving organizational performance when it is possible to provide effective organizational structures for all employees at the beginning of this process.

In this context, it would be possible to improve the effectiveness of e-learning when the necessary infrastructure to improve employees' performance and increase their abilities is provided (Al-Rahmi et al., 2015). The growing capabilities of web technologies and increasing acceptance of individuals and organizations to take advantage of many benefits of e-learning system reveal the need for conducting studies on identification of factors affecting the effectiveness of e-learning and providing ways to measure the e-learning effectiveness (Fallon & Brown, 2016). However, studies on e-learning systems in Iran have mainly focused on e-learning at universities or on issues before implementing this type of training. In fact, the lack of research studies in this regard is quite tangible despite of widespread use of e-learning by organizations and the high importance of measuring educational effectiveness (Lo, 2014). The subject of education is more important in Ministry of Education as a trustee of high-level education. There are individuals working in this ministry who ultimately are directly or

indirectly involved with the subject of community education (Aydin & Tasci, 2005). Therefore, utilizing from new methods that can effectively transfer these trainings to this group of people is also very important (Bernard et al., 2004). In this regard, e-learning can be implemented efficiently when it can ultimately take into account the various dimensions of effectiveness and infrastructural factors. It is while that no effective research study has ever been conducted on this field so that executive activities can be performed by relying on it. The main question of present study is: can the dimensions of effective relationships be identified in Ministry of Education due to the wide range of e-learning?

### *Theoretical framework*

Education can be considered a kind of continuous and systematic activity which usually is conducted under the guidance of skilled attendants and aimed to develop the level of knowledge, skills and behavioral patterns required by individuals to perform their work activities with high level of performance (Anohina, 2005). In fact, education helps organizations to achieve their goals on the one hand and fosters their workers and employees on the other hand (Ibrahim et al., 2011). Education is increasing in the industry and plays a strategic role in many companies and organizations. Organizational managers are keen to increase their strategic position through training and education. Executive executives are also keen on providing their skills through training. Understanding the various factors that promote or hinder the growth of learning is important when designing and developing educational programs (Darzi, et al., 2012). In traditional education, educators are considered as an important factor in the educational environment. Educators' readiness and knowledge in traditional education plays an important role in his ability to train. In a study conducted on petrochemical workers in Indonesia with the aim of comprising two types of virtual and traditional training, it was found that there is no significant difference between traditional and virtual education in the term of learning progress (Heidari et al., 2013). In interview with employees, it became clear that they preferred traditional education to virtual education (Ibrahim et al., 2011). Many researchers have investigated and comprised traditional teaching methods as well as new methods of e-learning. Robert Bernard has studied the literature in this area. In his study, Bernard reviewed the researches on issues such as traditional education and distance education and presented methods and conceptual models of various scholars. Although traditional and virtual training processes have become common in recent decades, there are still differences between these two types of training. Larson (1996) has classified traditional academic education as teacher-centered, coordinated and programmed, while

considered virtual learning as student-centered, inconsistent (in the term of time) and accessible to all times and places (Larsson, 1996).

Although e-learning has many benefits in learning and teaching, it is difficult to replace it with traditional training classes in the current situation. As the replacement of e-commerce cannot replace retail markets, e-learning cannot replace the need for educator guidance, specialist support, labs and college experiences (Hounsell et al., 2010). Factors such as course content, presentation methods, software, hardware, and financial issues can only create a basic environment for e-learning. In a general sense, students and educators are who determine the success or failure of the implementation of education. Educational technologies have changed a lot over the years. In this regard, it can be argued that each of the existing models of e-learning has pointed to various aspects of effectiveness in the field of e-learning effectiveness. However, it can be argued that the majority of these researches have commonly identified three dimensions of individual, organizational and infrastructural as the main effective dimension's effectiveness. In continue the studies pointed to these dimensions have been presented in following table.

