

Designing Effective E-Learning Framework for Higher Education: Critical Success Factors

Naveed Sultana¹, Aysha Khalil², Uzma Perveen³

¹Associate Professor, Allama Iqbal Open University, AIOU Islamabad, Pakistan

²PhD Scholar, Secondary Teacher Education Department, AIOU Islamabad, Pakistan

³Research Officer, National Accreditation Council for Teacher Education (NACTE), Islamabad

ABSTRACT

The progression of digital technologies and eruption of web incorporation into education proffers a novel trend for higher education institutions to establish web-based environments for teaching and learning. E-learning has become an imperative means for establishing the innovative learning environment for Higher Education in the digital age by offering new flexible learning methods. E-learning is promptly occurring as educational means in Pakistan as in the other global areas, hence utilizing web technologies for the provision of learning in higher education institutions which illustrate the sample acceptance of E-learning system in Pakistani higher education. For establishing E-learning systems, the higher education institutions are required to take broader initiatives for technological infrastructure at higher education institutions. However, a number of factors need serious consideration while designing a successful E-learning framework. The current study aims to determine the CSF (critical success factors) for designing E-learning framework for HEIs (higher education institutions) of Pakistan. Eight studies, already carried out by different researchers providing factors of E-learning framework in varied contexts, were systematically reviewed for deriving critical success factors for E-learning design for higher education institutions of Pakistan. This paper presents an analysis of factors which impact the designing of successful E-learning framework/structure in higher education. Based upon the emphasis in greater chunks of the literature resources, five main classes of factors were considered to be critical by the authors for the successful design of E-learning framework. Conclusively, the five factors i.e. *pedagogical factors*, *technological factors*, *institutional factors*, *Design factors* and *behavioral factors* were derived as critical for an effective design of E-learning system. These critical success factors are the main areas of activity that must receive constant and careful attention from the management of Higher Education Institutions (HEIs) while planning to design E-learning framework for their institution.

Key Words: *E-learning design, critical success factor, higher education, E-learning systems, E-learning infrastructure.*

1. INTRODUCTION

E-learning may be defined as means of using information, communication, and

Address of Correspondence

Naveed Sultana
drnaveeda@gmail.com

Article info

Received July 2016
Accepted Nov 28, 2016
Published Dec 26, 2016

digital technologies to approach the knowledge and enhance competencies in interactive, captivating and engaging learning environments. E-learning is considered as the crucial driver having exceptional influence on the tremendous technological change in higher education. It is now a global trend to develop and utilize E-learning in higher education. E-learning has revolutionized the process of teaching and learning by using the emerging web-based digital tools and technologies. It is an emerging expansion of information, communication and web technologies which have been incorporated in a number of higher education universities throughout the world. Thomas and Brown (2011) has acknowledged E-learning as an imperative revolution in the Higher Education culture.

It is now a global comprehensive trend in higher education institutions to design and develop E-learning frameworks for growth and advancement. However, researchers which are associated with the design and development of E-learning, evoke the need of standards and factors which are essential for designing the E-learning systems. These essential factors are known as critical success factors. A critical success factor is a factor whose occurrence is vital for an organization to accomplish its tasks and targets. Conversely, it can be said that the absence of such factors will cause organizational missions' failure. (Bacsich 2009a 2011, Re.ViCa 2009).

As depicted by Frimpon (2011), “critical success factors (CSFs) are variables that are fundamental to the success of the design and implementation, and an organization must handle these CSFs well in order to have a successful implementation”. These factors are fundamentals and indispensable for successful organizational strategies. Critical success factors steer the strategies forward. According to Bacsich (in Schreurs 2009), critical success factors for E-learning framework occupy an underlying functioning in the design and development of supportive, upholding, and cost-effective digital system in education. As Schreurs (2009: 59) argues that critical success factors are illustrious than other factors which may be important but not imperative and domineering ones for the success of E-learning framework. He further states that if all the factors may be represented by a pyramid, the critical success factors stay at the topmost level.

Researchers reveal that there exist many categories of factors, requirements, and

standards which are desirable for designing and development of E-learning systems in higher education. CSFs mention the key areas which are vital to be activated and must be accomplished to achieve the mission and goals of E-learning in HEIs. The influential factors affecting the success and quality of E-learning has been referred by many researchers.

