

## THE MCKINSEY 7S MODEL FRAMEWORK FOR E-LEARNING SYSTEM READINESS ASSESSMENT

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### ABSTRACT

*These study it is necessary to can be used as a theoretical foundation upon which to base decision-making and strategic thinking about e-learning system. This paper proposes a new framework for assessing readiness of an organization to implement the e-learning system project on the basis of McKinsey 7S model using fuzzy logic analysis. The study considers 7 dimensions as approach to assessing the current situation of the organization prior to system implementation to identify weakness areas which may encounter the project with failure. Adopted was focus on Questionnaires and group interviews to specific data collection from three colleges in Mosul University in Iraq. This can be achieved success in building an e-learning system at the University of Mosul by readiness assessment according to the model of multidimensional based on the framework of 7S is selected by 23 factors, and thus can avoid failures or weaknesses facing the implementation process before the start of the project and a step towards enabling the administration to make decisions that achieve success in this area, as well as to avoid the high cost associated with the implementation process.*

**KEYWORDS:** E-Learning System, Readiness Assessment, McKinsey 7S Model.

### I. INTRODUCTION

E-learning system is a special type of IS [61]. E-learning system have now been adopted by most universities [24]. Traditionally, Education was based on attending classes, listening to lecture and appearing in exams [5]. This traditional method of imparting education is evolving and new methods are developed day by day. The introduction of information technology in education is viewed as one of the important means of meeting the need's students, universities and society as a whole. Fry, 2001 suggests that universities must embrace new technological advancements, which are capable of transforming educational and business in order to survive in a global higher-education market. The constant and rapid development of Information and communication technology has led to the introduction of E-learning systems in the system of education. E-learning is now the main focus of introducing and using new and advanced technologies in the field of higher education [12].

Most major universities all around the world provide some kinds of e-learning systems to enhance overall education system and to improve the performance of students. The e-learning systems used can systems can be as simple as a projector or an interactive board to a complex and sophisticated system like a learning management system or an online portal [10].

Undoubtedly, the implementation of e-learning systems in higher education has enabled a dramatic change in teaching and learning practice. The success of e-learning adoption across an organization depends on several factors [11]. Although there are a large number of research articles on e-learning, few of them address the most important issue of e learning – Readiness Assessment [38]. In this paper, the author tries to build a model determines the factors by which to assessment the readiness of the organization to adopt e-learning system based on the framework 7S.

The current manuscript is organized as: Related Work is describe in section II, The Research Methodology is explain in section III, The analysis and discussion in section IV, The conclusions are in section V, and finally authors are conclude the study in section VI.

## II. RELATED WORK

Two basic elements of the present research, a brief review on available in the field is presented and e-learning system readiness assessment based on the McKinsey 7S model which are well described. Finally the most important factors in ELRA are extracted from the most relevant literature and the conceptual framework is developed based on these factors.

### 2-1. E-Learning System

#### 2-1-1 Related Terms and Concepts

When investigating e-learning issue in various sources one can find out that the term "e-learning" is often connected or even equated to the following concepts: [17]

- ♦ **Distance education (or also Distance learning):** According to Willis distance education “takes place when a teacher and students are separated by physical distance, and technology (i.e. voice, video, data and print) is used to bridge the instructional gap [33].
- ♦ **Online learning:** White describes online learning as “an approach to teaching and learning that includes the use of Internet technologies for learning and teaching. Learners use the online learning environments not only to access information and course content but also to interact and collaborate with other online participants within the course.
- ♦ **Blended learning:** Blended learning, according to Sharma and Barrett, refers to “a language course which combines a face-to-face classroom component with an appropriate use of technology.
- ♦ **Flexible learning:** expands choice on what, when, where and how people learn. It supports different styles of learning.

#### 2-1-2. Evolution of E-Learning System

The Evolution of e-Learning displays the transformation of e-learning that has taken place since its beginning some 40-plus years ago [21], Figure 1.

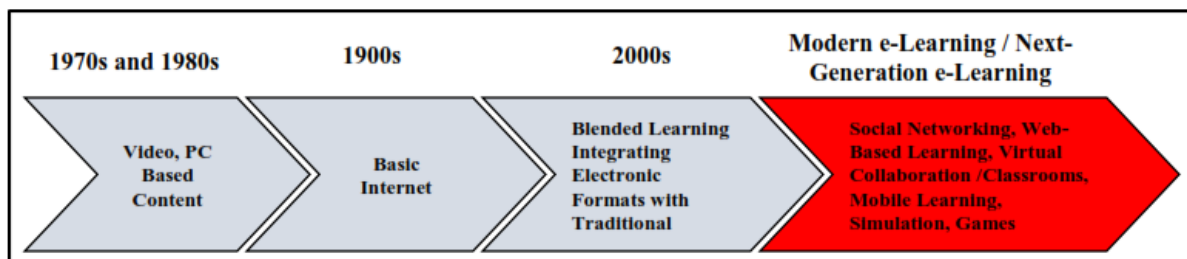


Figure 1. Evolution of e-Learning [9]

The evolution of the web to Web 2.0 has influenced today's e-learning design. As a result, e-learning can take on a much more interactive and social-oriented format that is embedded in the context of the learner's work. We call this next-generation e-learning.

#### 2-1-3. E-learning System Benefits

Much has been promised about the potential of technology to revolutionize learning, with benefits identified in six key dimensions: [7] [20]

- Connectivity: access to information is available on a global scale.
- Flexibility: learning can take place any time, any place.
- Interactivity: assessment of learning can be immediate and autonomous.
- Collaboration: use of discussion tools can support collaborative learning beyond the classroom.
- Extended opportunities: e-content can reinforce and extend classroom-based learning.
- Motivation: multimedia resources can make learning fun.

