SUCCESS FACTORS OF E-LEARNING PROJECTS: A TECHNICAL PERSPECTIVE

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ABSTRACT
The aim of this study is to identify the success factors of e learning programs in King Saud University from an engineer and technician's point of view. An extensive study of existing literature was done to determine the 11 success factors of e learning program. The factors identified as success factors are: Sufficient Users Training, Organization Commitment. Management Support, Technical Support, Positive attitude of users, Easy To Use tools, Sufficient Training to Engineers, Sufficient e learning initiatives, Sufficient Manpower, Availability of Info on E learning Website, Support from other Departments. A survey was conducted to evaluate these success factors in King Saud University. Personal interviews were also conducted with some of the engineers.

All the factors were tested to determine whether they are important for the implementation of e learning programs in King Saud University. The levels of importance of success factors were determined on the basis of quantitative methods.
Keywords: E-learning, Success Factors, Implementation, Engineers, King Saud University

1. INTRODUCTION
Traditionally, Education was based on attending classes, listening to lecture and appearing in exams (Albarrak, 2007). 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 (Fry, 2001, p.236). 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. E-learning has been defined in different literatures in distinctive ways (Wagner, Hassanein & Head, 2008). In general, E-learning can be defined as an educational system that delivers the information using the Information technology resources like the Internet, intranet, satellite broadcast and multimedia applications(Albarrak, 2007 and Urdan,& Weggen, 2000). The main aim of e-learning systems is to improve the whole educational system and to enhance the interaction between students and teachers (Nycz &Cohen, 2007).
E-learning systems are often used in distance-learning education in different countries enabling students to obtain degrees online. In 2006, about 3.5 million students in United States were taking online courses at the different level of their higher-education (Nagy, 2005). According to the recently conducted report by Sloan consortium, Over 6.1 million students in United States have taken an online course during fall 2010. Another result of their study was that over 65% of higher educational institutions regarded online-learning as a critical part of their longtime strategy (Allen & Seaman, 2011). The future delivery of education is seen through e-learning systems providing teachers with superior and enhanced teaching tools.

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 (Abouzahra, 2011).

Given the role of e-learning systems in the world of modern education and its importance in improving the performance of students, King Saud University decided to implement the e-learning systems in various collages, deanships and departments of the universities. King Saud University is one of the biggest universities in the world. It stands as Number one University in Middle East and Africa (Shanghai, Webometrics, QS World University Rankings, 2012). The university has around 38000 students and around 5000 faculty staff. The University in 2010 established the "Deanship Of E-Learning and Distance-learning" which is responsible for the implementation of e-learning projects all over the university. The university received United Nations prize for

public service 2010 – Western Asia region for the successful implementation of e-learning systems in the university (King Saud University and United Nations Public Service Awards, 2010).

This paper will describe the success factors of e-learning programs in King Saud University from a technical point of view.

2. BACKGROUND

E-learning is one of the largest sub sectors of global education market. There are a wide variety of e-learning definitions. So it's difficult to estimate the size of the e-learning market (Wagner, Hassanein & Head, 2008). Global Industry Analysts, Inc. (GIA) in 2010 published a report which estimates the worldwide e-learning market to reach $ 107.3 billion by 2015.

The success factors of e-learning have been mentioned in a wide variety of literatures. It has been found that a wide variety of factors can have effect on the success of e-learning. The institute of higher education in 2000 conducted a study named "Quality on the line: Benchmarks for Success in Internet-Based Distance Education" which identified the following as critical factors for the success of e-learning:

- *Institutional support:*
  Benchmarked the technological infrastructure issues

- *Course Development:*
  Benchmarked the development of courses by faculty on campus or by experts.

- *Teaching/ Learning:*
  Benchmarked on the way of teaching and learning.

- *Course Structure:*
  Benchmarked on the basis of self-motivation and commitment to learn.

