

An Overview of E-Learning in Educational Institutions of Saudi Arabia with Particular Reference to Students

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Abstract--The present study discusses applications, benefits, characteristics, importance, and current trends of E-learning, Information and Communication Technology, and Learning and Management System in educational institutions of Saudi Arabia. It describes influence of various factors such as Facilitating Conditions, Performance Expectancy, Motivation, Behavioral Intentions, Social Influence, and Effort Expectancy on the participation of users in the Learning Management System with the help of Use of Technology (UTAUT), Unified Theory of Acceptance and Keller's Theory (ARCS).

The current study is in the context of social and cultural uniqueness of Saudi society, which has been derived from traditions and values. This paper has lots of significance, since it describes the importance and application of E-learning in Saudi educational institutions, where Learning Management System has been introduced only at the later part of the last decade. Theoretical knowledge, practical application and available studies discussed in this paper will assist administrators in the higher education as well as other organizations to introduce E-learning for their own benefits as well as for the benefits of institutions and the nation.

Keywords-- E-learning, information, communication, student, education, Saudi Arab.

I. INTRODUCTION

The E-learning, which was originated in 1980's, has evolved through many definitions, terms and terminologies. Abuhamdeh [1] defined E-learning as "learning through electronic devices such as desktop and laptop computers, smart phones, CD and DVD players, iPhone and iPads etc.).

The E-learning is considered as one of the important tools in the field of education, involving distance training through electronic media. Gradually, E-learning is becoming a necessity rather than a trend in various professions throughout the country. What the E-learning is, moreover, what does it achieve? The E-learning is training initiatives, which felicitate materials for learning, and communicates and delivers course contents electronically with the help of technology mediation [2]. It is considered as a significant form of technology that support teaching [3] for students, which can also be used by human resource managers to impart training to their employees. As the result of growing interest, E-learning is considered as one of the task-oriented application tool for human resource development and training [4].

The increasing rate of utilization of Web 2.0 technology, which includes social networking, emails, and blogging by students in Saudi Arabia, is a good indicator of their intentions to share learning information and materials electronically [5]. E-learning requires internet enabled mobile devices such as the computer, internet connection to access resources, blogs, net-meetings, classes, social networking sites etc., for learning.

The degree of familiarity of students with communication devices and their skills to use such technology reflects intensity of internet usage, computers, and mobile-based technologies for social interactions, educational purposes as well as for entertainment [6]. The usefulness of technology-based education is measured by the perception of student, which vary according to the age, gender, technology acceptance, preferred learning style and previous experience in using such devices [7]. Despite challenges, technology based tools are now commonly used by students, professionals and common people in Saudi Arabia, which is highly beneficial in their learning activities.

One important requirement for integrating Information with Communication Technology is successful implementation of E-learning in academic institutions of the country. Such integration may be achieved by using Learning Management System, which is considered as an exclusive platform for students, professionals and others to access Electronic Learning [8]. The benefits of Learning Management System is enormous in fields of education and management, where various courses, training programs, documentation, organization of E-learning sessions and management of training process can be accessed from remote locations [8].

In Saudi Arabia, E-learning is used in various academic institutes including Saudi Academy of Civil Aviation. The Academy assumes responsibility of preparing, teaching, training and rehabilitating airport operations, employee safety, staff, and air traffic controllers, technicians of navigational equipment maintenance, firefighters and rescue officers. The Academy also plays role of General Authority of Civil Aviation to provide it's employees with mandatory knowledge and skills to perform at International standards [8].

II. E-LEARNING IN SAUDI ARABIA

The Information and Communication Technology is adopted globally at accelerating rate, whereas the Ministry of Education in Saudi Arabia has adopted Information and Communication Technology only in the recent time [9]. The recent developments as witnessed in Saudi economy have encouraged entities to integrate Information and Communication Technology in higher education system [10].

Various bodies of higher education in Saudi Arab are responsible to improve future prospects of young generation, who faces increasing competitiveness in Saudi employment market. With the help of National Centre for E-learning and Distance Learning (NCeDL), many researchers in Saudi Arabia have started to develop and implement Information and Communication Technology in educational institutions in order to overcome increasing rate of unemployment. Despite of the efforts made by many institutions to adopt E-learning in higher education, the process of implementation of Information and Communication Technology is still at the snail's pace in Saudi Arabia. The Saudi National Centre for E-Learning and Distance Learning is committed fully to implement Information and Communication Technology under the national plan.