In addition, e-Learning, through its flexible nature, provides benefits such as: [16]

- Improved knowledge access and quality of learning hence enhancing performance.
- Increased access to information and training resources at minimal cost.
- Convenience and flexibility to learners, especially adult learners.
- Facilitating development of essential skills for knowledge-based work by embedding the use of information and communication technologies within the curriculum

#### 2-1-4. E-Learning System Definition

The year 2001 Castell argued how the revolution within technology would come to change society and education. He prophesied at that time that technology would come to be a facilitator for participation and openness and would have an impact on learning and communication processes from lifelong learning perspectives. He emphasized a changing culture in which personalization would be of the utmost importance. Since that time, several projects and initiatives on ICT and e-learning have been accomplished internationally [45]. E-Learning can cover a spectrum of activities from supporting learning. Learning is the vital element. e-Learning is no longer simply associated with distance or remote learning, but forms part of a conscious choice of the best and most appropriate ways of promoting effective learning [30]. The basic idea of e-learning to design effective teaching and learning environment by the teacher, which focuses on the learner's needs and capabilities are facilitates the process of learning any individual at any time and place using sources of learning various digital to support and expand the educational process under the supervision of the teacher. If we want a comprehensive definition for this type, we find that there is no agreement on defining the concept of a unified and comprehensive approach to the term e-learning, because it is modern phenomenon began emerge in the mid-nineties the calendar of the last century, and until the year 1988 was of e-learning in the bud, so we find it difficult at this time early agreed on a unified definition for e-learning.

However, the term e-learning is often used interchangeably with distance education or distance learning [27]. We could the statement of some of the definitions put forward by writers and researchers in this area prelude to building of the procedural definition of e-learning, which is adopted by this research. The concept E-learning system can be defined as learning using electronic means: the acquisition of knowledge and skill using electronic technologies such as computer- and Internet-based courseware and local and wide area networks another definition of e-learning is as education via the Internet, network, or standalone computer. While It is defined by the Instructional Technology Council, as well as the National Center for Education Statistics, as the process of extending learning or delivering instructional materials to remote sites via the Internet, intranet/extranet, audio, video, satellite broadcast, interactive TV, and CD-ROM [27]. As well as, Define 'learning facilitated and supported through the use of information and communications technology, e-learning may involve the use of some, or all, of the following technologies: [30] [47]

- desktop and laptop computers
- software, including assistive software
- interactive whiteboards
- digital cameras
- audio or video tape
- satellite TV
- mobile and wireless tools, including mobile phones
- electronic communication tools, including email, discussion boards, chat facilities and video conferencing
- Virtual Learning Environments.
- Learning activity management systems.

Accordingly be procedural definition of e-learning as the use of tools of information and communication technology and information systems in the education of individuals. Hence, the main consequences in e-learning are as follows: [45]

- E-learning is not one "thing", but an historical development and process that mean different things to different people.

- Educational technology has moved from being something that supported classroom teaching, and later distance education, to a force for radical change in our educational systems—but radical change based on the full potential of e-learning is something that still has yet to occur on any significant scale.
- The challenges for e-learning are no longer technological, but ones of desire, organization and appropriate application based on prior knowledge, experiment and evaluation.
- We need innovative teachers, administrators and thinkers to continue to push the boundaries of what is possible, while at the same time not ignoring the lessons from history.

## 2-2. E-learning System Readiness Assessment (ELSRA)

Many organizations failed in adopting e-learning system. A primary reason for this failure is the lack of assessment of organizational readiness for e-learning. To reduce failure risk, organizations should assess their readiness for adopting e-learning to identify some weak points which have to be improved by taking some improvement actions. That the evaluation process should be identified at the beginning of the project to avoid potential risks in latter stages. Thus, it would be necessary to assess and analyze the preparedness of an organization before initiating the project. Without proper readiness, the project probably fails or faces intensive challenges [28].

There is no agreement in the literature on what constitutes e-learning "readiness". It means different things to different writers, but one commonly used approach to e-learning 'readiness' is the assessment of certain organizational and individual factors that should be considered if organizations are likely to be successful with the introduction of an e-learning strategy [19]. Also, Readiness for an organization intending to adopt e-learning can be defined as the "mental or physical preparedness for that organization for some e-learning experience or action" [57]. According to (Odunaike *et al.*) The Readiness can be seen as those factors that must be accomplished before e-learning implementation can be regarded as being successful. It can be define as set of factors that can positively influence e-learning implementation success [46]. In this research Readiness Assessment will be through a set of factors, depending on McKinsey 7S Model. Illustrated in below.

## 2-3. McKinsey 7S Model

The McKinsey 7S Model was developed in the early 1980s by Tom Peters and Robert Waterman, two consultants working at the McKinsey& Company consulting firm and has been used to analyze over 70 large organizations, since then. The model was created as a recognizable and easily remembered model in business. The seven variables, which the authors termed "levers" all beginning with the letter "S" include "structure", "strategy", "systems", "skills", "style", "staff", and "shared values/superordinate goals" [22] [37]. Table 1, summarizes the definition of the model elements.

**Table 1.** Definition of the elements of McKinsey 7S model [28]

| Dimension       | Definition  |
|-----------------|---|
| Strategy        | Actions a company plans in response to changes in its external environment.   |
| Structure       | Basis of specialization and co-ordination influenced primarily by strategy, size, and diversity of organization.  |
| Systems         | Formal and informal procedures that support the strategy and structure..  |
| Style / Culture | Consisting of two components as below: Organizational culture: the dominant values, beliefs, and norms which develop over time and become relatively enduring features of organizational life. Management style: more a matter of what managers do than what they say; how do company managers spend their time; what are they focusing on. |
| Staff           | The people/human resource management- processes used to develop managers, socialization processes, and ways of introducing young  |

|               |  |
|---------------|--|
|               | recruits to the company.   |
| Skills        | The distinctive competences- what the company does best.   |
| Shared Values | Guiding concepts, fundamental ideas around which a business is built- must be simple, usually stated at abstract level, have great meaning inside the organization even though outsiders may not see or understand them. |

It is believed that for long-term benefit, these variables should be changed to become more congruent as a system. Effective organizations achieve a fit between these seven elements. These elements are categorized in so-called hard S's and soft S's. The hard elements (strategy, structure, and systems) are feasible and easy to identify. The four soft S's (shared values, skills, staff, and style) however, are hardly feasible. Regarding the high capability of the 7S model to give a comprehensive view of every organization, author have exploited the model in developing their conceptual framework [28].

Since there are numerous factors affecting e-learning system projects implementation, it was necessary to search through a wide range of studies, but the scope of this part is limited to only those e-learning system readiness assessment factors that were published widely in the literature from e-learning system, IT, and IS. While the 7S model has been used as the basis of the proposed framework, McKinsey 7S questionnaires have been used for discovering other associated factors in each dimension. Through this method, 23 factors were identified in 7 main dimensions. Each main dimension and associated factors are explained below.

