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Web-based Learning: Characteristics, Practices, Challenges and Recommendations

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Abstract: ***The present research attempts an overview of web-based learning (WBL/online) technologies and a description of their status of understanding, in the literature. The paper also tries to explain it can be adapted for various online education environments. The paper has also touched on the foundations of design, advantages, and obstacles of evaluation in online learning. The best practices and feedback of learners and educators have also been touched upon in the present review of literature. Due to swift advances in technology today, the research points to the fact that institutions are in need of being acquainted with the fast emerging tools every now and then. There is a continuous need for digital literacy as a key skill for instructors who are committed to quality online learning, and developing individuals' ICT knowledge is an urgent need for WBL. Educational institutions also need to provide opportunities and maintain these crucial skills. WBL also needs to cultivate constructivist practices in education, which undermines a need for developing EBL tools that nurture and develop the various skills needed in 21st century education.***

Keywords: web-based learning, ICT, course design, education, teaching, online learning

1. Introduction

Online education is gaining more and more territory in front of traditional classroom education. Increasing demand has been documented on the need for international diplomas (Tarhini et al., 2014). A significant number of researchers encourage students to partake in online education for many reasons; most studies report that online education provides learners with many advantages that traditional education does not (Hubackova and Golkova, 2014). E-learning, or web-learning - hence WBL - is generally defined as the use of internet as the main channel for information and knowledge delivery for individuals or institutions (Clarkand, 2011).

Recent research has mainly focused on two types of e-learning systems: Blackboard and Second Life WBL. The second life systems, launched publicly by Linden Lab (2003), is commonly used for educational purposes. This system relies on 3D technologies, which makes students feel much more comfortable, and they go through realistic experiences. (Alenezi and Shahi, 2015). The second life system makes it easy for learners to attend classes at home, adopting and practicing new communications forms, solving problems in ways that may not be possible in the 'real world'. Researchers have been given a plethora of new opportunities thanks to real-time conferencing, collaboration and communication. Given a good internet rate and advanced computers, the second life system makes online education and research easier today than any other past time. Inadequate internet access has been reported to affect many universities to partake in distance learning programs worldwide (ibid). However, second life e-learning cannot replace traditional online learning.

In the early 2000s, WBL attracted educators worldwide. A significant number of international students have benefited from e-learning (Draghici et al. (2014), this era gave birth to various platforms such as Peer-To-Peer and Client-server. According to Moravec et al. (2015), a considerable number of studies investigated how e-learning tools affect the achievements of students. The researchers report a study about the students who described the influence of e-tools in higher education as a positive one. They maintain that e-learning platforms allowed students to access updated information anywhere while mobile e-learning (M-learning) allowed information access for learners through more modern mobile devices (Zamfiroiu and Sbora, 2014). This has made learning and interaction with courses, institutions and peers easier than any other time.

One should, nevertheless, bear in mind that the success of e-learning technologies rests significantly on many factors; it is not as easy as it may seem given the various social, technological, cultural and organizational variables that come into play. The present study aims to highlight the current e-learning technologies, their settings, characteristics, advantages, the main factors that affect their success and their limitations.

1.1. Overall aspects of WBL

E-Learning is the reliance and use of Information and Communication Technology (ICT) to share information for education in circumstances of distant instructors and learners, either through time, space or both in order to improve the learner's learning experience and performance. For Horton (2011), e-learning is a set of instructions sent via electronic media: the internet, intranets, and extranets. Thus, discarding time and distance, learners can now take care of their own lifelong learning (Almajali et al., 2016). E-learning environments provide higher benefits for academic institutions because they reduce the cost of course provision (Ho and Dzeng, 2010). Three main approaches have resulted from the existence of E-learning today: face to face, online learning, or a blended approach.

