e-Learning in Higher Education: A Review

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Abstract: *e-learning is gaining more and more impact in higher education, especially in the format of blended learning. A number of studies have compared face-to-face teaching to online learning and/or blended learning in order to try to characterize which of the formats provides, e.g., the highest learning effect, creates the most satisfied students or has the highest rate of course completion. However, these studies often show that teaching and learning are impacted by more than teaching format alone. Many factors play important roles, and this literature review will look further into some of them. The review focusses on factors that influence learning experiences in e-learning with perspective of two major stake holders in education- teachers and students. Thus, the research question of the review is as follows: Which factors are found to influence e-Learning in relation to learning outcome, student satisfaction and engagement in collaboration in higher education? The review is based on systematic database searches conducted in April 2020, and it includes 40 peer reviewed articles and papers published between 2000 and 2020.*

Keywords: *e-learning, blended learning, learning outcome, student satisfaction, collaboration*

1. INTRODUCTION

Once we free ourselves from the mental limits of viewing the technology as a weak sister to face-to-face synchronous education, the potential to revolutionize education and learning becomes readily apparent. (Turrof, 1995).
e-Learning is often defined in terms of technology. Abbad et al (2009) define e-Learning as any learning that is enabled electronically. Welsh et al (2003) define e-Learning as the use of computer and internet technology to provide content and instructions to individuals. Rosenberg (2001) shares a similar definition referring to e-Learning as using ICT to deliver various solutions to students. Holmes and Gardner (2006) contended that e-Learning provides access to resources that promote learning on any place and anytime basis. Although the definitions of e-Learning may differ, they all emphasize on three basic concepts which include learning, technology and access.

In the literature reviewed, a great number of studies have aimed at determining whether e-learning, blended learning or hybrid learning is better than traditional face-to-face teaching in relation to, it's various factors like student satisfaction, or interactivity. Researchers, educators and educational decision makers are equally eager to find out which arrangement leads to the best results for their students. In this paper the researcher first of all attempts to find out the dimensions of e-Learning as identified in various research papers. The papers are also reviewed to identify various benefits of e-Learning in education. Finally the researcher has extensively evaluated the pool of papers to find out the perception of students and teachers with regards to e-Learning.

2. METHODS

A systematic search in the Google scholar and Ebsco databases was carried out in April 2020, using the search keywords ["e-learning" OR "online learning" OR "blended learning" OR "hybrid learning"]. To ensure that the latest findings are presented in the review, the systematic search was restricted to articles published between 2000-2020.

The database searches generated a total of 105 articles. The authors read the full articles, discussed how to categorize them and, eventually, 83 articles were selected as relevant and grouped into 10 major categories that affect e-learning and blended learning in higher education. The 10 categories were further reduced to five categories based on areas of e-Learning required to be studied. Thus, the review draws on a total of 40 articles and addresses the following categories: factors, e-Learning in education, students and teachers. Below, we present the results from our reading and analysis of the articles included in the review by starting out with a discussion of the factors of e-Learning.

3. FACTORS OF E-LEARNING

The multimedia enabled online learning environment has motivated the learners since it provides them with the content in the form of text, sound, images, videos etc. The other positive aspects of e-Learning are flexibility, interactivity, capturing and autonomous learning. Liu and Wang (2009) found that the features of e-learning process are globally sharing resources and flexibility of learning as computer enabled learning environment has overcome the issues of distance and time. The literature also suggests that e-Learning can increase the quality of learning experience (McKnight, 2001; Garrison and Anderson, 2003; Heckman and Annabi, 2005). It has also been reported that e-Learning helps in the development of argument formation capabilities, develops written communication skills and enhances the opportunities for critical and reflective thinking (Hawkes 2001).

Online learning is useful in disseminating knowledge even to the most geographically inaccessible areas and is acknowledged as the most reliable media of education. Online method provides access to number of courses not available in traditional institutions. It allows absentee students to even study away from institutions. Online learning has become a boon for parents as it provides a system to track the progress of their children. Robyler and Edwards (2000) contended that e-Learning offers simple access to a pool of information to solve difficult problems. e-Learning has also proved to be an exceptional solution to lifelong learning and employee training (Zhang et al, 2004).