**Table 1**
*Dimensions extracted from research literature*

| Main dimension | Sub-dimension | Author's name |
|---|---|---|
| **Individual factors** | Individual characteristics | Venkatesh and Bala, 2008, Nakintu and Neema-Abooki, (2011), Mukiri, (2011), Noesgaard and Ørngreen (2015). |
| | Individual perceptions | Nanayakkara, 2007, Venkatesh, 2000 |
| **Organizational factors** | Management support | Venkatesh and Bala, 2008, Bixler and Spotts, (2000), Jasperson et al. (2005), Nanayakkara, (2007), Mukiri, (2011), Yuan & Lee, (2009). |
| | Social impacts | Venkatesh, Morris, Venkatesh and Bala, (2008), Whiddelt, (2005) |
| | Organizational Leadership | Nanayakkara, 2007, Rytkønen and Rasmussen, 2010, Birch, (2008), Vance et al., (2018). |
| | Organization learning strategies | Boezerooij, (2006), Nanayakkara, (2007), Vance et al., (2018). |

| **Infrastructure factors** | Usefulness perception | Venkatesh, 2000, Nanayakkara and Whiddelt, (2005). |
| | Ease to use perception | Venkatesh and Davis, (2000), Venkatesh, (2000), Omondi, (2009), Zheng et al., (2010). |
| | IT infrastructure | Nanayakkara, 2007, Nanayakkara and Whiddelt, (2005), Omidinia, Masrom, and Selamat, 2011, Mukiri, (2011) |

## *Literature review*

In a study, Abu et al., (2014) investigated the attitude of students towards e-learning at the University of Nigeria. Specifically, this study was conducted on the relationship between e-learning attitudes and e-learning using the Technology Acceptance Model (ATM) model. In his study, Lister (2014) showed that there are four main considerations in the design of online e-learning courses: a) the structure of course; b) providing content; c) collaboration and interaction; and d) timely feedback. Amau, (2013), showed that all external variables in considered model are directly influenced by both key components of traditional TAM, the understanding of utility and ease of use. Therefore, their model is useful for studying the admission and continuous use of SPSS among students of social sciences. The results are helpful to educators and also can help to improve the learning process. In a study entitled" Experiences in Taiwan in the National E-learning Program", Yu et al., (2006) has noted that Taiwan government began an e-learning program from 2002 to 2007 and allocated $ 25 million per year to carry out the program. This training program included training to Ministry of Economic Affairs, National Council for Science, Labor Council, Ministry of Education, Council for Culture Affairs and Department of Defense, which has been implemented another five-year program since 2008.

In this study, the methods and strategies for implementing the program have been discussed and the results and experiences presented. In his study, Gaebel et al., (2014) has pointed out that e-learning can be used as a tool for converting industrial-era models. This model is now common in the United States or around the world and the best response to e needs of 21st century. Educational managers and educators are working to create such developments that are faced with three major challenges in this way. The first challenge is to provide technology that can be accessed at any time and place. The second challenge is to rebuild the education system so that it becomes possible to select a full training program. The third challenge is to provide high-quality training that can make it easy to use the capabilities of emerging technologies. Creating a vision of a rebuilt educational system allows managers to plan for training programs based on their own needs and interests and identify discussions

about high-quality training principles. In a study entitled "Factor Structure Test of User-learn Questionnaire and Its Investigation at Universities of E-learning in Tehran", Kamkar et al (2013) have stated that usability assessment is an initial step to improve the status of e-learning systems. Since there is no proper tool to fully measure this component in Iran, Faraji (2013) conducted a study entitled "the role of e-learning in improving organizational performance" and stated that e-learning has emerged in early 1990s with the advent of World Wide Web and has grown rapidly with regard to the vast capabilities of web and today it has maintained its place in the educational structure of many countries.

An extensive approach to e-learning indicates that the new e-learning system has unique benefits for individuals, organizations and educational institutions. In the last century, the definition of educational technology has undergone fundamental changes based on the ongoing developments in epistemological perspectives, psychological approaches to learning and other affiliated science of communications, systems and education. In their study, Fathi et al., (2011), showed that the advantages of implementing e-learning have effect on the effectiveness of education. The education effectiveness also influences and improves the managers' economic performance. The results of study conducted by Bagheri Majd et al (2013) showed that the managerial factor with an average of 4.07, the technology factor with an average of 4.03, an organizational factor with an average of 3.85 and the individual factor with an average of 3.83 had effect on the obstacles of e-learning in Shahid Chamran University of Ahwaz. In this study, it was concluded that each of the components of results section have effect on virtual higher education in the form of a combination in higher education. Beker (2015) have emphasized that two variables of self-motivating and self-conscious as predictive variables can be proper criteria for entering the final regression equation to explain the changes in tendency of employees to accept e-learning. Otarkhani et al (2012) showed that a large number of students starting virtual education programs are reluctant to continue and express their dissatisfaction. Garavan et al., (2010) showed that students participating in virtual education courses of e-learning centers of universities were satisfied with access to facilities for virtual education centers, learning through this method and application of virtual learning method.