In the present paper, there is a special focus on higher education institutions using WBL technologies to support face-to-face education. According to (Freire et al., 2012), this approach has witnessed the highest rate of success compared to uniquely online or only face to face interaction. Learning Management Systems (LMSs) are defined as the web-based delivery technologies or programs that are

designed or adopted by higher education institutions to deliver contents, facilitate distance learning and to supervise the education process. LMS offers a plethora of options to deliver information and instruction and provides electronic materials for student learning. Some options, such as Web pages to deliver text almost similarly to hard bound texts, are very familiar to learners and academic staff. Moreover, the Internet also facilitates the delivery and access to multimedia elements: video, sound, and interactive hypermedia (Masa'deh et al., 2016). Various higher education WBL systems have been created to enhance learning online; Moodle, LAMS, Web Course Tools (WebCT) SAKAI, and Blackboard Learn (BBL) are the best instances. BBL is discussed in detail in the next paragraph.

BBL is considered one of the most popular WBL systems tools in higher education today as it provides a framework for course delivery in addition to its ease of use by learners (Iskander, 2008). According to BlackboardInc. (2012), it is defined as "the comprehensive technology platform for teaching and learning, community building, content management and sharing, and measuring learning outcomes and consists of integrated modules, with a core set of capabilities that work together"(p.741). More than 39,000 instructors use it at over 1,350 colleges and universities. It allows to deliver over 147,000 courses to more than 10 million student. There are more than 80 countries subscribed to the system. The system includes communication tools that integrate a bulletin board, chat room and private e-mail.

Moreover, video, audio and graphics files can be all gathered onto a Blackboard site. Instructional tools are also provided to accompany course content; these are: glossary, quiz module, self-test, and references. The learners also have access to the system uploads; they can save materials for their courses. In addition, Blackboard enables academic staff to track the learning experience such as grades, student interaction, and monitoring class progress. This facilitates the interaction between the learners and academic staff. All the interaction is done in a complete secure way (Tella, 2012), which protects the instructor, the student, and the content from external parties.

Simplicity is the first characteristic of WBL; no extensive computer skills are required (McCombs, 2011). WBL is generally described as self-paced independent study: the learners determine their schedules and study accordingly. The materials are accessible anytime. Second, online tests and evaluations are done automatically. However, there is little interaction during evaluations, which requires the highest levels of self-motivation. The third characteristic is that WBL is asynchronous interactive. The learners interact with instructors and students alike. They can attend classes anytime and until the course is completed. WBL nurtures support and feedback from teachers and classmates. Fifth, it permits longer time for different feedbacks from learners and teachers, which enhances critical skills (McCombs, 2011). Having more time leads to deeper analysis and evaluation of ideas, tasks and assignments. The sixth aspect, it has been found to increase the total effort made by group members as a result of social encouragement and support among them. This goes hand in hand with the learner-centered approach that is adopted in real-time classes worldwide, in which the instructor guides the learning experiences (McCombs, 2011). WBL is also synchronous learning; the learners have access to live lectures via smart electronic gadgets and can use e-mail or real-time live chat for interaction. However, the course offerings in this format are still limited given the high delivery costs (Weimer, 2013).

1.2. Utility of WBL

The literature on WBL comprises a plethora of advantages. Garrison (2011) mentions a number of them as follows:

- Effective interaction between the learners and instructors through emails, chat rooms and discussion boards,
- Less expensive to deliver, affordable and time-saving,
- Flexibility and anytime-anywhere availability,
- Access to global resource databases and materials suitable for students' interests.
- Self-pacing (slow or quick learners), which reduces stress and increases focus and retention,
- Self-evaluation; learners can track their own learning,
- Flexibility in terms of learning styles; learners can chose the materials and learning resources that suit their learning styles,
- Familiarity and updating of the learners' knowledge and use of the latest Internet technologies,
- Developing personality and values, such as responsibility for own learning and success and intellectual interest.

1.3. Weaknesses of WBL

It is of equal importance to highlight the disadvantages of WBL. The first may be the scarce or no "in-person" contact with faculty and a feeling of isolation, especially when it comes to how to navigate the systems, solve technical problems, be interactively involved in learning in real time (Kanaan et al., 2013). However, Mothibi (2015) examined the relationship between WBL and students' academic achievement in higher education. It was found that ICT had a significantly positive influence on WBL students' academic and overall educational achievements.