### 2-3-1. Strategy

An e-learning strategy is a systematic and comprehensive plan of action designed to ensure the success of a broad-based e-learning initiative that adds value to the organization in ways that are supportable and sustainable. Therefore (Moore et al.) suggests that the e-Learning strategy lives through the learning strategy, which in turn is deeply embedded in the organizational strategy, In addition, the learning strategy must link clearly to the mission and vision of the organization [42].

- **Vision and mission:** It is essential to have a clear vision and mission for the e-Learning system [21] [35] [28]. Emphasized (Rosario) on the importance of having a vision and a clear action plan to guide the direction of implementation of the project throughout the life cycle of e-learning system [58], and should be a project related needs of the project [48].
- **Goals / objectives:** Goal is a general aim in line with the company's mission [21] [28]. The initial phase of any project should begin with a conceptualization of the goals and possible ways to fulfill them [52]. Therefore, This Objective are essential if learning is to be effective under all conditions [36].
- **Strategic plans:** planning helps to develop a concept for the e-learning system, which enables it to formulate plans and activities that will bring a project closer to its goals. strategy is needed to set the direction, to focus efforts [21] [14].

### 2-3-2. Structure

The structure of an organization is considered very important for firms adopting e-learning system. According to Daft "Structural dimensions provide labels for describing the internal characteristics of an organization. One can mention commonly cited structural dimensions as centralization, specialization, standardization, formalization, hierarchical levels, and span of control". Different researchers used specific dimensions based on their research purposes; for example, specialization, size, hierarchy, complexity, centralization and formalization have been used in assessing technology-structure relationships [28] [29]. In addition, it was suggested (Rajoo & Radakrishnan) The structure of present universities must be 'changeable' in order to integrate e-learning courses. In this study, authors focused on the centralization, specialization, and formalization aspects, which are believed to be adequate for assessing technology- structure relationships [49].

- **Centralization:** refers to the extent to which project decisions are controlled by the top management or project managements. Tight control over project decisions can ensure that system implementation is consistent with the organization's goals and conflicts can be efficiently resolved [28].

- **Size:** Evidence suggests that the success of IT projects in general and e-learning system projects in particular may be impacted by organization size [58]. It seems that, larger organizations (universities) have bigger pools of sophisticated professionals and are able to house larger IT departments than do smaller organizations. Furthermore, other researchers imply that success of IT projects increases in larger organizations because of more availability of resources [28].
- **CIO position:** The role of the chief information officer (CIO) has grown in importance just as the role of IT within organizations in recent years. Today, the role of CIO has evolved into the one responsible for providing IT infrastructure and capabilities to ensure effective business operations. They help planning and implementing IT strategies in organizations. In successful e-learning system projects, the CIO must be able to build strong relationships with her/his business executive peers, must behave as a strategic partner with the business, and be able to align IT investments with strategic business priorities [28].

### 2-3-3. Systems

Systems refer to formal and informal procedures and systems that support the strategy and structure [28]. For assessing this dimension, authors used three following factors:

- **Technology:** One of the important requirements of the success of an e-learning system [21] [58] [5] [55] [43] [12]. Because e-learning, by definition, depends on access to a computer and Inter- and/or Intranet, one important determinant of e-learning readiness is that of technology. If the benefits of e-learning are to be attained, employees must have easy and fast access to the network where the e-learning material is hosted. This means that computers should be available to learners and the hosting network being capable of providing the content at a speed, security level and reliability that is deemed necessary for the organization's planned e-learning strategy. As a conclusion, an organization's technology readiness include making sure that the content is easily accessible to learners; that speed and reliability issues with the Intra- and/or Internet will not hamper the learning process; that IT support exists for helping learners and solving technological problems; and that security issues are resolved to protect the company's information and content. [19].
- **Content:** One of the important requirements of the success of an e-learning system [23] [21] [58] [5] [56] [38]. For some organizations, it might be difficult or undesirable to transfer certain training content to the Internet or an Intranet. For example, work processes that require certain physical skills may not be practical or feasible to teach over a computer. Additionally, work processes that involve extremely vulnerable or dangerous actions may best be taught in traditional classroom settings to ensure highest quality of performance. Whether e-learning is an appropriate training solution for learning content should be an a priori outcome of the needs analysis before the organization's readiness is assessed. However, it is also a part of the readiness assessment in that organizations must decide whether to build or buy the content. It is more expensive and time-consuming to build own content than to buy and may necessitate a strong IT department capable of converting the material to digital media. What learning material is to be taught, whether it is feasible to be taught over the computer, and whether it can be bought or must be created, thus are e-learning readiness determinants in terms of content [19].
- **Platform support:** A platform is like the backbone of an e-learning course. Due to its importance, it is necessary to choose the platform before the e-learning course design. If the platform is not powerful enough or supportable, it will lead to problems later during the implementation stage [8] [38].
- **Documentation:** It is common for some members of the team to leave and be replaced by someone new. Therefore, storing the knowledge or experience is important. Documentation can help the e-learning development to continue without being seriously disabled by any knowledge gap. To help the new technician to become familiar with the project without

further delaying the progress, the previous technician included many lessons learned from the project in the documentation to pass on his experience [38].

#### 2-3-4. Style / Culture

Style mainly refers to organizational culture and management style [28]. Four factors are extracted here as below:

- **Organizational culture:** Cultural attributes are cited among important factors affecting e-learning system projects and many researchers have suggested that the Organizational culture can cause mismatch problems during the e-learning system implementation process [58] [6] [8] [39] [12]. Some researchers suggested that successful technological innovations require that both the technology be aligned with the organization culture and the culture be reshaped to fit the demands of the new technology [28]. Therefore, a supporting culture is an important determinant of e-learning readiness. The company must ask itself whether learning is supported and encouraged; whether learners are given time and opportunities to learn; whether employees and managers, in general, have a positive attitude toward training and learning; and whether e-learning is supported by top management and linked to broader organizational goals [19] [39] reported that, In the e-learning context, Organizational culture focuses on the value of an atmosphere of knowledge creation and sharing, mutual help, and the achievement of organizational goals. When designing and implementing e-learning system solutions, adapting Organizational culture to the solutions is crucial to avoid potential conflict [41]. Organizational culture joins content, technologists, experts, and employees to construct an e-learning environment. [12] Also report that organizational culture relate to Learning culture, Change in study habits and Making people understand how to e learn.
- **Leadership:** Two of their key contributions were decision making and problem solving skills during e-learning system implementation [38].
- **Top management support:** The influence of the top management on an e-learning project is significant [25] [8] [39] [12]. Their support can range over three different aspects, notably funding support, technological support and experience support. In terms of funding support, it is clear that, without them, the project could not happen [38].
- **Communication:** Is another important factor for e-learning implementation. Its importance is not limited only to the stakeholders within the team, but also those outside the team and Within the e-learning project, communication between the project manager, technicians, and module lecturers is necessary. For example, most e-learning courses are designed by both the technician and the module lecturers jointly. Therefore, they need to understand each other, through communication. The importance of communication becomes even more significant when the e-learning project requires cooperation between several teams, in different locations, with different cultural backgrounds [38].