This paper expounds on designing an effective E-learning framework for higher education based on the critical success factors of E-learning derived from an in-depth systematic review of existing literature. The aim of this study was to identify the factors which are crucial for the successful design of E-learning framework in the context of higher education institutions of Pakistan. This CSF framework may help in developing the E-learning based instructional programs for HEIs. Furthermore, this framework may be applied for the implementation of E-learning systems to meet the emerging demands in the context of 21st century higher education. Policymakers of HEIs may consider the results of this study to recommend digital policy for universities. The universities which are already on the way of E-learning may utilize this CSF framework as a self-assessment tool to measure the adequacy of design, implementation, and maintenance of their E-learning systems. The research methodology was comprehensive which comprised of reviewing and analyzing eight studies which highlighted CSFs of E-learning in different contexts. All eight studies were reviewed and in-depth analysis demonstrated the sub-factors of each factor meticulously. The review of literature illustrates the details of following eight studies:

| | Author | Title of study |
|---------|---------------------------|---|
| Study-1 | Puri (2012) | <i>Critical success factors in E-learning – an empirical study</i> |
| Study-2 | Fresen (2005) | <i>Critical success factors for quality web-supported Learning</i> |
| Study-3 | Khan (2005) | <i>E-learning QUICK Checklist</i> |
| Study-4 | Selim (2007) | <i>Critical success factors for E-learning acceptance: Conformity factor models</i> |
| Study-5 | Le Blanc and Wands (2001) | <i>Critical Success Factors: E-learning Solutions Cappuccino</i> |
| Study-6 | Papp (2000) | <i>Critical success factors for distance learning</i> |
| Study-7 | Volery and Lord (2000) | Volery and Lord (2000), <i>Critical success factors in online education</i> |
| Study-8 | Soong et al. (2001) | <i>Critical success factors for on-line course resources</i> |

2. LITERATURE REVIEW

Study – 1: Puri (2012), “Critical success factors in E-learning – an empirical study”

Puri conducted a survey study with 300 respondents in order to derive CSFs of E-learning. Results of exploratory factor analysis depicted the highest factor loadings for following six factors of E-learning.



Figure-1: Puri (2012) CSFs of E-learning

Pedagogical: On the basis of highest explained variances, the seven variables were categorized under pedagogical factor. This factor incorporated the aspects of teaching and learning in E-learning environments, including prompt feedback, multimedia technologies/tools, interactive course, teachers as facilitators, learning styles, alternative submission of assignments, and student commitment.

Institutional/Administrative Affairs: This factor is discovered to be a second most important factor on the basis of higher values of explained variances. It converges on the issues and aspects of organization, for instance, student affairs/services, administrative and academic affairs. Five variables were loaded under this factor which was: cost and benefit; expert E-learning course designers; staff/students training programs; online disbursement system and willingness of staff to seek and learn the (novel technology-based) system.

Technological Factor: The variables/sub-factors included in technological factors are high broadband wifi/internet connections; system error tracking system; system

reliability; system backup procedures.

Evaluation: This factor focuses on the aspects and issues of evaluation and assessment of teaching and learning in E-learning systems. Variable loadings on this factor were mentioned as learning from past performance, online tests/quizzes, and measuring teaching effectiveness.

Resource Support: This factor is concerned with the online support of online and offline means and resources. For this factors, two variables loaded on the basis of high explained variances values, those were IT support and language support.

Interface Design: This factor is concerned with the feel and looks features of E-learning framework. The variables included in this factor are: designing a user-friendly visual structure and incorporating (significant uncomplicated) features to accomplish tasks.

Study – 2: *Fresen (2005), “Critical success factors for quality web-supported Learning”*

Fresen (2005) conducted a study regarding quality assurance in which she evaluated the E-learning programs of a South African university. This study was based on the assessment of a framework comprising critical success factors for online learning. Fresen recommended the subsequent categories of critical success factors in her research. Each category of factors was comprised of subfactors having the same distinctive characteristics of relevant main factors. She proposed six core categories of the critical success factors of E-learning system. Those were: Technology Factors, Institutional factors, Student Factors, Lecturer Factors, Pedagogical Factors and Instructional Design Factors.