Oliver and Towers (2000) contended that without suitable equipment and easy access, it is difficult to implement e-Learning. In contrast to this, Broadbent (2001) states that e-Learning does not necessitate a huge infrastructure. He stated that providing a high speed internet connection and sufficient number of computers for end users would be adequate for an effective e-Learning.

Many researchers from information technology field have identified significant variables dealing with e-Learning. Among them, the technology acceptance model Davis et al (2000), has identified six dimensions of e-Learning. They are student dimension, faculty dimension, course dimension, technology dimension, design dimension and environment dimension. Under the six dimensions identified, thirteen factors were recognized. In the learner dimension, the factors involved were learner attitude toward computers, learner computer anxiety and learner Internet self-efficacy. The factors such as faculty response, timeliness and faculty attitude toward e-Learning were identified in the faculty dimension, and e-Learning course flexibility, e-Learning course quality in the course

dimension. Goh et al (2017) in their ound that course design, interaction with the instructor, and interaction with peer students as determinants of learning outcome and satisfaction.

Long et al (2019) in their research on college students in Vietnam found that e-learning service quality perceived by e-learning students includes three factors: e-learning system quality, e-learning instructor and course materials quality, and e-learning administrative and support service quality.

4. E-LEARNING IN EDUCATION

e-Learning or online learning which takes care of the needs of present-day learners has created a niche for itself in the education world. Werbach (2000) stated that with the insufficient capacity of classrooms and limited budget for building new infrastructure; e-Learning was a just the right alternative to traditional teaching-learning methods.

Auwal (2009) reported that there were some unique features offered by e-Learning, such as reducing isolation, facilitating discussion and promoting interactive networks. He further stated that ICT users can also deliver the information instead of just being inactive recipients. For centuries higher educational institutions have been perceived as knowledge creators. With the initiation of e-Learning, it has become easier to create knowledge and disseminate it. Zhang et al (2004) reported that the economy has become absolutely knowledge-based and this has therefore resulted in an increasing demand for new ways of delivering education. Since the traditional educational systems were unsuccessful to satisfy the crucial and changing learning needs of the learners, there was a shift to new forms. Therefore, the methodology experienced a transition from teacher-centered to learner-centered approach.

Globalization has made considerable impact on different sectors like education, industry, ecology and sociology. To meet the pressing demands of globalization, it is important to adopt educational reforms which will improve the qualification of the people involved in the various sectors. Daniel (2000) reported that e-Learning technologies can respond efficiently to increasing global competition. It can increase the quality of learning experience (Garrison, 2003), remove situational barriers and prove to be more economical than face-to-face learning (Bates, 2005). Knight (2002) and Twigg (2003) stated that the globalization in higher education paved the way for the emergence of virtual education.

Alsunbul (2002) and Altbach (2002) contended that with the tremendous growth in Internet technology, it has been simple to incorporate Information Technology (IT) tools into higher education. In this context, e-Learning has evolved as an important mode of learning in higher education in India as well as globally. Anderson et al (2006) conducted an analysis of national e-Learning strategies and reported that there are two main drivers leading to the adoption of e-Learning. They are: the need to skill the population to meet the challenge of the information and knowledge society; and the need for flexible access to education in order to fulfill the changing nature of society and the lifelong learning program.

In education, these latest technologies can bring a colossal change to the system of delivering and acquiring knowledge. Today, e-Learning has become a viable alternate to traditional methods of learning, and has been adopted by many educational institutions. Rice (2000) and Rosenbaum (2001) contended that the efficacy of online learning has been found equal or even more than that of classroom learning, but Hongmei (2002) reported that the quality of online programs is still debatable. Some researchers found that online courses were more interactive than the traditional ones (Mangan, 2001; Rosenbaum, 2001). Smith (2001) contended that online education made learning easier for slow learners since they might require more time to respond. Cynthia Janet Tanis (2019) in her research on 14 college faculty and 111 alumni, from the same graduate program, demonstrated the importance of faculty–student communication. The alumni participants preferred engagement with their faculty

more than engagement with other students or the course content. Faculty participants desired a well-designed class, with students who can navigate technology and submit timely work.