However, there was no positive attitude towards virtual training courses. Lister (2014) stated that the effectiveness of virtual education course was favorable in the viewpoint of faculty members and moderately in the viewpoint of students. Also, the comparison between opinions of faculty members and students showed that faculty members had more positive opinions about the effectiveness of virtual education course compared with students. Zolfaghari et al (2011) stated that combination of e-learning as a new mechanism combining different

learning and teaching methods has made it more satisfactory for students and faculty members and can be flexible in learning and benefiting from the advantages of both online and e-learning techniques and increase the quality of learning. Hence, it was recommended that this combination is considered in medical universities of the country as an effective teaching method.

### *Development of hypotheses and conceptual model*

The purpose of present study was to design and explain the model of e-learning effectiveness in education system. For this purpose, the following objectives were considered:

- Identifying the dimensions and indicators of e-learning effectiveness
- Prioritizing the dimensions and indicators of e-learning effectiveness

## Methodology

To explore some of the behavioral science topics, the researcher cannot manipulate the situation and has to study the research subject in the same natural position intact. Qualitative rather than quantitative research (Naderi & Naraghi, 2006). However, the present study is a qualitative and quantitative research (mixed method). Qualitative research based on the data-driven strategic approach is used if one wishes to study a phenomenon in various ways. Qualitative research can be considered a complement to quantitative research. In other words, qualitative research does not replace statistical or quantitative research.

Research can be categorized according to different criteria and bases. These criteria and conditions provide the conditions on which to classify research, in general the most useful scheme for classifying research types is the one in which the categories are minimized and Maximum (Khaki, 2010, 93).

Purpose-based research is divided into three types: fundamental, applied, and practical (Ahmadi et al., 2011, 138). The present study is based on the purpose of "applied" research (due to its application in the Ministry of Education), and is a descriptive-survey research in terms of data collection method. Relevant data were used to prepare the theoretical bases and review the research records using the library method. Also, field method was used to gather information to identify and identify indicators and dimensions of e-learning. In theory making using fundamental conceptual theory (foundation data strategy), purposeful sampling is done

with emphasis on the production of theory. Therefore, in this method, each piece of data should be collected immediately after the piece has been collected.

After analyzing this data, the researcher will find guidelines or clues for collecting subsequent data. These clues can come from underdeveloped categories, information gaps, or people who have a good understanding of the phenomenon. In this regard ‹for the qualitative analysis of the collected data ‹three stages of open ‹axial and selective coding have to be done ‹in order to finally provide an objective picture of the created theory. The qualitative data analysis steps are as follows:

### *Open coding*

Since the foundations of concept theory are fundamental, a mechanism needs to be developed to identify concepts and expand them in terms of their properties and dimensions, so that basic raw data on the phenomenon under study can be extracted from the raw data. (Strauss & Corbin, 1998). Open coding involves asking questions and making comparisons. The data is first analyzed by asking simple questions such as what, how, how much, and so on. At this stage it divides the data into concepts and categories (Daneshfard et al., 2009).

### *Axial coding*

Axial coding is the second stage of analysis in the theory of data base. The purpose of this step is to establish relationships between the classes generated in the open coding phase. This is based on a paradigm model and helps the theorist to make the theory process easier. The basis of the communication process in coding is based on the expansion of one of the classes. Axial coding by linking a category and its subcategories link the data (Danaifard et al., 2009). In axial coding, Strauss & Corbin (1990) identified the types of categories that are identified around the axial phenomenon. These include the causal conditions (what factors lead to the emergence of the pivotal phenomenon); the strategies (the actions and actions taken in response to the pivotal phenomenon); the intervening conditions (the general contextual conditions that influence the strategies); They are contextual (specific contextual conditions that influence strategies) and outcomes (strategies that result from the use of strategies). These categories are related to the axial phenomenon in the form of an image model known as the axial coding paradigm.