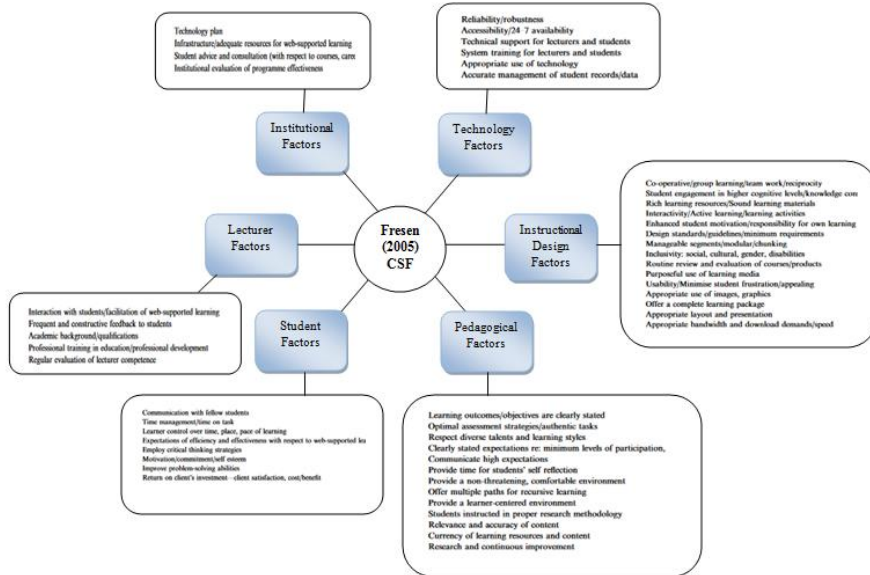


Figure-2: Fresen (2005) CSFs of E-learning

Technology Factors: The technology factors consisted of the reliability and robustness of the technology-based infrastructure; availability and accessibility of technology on 24/7 basis; technical assistance and support for instructors and learners; conducting technological and technical training programs for instructors and learners to make them capable for the appropriate and suitable use of technology. It also highlighted the significance of maintaining and managing the records and data of learners.

Institutional Factors: These factors drew attention to the efforts of the institutions towards policy making for online/E-learning systems. This category included the steps taken for preparing technology plan for an institution which might work as a ladder towards highlighting the needs of technological requirements and plans to fulfill those requirements for assuring the quality of technological infrastructure established by the institutions. It also included the plans considered by the institutions for learners' support to enrich them with the learning resources and learning objects and to provide them proper advises and consultation regarding using E-learning infrastructure, (with respect to courses and careers etc.). It also focused on the institution's role for the evaluation of the effectiveness of E-learning programs offered by the institutions.

Student Factors: this category depicted the attention towards the dedication, allegiance, and exclusivity of learners towards E-learning. This drew focus upon the need and establishment of learning communities to enhance collaboration and interaction among the learners and also lecturer-student interaction. The subfactors of this category involved time management of learners in accomplishing their tasks; learners' control of pace, place and time; improving critical thinking and problem-solving skills among learners; enhance motivation, self-esteem, and commitment of learners towards E-learning. This category also referred to the positive attitude and expectations of learners towards learning through online systems.

Lecturer Factors: Fresen in her research mentioned the category of lecturers' factors which highlighted the roles and responsibilities of teachers in the instructional process through E-learning perspective. It also brought in the characteristics, functions, and performance of teachers in E-learning systems. These functions and performances include interaction with the students; facilitation of E-learning; providing constructivist and recurrent feedback to the learners. It also focused the need of conducting teachers' training and development programs for the continuous enhancement of skills and proficiency of using innovative E-learning frameworks.

Instructional Design Factors: This category emphasized on designing cooperative, team-based and group learning activities which might reciprocate positive learning upshot. It focused on establishing enhanced learning engagement, knowledge and higher order cognitive skills among learners. Instructional design factors comprised of planning and designing the purposeful use of rich learning resources, learning media, images, graphics and appropriate layout and presentation of learning activities. It emphasized on the design of standards and guidelines to meet the challenges of interactivity and inclusivity (social, cultural, gender, disabilities etc.).

Pedagogical Factors: In this category, Fresen tinted on offering multiple paths for recursive learning by providing a learner-centered environment with accuracy and relevance of content. It mentioned the importance of instruction to learners with a proper research methodology and establishing the ways of research and continuous improvements in learning of students.

Study – 3: *Khan (2005), “E-learning QUICK Checklist”*

Khan presented eight categories of critical success factors which affect the design and development of E-learning systems. The dimensions of these categories were described as:

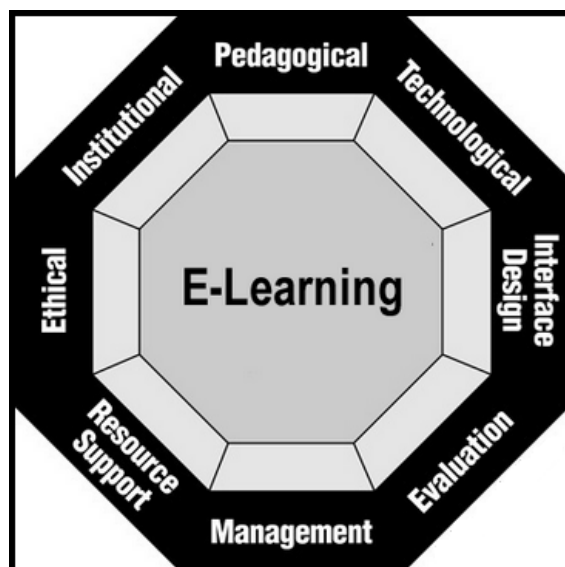


Figure-3: Khan (2005) CSFs of E-learning

Institutional Factors: This category is concerned with need assessment and institutional readiness for setting up an E-learning system. It also comprises the academic and administrative affairs and student services required to be caged in E-learning systems. Readiness implicates infrastructure readiness, financial readiness, cultural readiness and content readiness. Administrative and academic affairs relate to the teacher's readiness and ease of using and launching online materials and content; and off-campus students are provided support in terms of library services, counseling, orientations, and financial aids etc.