5. E-LEARNING AND STUDENTS

Khor (2014) reported that students' perception has a considerable effect on the approval and acceptance of e-Learning. The students of 21st century who have grown in the IT era are not just consumers of the educational programs, but they are active participants as well. They are skillful and competent to work successfully with digital technologies, which is a pre-requisite for effective e-Learning. Benta (2014) reported that students perceive e-learning to be helpful in many ways like for accessing the course material, collaborating with their peers in doing homework as well as for motivating them. Cruthers (2008) contended that e-learning is generally accepted by students as a means of enhancing accessibility and quality of teaching-learning process. It is looked upon as a tool to reach all students even one's with special needs, provided there is accessibility of computer system with Internet connection. A few reports are available which suggest that e-Learning develops various skills in the learners like critical thinking, problem-solving, communication, interaction, autonomous learning and time management (Cavanaugh, 2001; Swan, 2001; Johnston et al, 2005).

The study by Boumedyen et al (2011) contended that teaching with software and computers has significant effect on the marks of the students. Also, the marks obtained by the students are comparatively better, if multimedia is used in the classroom and the students appear in online examination. The students who were taught only with the help of e-Learning software and were not taught with the help of books or physical models gave the best results. Students believed that technology arouses their self confidence, improves their concentration and enhances their motivation. Buckley (2008) reported that web-based learning provides easy access to learning resources for learners everywhere, even in remote areas, thereby providing educational justice. Timely instructor feedback promotes student motivation and course satisfaction (Dahalan et al. 2013) and cultivates positive connections with the University (Lewis and Abdul-Hamid 2006).

Teresa & Ana (2008) found that the usage of multimedia tools which encompasses audio, video, animation and interactivity to create attractive learning activities makes the learning process friendlier and beneficial to the students. As a result, these e-Learning activities enhance the interest of the students.

Many research studies have reported that learning is enhanced when there is active involvement in the learning process, a practice often referred to as active learning (Benek and Matthews, 2004; Sarason and Banbury, 2004). Interactive learning or learning by doing results in positive learning outcomes (Picciano, 2002 and Watkins, 2005). In online learning environment, the students actively connect with the material, learn by doing and refine their understanding as they discover new knowledge (Omomen, 2005). Driscoll (2002) reported that in e-Learning the focus of learning shifts from covering the curriculum to working with ideas since students become active participants in the knowledge construction process,

O'Malley and McGraw (2000) reported that students do not initially feel that they learn as much in online courses as they do in traditional, face to face courses. However, research by Bernard et at (2004) and LaPointe and Reisetter (2008) supported the view that students can learn equally well in both formats. Neuhauser (2002) looked at two sections of the same course, one taught online and the other taught face to face, and reported that online students found the course to be as effective or even

more than typical face to face courses. These results were comparable to the findings of Wyatt (2005) and Braun (2008), who reported that most students believed that the quality of e-Learning was equal to that of traditional learning. This is further supported by Kirtman (2009), who conducted a study on the elementary or middle school teachers in a master's research methods course and found that the learning outcomes were same whether the course was taught face-to-face or online. Legutko (2007) reported that online learning can be successful if the courses are developed with instructions and conducted similarly; the results are similar to direct instructions. According to Lao and Gonzales (2005), learning in an online environment can be a satisfying and rich experience for learners and teachers. Therefore, to improve learning in much less time many educational institutions in recent decades have tried entering and using this new technology (Adelman, 2005).

6. E-LEARNING AND TEACHERS

The role of teachers in the e-Learning environment is very important. The questions that arise are: Does the value of teachers decrease with the growth in technology? And what is the role of teachers in e-learning system? The role of the teacher in the innovative learning environment has grown as the teachers have to play the dual role of knowledge providers as well as facilitators. Teachers will always play an effective role in the successful delivery of e-Learning initiatives, as it is the teacher not the technology that facilitates the learning experience of students.