#### 2-3-5. Staff

Staff refers to people/ human resource related issues. Four factors have been identified here as factors affecting staff:

- **Sufficient Manpower:** It's crucial for organizations to exploit proper mechanisms to recruit and preserve qualified employees, and nurture and maintain a high level of employees' morale and motivation among them [28] [32]. Hence, it can be implied that majority of the respondents believed that sufficient manpower is extremely important to manage the e-learning programs in their respective Colleges and deanships [12].
- **Project team:** Project team competences is another most widely cited e-learning System Readiness Assessment. The team work and composition of the important factors in the success of e-learning system, and the team must consist of the most efficient people in the organization [13]. The building cross-functional team is crucial, as it is both knowledge in business and technology is necessary for success [51].
- **Trust:** There are two types of trust required during e-learning implementation. The first type is inner trust, built within the e-learning project team. The second type is inter-trust, between

the e-learning project team and other stakeholders, such as central IS department or partners outside university. Mistrust can seriously delay the progress of any e-learning implementation. Normally, it is relatively easy to build the inner trust inside an e-learning project, and usually it is quite difficult to build the inter-trust with the university's central IS department or between partners from different institutions [38].

- **Training and education:** Users' training is another most widely cited critical factor [2] [1] [13] [53] [59]. Some researchers have specifically mentioned the need for project team training [31]. While others have focused on user training [13] [31]. Training allows employees to understand the overall concepts of the e-learning system [28].

### 2-3-6. Skills

Skills are the distinctive competences and what the organization does best. E-learning systems are complex technologies that require specialized skills. Several studies have showed that it is essential to have skilled people to assure the success of a project [28]. Tadinen (2005) identified 7 key people in e-learning project implementation team as management, IT personnel, top management, consultants, vendors, IT consultants, and end users. This classification has been selected here for investigating the situation of skill dimension [28]. Hence, three key people groups as management, IT personnel, and Students are investigated:

- **Managements skills:** Several skills are cited by researchers as required managerial skills such as political and personal skills, communication, and team-building skills [28].
- **IT staff's skills:** The IT staff's skills are cited among the important factors required for the success of IT systems in general and e-learning systems in particular [18] [34] [28]. Several studies have suggested that the skills of IT professionals must be adequate to ensure success with e-learning project [28].
- **Students Skills:** When studies to build the system started, it was necessary to measure the students' information technology skills to assess their readiness for the new system. In order to do this a questionnaire was introduced to the students [4] with questions involving whether they own computers, and how they use computers in general [5] [15].

### 2-3-7. Shared Values

In e-learning projects, the term refers to the degree to which a project team accepts and believes the project goals [28].

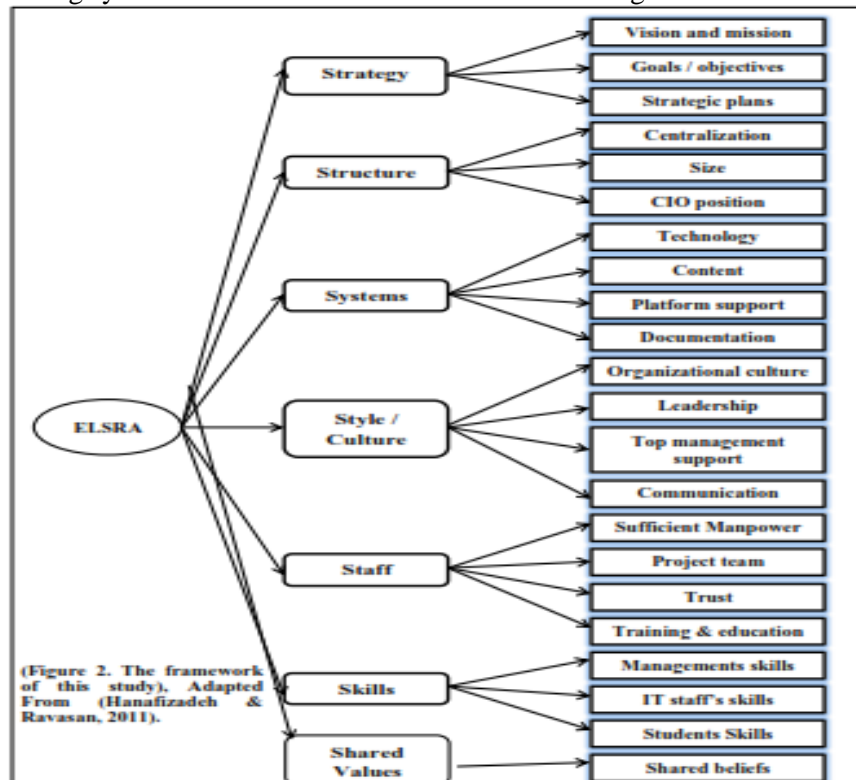
- **Shared beliefs:** refer to a belief about the overall impact of the system on the organization with regard to its benefits. It is a shared belief with employees and managers regarding the benefits of the e-learning system [3] [54]. It is believed that if employees have a shared understanding of why a technology is being implemented, it is likely to foster trust and cooperation among them that can lead to implementation success. Thus, it is important for managers to be aware early in the project whether different members of the organization have different perceptions on the shared beliefs about the concept of e-learning. Knowing this, they can develop mechanisms such as communication and training plans to minimize those gaps [28]. Also (Mahmod *et al.*) stated that individuals will use the system only if they perceive that such usage would help them achieve the desired task performance. Therefore, if a user perceives that adopting e-learning system will be more useful than not, the person will have positive attitudinal belief e-learning system [40].
- **E-learning Champions:** Someone who both supports and personally implements pedagogic innovation and who seeks to influence others to innovate, but not per se from a formal administrative or managerial position [26] [54]. We provided with suggestions. suggestion of roles for champions, including to:
  - ◆ Write an e-learning strategy for their university.
  - ◆ Collate and disseminate good practice in e-learning.
  - ◆ Contribute to research and publication related to e-learning. Also, aimed to create a local power base, providing authority, support and resources.