Scholtzand Kapeso (2014) found that the mobile learning (ML) systems were evaluated significantly for their ease of use and usefulness. This confirms the quality of course content in WBL and m-learning projects. Research on the experience of WBL using web 2.0 at the University of Milano-Bicocca for the year 2011-2012 revealed that the implicit/tacit knowledge of the learners was made explicit, and more accessible on mobile learning systems (Soussi, 2016).

The fact that ICT is being used today by people from all ages, researchers and specialists are integrating web 2.0, social networks and e-learning tools to better facilitate the learning experience. This leads to more flexibility, more power and more resources. For instance ThinkTag Smart has been used recently as a new Web2.0 platform integrated with the learning opportunities of social networks for sharing knowledge. A total of 137 students (ibid) were trained on the platform in two subjects: tourism and sociology of innovation. The results of the experience indicated that resources, shelves, and groups were the features most used on the platform, and the least used were:

Wiki, collections and chat (Salter et al. (2014). The ability to exchange and share information with users of Thinktag Smart; support teaching; connection to needed courses; and interactivity were the most valued features of the platform.
The platform had a few weaknesses as well: slow loading of the pages, the non-user-friendliness of some features, and the lack of intuitiveness. However, the platform was rated as a *"very useful technology with significant potential".* Higher education today needs complex e-education systems capable of analysis (attendance, grading, course content access, evaluation, etc.), which saves time, effort and cost. The ThinkTag Smart experience showed also that all learners increased their knowledge quickly in all aspects of their training.

Other researchers focused on teacher satisfaction (Teo 2014) with e-learning systems. Teo conducted a survey with 387 participants in a postgraduate programme to measure 6 constructs: tutor quality, course satisfaction, perceived ease of use, perceived usefulness, course delivery and facilitating conditions. The analysis showed that all constructs were rated as significant predictors of success in online learning, apart from facilitating conditions. Still, the facilitating conditions construct was evaluated as a significant mediator of satisfaction and perceived ease of use.

The rapid expansion of WBL has also received significant attention (Suri and Sharma (2014)). They examined the relationship between the fields of student specialization and their attitudes and responses to e-learning. The researchers used online and computer programs that are equipped with attitude-measuring scales with 477 students across 6 major disciplines in Panjab University Chandigarh. They found a significant relationship between the discipline of the learner and the factors of scale; briefly, the roles of university departments in adopting and training students was very significant in affecting the latter's own attitudes.

Mobile learning (refered to as mLearning) being part of WBL, Ceobanu and Boncu (2014) discussed the challenges related to the use of mobile technology in adult education. They advance that mobile learning can combine eLearning and mobile computing. For them, this leads to the *"...capability to access learning resources anywhere, anytime, through high capabilities of search, high interaction, high support for effective learning and ongoing assessment based on performance. Also, mLearning is considered to be as an extension of eLearning, but characterized by its independence from a location in space and time. Furthermore, mLearning comprises the use of mobile technology in the service of the processes related to teaching and learning. The mLearning can be considered as the point where mobile computing and eLearning meet to create a learning experience that can be commenced anytime and anywhere."* (in Kattuna, Al-Lozi and Alruwwad, 2016: 758).

Another study (Beurs et al., 2015) found that the intervention of peers specialized in suicide prevention programs resulted in an improvement of individual professionals. In the same connection, Judrups (2015) states that knowledge management and e-learning both deal with knowledge storage, application, sharing and generation; knowledge management and mLearning have crucial technological features that enhance continuous learning. It has also been found that e-learning and knowledge management are brought closer and support integration.

2. Effective Practices

2.1. Promoting Social Presence

The term 'social presence' was created in the 1970s. It embraces the social effects that are primarily influenced by the extent of individuals' participation in particular occasions. Swan, Garrison, & Richardson (2009) claim that it has a direct effect on the development of a learning community and interaction in online environments.

It is the sense of the individual's awareness of the presence of other individuals through interaction. Concerning WBL, social presence is defined as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people (i.e. their full personality), through the medium of communication being used" (Garrison et al, 2000, p. 94). The researchers (ibid) described three factors of social presence – open communication, expression of emotion, and group cohesion. WBL being asynchronous, online learners need to develop social connections, to be able to feel secure and open in communicating with other learners.