Management Factors: This category involves the issues related to management which contain two main subfactors, Maintenance of learning environment and distribution of information. Maintenance of learning environment covers allocation of budget, management of the delivery of learning resources and course content, security measures, staffing the management teams, maintenance, and evaluation procedures.

Technological Factors: Khan, in his study mentioned the category which involved the factors relating to the accessibility and availability of technological infrastructure for all the learners. It involved the process of planning of information technology (IT) need analysis, availability of human resources to support and maintain the ICT. Technological infrastructure also comprises the arrangement and availability of software and hardware resources.

Pedagogical Factors: The pedagogical dimension refers to “issues concerning objectives/goals, design approach, organization methods/strategies and instructional media of E-learning environments” (Khan, 2005: 79). It includes content analysis, audience analysis, medium analysis, goal analysis, design approach, learning approaches and organization. Objectives/goals are concerned with the obvious declaration of goals and objectives relating to the course. Design approach indicates the issues related to pedagogical philosophy and diverse learning tactics and approaches in E-learning environments. It also refers to the methods, strategies, and media for the learners to facilitate them in learning and in attaining their learning objectives in an E-learning system.

Ethical Factors: This dimension of critical success factors contains “the considerations related to social and cultural diversity, geographical diversity, learner diversity, information accessibility, etiquette, and legal issues” (Khan, 2009:89). This category highlights the substance of taking into account the diversified characteristics of the learners who learn in E-learning environments. The ethical issues relating to the learners encompass social & political influence, bias, geographical diversity, cultural diversity, learners diversity, legal issues, etiquettes and the digital divide.

Interface Design factors: This category refers to “the overall look and feel of E-learning programs; it encompasses page and site design, content design, navigation, and usability testing” (Khan, 2005: 84). It takes up the processes of page and website design, content design, accessibility, navigation, usability testing, online support, resources support, online and offline resources. Page and site design address “the physical appearance and functionality of the screen” and its accessibility standards. The visual representation of content in the form of videos and graphics, efficiency and easiness of content navigation

system, reliability and ease of using the courses, and getting the support services are major considerations of interface design factors.

Evaluation Factors: Khan's framework also highlighted the evaluation factors which include "both assessment of learners and evaluation of the instruction and learning environment" (Khan, 2005: 85). This category comprises the evaluation of E-learning environment, evaluation of the process of E-learning content development, program-level evaluation of E-learning, institutional-level evaluation of E-learning, and most importantly assessment of the learning level of learners.

Resource Support Factors: This category refers to "online support and resources required for fostering meaningful learning environments" (Khan, 2005: 88). The online support comprises the availability and accessibility of technical support documents and guidelines. Resources involve the retrieval of E-library services, research databases and online help desk for the assistance of online learners.

The above discussion of Khan's framework reveals that there are mainly three aspects which are emphasized in almost all the critical success factors. Those are an institution, instructor, and the learner. Khan has discussed all the factors and their respective subfactors in detail which are vital for the success of design and development of E-learning system.

Study-4: *Selim (2007), "Critical success factors for E-learning acceptance: Conformity factor models"*

The main objective of this study conducted by Selim (2007) was to indicate the Critical Success Factors of E-learning acceptance by students. The research focused on classifying the critical success factors for E-learning systems acceptance by the students. According to Selim, the critical success factors relating to E-learning in a university environment might troop into four categories: i) instructor; ii) student; iii) information technology; and iv) University support. There is a good supposition that the above categories are the main actors of an E-learning initiative.

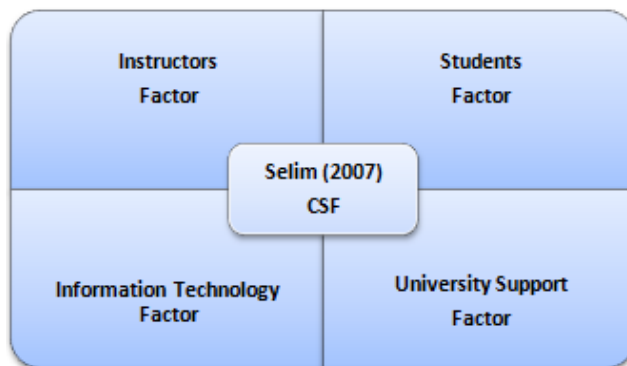


Figure-4: Selim (2005) CSFs of E-learning

Instructor: The effectiveness and success of E-learning courses at university level mainly depends on the role of the instructor in the whole process. The instructor competencies involve me) IT competency; ii) teaching style; and iii) attitude and mindset towards control of technology.