The National Centre for E-Learning and Distance Learning has developed infrastructure for E-learning, it has provided complete solutions to resolve problems associated with E-learning in collaboration with concerned parties in higher education, government and semi government organizations. It has also developed rules, standards and regulations to increase awareness of E-learning programs in Saudi Arab.

Along with other developed countries, Saudi Arab has seen growth of E-learning in the education and other sectors [11]. The personal computer (PC) is still considered as the most important tool used by Saudi students for E-learning [12, 13]. Due to the continuous increase in the number of students in Saudi Arabian educational institutions, the use of e-learning and associated technologies is becoming more and more common and normal activity.

The Saudi education system is not different from other socio-economic aspects and cultural issues of the country, such as complete separation of males from females, or women not driving the cars etc. Such type of gender segregation requires separate buildings, staff, learning resources and accommodation for the two sexes simultaneously but at different locations, which exert extra burden on educational institutions [14]. Under such a scenario, E-learning and its associated technologies will play a very significant role in overcoming extra financial burden, additional management and in the use of existing resources to educate both males and females separately but concomitantly by keeping cultural values in place.

The rate at which E-learning is adopted in educational and other institutions of Saudi Arabia is encouraging, which always come with benefits offered to administrators of educational institutions as well as students and teachers [15]. In Saudi Arabia, E-learning is seen as more constructive and interactive approach for education that enables students to get maximum benefits of technology in learning subjects of their interests. Switching over to new interactive and paper less learning from the printed-paper is seen as great progress in the technology of the country. The E-learning technology increases ways of interaction between teachers and students, and employee and managers through easy provision of information and knowledge [15].

The rate of change in learning process of students and extent of achieving goals of implementing E-learning technologies greatly depend on their acceptance by students, teachers, human resource managers, employee etc., [15]. However, overcoming existing and forthcoming challenges in implementing E-learning and level of perception among various users will impact behavioral intentions to use E-learning technologies.

III. BENEFITS OF E-LEARNING

According to [16], E-learning refers to "the system of education that integrates Information and Communication Technology with current forms of education in order to improve manageability of learning processes". The following four characteristics are linked to E-learning systems [17].

- i. The multimedia environment is offered through E-learning.
- ii. The interactive communication is supported by E-learning systems, where dynamic control of information and learning situation is achieved through high degree of interaction.
- iii. E-learning supports networking for accessing and sharing information. E-learning system goes beyond static web pages by creating fully interactive networks with the exchange of information between learners and servers.
- iv. The execution of web-based applications is allowed independently across the platform through various computerized operation systems.

According to recent developments as witnessed in terms of communication technologies, successful implementation of E-learning depends on tools of networking and computers, which perform such types of learning processes. Systems consisting of many channels, such as wireless, satellite, cellular phones and PDA's are also included in E-learning. Synchronous or asynchronous access may be incorporated in E-learning to distribute it geographically over a period.

There are many factors involved to attract organizations, companies and educational institutions to adopt e-learning technology. E-learning has wide range of benefits that include cost reduction, quality improvement, efficiency improvement and intention to access education, which are of great advantage in E-learning by educational institutions and profit or nonprofit organizations. Additionally, E-learning provides opportunities to implement standard and decentralized education system for large group of trainees globally or within the same workplace. Sahlberg [18] is of the opinion that E-learning will soon replace conventional forms of education with distance education and gradually replace formal public schooling in the near future.

IV. LEARNING MANAGEMENT SYSTEM

The Learning Management System is defined as “the web-based technology, which assists in planning, distribution, and evaluation of specific learning processes” [19]. Learning Management System is also defined as online system that allows users to share information and collaborate online [20]. Sallum [21] has described Learning Management System as the package of high solution that allows administration to deliver contents and resources to all students and employees of the institution. With the help of Learning Management System, course websites can be building and maintained by using information technology. The website maintenance includes updating events, posting course contents, and managing interactive communication with students via messages, forums, and surveys [22]. Learning contents can be accessible and managed easily through software application and features contained in the system. Additionally, the Learning Management System helps instructors to provide their students with learning materials and in their management. Lonn & Teasley [20] described Learning Management System as the system that provides tools of various functions such as notifications, assignments, quizzes, syllabus, course readings, lecture slides, etc. to students and teachers.

The most common E-learning functions are integrated in a single application known as the Learning Management System, which is a set of software and programs that automate administration, tracking and reporting of online courses, programs etc., [23]. The learning system provides a centralized method of organizing various learning processes in the form of recommendations and scheduling courses, registering learners, and assessment of learning outcome.

The effectiveness of Learning Management System is linked to the student satisfaction, teaching redesign, student performance, dropout prevention and monetary savings [24].