In such environments, social interaction and communication can be nurtured around common goals among students themselves and between students and their instructors (Garrison et al. (2000). In this regard, Kehrward (2008) defined social presence as "an individual's ability to demonstrate his/her state of being in a virtual environment" (p. 94). Individuals, here, need to be willing to engage in exchanges and communications that revolve around learning, obstacle, motivation, needs, etc., which reflects their "performance". In addition, the researcher advances that learners have to demonstrate their motivation, skills, and continuous participation (ibid).

Sebastian said*, "Solitary learning is hard. Many people run into an insurmountable technical challenge they cannot get past. Without the kind of personal attention that comes from more traditional forms of training, they become demoralized and give up*."(in Murphy, 2019:2). Features like regular face-to-face interaction with teachers, online courses often achieve social virtual gatherings and team building activities, leading to a real sense of community among the learners. The presence of "older" staff often leads to more recognition (ibid). Sending a "congratulations" or a "thank you" through platforms or even real-time software after passing tests or exams, leads to the feeling of real life interactions.

Ke (2010) contends that it is crucial to develop "virtual relationships, virtual knowing, and virtual clique," and relationships developed among adult learners tend to be "those with similar working styles or those who were in a cohort group during the program of study" (816). He also maintains that it is not easy to establish such relationships. Many teachers do not really believe that relations can be

built online and that it is a basic need nowadays to "stay connected" with learners as part of the job; Soussi (2019) claims that *"dealing with students is the highest need that worries teachers most, especially dealing with students coming from different cultural backgrounds and having special learning needs. Teaching in a multicultural setting and ICT tools come in the second place, and the other aspects are ranked very low with little or no need"* (286).

2.2 Online learning communities: interactivity and collaboration

Research on learning communities has gained considerable research recently. Yuan and Kim (2014) advance that a learning community is the result of trust, shared knowledge, information, and established connections. This is achieved through interaction and setting common goals, in addition to the belief that such goals would be achieved. Yuan and Kim (2014) provided the steps below for the creation and maintenance of an online learning community:

- start at the beginning of a course and continue throughout the term,
- be involved in building the learning community,
- use technology to create a shared space for interaction,
- employ different strategies to stimulate discussions,
- encourage task-oriented discussions and social interactions,
- assign tasks that require teamwork.

Online learning is on its way to foster more creativity and realism. Guido Kovalskys 9in Murphy, ibid) says, *"VR is an engaging tool, but within a 35-minute lesson plan, it might only be two or three minutes. Learning is a social experience. It is not only about learning content but learning to deal with others. Teachers play a really influential role."*. for instance, students in forensics or criminology will play games that stimulate real life situations and study every aspect of their courses in 3D technology.

3. Implications

The paper attempted to highlight the fact that developing a sense of community online has been a central component to WBL. Considerable research – based on the reviewed studies - points out the importance of promoting social presence, interaction, and collaboration (e.g. Yuan & Kim, 2014). It is of primordial importance that both learners and instructors to be "present" and engaged actively in creating interaction and collaboration for effective online learning communities. In the same regard, effective approaches, such as learner-centered teaching methods and technologies - need to be used to achieve this objective.

The paper also reviewed the rapid advancement of technologies and how they have immensely impacted on online education. The impacts of technology on WBL will continue and will bring about radical changes as more and more wireless technologies are invented. The reviewed evidence suggests that technology is instrumental for the rapid development of online education. However, WBL has also been reported to be inflexible and standard. Such standardization and inflexibility of online materials and technologies can hamper the individualization of teaching and learning. In fact studies have shown that individualized WBL has failed, even though instructors have adapted their course curricula, approach, and instruction to the online environment.

The study at hand has also covered research dealing with best practices for more effective online teaching. A considerable number of studies have focused on trust-inducing factors. Wang 2014, for example, focused on handicapped learners online. She attempted to investigate the perceptions of disabled students of perceived online learning and building trust. More research is needed to highlight the roles of disability, ethnicity, culture, gender, and language in online education.