### III. RESEARCH METHODOLOGY

#### 3-1. Developing the Conceptual E-Learning System Readiness Assessment Framework

Adopts a researcher in this study, a multidimensional model to of e-learning system readiness assessment. The advantage of using multidimensional model is that the contribution of each dimension in a higher level construct can be assessed as compared to setting all items in a single composite score. If all items are posited in a single first-order construct, then it would be difficult to ascertain the contribution of each domain on the overall construct. With respect to this advantage, there are many multidimensional constructs proposed by authors in different subjects, but there are few multidimensional constructs in which the overall relations of the construct [28]. The proposed model for e-learning system readiness assessment is indicated in Figure 2.



#### 3-2. Data Collection

The research steps including MIS and e-learning Literature review, ELSRA factors extraction, Extracting factor assessment questions, data collection, data analysis, and finally applying the model on 3 colleges. The questionnaire used in two directions:

1. The questionnaire used for data collection contained scales to measure the various factors of the research model. The survey instrument asked the experts to rate the impact of 23 identified factors on e-learning system readiness using expressions relevant to irrelevant.
2. The questionnaire used for data collection contained scales to measure e-learning system readiness using items ranged from 1 (Strongly disagree) to 5 (Strongly agree). The questionnaire was then distributed to the Engineer's and technical support staff of e-learning programs in different departments, managers, deanships.

A set of a questionnaire was created, which contained a total of 81 questions. The questionnaire was completely paper based and respondents were required to return the questionnaire before the given deadline. This ensured the completion of the questionnaire within a limited time frame. All the questionnaires were complete and therefore, were useful in our study. Thus, a very high response rate was achieved. Personal interviews were also carried out with the e learning support staff in Mosul University. Interviews were carried out with the support staff of three main colleges of Mosul

University: Collage of Computer Sciences, College of Business and Economics and college of Arts. With these interviews, we were able to conduct a meaningful discussion and generate a fruitful feedback. These interviews offered a clearer picture and deeper understanding of e-learning Readiness Assessment in Mosul University. The data collected was subsequently analyzed on mean and fuzzy logic. The analyzed data was afterwards synthesized and presented in the form of table 1. In the event of an invalid answer or an unanswered question, the question was deemed void and was not used in the analysis.

Fuzzy Logic was initiated in 1965 by Lotfi A. Zadeh, professor for computer science at the University of California in Berkeley. Basically, Fuzzy Logic (FL) is a multivalued logic, that allows intermediate values to be defined between conventional evaluations like true/false, yes/no, high/low, etc. Notions like rather tall or very fast can be formulated mathematically and processed by computers, in order to apply a more human-like way of thinking in the programming of computers. Fuzzy systems is an alternative to traditional notions of set membership and logic that has its origins in ancient Greek philosophy. The precision of mathematics owes its success in large part to the efforts of Aristotle and the philosophers who preceded him [60]. The fuzzy membership function adopted in this paper can be specified as follows:

$$\mu_x(x) = \begin{cases} 0 & Y(X) \leq 3.60 \\ 0.05 + \left[ 1 + \left( (Y(X) - 3.60) / \text{Std. Deviation} \right)^{-2} \right]^{-1} & \dots \quad Y(X) > 3.60 \end{cases}$$

#### IV. ANALYSIS AND DISCUSSION

Table given below shows Results of the Fuzzy Logic Analysis for each factor.

**Table 2.** Results of the Fuzzy Logic Analysis

| Variables                 | Mean | Membership Function | The Level of Acceptance (%) |
|---------------------------|------|---------------------|-----------------------------|
| <b>Vision and Mission</b> |      |                     |                             |
| X1                        | 4.75 | 0.84                | 84                          |
| X2                        | 4.70 | 0.82                | 82                          |
| Average                   | 4.73 | 0.83                | 83                          |
| <b>Goals/ Objectives</b>  |      |                     |                             |
| X3                        | 4.50 | 0.74                | 74                          |
| X4                        | 4.75 | 0.84                | 84                          |
| X5                        | 4.55 | 0.76                | 76                          |
| X6                        | 4.75 | 0.84                | 84                          |
| Average                   | 4.64 | 0.80                | 80                          |
| <b>Strategic plans</b>    |      |                     |                             |
| X7                        | 4.80 | 0.85                | 85                          |
| X8                        | 4.65 | 0.80                | 80                          |
| X9                        | 4.75 | 0.84                | 84                          |
| Average                   | 4.73 | 0.83                | 83                          |
| <b>Centralization</b>     |      |                     |                             |
| X10                       | 4.75 | 0.84                | 84                          |
| X11                       | 4.75 | 0.84                | 84                          |
| X12                       | 4.70 | 0.82                | 82                          |
| Average                   | 4.73 | 0.83                | 83                          |
| <b>Size</b>               |      |                     |                             |
| X13                       | 4.75 | 0.84                | 84                          |
| X14                       | 4.65 | 0.80                | 80                          |
| Average                   | 4.70 | 0.82                | 82                          |
| <b>CIO position</b>       |      |                     |                             |
| X15                       | 4.75 | 0.84                | 84                          |
| X16                       | 4.60 | 0.79                | 79                          |
| X17                       | 4.75 | 0.84                | 84                          |