Students: Selim refers to the arguments of Papp (2000) and Volery & Lord (2000) that the university students are, going to be more assorted diverse and the demand for E-learning programs is escalating. Student characteristics, according to Selim, comprise computer competencies, interaction, collaboration, E-learning design, E-learning course content, and e-readiness.

Information Technology (IT): E-learning integration into university educational programs illustrates the IT explosion which has caused E-learning revolution into higher education. Selim mentioned that IT is one of the major components which is of critical importance to the success and student acceptance of E-learning. He argued that the factor of rich and reliable IT infrastructure with all necessary course delivery tools and techniques is critical to the success of E-learning. IT tools include network bandwidth, network security, network accessibility, audio and video plug-ins, courseware authoring applications, Internet availability, instructional multimedia services, video conferencing, course management systems, and user interface.

University Support: Selim referred chin (2004) in his study by arguing that it is vital for the success of E-learning system of any university that administration must provide institutional support services to the E-learners.

Study-5: Le Blanc and Wands (2001) “Critical Success Factors: E-learning Solutions Cappuccino”

Le blanc and wands (2001) in their research depicted three main categories of critical success factors of E-learning systems. Those were organizational factors, general factors, and cognitive factors.

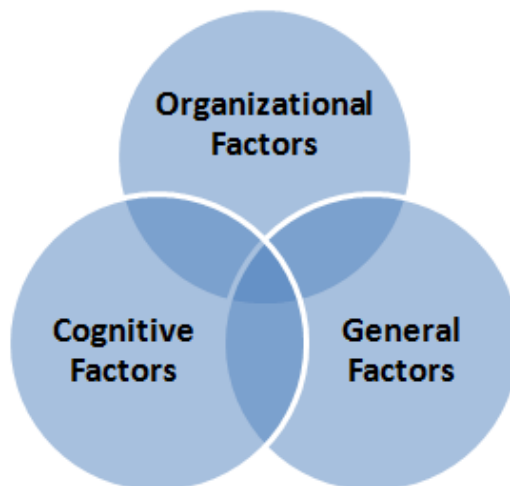


Figure-5: Le Blanc and Wands (2001) CSFs of E-learning

Organizational factors: This category consists of technological infrastructure and also Management support services to E-learning.

General factors: This category includes learning principles, learning pathways, defined outcomes, and appraisal of the E-learning system

Cognitive factors: Subfactors under this category of success factors include access to assistance, user interface, user control, use of multimedia and staging of complex information.

Study-6: Papp (2000), “Critical success factors for distance learning”

Papp (2000) recommended various critical success factors that can contribute to the faculty and universities in design and development of E-learning environments. Papp’s E-learning critical success factors included intellectual property, suitability of the course for E-learning environment, building the E-learning course, E-learning course content, E-learning course maintenance, E-learning platform and measuring the success

of an E-learning course. Papp advised for studying each one of these factors in isolation and also as a composite to determine which factor(s) influence and impact E-learning success.

Study-7: Volery and Lord (2000), “Critical success factors in online education”

Volery and Lord (2000) drew upon the results of a survey conducted amongst 47 students enrolled in an E-learning-based management course at an Australian university. They identified three CSFs in E-learning:

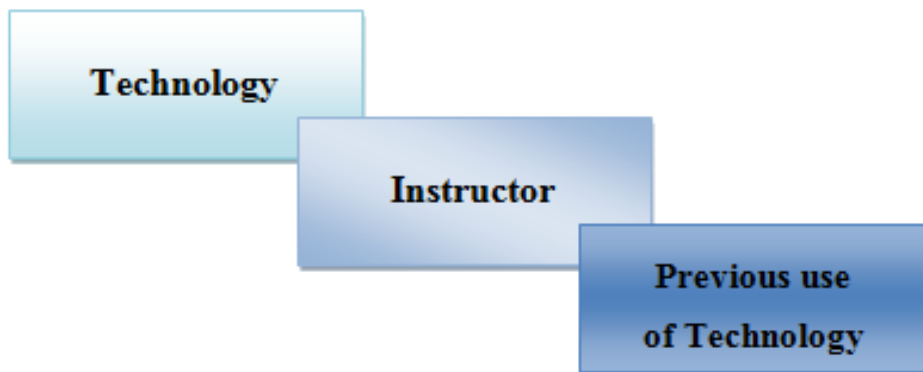


Figure-6: Volery and Lord (2000) CSFs of E-learning

Technology: This factor comprised of ease of access and navigation, interface design and level of collaboration and interaction.

Instructor: The Instructor factor covered the attitudes of instructors towards students, instructor technical competence, and classroom interaction practices.