Online teaching success does not only depend on a mere command of technology or the use of complex software features; motivation and interaction between the instructor and learners, course content design, instructor preparedness and support from the community and administration all play central roles. The role of the teacher stands prominent, though. Monitoring individual and group discussions, responding to inquiries, preparing courses and assignments, and measuring students' learning are all part of what it takes to teach. Technology is meant to facilitate distance learning, material access and time management. The study has also shown that higher education faculty have not generally received enough and adequate support in terms of technology for online education. Professional development training in online education is a major need.

4. Recommendations

Gallagher & LaBrie (2012) advance that WBL has strongly joined mainstream education and that its market has considerably grown as it continues to become more and more accessible for learners and institutions alike. In this connection, fostering critical learning spaces are needed, so that students are "*encouraged to increase their capacities of analysis, imagination, critical synthesis, creative expression, self-awareness, and intentionality in action" (p.71).* Course design takes on crucial importance here since it is the only way through which formal education can be broadened to reach the virtual world and blend the boundaries with traditional education.

Nurturing different ideas, numerous standpoints, and a multitude of voices has always been the goal of education. Online education can significantly contribute to this status quo through facilitation. Student discussions, group work and assignments could be the best instances for experience sharing about their subject matters, viewpoints, work and learning. Present web-based education has still not given enough attention to individualized learning; learner needs and differentiated online instructions need still to be focused on in future research related to course design.

Motivation toward web-based learning is still needed to be researched. Web-based education is still being designed in a standardised fashion; taking into consideration learner age, gender, needs, learning paces, cultures, socio-economic status, etc. will certainly enhance it and make it more flexible. The affective factor, for instance, has been found

to play a major role in online learner motivation; Ke (2010) explains that *"a group of friends could dominate online discussion, thus intimidating others who were newcomers" (p.817).* An effort is needed to bridge differences in online environments. Instructors need to develop, promote and facilitate an environment where peer learning can take place smoothly. Some of the online education programs require learners to sit together in the same place and use the same materials at the same time. This makes no sense as all the needed materials are online.

Online learning no longer needs to be state-based. Technology has made boundaries inexistent. One of the strongest aspects of online learning is that students cannot only focus on their local science and knowledge content but transcend it to international knowledge and pedagogical experiences.

Online learning materials need to be shared. There is considerable fabulous online content that is developed by universities, but most of them hoard it. Too much funding is spent on developing materials that only reinvent the wheel. Therefore, online content needs to be shared especially that the modern platforms have made it easier to share all content forms anywhere. Experts advance that *"Today, more students have multiple commitments, and they navigate to the flexibility of online courses. Students take UNM-LA classes from all over the world. I have had students in Vienna and in the Philippines, and students who are deployed with the military."* (Murphy, 2019:1)

Social media should more involved in online education. Sometimes, the same online course is given to students from different parts of the world. Still, no sharing of feedback, discussions, group projects are done while those learners are always connected to social media. The more teachers and students are connected, the more fruitful learning is and more robust discussions are. Online media should function as connection tools for learning.

There is more need for interest in online classes (Soussi, 2019). Generally, the courses offered in online learning are more or less the same courses in traditional education. Students need new opportunities for learning that traditional programs have failed to create. Using technology to learn is an opportunity itself in teaching how to use it in training stylists, photographers, curriculum designers, etc. Educational and pedagogical experts need to enter this field and see how technology can bring out students' interests, talents and passion.

The measurement of how much time has been done by a student to complete a course needs to be seen differently with online education. Students should be able to prove mastery any time during the class or take extra time and get additional supports if necessary.

There is a need for more international testing with international students being tested across various states. Moreover, testing time need no more to be restricted to a certain period of the year after the students have completed the course. Proctors and educators need more training on ICT to administer tests and evaluations securely anytime anywhere.

Textbooks need to be eradicated or used in conjunction with online materials. With access to free, various formats of data and knowledge, students need to work on up-to-date, more practical and more realistic materials.