|                        |      |      |    |
|------------------------|------|------|----|
| X18                    | 4.65 | 0.80 | 80 |
| Average                | 4.69 | 0.82 | 82 |
| Technology             |      |      |    |
| X19                    | 4.65 | 0.80 | 80 |
| X20                    | 4.70 | 0.82 | 82 |
| X21                    | 4.30 | 0.63 | 63 |
| X22                    | 4.45 | 0.72 | 72 |
| Average                | 4.53 | 0.76 | 76 |
| Content                |      |      |    |
| X23                    | 4.75 | 0.84 | 84 |
| X24                    | 4.50 | 0.74 | 74 |
| X25                    | 4.65 | 0.80 | 80 |
| Average                | 4.63 | 0.80 | 80 |
| Platform support       |      |      |    |
| X26                    | 4.60 | 0.79 | 79 |
| X27                    | 4.65 | 0.80 | 80 |
| Average                | 4.63 | 0.80 | 80 |
| Documentation          |      |      |    |
| X28                    | 4.55 | 0.76 | 76 |
| X29                    | 3.65 | 0.06 | 6  |
| X30                    | 4.50 | 0.74 | 74 |
| X31                    | 4.75 | 0.84 | 84 |
| Average                | 4.36 | 0.67 | 67 |
| Organizational culture |      |      |    |
| X32                    | 4.55 | 0.76 | 76 |
| X33                    | 4.75 | 0.84 | 84 |
| X34                    | 4.80 | 0.85 | 85 |
| X35                    | 4.75 | 0.84 | 84 |
| X36                    | 4.50 | 0.74 | 74 |
| X37                    | 4.65 | 0.80 | 80 |
| X38                    | 4.60 | 0.79 | 79 |
| Average                | 4.66 | 0.81 | 81 |
| Leadership             |      |      |    |
| X39                    | 4.65 | 0.80 | 80 |
| X40                    | 4.55 | 0.76 | 76 |
| Average                | 4.60 | 0.79 | 79 |
| Top management support |      |      |    |
| X41                    | 3.65 | 0.06 | 6  |
| X42                    | 4.75 | 0.84 | 84 |
| X43                    | 4.55 | 0.76 | 76 |
| Average                | 4.32 | 0.64 | 64 |
| Communication          |      |      |    |
| X44                    | 4.75 | 0.84 | 84 |
| X45                    | 4.80 | 0.85 | 85 |
| X46                    | 4.35 | 0.66 | 66 |
| X47                    | 4.80 | 0.85 | 85 |
| Average                | 4.68 | 0.81 | 81 |
| Sufficient Manpower    |      |      |    |
| X48                    | 4.50 | 0.74 | 74 |
| X49                    | 4.65 | 0.80 | 80 |
| X50                    | 4.70 | 0.82 | 82 |
| Average                | 4.62 | 0.79 | 79 |
| Project team           |      |      |    |
| X51                    | 4.60 | 0.79 | 79 |
| X52                    | 4.65 | 0.80 | 80 |
| X53                    | 4.70 | 0.82 | 82 |

|                               |             |             |           |
|-------------------------------|-------------|-------------|-----------|
| <b>Average</b>                | <b>4.65</b> | <b>0.80</b> | <b>80</b> |
| <b>Trust</b>                  |             |             |           |
| <b>X54</b>                    | <b>4.20</b> | <b>0.55</b> | <b>55</b> |
| <b>X55</b>                    | <b>4.25</b> | <b>0.59</b> | <b>59</b> |
| <b>Average</b>                | <b>4.23</b> | <b>0.57</b> | <b>57</b> |
| <b>Training and education</b> |             |             |           |
| <b>X56</b>                    | <b>4</b>    | <b>0.35</b> | <b>35</b> |
| <b>X57</b>                    | <b>4.05</b> | <b>0.41</b> | <b>41</b> |
| <b>X58</b>                    | <b>4.55</b> | <b>0.76</b> | <b>76</b> |
| <b>X59</b>                    | <b>4.15</b> | <b>0.51</b> | <b>51</b> |
| <b>Average</b>                | <b>4.19</b> | <b>0.54</b> | <b>54</b> |
| <b>Managements skills</b>     |             |             |           |
| <b>X60</b>                    | <b>4.65</b> | <b>0.80</b> | <b>80</b> |
| <b>X61</b>                    | <b>4.20</b> | <b>0.55</b> | <b>55</b> |
| <b>X62</b>                    | <b>4.35</b> | <b>0.66</b> | <b>66</b> |
| <b>X63</b>                    | <b>4.35</b> | <b>0.66</b> | <b>66</b> |
| <b>X64</b>                    | <b>4.40</b> | <b>0.69</b> | <b>69</b> |
| <b>X65</b>                    | <b>4.65</b> | <b>0.80</b> | <b>80</b> |
| <b>Average</b>                | <b>4.43</b> | <b>0.71</b> | <b>71</b> |
| <b>IT staff skills</b>        |             |             |           |
| <b>X66</b>                    | <b>4.70</b> | <b>0.82</b> | <b>82</b> |
| <b>X67</b>                    | <b>4.60</b> | <b>0.79</b> | <b>79</b> |
| <b>X68</b>                    | <b>4.65</b> | <b>0.80</b> | <b>80</b> |
| <b>Average</b>                | <b>4.65</b> | <b>0.80</b> | <b>80</b> |
| <b>Students Skills</b>        |             |             |           |
| <b>X69</b>                    | <b>4.60</b> | <b>0.79</b> | <b>79</b> |
| <b>X70</b>                    | <b>3.70</b> | <b>0.08</b> | <b>8</b>  |
| <b>X71</b>                    | <b>3.75</b> | <b>0.11</b> | <b>11</b> |
| <b>X72</b>                    | <b>4.10</b> | <b>0.46</b> | <b>46</b> |
| <b>Average</b>                | <b>4.04</b> | <b>0.40</b> | <b>40</b> |
| <b>Shared beliefs</b>         |             |             |           |
| <b>X73</b>                    | <b>3.80</b> | <b>0.15</b> | <b>15</b> |
| <b>X74</b>                    | <b>4.60</b> | <b>0.79</b> | <b>79</b> |
| <b>X75</b>                    | <b>4.10</b> | <b>0.46</b> | <b>46</b> |
| <b>X76</b>                    | <b>4.30</b> | <b>0.63</b> | <b>63</b> |
| <b>Average</b>                | <b>4.20</b> | <b>0.55</b> | <b>55</b> |
| <b>E-learning Champions</b>   |             |             |           |
| <b>X77</b>                    | <b>4.40</b> | <b>0.69</b> | <b>69</b> |
| <b>X78</b>                    | <b>4.10</b> | <b>0.46</b> | <b>46</b> |
| <b>X79</b>                    | <b>4.40</b> | <b>0.69</b> | <b>69</b> |
| <b>X80</b>                    | <b>4.40</b> | <b>0.69</b> | <b>69</b> |
| <b>X81</b>                    | <b>4.80</b> | <b>0.85</b> | <b>85</b> |
| <b>Average</b>                | <b>4.42</b> | <b>0.70</b> | <b>70</b> |

Illustrate that the strategy got on the rate or Average of 82%, which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of vision and mission, goals and strategic plans. The structure got on the Average of 82.33%, which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of Centralization, Size and CIO position. The system got on the average of 75.75% which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of technology, content, platform support and documentation. The style/culture got on the average of 76.25% which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of Organizational culture, Leadership, Communication and top management support. The staff got on the average of 67.5% which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of Sufficient Manpower and Project team, but the organization should increase of the trust among its staff, and its training and education. The skills got on the average of 63.67% which

exceeding on the threshold of the cutting, amounting to 50% and this is evidence of an Existence of Managements skills and IT staff skills, but the organization should increase of the Students Skills from during Training courses. The shared values got on the average of 62.50 which exceeding on the threshold of the cutting, amounting to 50% and this is evidence of a Existence of E-learning Champions, But with the need for the organization to a statement on the benefits derived from the implementation of the e-learning system to related parties.