Volery (2000) and Holley (2002) reported that e-Learning is difficult to implement without the full collaboration of teachers as the interaction between teachers and students is still predominant in e-Learning environments. The same view is shared by Shank (2002), who maintains that teachers must be involved in all the stages of e-Learning course development, including determining the potential learners, the function of the learning programme and the format. This view emphasizes on the requirement for teachers who are trained in the usage of e-Learning technology in higher education and are also having knowledge of the concepts behind it. Expert training in e-Learning includes both technical and theoretical issues, and if executed correctly will increase the support for the merits of e-Learning (Shapiro, 2000).

Tamrakar and Mehta (2011) contended that as compared to traditional teaching methods, e-Learning helps teachers in effective teaching. O'Toole & Lee (2015) contended that teachers should incorporate effective online teaching methods to motivate students for learning and to achieve better learning performances. Internet driven technologies provide teachers with many tools that can be used to improve the teaching-learning process. e-Learning applications allow teachers to provide the students with different types of material as well as help in interacting with them in real-time.

Lincoln (2008) reported that in a classroom having large number of students, the faculty faces challenges like: attendance, attention and participation of the students. He also reported that it becomes difficult for the faculty to understand the progress of the students in the learning process and manage the course effectively. Interactive technology in the form of e-Learning can come to the aid of faculty to accomplish these goals (Terreri and Simons, 2005; Lincoln, 2008). This is in contrast to the study conducted by Raspopovic (2016) contended that traditional classroom students gave more significance to establishing good interaction with their classmates, while online students gave equal importance to their interaction with the faculty.

Wilson (2001) enumerated the characteristics of the teacher which will manage the degree of learning: outlook towards technology, teaching method and the control of technology. A few studies also suggest that the role of the lecturer will gradually disappear completely with the rise of improved e-

Learning technologies and methodologies. Scott (2000) conducted a study at Carnegie Mellon University in America, where all students learn in a number of disciplines via e-Learning. He found that in Carnegie Mellon University the traditional teacher is considered to be outdated and has been replaced by virtual tutors. He further reported that e-Learning will surpass traditional face to face techniques because in traditional lectures vital information flows past students, whereas in online learning the virtual tutor waits until a student demonstrates a clear understanding of the information.

Yuen and Ma (2002) examined pre-service teachers' technology acceptance and reported that the perceived usefulness of technology had a significantly positive effect on teachers' intentions to use computers in the classroom. The teachers who perceived computers as 'easy to use' had high rate of personal use and were expected to use computers in classrooms. Although teachers emphasized the benefits of technology, the attitudes of mathematics and science teachers were different. More recent findings found similar patterns (Drier, 2001). Guerrero et al (2004) summarized teachers' attitude towards the use of technology in mathematics classrooms as hesitant, whereas their students' attitude was mainly passionate.

Barbas et al (2002) and Pelgrum (2001) identified obstacles perceived by teachers in the context to integration of online learning in teaching. The most commonly cited obstacles were: technological limitations (including an inadequate number of computers and insufficient technological knowledge among teachers); difficulty in integrating technology into the regular curriculum; and lack of technical staff.

7. CONCLUSION AND DISCUSSION

Majorly studies reviewed here have proposed positive effects of e-Learning on the students, faculty and education as whole. As for the students, research indicates that a number of factors influence their learning experience in elearning/blended/online courses. Across studies, it is found that Students believed that e-learning/blended courses arouse their self confidence, improves their concentration, improves their grades and enhances their motivation. The general perception of faculty is that innovative technologies provide teachers with many helpful tools that can be used to improve the active teaching-learning process. However, at the same time the educators were also of the view that interaction in online teaching/learning is less compared to traditional face to face method. Many common factors of e-Learning have been identified from the review. The findings from the research papers included in the review show that among the many factors, some seem more salient than others: self paced learning, interactivity, flexibility and quality content In conclusion, the literature review confirms that there is an intense interest within the field of educational research to determine which factors affect learning outcome and student satisfaction in e-learning, in higher education, but further research is needed to better understand what influences students' learning experiences in the online formats.

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