The National Centre for E-learning and Distance Learning (NCEL) in Saudi Arabia has established its own Learning Management System known as Jusur Learning Management System [25]. Jusur Learning Management System has been established in collaboration with the Meteor Group of Companies, Malaysia. Seventeen tools: Courseware Control, Course Description, Announcement, Learning Content Management System, Glossary, Forum, General Chat, File Sharing, Assignment, Test and Assessment, Virtual Classroom, Lecturer Information, User Administration, Survey Manager, Questions Bank, Grad Book, Tracking Forum Participation (National Centre for e-learning and Distance Learning) are included in the Saudi Learning Management System.

One of the most important goals of Learning Management System is to help instructors to integrate all types of educational contents including Microsoft PowerPoint, Questionnaire, Sharable Content Object Reference Model, as well as management of educational contents like categories and versions. Further, the Learning Management System helps instructors to follow-up progression and evaluation of knowledge acquisition of local and remotely available students.

The solutions offered by E-learning in terms of management include management of users of the Learning Management System, availability and occupation of instructors and classrooms, and management of reports and dashboards. Training actions offer solutions required to organize training courses, to integrate a new training course in catalogue, to integrate training contents, to create new training sessions and to enroll students and instructors in training sessions. Training processes also include follow-ups of training sessions by instructors through E-mail message tool to guide students and notification tool to assess students' progress. The Learning Management System offers students to access many browsers including training contents of assigned sessions and forums with instructors and colleagues [8].

V. FACTORS INFLUENCING APPLICATION OF LEARNING MANAGEMENT SYSTEM

In order to implement E-learning and attaining most benefits, educational organizations must promote its merits among students and teachers as well as administrators [26]. The courses, workshops and training programs must be organized on the use of technology [27], importance of using E-learning [28], how E-learning would benefit friends and family [29], technology competency [30] etc.

We have defined the following important factors, which influence students as well as teachers to use Learning Management System.

- i. Facilitating Conditions
- ii. Social influence
- iii. Behavioral intention
- iv. Motivation
- v. Performance Expectancy
- vi. Effort Expectancy

A. Facilitating Conditions

Many authors [35] have discussed facilitated conditions and their role in enhancing Learning Management System. Technical support is one of the important Facilitated Conditions that must be included in the Learning Management System in order to encourage users [38]. Various organizational and personal characters, considered as technical and non-technical issues may affect use of Learning Management System [10]. Despite recognition of many technical and non-technical issues, empirical researches affecting Learning Management System are still lacking [39]. Accordingly, there is a need to conduct studies to identify technical and non-technical issues affecting Learning Management System and Behavioral Intentions of students to participate in E-learning processes.

B. Social Influence

The Social Influence refers to consistent and continuous use of technology by undergraduate students, when encouraged by important and influential people around them [36]. Sevendsen et al., [37] was of the view that students are likely to use technology more, if they think that their doing can influence perceptions of people about their social influence. The social influence is considered as one of the external variables influencing student's use of E-learning. It is hard to define social dimensions of learning, which most scientists believe that social interaction is very useful as an informal type of learning. Improvement in social dimension of learning environment can be achieved through newsgroups, e-mail, chat interfaces, online forums, distribution lists, and live web cam video etc.

The usefulness of the Information and Communication Technology is fully linked to skills of students and their learning processes. Therefore, organizations and institutions should enable students to utilize Learning Management System with required training. Such motivations from organizations may come in the form of commitment, support, help, and technical guidance. In order to enhance acceptability of Learning Management System, support by organization is greatly required for maximum participation of students and their success in using Learning Management System.

C. Behavioral Intentions

Behavioral Intention is another factor influencing users to use Learning Management System.

The behavioral intention is linked to the intention of students to use technology. The more desire they have, the more they will use technology in Learning Management System achieving more in most positive ways [40]. The attitudes, perceptions and beliefs of other people about the Learning Management System greatly influence attitude and Behavioral Intention of students as suggested by [41]. Chang & Yang [42] and [43] have rightly mentioned that characteristics of E-learning is not that important as readiness and acceptance of E-learning, Learning Management System and Information and Communication Technology by students. In addition to the above, positive attitude and positive behavior of students and their behavioral intentions towards use of technology, must include suitable degree of knowledge, competency, and volunrariness in order to deal better with learning technologies.

The popularity and applications of E-learning in higher education is growing by days and nights. The students and teachers in Saudi Arabia must also avail newly emerging technology for their own benefits, and for the upliftment of their society, institution and nation [26, 44].