- *Student Support:*
  Benchmarked on the basis of information provided to students. This included information about admission, tuition, fee, books and student support services

- *Faculty Support:*
  Benchmarked on the basis of technical support available to the faculty included transition from classroom teaching to the online teaching

- *Evaluation and assessment:*
  Benchmarked on the basis of overall effectiveness of the e-learning systems. This includes reviewing the intended outcomes regularly to ensure the utility of e-learning systems

Volery and Lord (2007) conducted a study on an online management course in Australian university and found Instructor, technology and previous use of technology by a student as critical factors for the success of online e-learning systems. Papp in 2000 identified intellectual property, suitability of course content, building e-learning course, suitability of e-learning course, e-learning platform and measuring the success of e-learning courses as critical success factors for any e-learning system. Le blanc and wands (2001) categorized the success factors of e-learning systems as follows:

- *Organizational factors***:**
  Include technological infrastructure and Management support to e-learning.

- *General factors*:
  Include-learning principles, defined outcomes, learning pathways and assessment of the e-learning system

- *Cognitive factors***:**
  Include access to help, user control, user interface, use of multimedia and presentation of complex information.

Sela and Sivan (2009) divided the success factors of e-learning as "Must have factors" and "Nice to Have Factors"

Must have Factors Include
   1. Usefulness and Ease of use:
   - o   Easy to use for learners
   - o   Engaging employees
   - o   Short course duration
   2. Marketing
   - o   Understanding the reason for e-learning
   - o   Awareness to e-learning tools
   3. Management support
   - o   Top Management support to employees.
   - o   Management assistance to employees
   4. Organizational culture
   - o   Learning culture
   - o   Change in study habits
   - o   Making people understand how to e learn
   5. Real need
   - o   The organizations motive behind the e-learning implementation.

Nice to have factors include
   1. Time to learn
   - o   Allocate sufficient time for e-learning
   - o   Make e-learning a routine
   2. Support
   - o   Provide technical support on how to use the e-learning system
   3. Mandatory usage
   - o   Integrate e-learning into organization policy
   - o   Enforce e-learning
   4. Incentives
   - o   Recognition to e-learning usage
   - o   Provide materials that are otherwise unavailable

There are also some challenges and issues faced in the successful implementation if e-learning in an organization. Madhukar in 2002 pointed out some of the negative influences of using the Internet as a medium of e-learning. He argued that introduction of the Internet as an e-learning tool reduces the student concentration on studies and is time consuming. He also argued that this makes student dependent on the Internet and in turn restricts a student to gain knowledge by research.

Another study conducted by Alexander & McKenzie in 1998 pointed out certain factors, which may result in the failure of e-learning systems. According to them, failure to prepare students for using e-learning and not obtaining the copyright clearance may result in the failure of e-learning. They argued that e-learning will fail if the outcome desired is not supplied with sufficient budget and time. They also argued that e-learning will fail if the system applied does not meet the requirements of the organization. The shortage of skilled IT workforce can as well be an important factor for the failure of an e-learning system. According to an estimate by Gordon in 2002, there will be more than one billion Internet users but there will be a shortage of skilled workforce to sustain this growth.

3. OBJECTIVES
The main objective of this study was to measure the success of e-learning programs in King Saud University from a technical point of view. This study was carried out with the help of engineers and technicians working towards the implementation of e-learning in King Saud University. Based on extensive literature review and consultation with the engineers and technicians, there were 11 factors that were identified as the success factors for e-learning implementation in King Saud University. These 11 factors were identified as:

- ✓   Sufficient Users Training
- ✓   Organization Commitment
- ✓   Management Support
- ✓   Technical Support

- ✓ Positive attitude of users
- ✓ Easy To Use tools
- ✓ Sufficient Training to Engineers
- ✓ Sufficient e-learning initiatives
- ✓ Sufficient Manpower
- ✓ Availability of Info on E-learning Website
- ✓ Support from other Departments

4. METHODOLOGY

A set of a questionnaire was created, which contained a total of 16 questions. The questionnaire was then distributed to the Engineer's and technical support staff of e-learning programs in different departments, deanships and Colleges of the King Saud University. 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. The questionnaire was sent out to nineteen engineers and technical support staff and the response was collected within the supposed time. 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 King Saud University. Interviews were carried out with the support staff of two main colleges of King Saud University: Collage of Computer Sciences and Collage of Pharmacy. 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 program implementation in King Saud University.