Students no longer need to be grouped by age or grade. Even subject specialization needs to be looked at differently; sometimes some students want to go deeply into science, literature or math. Online courses should build flexibility for such students. A student can move really fast forward in a special course. Other times, a student really lags behind in a given course, so why do they have to be kept with the same group having a different learning pace.

For the time being, online education either takes place at universities, based on special schedules and appointments with teachers. The ability to always enroll at a university and have access therein to online programs is not always easy for students. Therefore, communities need to work on providing e-learning centers that government or non-government establishments would take care of such centers. Schools, teacher training colleges, unused spaces and local libraries could be good examples.

The last recommendation relates to the practices of online education, practices that are mostly still based on old ones (Soussi, 2015). A considerable number of practitioners still adopt the old practices simply because that is how it has always been done or because that is how the ministries and authorities say. Online education today needs to meet the needs of always-connected learners, learners who master aspects of technology more than their teachers perhaps. The practices should all be geared towards motivation and interest, IT use one being of them.

5. Future Research

With the certainly increasing online education, more research is needed to highlight its key aspects, such as efficacy, effectiveness, and improvement of online teaching and learning materials. Significant research needs to focus more on *"in-depth analysis of online instruction practices, step-by-step implementation, and the most effective practices for online course design and instruction" (Sun & Chen, 2016:173).* Moreover, there is an abject need to focus on learner outcomes in relation to web-based education. Student achievement has almost been neglected in connection with online learning.

Given that technology governs web-based learning to a large extent, further research should explore technology and software could be affect students social interaction and group members' different personalities, learning styles and development of skill. Most of the date from previous studies. It would be interesting to investigate the effects of different technological tools on the type of learning suitable for each community. Such tools range from Google Hangout and Skype, to virtual reality environments.

Add to it, there is a need to study the extent to which technology in education has been incorporated in teachers' professional development. Many studies report the reluctance of higher education teachers to integrate technology in their practices (e.g. Crawford-Ferre & Weist, 2012). There is also a need to compare the traditional and online teaching styles in terms of time, effort, course design, evaluation and obstacles in higher education.

At the end, there is an abject for research that investigates how to motivate both reluctant teachers and learners to rely on online learning. As Soussi (2016) mentions, *"both the teachers and the students expressed their disinclination in using ICTs for language learning evaluation; it seems that the traditional pen, drafting and exam sheets constitute the "comfortable", elemental bits and pieces of a test or exam long inculcated in the mental representation of learners and teachers alike, even though both of them recognize the time-saving attributes of ICTs in the EFL classrooms"* (p. 83).

6. Conclusion

The present paper has attempted an overview of WBL (online) tools and their status of understanding, from the reviewed literature and how it can be adapted for online education environments. It was made clear that online learning is on the rise. As Murphy (2019) advances, *"A recent poll found that 46% of recent graduates took an online credit as part of their degree, while more people than ever are turning to hybrid courses that combine distance learning with traditional classroom methods. Many students are attracted to the flexibility of online learning and combine their studies with work or personal commitments* (1).

The paper has also touched on the foundations of design and evaluation in online learning. Nevertheless, due to swift advances in technology today, educational institutions need to be acquainted with the newly developed tools every now and then. Digital literacy has been stressed as a key skill for instructors committed to quality online learning (Eyal, 2012; Soussi, 2019).

Online learning provides more accessibility and inclusivity for students, especially in regions where the income is too low to join higher education institutions, given the high cost. Materials will no longer be a problem given the fact that internet provides more and more material every hour worldwide. Government institutions need to work with the private sector for many benefits: infrastructure, unity of educational goals and outcome and curricula.

Brushing up one's ICT knowledge is an abject need today for WBL to take place. Educational institutions also need to provide opportunities and maintain these crucial skills.

Digital literacy needs to be cultivated; constructivist practices in education, such as feedback and collaborative learning, need to be encouraged via online tools; designing assessment and evaluation that centers around problem-solving and decision-making skills also need to be facilitated via the different technical features of online education tools.

Traditional, physical classroom-based teaching will always persist, but online learning is becoming increasingly more integrated with them. Online learning is seen to host future education in fashions no one can predict.

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