Previous use of technology: This discussed the level of previous experience and use of technology from students' perspective.

Study -8: Soong et al. (2001) “Critical success factors for on-line course resources”

Soong et al. (2001) in a multiple case study mentioned that the E-learning critical success factors are human factors, technical competency of both instructor and student, E-learning mindsets of both instructor and student, the level of collaboration, and perceived information technology infrastructure. They recommended that all these factors should be considered in a holistic fashion by E-learning adopters.

Soong et al. mentioned the importance of having the computer competency for both

students and instructors. Student collaboration factor indicated that the more interactions the students get exposed to, the more opportunities they have to learn. The study also focused on the measurement of the instructor's teaching style.

Conclusion: Proposing a Design framework of E-learning for Higher Education Institutions

Information and Communication Technology (ICT) has revolutionized and reshaped the higher education institutions as a global scenario. E-learning has been incorporated in several higher education institutions. For the successful design of E-learning environments, a number of the factor must be evaluated carefully before the attempts for implementation of E-learning systems in universities and by the instructors. Its adoption primarily requires the establishment and development of information technology infrastructure at the institutional level. The E-readiness of students and teachers is also a crucial element to work in E-learning environments.

Review of previous literature resources in this study invites a debate on the careful selection of factors which are really critical for the success of an E-learning system in institutions. The present study reviewed the seven previous studies and following factors were drawn from each study.

Table 1: CSF identified in previous studies with references

| <i>Study no.</i> | <i>References</i> | <i>Critical Success Factors identified in the study</i> |
|------------------|----------------------|---|
| Study – 1 | Fresen (2005) | Technological factors |
| | | Institutional factors |
| | | Student factors |
| | | Lecturer factors |
| | | Instructional design factors |
| | | Pedagogical factors |
| | | |
| Study – 2 | Khan (2005) | Institutional factors |
| | | Management factors |
| | | Technological factors |
| | | Pedagogical factors |
| | | Ethical factors |
| | | Interface design factors |
| | | Evaluation factors |
| Study – 3 | Selim (2007) | Resources and support factors |
| | | Instructor factors |
| | | Student factors |
| | | Information technology |
| | | University support |

| | | |
|-----------|----------------------------------|---|
| Study – 4 | Le blanc and wands (2001) | Organizational factors |
| | | General factors |
| | | Cognitive factors |
| Study – 5 | Papp (2000) | Intellectual property |
| | | Suitability of course for e-learning environment |
| | | Building the E-learning course |
| | | E-learning course content |
| | | E-learning course maintenance |
| | | E-learning Platform |
| | | Measuring the success of e-learning courses |
| Study – 6 | Volery and Lord (2000) | Technology |
| | | Instructor |
| | | Previous use of technology |
| Study – 7 | Soong et al. (2001) | Human factors |
| | | Technical competencies of both instructors and students |
| | | E-learning mindset of both instructors and students |
| | | Level of collaboration |
| | | Perceive IT infrastructure |

All these factors are analyzed by the researcher and occurrence of each factor in all previous studies is represented in the following table.

| | | Study -1 | Study -2 | Study-3 | Study-4 | Study -5 | Study-6 | Study-7 | Study -8 | |
|---------|---|-----------|-------------|-----------|------------|----------------------|-----------|---------------------|--------------------|-------|
| Factors | | Puri 2012 | Frese n 205 | Khan 2005 | Selim 2007 | Le blanc &wands 2001 | Papp 2000 | Vole ry & Lord 2000 | Soon g et al. 2001 | Total |
| 1 | Technological infrastructure / ICT factors | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | 7/8 |
| 2 | Institutional factors | ✓ | ✓ | ✓ | | ✓ | ✓ | | | 5/8 |
| 3 | Student factors | | ✓ | ✓ | | ✓ | ✓ | | ✓ | 5/8 |
| 4 | Instructor factors | | ✓ | | ✓ | | ✓ | ✓ | ✓ | 5/8 |
| 5 | Pedagogical factors | ✓ | ✓ | ✓ | | | ✓ | | | 4/8 |
| 6 | Design factors | ✓ | ✓ | ✓ | | | ✓ | | | 4/8 |
| 7 | Ethical factors | | | ✓ | | | | | | 1/8 |
| 8 | Management factors | | | ✓ | | | ✓ | | | 2/8 |
| 9 | Collaborative factors | | | | | | | | ✓ | 1/7 |
| 10 | Resources and support factors | ✓ | | ✓ | | | | | | 2/8 |
| 11 | Behavioral factors (E-Readiness and motivation of students and instructors) | | ✓ | ✓ | ✓ | | ✓ | | ✓ | 5/8 |
| 12 | Cognitive factors | | | | | ✓ | | | | 1/8 |
| 13 | Intellectual property | | | | | | ✓ | | | 1/8 |
| 14 | Evaluation | ✓ | | | | | | | | 1/8 |

Table – 2: Factors occurrence in the reviewed literature resources.