The data collected was subsequently analyzed on mean, percentages, frequencies and standard deviation using PASW Statistics 18 software. The analyzed data was afterwards synthesized and presented in the form of table. In the event of an invalid answer or an unanswered question, the question was deemed void and was not used in the analysis.

5. ANALYSIS AND DISCUSSION

Table given below shows the Mean and Standard deviation for each factor. The factors are arranged from the highest mean score to the lowest mean score. There were six factors that have a mean score in the range of 4 to 5. The rest had a mean score of less than 4.0. The six factors that have a mean score of greater than 4.0 are Sufficient Users Training, organization Commitment, Management Support, Technical Support, Positive attitude of users, Easy To Use tools. This implies that six factors were deemed most important by our respondents for the success of e-learning initiatives. There were four factors that have a mean score of more than 3.0 up to 4.0, which implies that all these factors are fairly important for the success of e-learning programs and play a vital role in successful e-learning implementation. These factors are Sufficient Training to Engineers, Sufficient e-learning initiatives, Sufficient Manpower, Availability of Info on E-learning Website. There was only one factor, Support from other Departments, which has a mean score of less than 3.0 implying that this factor was not considered important by our respondents.

Table: E-Learning Success Factors

Success factors	Mean	Std. Deviation
Sufficient Users Training	4.4211	.69248
Organization Commitment	4.3889	.77754
Management Support	4.2105	.91766
Technical Support	4.1579	.83421
Positive attitude of users	4.1579	1.11869
Easy To Use tools	4.1053	.87526
Sufficient Training to Engineers	3.7368	.65338
Sufficient e-learning initiatives	3.7368	1.04574
Sufficient Manpower	3.6316	.95513
Availability of Info on E-learning Website	3.2105	1.13426
Support from other Departments	2.0000	.94281

5.1 Sufficient User Training

A lot of respondents felt that sufficient user training is the most important factor for the success of e-learning programs. 52.6% of respondents felt that this factor is of topmost importance to the success of e-learning in King Saud University. This is the highest percentage of importance given to any factor in this survey. This factor was also considered very significant by 36.8% of the respondents and a minority of 10.5% of

respondents considered this factor as just important. None of the respondents deemed this factor as less important or not important at all.

5.2 Organization Commitment

Organization commitment determines organization effort and seriousness towards the implementation of e-learning programs. Different Organization all over the world has distinct motivations and strategies for the implementation of e-learning programs. If the organization is not committed towards e-learning programs, the e-learning initiatives are bound to fail (Goi and Ng, 2009). Respondents in this survey considered organization commitment of topmost importance with 36.8% of respondents agreeing to this fact. A same percentage (36.8%) of respondents termed organization commitment to be a very important factor for the success of e-learning programs. This implies that more than 73% of respondents considered this factor as either topmost important or very important. The results strongly support the Henry's theory (2001) which stated E-learning requires the same management commitment as other mission-critical organization-wide initiatives.

5.3 Management Support

This is one of the most important factors for the success of any IT project including E-learning. The top management support and consistency is critical to implementation of any project (McPherson & Nunes, 2006 and Selim, 2007). The management can help an employee to learn and support the acceptance of the new system (Sela and Sivan, 2009).The importance of this factor can be attributed to the fact that 47.4% of the respondents termed this as a factor of topmost importance. 31.6% of respondents termed this factor to be very important while as 15.8% termed it as an important factor for the successful implementation of e-learning in King Saud University. A small percentage of 5.3% people considered this factor as less important.

5.4 Technical Support

The availability of technical support has a positive effect participation and willingness to use e-learning systems (Masie, 2001; McPherson & Nunes, 2006; Selim, 2007). It was found that 36% of the respondents deemed the technical support availability factor of topmost importance. Approximately, half of the respondents (47.4%) considered the availability of technical support to them as a very important factor. None of the respondents felt that they don't need any technical support.