## **V. CONCLUSIONS**

The boom of e-learning system is continuously increasing because of various international universities allow, a distant education all over the world. That educational and non-educational organizations have adopted these systems to train their employees or users.

The adoption of e-learning system is a complicated process of establishing and developing an integrated information technology system. This paper, in line with the literature, specified 23 e-learning factor categories in 7S that can assist universities and instructors to efficiently and effectively readiness assessment e-learning system. The 23 factors categories impact the decision to adopt e-learning system in higher education organizations. The fuzzy logic values were above 50% indicating high level of accept. The most critical indicators were towards trust, training and education, students skills and shared beliefs, But in spite of that organization can be processed so as not to face any problems during implementation of e-learning system. For future work, there is a need to expand on this research to develop a dimensions from during add new dimensions.

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## APPENDIX QUESTIONNAIRES

| The scale | Strongly disagree | Disagree | Unsure | Agree | Strongly agree |
|-----------|-------------------|----------|--------|-------|----------------|
| Weight    | 1                 | 2        | 3      | 4     | 5              |

| R                  | Questions  | 1 | 2 | 3 | 4 | 5 | References          |
|--------------------|--|---|---|---|---|---|---------------------|
| Vision and Mission |  |   |   |   |   |   |                     |
| 1                  | Existence of documented vision and mission of the e-learning system project.                                     |   |   |   |   |   | [48] [28]           |
| 2                  | Existence of well understood to vision and mission of the e-learning system project are across the organization. |   |   |   |   |   |                     |
| Goals/ Objectives  |  |   |   |   |   |   |                     |
| 3                  | Existence of carefully defined goals of the e-learning system.   |   |   |   |   |   | [52] [21] [36] [28] |
| 4                  | Existence of documented Goals / objectives of the e-learning system project.                                     |   |   |   |   |   |                     |
| 5                  | Existence of measurable goals of the e-learning system.  |   |   |   |   |   |                     |
| 6                  | Existence of well understood to Goals / objectives of the e-learning system project are across the organization. |   |   |   |   |   |                     |
| Strategic plans    |  |   |   |   |   |   |                     |
| 7                  | Existence of Strategic plan of the e-learning system project.  |   |   |   |   |   | [21] [14]           |
| 8                  | Focus the Strategic plan of the e-learning system project on set the direction, to focus efforts.                |   |   |   |   |   |                     |
| 9                  | Existence of inputs from all functional areas the Strategic plan of the e-learning system project.               |   |   |   |   |   |                     |
| Centralization     |  |   |   |   |   |   |                     |
| 10                 | Existence of clearly decisions from top management to e-learning system project implementation.                  |   |   |   |   |   | [28]                |
| 11                 | Existence of Tight control from top management over e-learning system project implementation.                    |   |   |   |   |   |                     |
| 12                 | Top management have the ability to resolve disputes through the implementation of e-learning system.             |   |   |   |   |   |                     |
| Size               |  |   |   |   |   |   |                     |
| 13                 | The organization have IT department.   |   |   |   |   |   | [50] [28]           |
| 14                 | Availability of the organization of required or necessary resources to e-learning system implementation.         |   |   |   |   |   |                     |
| CIO position       |  |   |   |   |   |   |                     |
| 15                 | Existence of CIO in the organization.  |   |   |   |   |   | [28]                |
| 16                 | Existence of CIO reporting directly to the CEO.  |   |   |   |   |   |                     |
| 17                 | CIO able to build strong relationships with her/his business executive.  |   |   |   |   |   |                     |
| 18                 | Is CIO a strategic partner in the organization.  |   |   |   |   |   |                     |
| Technology         |  |   |   |   |   |   |                     |
| 19                 | Existence of adequate hardware infrastructure.   |   |   |   |   |   |                     |
| 20                 | Existence of adequate software and application.  |   |   |   |   |   |                     |



|                        |  |  |  |  |  |  |                                      |
|------------------------|--|--|--|--|--|--|--------------------------------------|
| 21                     | Existence of adequate networking infrastructure.   |  |  |  |  |  | [19] [21] [50] [5] [55]43]<br>[12]   |
| 22                     | Interest our organization to the security issues that resolved to protect are the company's information and content.                                 |  |  |  |  |  |                                      |
| Content                |  |  |  |  |  |  |                                      |
| 23                     | Want our organization to transfer learning content on the Internet.  |  |  |  |  |  | [19] [23] [21] [50] [5] [56]<br>[38] |
| 24                     | Interest our organization to buy the content.  |  |  |  |  |  |                                      |
| 25                     | Interest our organization to build the content across its converting to digital media from through IT department.                                    |  |  |  |  |  |                                      |
| Platform support       |  |  |  |  |  |  |                                      |
| 26                     | Interest our organization to choose the platform before the e-learning course design.  |  |  |  |  |  | [8] [38]                             |
| 27                     | Our organization You may addressing the problems faced by the design of the e-learning course during the implementation phase or process.            |  |  |  |  |  |                                      |
| Documentation          |  |  |  |  |  |  |                                      |
| 28                     | Existence of Documentation to stages e-learning system implementation.   |  |  |  |  |  | [38]                                 |
| 29                     | Do not face the organization any problems in any individual is left in the team tasks entrusted to him.  |  |  |  |  |  |                                      |
| 30                     | Existence of documentation or storage of knowledge or expertise practiced by individuals during the implementation of the e-learning system project. |  |  |  |  |  |                                      |
| 31                     | Documentation can do lessons for the transfer of expertise for new members.  |  |  |  |  |  |                                      |
| Organizational culture |  |  |  |  |  |  |                                      |
| 32                     | Existence of a learning and development culture.   |  |  |  |  |  | [19] [50] [6] [8] [39] [12]<br>[41]  |
| 33                     | Existence of a support and collaboration culture.  |  |  |  |  |  |                                      |
| 34                     | Existence of a knowledge creation and sharing culture.   |  |  |  |  |  |                                      |
| 35                     | Existence of a mutual help culture.  |  |  |  |  |  |                                      |
| 36                     | Existence of a achievement of organizational goals culture.  |  |  |  |  |  |                                      |
| 37                     | Existence of tolerance for conflicts and risk culture.   |  |  |  |  |  |                                      |
| 38                     | Existence of a Learning culture.   |  |  |  |  |  |                                      |
| Leadership             |  |  |  |  |  |  |                                      |
| 39                     | Existence of a Leadership during the implementation process.   |  |  |  |  |  | [38]                                 |
| 40                     | Contribution of a Leadership in decision making and problem solving skills during e-learning system implementation.                                  |  |  |  |  |  |                                      |
| Top management support |  |  |  |  |  |  |                                      |
| 41                     | Existence of required support from top management to e-learning system implementation.   |  |  |  |  |  | [25] [8] [38] [39]12]                |
| 42                     | Existence of funding support from top management to e-learning system implementation.  |  |  |  |  |  |                                      |
| 43                     | Existence of interest from all levels of management to support the overall goals of the  |  |  |  |  |  |                                      |