### *Optional coding*

Selective coding involves integrating the categories that have been created to form the initial theoretical framework (Danaifard et al., 2009). At this point, the researcher considers the

model and makes theorems (or hypotheses) that relate the categories; Plano, 2007). Atlas software is generally used to analyze qualitative research data.

The statistical population of this study is divided into two groups. For qualitative study, the first group are subject specialists and experienced teachers of e-learning and e-learning who extract and identify e-learning indicators and variables and formulate an effective e-learning model and model through interviewing. Sampling in this group was non-random, purposeful and based on criteria. Twenty professors with a PhD degree with a history of attendance and teaching participated in e-learning with papers and research available in the field available. For quantitative study, the second group will train all managers (from expert to top) in Warthe. Education in Tehran (staff of the Ministry of Education) with a total population of 140 statistical population, according to Morgan table, 100 people are selected by simple random sampling.

## Research findings

### *Analytical hierarchy of main factors of e-learning*

As it has been shown in below table, the mean of average respondents' response to each criterion in comparison with other criteria has been presented in the form of decimal digits.

**Table 2**
*The matrix of paired response of expert to main factors of e-learning*

|  | Individual | Organizational | Infrastructure |
|---|---|---|---|
| Individual | --------------- | 4.5 | 2.5 |
| Organizational | --------------- | --------------- | 3.4 |
| Infrastructure | --------------- | --------------- | --------------- |
| Incompatibility rate | 0.056 | | |

As it can be seen from table (2), the incompatibility rate of this test has been obtained equal to 0.056. This value is less than the 0.1 criterion, so the reliability of research tool was confirmed in this dimension. In the following diagram, the priority of calculated factors has been presented:
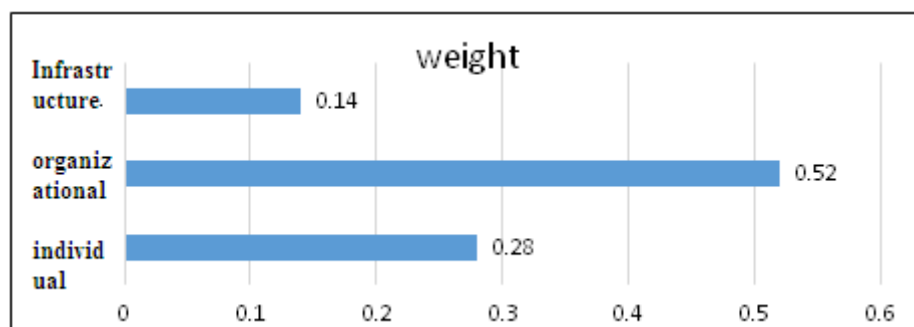
**Figure 1.** The diagram of prioritizing the main factors of e-learning

As it can be seen from the diagram of Figure (1), the dimensions of organizational (0.52), individual (0.279) and Infrastructure (0.139) have the highest to lowest priority, respectively.

### *Investigating the status of understudy dimensions*

The dimension's determination questionnaire was distributed among experts to investigate the status of understudy dimensions in desired organization. Therefore, a population was examined in this section using a mean test which the results have been presented in Table (3).

**Table 3**
*The results of investigating the status of understudy dimensions*
*based on t-student test*

| Dimension | T-statistics | Significance level | Lower boundary | Upper boundary |
|---|---|---|---|---|
| Organizational | -2.93 | 0.019 | -0.42 | -0.03 |
| Infrastructure | -2.05 | 0.04 | -0.37 | -0.006 |
| Individual | 0.899 | 0.37 | -0.10 | 0.28 |

In investigating organizational dimension, it was found that the test statistic was 2.93 and reported negatively. Also, the significant level was calculated less than 0.05. Therefore, the status of this indicator was not evaluated moderately. Considering the negative sign of upper and lower boundaries, it can be stated that the status of this dimensions has been evaluated at a lower than average level from the viewpoint of respondents.  In investigating infrastructure dimension, it was found that the test statistic was 2.05 and reported negatively. Also, the significant level was calculated less than 0.05. Therefore, the status of this indicator was not evaluated moderately. Considering the negative sign of upper and lower boundaries, it can be stated that the status of this dimensions has been evaluated at a lower than average level

from the viewpoint of respondents. In investigating individual dimension, it was found that the test statistic was 0.88 and reported positively. Also, the significant level was calculated higher than 0.05. Therefore, the status of this indicator was evaluated moderately. In this section, the hierarchical analysis has been separately carried out for all of these three dimensions.