C. Motivation

Motivation is defined as the inner state of mind that ensures accomplishment of goals. It is the ability of individuals to find academic activities, which are meaningful and worthwhile to achieve academic benefits. Poor student motivation is the reason of failure, whereas high level of motivation succeeds in the implementation of E-learning programs in educational institutions.

There are different theories and methods proposed by researchers in dealing with motivation. The students can be motivated either by striving success or fear of failure or the success may be attributed to the ability, luck, effort, self-efficacy, self-regulation, freedom, meaningful individual goals, self-awareness and extent of difficulty.

In this study, motivation is defined as the concept to find the Learning Management System useful and easy so that it can benefit students academically. Performance and effort expectancy are found to have a great influence on student's motivation by having an effect on intention to use e-learning system.

D. Performance Expectancy

Performance Expectancy is one of the most important and well-known factor influencing adoptions of Learning Management System. The continuous use of technology linked to the perception of students indicates usefulness and capability of technology to improve job skills and performance [31]. Venkatesh [32] defined performance Expectancy as the extent of a person's believes in the benefits of using information system in performing a job.

Performance Expectancy also includes concepts like perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations [32], where each factor represents strong predictor of behavioral intention to use information technology.

The following concepts are suggested to compose Performance Expectancy; the perceived usefulness of technology, extrinsic motivation to use technology, usefulness of technology to job-fit, relative advantages of technology over other technologies, and outcome expectancy [32]. The following points reinforces discussion on the five hypotheses that are included in Performance Expectancy:

- a. Perceived usefulness of technology measures extent of person's believes and consideration to use particular technology to improve job performance [32]. As suggested by many researchers Performance Expectancy is one of the important factors in UTAUT model [33].
- b. Extrinsic motivation, defined as perception of users, is derived from motivational model, which is governed by job performance, pay and promotions [32].
- c. It is distinct from the activity and beneficial to achieve outcome e.g., modified job performance, pay and promotions [32].
- d. Governed by extrinsic forces e.g., job performance, pay and promotions for using a particular technology.
- e. Job-fitness emphasizes aspects of technology function in up grading individual's job performance. The fitness of job fit is defined as capabilities of a system to enhance individual's job performance. It is derived from MPCU [32].
- f. Relative advantages deal with the benefits brought by the new technology as compared to the old. It is derived from the diffusion theory of innovation, and it is defined as the degree of perception of innovation [32].
- g. Outcome expectancy, derived from social cognitive theory, distinguishes between performance and personal outcomes as consequence of the behavior coinciding with individual goals [32]. Performance outcome is job-related, whereas personal outcome is attained because of the sense of accomplishment.

E. Effort Expectancy

The Effort Expectancy is another important factor that influences utilization of Learning Management System. It has been found that the constant use of technology by students is greatly linked to the ease of using technology without exerting much efforts or attempts while dealing with programs regarding E-learning [34, 32].

The use of new technology can be enhanced if conditions are facilitated and access to Learning Management System is easier, specially when there are large populations seeking E-learning technologies such as in educational institutions [35].

The ideal Learning Management System includes direct support and help from administration, which has been considered as influencing factor to encourage students in order to let them use E-learning technology. The management support, consistency and positive roles played by academic institutions extend motivation in students and teachers alike.

The support from the Information and Technology department of educational institutions is very critical and facilitating factor in order to provide required knowledge to help and encourage students in joining the Learning Management System willingly and intentionally without any compulsion. Al-Khalifa [25] stated that unreliable technology, technical support, poor maintenance and poor infrastructure could negatively affect accessibility and availability of E-learning. The improvement of training processes and employee's motivation to use the system is linked to functions and advantages of the system.

VI. IMPORTANCE OF E-LEARNING

This study has examined factors such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Motivation on the Behavioural Intention of students to use the Management Training System. The above factors are important in many ways, since they are responsible to determine the final outcome of students' and participation of other users in the Learning Management System. This study will help in laying down the path for future studies to identify other technical and non-technical issues related to implementation of Learning Management System, and Information and Communication Technology in educational institutions. Observations made in the present study should help administration to prepare students and employees alike for better utilization of E-learning tools and to develop most favourable environment to bring growth to E-learning in the country. Recommendations generated from this study will enhance and improve strategies, job performance and knowledge of students, teachers and employee.

VII. TECHNICAL ISSUES IN THE IMPLEMENTATION OF E-LEARNING

The objective of this study is to evaluate the importance, application and use of E-learning, Learning Management System, and Information and Communication Technology in Saudi Arabian educational institutions. It also explains the need to study effects of various factors e.g., Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Motivational and Behavioral Intention of the users to use E-learning. The implementation of E-learning faces technical and non-technical issues, which should be overcome.