|                        |  |  |  |  |  |  |                                  |
|------------------------|--|--|--|--|--|--|----------------------------------|
|                        | e-learning system project.   |  |  |  |  |  |                                  |
| Communication          |  |  |  |  |  |  |                                  |
| 44                     | Existence of Communications plan to e-learning project implementation.   |  |  |  |  |  | [38]                             |
| 45                     | Existence of free flow of information in the organization.   |  |  |  |  |  |                                  |
| 46                     | Existence of flow of information between the team individuals and project manager.   |  |  |  |  |  |                                  |
| 47                     | Existence of flow of information between the lecturers and project manager during e-learning implementation.   |  |  |  |  |  |                                  |
| Sufficient Manpower    |  |  |  |  |  |  |                                  |
| 48                     | Existence of proper mechanisms to recruit and preserve qualified employees, nurture and maintain a high levels of employee morale and motivation among them. |  |  |  |  |  | [32] [28] [12]                   |
| 49                     | Existence of high rate of younger employees in the organization (The number of employees with less than 30 years old per total).                             |  |  |  |  |  |                                  |
| 50                     | Existence of the high rate of more educated employees in the organization.   |  |  |  |  |  |                                  |
| Project team           |  |  |  |  |  |  |                                  |
| 51                     | Existence of the both business and technical knowledge into the project team.  |  |  |  |  |  | [13] [51]                        |
| 52                     | Existence of the empowered project team members.   |  |  |  |  |  |                                  |
| 53                     | The degree to which project team have prior experience in large IT projects.   |  |  |  |  |  |                                  |
| Trust                  |  |  |  |  |  |  |                                  |
| 54                     | Existence of trust within the e-learning project team.   |  |  |  |  |  | [38]                             |
| 55                     | Existence of trust between the e-learning project team and other stakeholders, such as central IS department or partners outside university.                 |  |  |  |  |  |                                  |
| Training and education |  |  |  |  |  |  |                                  |
| 56                     | Existence of a clear education and training strategy.  |  |  |  |  |  | [13] [1] [2] [53] [59] [31] [28] |
| 57                     | Existence of the identified training needs.  |  |  |  |  |  |                                  |
| 58                     | Existence of training program to e-learning implementation project team.   |  |  |  |  |  |                                  |
| 59                     | Existence of training program to e-learning users.   |  |  |  |  |  |                                  |
| Managements skills     |  |  |  |  |  |  |                                  |
| 60                     | Existence of political skills.   |  |  |  |  |  | [28]                             |
| 61                     | Existence of personal skills.  |  |  |  |  |  |                                  |
| 62                     | Existence of communication skills.   |  |  |  |  |  |                                  |
| 63                     | Existence of team-building skills.   |  |  |  |  |  |                                  |
| 64                     | Existence of controlling skills.   |  |  |  |  |  |                                  |
| 65                     | Existence of IT management skills.   |  |  |  |  |  |                                  |
| IT staff skills        |  |  |  |  |  |  |                                  |
| 66                     | Existence of communication skills.   |  |  |  |  |  | [18] [34] [28]                   |
| 67                     | Existence of e-learning management skills.   |  |  |  |  |  |                                  |
| 68                     | Existence of technical skills.   |  |  |  |  |  |                                  |
| Students Skills        |  |  |  |  |  |  |                                  |
| 69                     | Existence of own computers to students.  |  |  |  |  |  | [4] [5] [15]                     |
| 70                     | Existence of computers use skills.   |  |  |  |  |  |                                  |
| 71                     | Existence of communication skills.   |  |  |  |  |  |                                  |

|                      |   |  |  |  |  |  |                    |
|----------------------|---|--|--|--|--|--|--------------------|
| 72                   | Existence of personal skills.   |  |  |  |  |  |                    |
| Shared beliefs       |   |  |  |  |  |  |                    |
| 73                   | Existence of managers believe in the benefits of the system.  |  |  |  |  |  | [3] [40] [54] [28] |
| 74                   | Believe of different members of the organization in the benefits of the e-learning system.  |  |  |  |  |  |                    |
| 75                   | Existence of user believe in the benefits of the system.  |  |  |  |  |  |                    |
| 76                   | Existence of cooperation among them (different members of the organization, managers, users).   |  |  |  |  |  |                    |
| E-learning Champions |   |  |  |  |  |  |                    |
| 77                   | Existence of the proper e-learning champion in the organization.  |  |  |  |  |  | [26] [54]          |
| 78                   | Existence of e-learning champions to supports and personally implements pedagogic innovation and who seeks to influence others to innovate. |  |  |  |  |  |                    |
| 79                   | Existence of e-learning champions to write an e-learning strategy for their university.   |  |  |  |  |  |                    |
| 80                   | Existence of e-learning champions to collate and disseminate good practice in e-learning.   |  |  |  |  |  |                    |
| 81                   | Existence of e-learning champions to contribute to research and publication related to e-learning.  |  |  |  |  |  |                    |