### *Hierarchical analysis of individual dimension*

As it has been shown in below table, the mean of average respondents' response to each criterion in comparison with other criteria has been presented in the form of decimal digits.

**Table 4**
*The paired comparison matrix of experts' responses for individual dimension*

|  | Individual characteristics | Individual perceptions | Individual skills | Tolerance of risk ambiguity | Technical skills | Personality | Culture |
|---|---|---|---|---|---|---|---|
| Individual characteristics | --- | 3.2 | 3.25 | 3.18 | 3.4 | 2.2 | 3.8 |
| Individual perceptions | --- | --- | 3.2 | 4.1 | 3.8 | 4.3 | 3.4 |
| Individual skills | --- | --- | --- | 2.2 | 3.4 | 2.2 | 3.8 |
| Tolerance of risk ambiguity | --- | --- | --- | --- | 2.2 | 2.1 | 3.4 |
| Technical skills | --- | --- | --- | --- | --- | 2.2 | 3.8 |
| Personality | --- | --- | --- | --- | --- | --- | 3.4 |
| Culture | --- | --- | --- | --- | --- | --- | --- |
| Incompatibility coefficient | | | 0.045 | | | | |

As it can be seen from table (4), the incompatibility rate of this test has been obtained equal to 0.045. This value is less than the 0.1 criterion, so the reliability of research tool was confirmed in this dimension. In the following diagram, the priority of calculated factors has been presented:
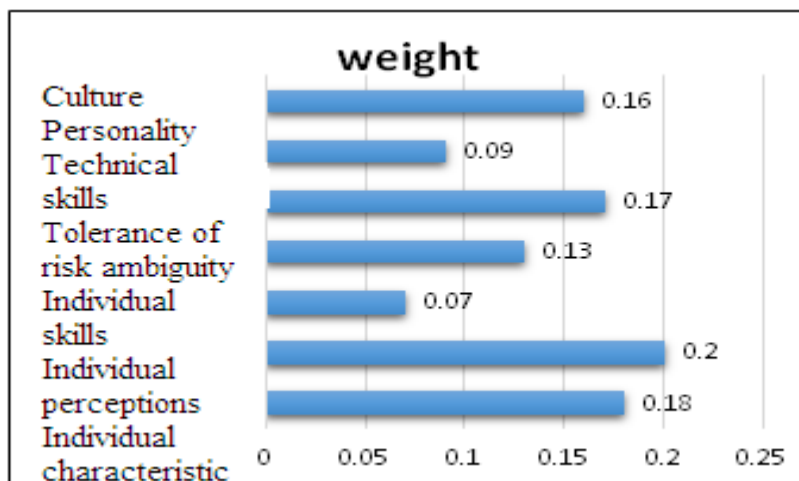
**Figure 2.** Prioritizing the factors of individual dimension

As it can be seen from figure (2), individual perceptions (0.2), individual characteristics (0.18), and individual skills (0.17), tolerance of ambiguity (0.13), appropriate personality (0.09) and individual skills (0.07) have the highest to lowest priority among understudy variables, respectively.

## *Hierarchical analysis of organizational dimension*

As it has been shown in below table, the mean of average respondents' response to each criterion in comparison with other criteria has been presented in the form of decimal digits.

**Table 5**

*The paired comparison matrix of experts' responses for organizational dimension*

| | Management support | Social impacts | Organizational leadership | Organizational learning strategies | Organization structure | Flexible organizational Agility | Organizational Accounting strategy | Creation of knowledge management | Organizational education | Quality services management |
|---|---|---|---|---|---|---|---|---|---|---|
| Management support | ---- | 3.4 | 4.2 | 2.2 | 7.5 | 3.6 | 4.5 | 6.5 | 4.2 | 3.5 |
| Social impacts | ---- | ---- | 3.5 | 1.2 | 4.5 | 3.5 | 3.5 | 6.2 | 4.8 | 6.4 |
| Organizational leadership | ---- | ---- | ---- | 3.5 | 9.5 | 1.3 | 1.1 | 3.5 | 2.2 | 4.1 |
| Organization learning strategies | ---- | ---- | ---- | ---- | 6.5 | 8.5 | 1.1 | 3.2 | 4.2 | 2.2 |
| Flexible organizational structure | ---- | ---- | ---- | ---- | ---- | 4.2 | 3.5 | 6.2 | 4.5 | 9.5 |
| Organizational Agility | ---- | ---- | ---- | ---- | ---- | ---- | 3.4 | 4.2 | 3.5 | 7.2 |
| Accounting strategy | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 4.2 | 3.2 | 3.2 |
| Creation of knowledge management structures | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 7.4 | 7.4 |
| Organizational education | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 4.2 |
| Services quality management | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Incompatibility rate | | | | | 0.086 | | | | | |