On the basis of total of all factors reviewed in previous literature resources, it is obvious that the seven studies including Puri (2012), Fresen (2005), Khan (2005), Selim (2007), Papp (2000), Volery and Lord (2000) and Soong et al. (2001) mentioned the technological factor critical for the successful E-learning design and implementation. It refers that higher education institutions which intend to start E-learning programs or convert their traditional system to E-learning must be efficient in planning, developing and maintaining ICT-based infrastructures. All researchers agree on one point that 24/7 accessibility of reliable and efficient technological tools and settings is vital for the success of E-learning in higher education institutions.

Five out of eight studies included the “student factors” and “instructor factors” as a critical success factor for E-learning systems. It showed that all the factors which relate to the issues of students and instructors were vital to being addressed for the success of E-learning in higher education. These factors, according to different authors, may include student-teacher interaction, qualifications and technical competencies of instructors, ease of use of technology, professional training, and development of teachers etc. Also, the student factors may contain communication with other learners, time management, critical thinking and problem-solving capabilities, previous use of technology etc.

Also, five out of eight studies bared that behavioral factors of students and teacher are critical to the success of E-learning designs in higher education. Behavioral factors may include E-readiness, motivation, expectations of efficiency and effectiveness of E-learning, commitment, self-esteem etc. E-readiness was, therefore, an imperative component which confers that students and instructors both must be ready, trained and efficient to use technology for teaching and learning.

Five out of eight studies indicated the institutional factors as critical for the success of E-learning systems. Institutional factors may cover infrastructure, human resources, availability of adequate technical and technological resources, student consultative and guidance services, continuous feedback system, and institutional evaluation of program quality and effectiveness. On the basis of above-mentioned figures, this research study has proposed a framework of five factors which were considered critical success factors

for the design of E-learning systems in higher education. These critical success factors were derived on the basis of the numerical majority of critical success factors identified from previous studies. These factors were: Technology Factors, Institutional factors, Student factors, Instructor factors, Behavioral factors.

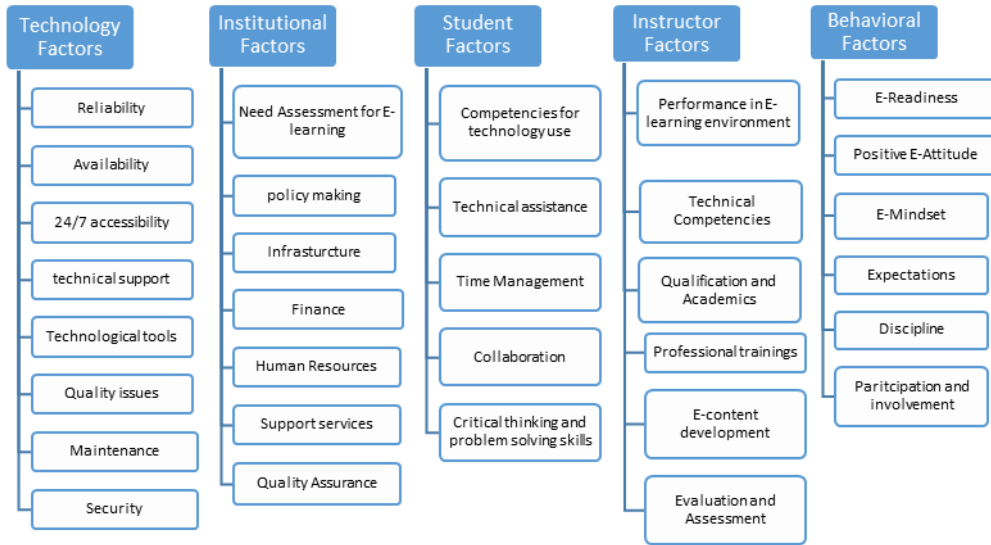


Figure-7: Proposed Critical Success Factors of E-learning design

Based on this framework and literature survey, this paper presents a set of critical success factors essential for designing effective E-learning systems. These factors include:

Technological Factors: (Reliability, availability, 24/7 accessibility, technical support, use of technological tool, technology-related quality issues, technological maintenance, security)

Institutional Factors: (Need Assessment, planning, policy making, infrastructure, Finance, Human resources, Support Services, Quality assurance)

Student Factors: (Competencies for technology use, time management, collaboration, interaction, critical thinking, problem-solving, technical support)

Instructor Factors: (performance, technical competencies, academic and relevant qualification, Professional training, E-content development, assessment, and evaluation)

Behavioral Factors: (e-readiness, positive e-attitude, e-mindset, expectations, motivation, discipline, participation, and involvement)