5.5 Positive Attitude of Users

The use of e-learning systems by the users is determined by their attitude towards technology. According to technology acceptance model (TAM), the acceptance of new technology is determined by its perceived usefulness. The user will have positive attitude towards technology if they believe that the system will enhance their performance (Sela & Sivan, 2009; Venkatesh, Morris, Davis & Davis F, 2003). Majority of our respondents also believed that user attitude will determine the success of any e-learning initiative in King Saud University. 47.4% of the respondents gave top importance to the positive user attitude and 36.8% of the respondents rated positive user attitude as a very important factor for the success of e-learning programs.

5.6 Easy To Use tools

The success of any system depends on the degree the person believes that the system will be free of effort (Venkatesh, Morris, Davis & Davis F, 2003). The easy to use tools are extremely important for the success of any e-learning program. This fact was also considered important by all of the respondents. 42.1% of respondents felt that it's extremely important to have easy to use e-learning tools. 26.3% considered this factor as very important while as 31.6% deemed this factor important. None of the respondents gave this factor less or no importance.

5.7 Sufficient Training to Engineers

There were 68.4% of respondents who chose this factor as very important. 21.1% of respondents deemed this factor as important. This implies that the sufficient training to engineers and technicians is essential for the efficient management of e-learning programs in their respective Colleges and deanships. The reason for this could be that there are new e-learning technologies coming out every day and King Saud University is constantly implementing these technologies in various streams of the e-learning programs and initiatives. The working of e-learning systems and programs in various Colleges and deanships is largely dependent these respondents, so they want to be well versed in every system and program that is implemented in King Saud University.

5.8 Sufficient e-learning initiatives

There were 21.1% of the respondents who rated this factor as Topmost Importance. 52.6% of the respondents placed this factor as a very important criterion. None of the respondents deemed this factor as not important.

The results regarding this factor imply that majority of the respondents felt that the sufficiency of e-learning programs and initiatives are important for e-learning to succeed.

5.9 Sufficient Manpower
There were 47.4% of respondents who considered this factor as very important factor and 21.1% of respondents chose this factor as important. 15.8% of respondents rated this factor of topmost importance. 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.

5.10 Availability of Info on E-learning Website
The opinions of respondents regarding this factor were fairly divided. Only 10.5% of the respondents considered this factor of topmost importance whereas vast majority of respondents considered this factor very important. 21.1 % of the respondents considered this factor as somewhat important and 26.3% considered it as less important. Only 5.3% of the respondents deemed this factor as not important at all. The importance of this factor can be attributed to the fact that engineers and technicians want to know about the department they are working with and also would like information about the e-learning systems and programs they are going to work with or provide support.

5.11 Support from other departments
This factor had a lowest mean score of 2.0. This implies that this factor is of least importance for the success of e-learning programs in King Saud University. 31.6% of the respondents felt that this factor is not important at all and 47.4% of respondents considered this factor as less important for the success of e-learning programs. There were only 10.5% of respondents that considered this factor as very important and none of the respondents gave this factor a topmost importance.

6. CONCLUSIONS AND RECOMMENDATIONS
Out of the 11 factors 10 factors were considered important by the respondents and only 1 factor was considered less important. The responses and findings of this study can help King Saud University and other similar Organization in deciding higher priority and the lower priority factors. Six factors had a mean score of more than 4.0 (Sufficient Users Training, Organization Commitment. Management Support, Technical Support, Positive attitude of users, Easy To Use tools) while as the rest had a mean score of less than 4.0(Sufficient Training to Engineers, Sufficient e-learning initiatives, Sufficient Manpower, Availability of Info on E-learning Website, Support from other Departments). There was only one factor, Support from other Departments, which was deemed relatively less important or not important at all by a significant percentage of respondents (79.0%).
The focus of e-learning programs should be on the learners and users rather than the introduction of new technology. The results of this study are of critical importance because this study was carried out with the involvement of engineers and technicians who are actually responsible for the implementation on e-learning programs in King Saud University. We consider this study to be important not only to King Saud University but also to other Organization and universities which are in a process of implementing the e-learning systems and programs.

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