As it can be seen from table (5), the incompatibility rate of this test has been obtained equal to 0.086. This value is less than the 0.1 criterion, so the reliability of research tool was confirmed in this dimension. In the following diagram, the priority of calculated factors has been presented:
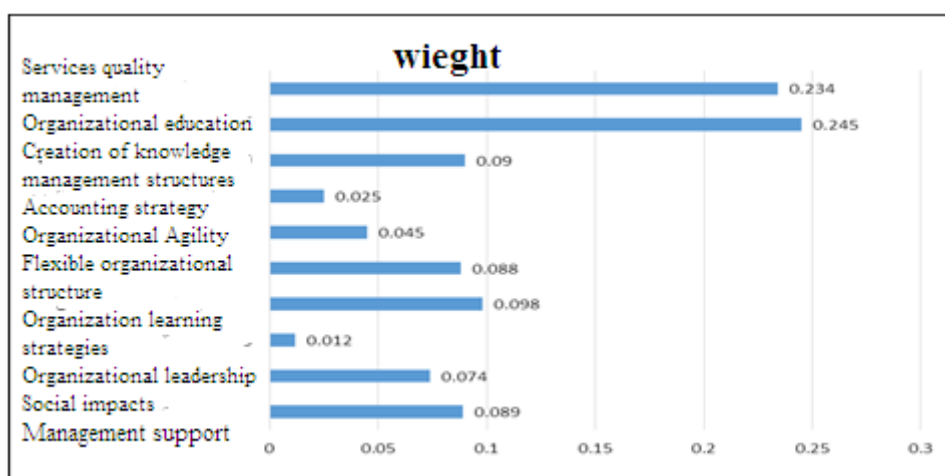


**Diagram 3.** Prioritizing the factors of organizational dimension

As it can be seen from Diagram (3), organizational education (0.24), service quality management (0.23), learning strategies (0.098), flexible organizational structure (0.088), creation of knowledge management structures (0.09), social impacts (0.074), organizational

agility (0.045) and organizational leadership (0.012) have the highest to lowest priority among understudy variables, respectively.

### *Hierarchical analysis of infrastructure dimension*

As it has been shown in below table, the mean of average respondents' response to each criterion in comparison with other criteria has been presented in the form of decimal digits.

**Table 6**
*The paired comparison matrix of experts' responses for infrastructure dimension*

|  | Usefulness perception | Ease to use perception | IT Infrastructure | Required hardware | Information infrastructure | Infrastructure management | Content production | Compliance with the |
|---|---|---|---|---|---|---|---|---|
| Usefulness perception | -------- -- | 2.2 | 2.2 | 3.2 | 3.3 | 4.34 | 2.54 | 3.78 |
| Ease to use perception | -------- -- | -------- -- | 2.9 | 2.2 | 2.2 | 4.2 | 3.42 | 4.56 |
| IT Infrastructure | -------- -- | -------- -- | -------- -- | 2.2 | 3.2 | 3.48 | 1.24 | 3.45 |
| Required hardware | -------- -- | -------- -- | -------- -- | -------- -- | 2.2 | 3.87 | 2.87 | 3.54 |
| Information infrastructure | -------- -- | -------- -- | -------- -- | -------- -- | -------- -- | ---- | 3.54 | 2.47 |
| Infrastructure management accountability | -------- -- | -------- -- | -------- -- | -------- -- | -------- -- | ---- | --- | 3.78 |
| Content production infrastructure | -------- -- | -------- -- | -------- -- | -------- -- | -------- -- | ---- | ---- | --- |
| Compliance with the country's technology infrastructure | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |

As it can be seen from table (5), the incompatibility rate of this test has been obtained equal to 0.086. This value is less than the 0.1 criterion, so the reliability of research tool was confirmed in this dimension. In the following diagram, the priority of calculated factors has been presented:

**Diagram 4.** Prioritizing the factors of infrastructure dimension

As it can be seen from Diagram (4), compliance with the country's technology infrastructure (0.148), required hardware (0.148), information infrastructure (0.143), usefulness perception (0.128), IT infrastructure (0.125), content production infrastructure (0.125), ease to use perception (0.114) and Infrastructure management accountability (0.069) have the highest to lowest priority among understudy variables, respectively.

## Discussion

The effectiveness and impact of each of the variables identified by e-learning was measured by regression test, which was confirmed with 95% confidence. In the same regard, it can be stated that the results of the present study are in line with the results of studies by Vance et al. (2018), Schoppert (2017), Nosgard and Ingrin (2015), Fao (2014), Hirami (2010). Regarding the effectiveness of e-learning in the education system, studies conducted in this regard in recent years have indicated that the implementation of e-learning in the education system of the country is challenging from various human, technical and managerial aspects that has ultimately led to the failure to achieve the desired effectiveness. In this regard, it can be stated that one of the most important educational organizations, Education Organization, has a special importance in this field. The number of employees involved in this field as well as the number of clients of this organization are great. Employees training has always been one of the issues raised in the field of education and training in different societies, especially in Iran. Today, educational texts are constantly evolving due to the rapid changes in science and technology. Meanwhile, organizational employees must constantly benefit from new training in order to keep up with these changes. Establishing these trainings at the level of the Education Organization is too costly.

Furthermore, it is not possible for the organization to standardize and harmonize the training due to the high number of employees, and employees working in remote parts of the country may not be able to benefit from some of these trainings. Utilizing e-learning can be an effective step in implementing these courses in the organization. However, in order to implement these courses, the necessary organizational, individual and environmental measures must be prepared for the organization.

The necessary ground for this important issue can be created by providing a model for the effectiveness of e-learning. In fact, the main challenge of this discussion is that the implementation of e-learning as a managerial decision certainly entails costs for the organization, which can lead to a particularly important challenge for managers in increasing costs without any return if the effective aspects of this measure are not taken into consideration; therefore, it is necessary to thoroughly analyze the key aspects in the effectiveness of these systems. Certainly, implementation of this study could be helpful in identifying the factors affecting the training courses in achieving these goals. Hence, it should be noted that the models studied in the field of e-learning effectiveness (as mentioned in the background section of this article) each focuses on specific aspects of e-learning effectiveness. However, in order to implement e-learning courses effectively, all effective aspects need to be considered as much as possible. In the present, it is tried to achieve this important issue by a combined qualitative-quantitative approach. Therefore, an attempt has been made to explain the effectiveness model of e-learning in the Ministry of Education.

## Conclusion

The electronic learning market is developing promptly on the basis of economic needs for high flexibility and the inclination towards taking advantage of new communication technology in educational concepts. Implementation of e-learning in the country's education system involves major challenges from human, technical and managerial points of view, which has ultimately led to the failure to achieve the desired effectiveness; therefore, presenting a model for the effectiveness of e-learning is a topic which needs to be deeply investigated. Using content analysis and interview, this study sought to identify the intended indicators and finally, using hierarchical analysis method, the effective dimensions were ranked.

The results showed that individual indicators Include individual perception, individual characteristics, individual skills, ambiguity tolerance, appropriate personality and individual skills and organizational indicators include organizational training, service quality management, learning strategies, flexible organizational structure, forming performance

management structures, social impacts, organizational agility, and organizational leadership and infrastructure indicators include compliance with technology infrastructure, required hardware, information infrastructure, understanding usefulness, information technology infrastructure, content production infrastructure, understanding ease of use, and management accountability infrastructure. Among the individual indicators, individual perception with a weight of 0.2 and individual skills with a weight of 0.07 and among the organizational indicators, organizational training with a weight of 0.24 and organizational leadership with a weight of 0.012 and among the infrastructure indicators, compliance with structural infrastructures with a weight of 0.148 and management accountability infrastructures with a weight of 0.069 have the highest and lowest priority among the studied dimensions, respectively.

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