CONCLUSIONS AND DISCUSSION

E-learning is considerably believed a stipulated mean of education in the digital era. The mounting influence of globalization and digital technologies on education have compelled the higher education institutions to transform their education systems according to the emerging needs. Thus E-learning is being adopted in the prestigious universities worldwide including Pakistan. Before designing effective E-learning systems for HEIs, it was crucial to find out and evaluate critical factors which considerably impact the successful design of E-learning frameworks in HEIs. This study was purposefully conducted to develop a framework of CSFs for the triumphant design of E-learning system. Findings derived from this study have indicated five success factors which are crucial for the design of E-learning frameworks in higher education institutions. Those are technological, institutional, student, instructor, and behavioral factors. Results demonstrate that these five factors, due to their characteristics and significant variables, have a vital impact on the successful design of E-learning framework which contributes to meeting the technology goals of HEIs more effectively.

REFERENCES

- Bacsich, P. (2009a). Critical success factors concordance. Sheffield, Matic Media Ltd.
- Colmenares, L. (2009). Assessing Critical Success Factors of ERP Implementation. © IGI Global.
- Elliott, R. & Clayton, J (2009). Critical success factors in E-learning for small and medium enterprises. In Same places, different spaces. Proceedings facility Auckland.
- Falowo, R.O. (2007). Factors impeding implementation of web-based distance learning. *AACE Journal*, 15(3), 315-338.
- Freund, Y. P. (1988). Critical success factors. *Planning Review*, 16(4), 20–25.
- Goi L.C., Ng, P.Y. (2009). E-learning in Malaysia: Success factors in implementing E-learning program. *International Journal of Teaching and Learning in Higher Education* 2009, Volume 20, Number 2, 237-246.
- Greenberg A. D. (2009). Critical Success Factors for Deploying Distance Education Technologies. Wainhouse Research.
- Ingram, H., Biermann, K., Cannon, J., Neil, J., & Waddle, C. (2000). Internalizing action learning: a company perspective. Establishing critical success factors for action learning courses. *International Journal of Contemporary Hospitality Management*, 12(2), 107–113
- Jafari, S.M., Osman, M.R., Yusuff, R.M., Tang, S.H. (2006). ERP Systems Implementation in Malaysia: The Importance of Critical Success Factors. *International Journal of Engineering and Technology*, Vol. 3, No.1, pp. 125-

131.

- Kaupla, J. & Nyez, B. (2001). E-learning Project Success: The Critical Success Factors. Kohl's Case Study of Success. 17th Annual Conference on Distance Teaching and Learning.
- Kreku, J. (2012). Early-phase performance evaluation of computer systems using workload models and System.
- Le Blanc, A. & Wands, M. (2001). Critical success factors: E-learning solutions cappuccino. The Official E-Newsletter of the Change and Learning Practice. 2.
- Mehregan, R. M., Jamporzmay, M., Hosseinzadeh, M., Mehrafrouz, M. (2011). Proposing an approach for evaluating E-learning by integrating critical success factor and fuzzy AHP. International Conference on Innovation, Management, and Service IPEDR vol.14, IACSIT.
- Ossiannilsson, E. (2012). Quality enhancement on E-learning. Campus Wide Information Systems. 29(4): 312–323.
- Papp, R. (2000). Critical success factors for distance learning. Paper Presented at the Americas Conference on Information Systems, Long Beach, California, USA.
- Puri, G. (2012). Critical success Factors in E-learning—An empirical study. International Journal of Multidisciplinary Research, 2(1), 149-161.
- Schreurs, B. (2009). Critical success factors: Reviewing the virtual campus phenomenon. The rise of large-scale E-learning initiatives worldwide. Leuven, EuroPACE view: 9–84.
- Sela, E., & Sivan, Y. Y., (2009). Enterprise E-learning Success Factors: An Analysis of Practitioners Perspective. Interdisciplinary Journal of E-learning and Learning Objects Volume 5, IJELLO special series of Chais Conference 2009 best papers.
- Selim, H. (2007). Critical success factors for E-learning acceptance: Confirmatory factor models. Computers & Education, 49 (2007) 396–413.
- Selim, H. M. (2005). Critical success factors for E-learning acceptance: conformity factor models.
- Soong, B. M. H., Chan, H. C., Chua, B. C., & Loh, K. F. (2001). "Critical success factors for on-line course resources. Computers & Education, 36(2), 101–120.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: four longitudinal Weld studies. Management Science, 46(2), 186–204.
- Volery, T. and Lord, D. (2000). Critical success factors in online education. The International Journal of Educational Management, Vol. 14, No. 5, pp.216–223.
- Vucetic, J. (2003). Challenges and Success Factors for Distance Learning. Organizations Targeting Information Technology Professionals. IACIS 323 – 329.