The infrastructure of the Information and Communication Technology is a pressing issue, which sometimes deters implementation of new technologies. Insufficient structural facilities slow down implementation of E-learning and related electronic services [45]. In other words, teachers and students should have easy and quick access to E-learning rather than wasting their time to search for available resources [46].

Security is another issue that impedes implementation of E-learning in academic institutions. In the context of online, security refers to threats to user's accounts and information by incoming dangers such as hacking, spamming, etc. It is therefore, user accounts and their personal information must be protected from potential outside threats [47].

The on-site and off-site access of E-learning, Information and Communication System and Learning Management System is affected by the access of individuals to technology [48], for example, students who do not have computer sets at the home would depend upon others to share it. The poor connectivity of internet also restricts access to E-learning [49]. What does this mean? Well it means implementation will not succeed, if technical help is not available to users. Al-Khalifa [25] have stated that in Saudi Arabia "unreliable technology", "infrastructure", "poor maintenance", "inadequate technical support" etc., could hamper implementation of E-learning.

VIII. ACTUAL USAGE OF E-LEARNING

It is very important to know that the use of E-learning is new in Saudi Arabia. Many studies found in the literature discuss E-learning issues in Saudi Arabia, but few deal with the Learning Management System [50]. Studies, so far, available discuss Learning Management System issues focussed on attitudes and various features of the system. Consequently, such studies did not target intentions and behaviours of Learning Management System [50].

The Saudi educational sector has exerted substantial efforts and investment to introduce E-learning in its educational system. King Saud University (KSU), Riyadh has established Deanship of E-learning and Distance Education in 2010 for the first time in Saudi Arabia. King Saud University, Riyadh; King Abdulaziz University, Jeddah and others have announced to introduce Distance education, E-learning and Blackboard programs through Learning Management System.

IX. THEORETICAL FRAMEWORK

The way of adopting Information and Communication Technology in teaching and learning processes has become the topic of discussion in Saudi Arabia.

Theories related to the use of technology are many that includes technology acceptance model which is applied recently to understand acceptance of E-learning systems by learners. It is always better to address E-learning issues by identifying causes and effects of variables on technology acceptance through important models available in the literature. Alharbi [51] has applied Technology Acceptance Model to investigate intentions of academics in Saudi Arabia by choosing, perceived ease of use, perceived usefulness, and attitude towards the usage as parameters. His study has also illustrated role of additional variables like; unavailability of Learning Management System, prior experience of using Learning Management System, and job relevance.

The findings of the study indicated that both direct and indirect variables affect behavior intention of students to use Learning Management System. The study analysed factors influencing the use of Learning Management System by faculty members teaching in Saudi Arabian Universities. Potential users of JUSUR Learning Management System are affected by internal variables such as users' attitude, pedagogical beliefs towards e-learning, level of competency, external barriers faced by academics and demographic factors. One of the theoretical tools proved powerful instrument in analysing implementation of Information and Communication Systems and usage behaviour is known as unified theory of acceptance and use of technology (UTAUT)[52].

X. DISCUSSION

Around the globe, E-learning is becoming an important tool in education and management fields. In Saudi Arabia, implementation of E-learning is still in its infancy. Saudi Vision 2030 brings significant development and dynamic growth in overall economy, job opportunities, human resource development and education sectors, E-learning will have great opportunity to grow in various sectors particularly in higher education.

In order to modernize Saudi Arabia, significant reforms are underway through initiatives taken in the fields of economy, human development, education, industry, employment, public health etc. Several major programs are dedicated to higher education and implementation of E-learning.

This paper has presented an overview of E-learning and its implementation in the higher educational system in Saudi Arabia with particular reference to students. It highlights facts about universities wishing to embrace E-learning systems. The technical issues that impact E-learning implementation must be overcome. The findings are based on a wide review of literature, key findings have highlighted technical issues affecting E-learning in Saudi Arabian universities (Altameem, 2013).

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The findings showed that Information and Communication Technology infrastructures, security, access (on- and off-site) and IT support, all influence implementation of E-learning (Altameem, 2013).

It is therefore, educational leaders and developers should pay particular attention to these issues and Saudi Arabian Universities should consider these issues seriously, if they wish to successfully facilitate E-learning adoption in their institutions (Altameem, 2013). The key findings are useful for both students and teachers, as they provide real understanding of technical issues impacting E-learning in Saudi Arabian universities. Further investigations should be conducted in organizational and environmental aspects of E-learning in order to resolve issues related to them.

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