**A Literature Review on the Implementation of E-learning**

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The late 1880s and early 1990s were marked by the inception of Computer-Based Training (CBT). CBT required the use of a personal computer with a multimedia system such as a CD-ROM. This limitation led to the development of the internet supported by the world wide web(www). Initially, information on the internet was displayed in text format and later evolved into text with the use of graphics in the early 1990s. This was supported by the development of browsers. Internet use increased over time and became affordable as the world wide web information system developed. As technology improved a Web-Based Training (WBT), new education programs and tools were developed. These fostered the improvement of communication infrastructure that improved teacher-student interaction (Hubackova, 2015). As technology advances, so does E-learning. This literature review explores peer-reviewed publications on the implementation of eLearning. It evaluates aspects such as technology used, stakeholders involved, content disseminated; strategies employed; and challenges that accompany it.

**Technical Aspects**

E-learning refers to a form of learning that uses electronic communication. It is also known as Open and distance learning (ODL), online learning, or web-based learning (Ansong, Boateng, L., & Anderson, 2017). It is a flexible, student-centered, and creative platform in education (Singh & A, 2018). Students within rural and remote areas leverage on this technology due to its ease of access and cost-effectiveness (Dhawan, 2020). Several learning institutions have embraced virtual learning using various software such as Microsoft Teams, Google Classroom, and Zoom to provide online courses. Leveraging on this technology, they have mitigated the effects of the COVID-19 pandemic to stay in constant contact with learners (Kaur, Dwivedi, Arora, & Gandhi, 2020). Integration of web-based learning into traditional learning techniques has resulted in a positive shift in modern education. It has eliminated challenges of location and time with the help of the internet.

**Stakeholders**

Teachers' attitudes during a change in learning technologies are among the key factors to be considered (Gundy & Berger, 2016). During the coronavirus pandemic, teachers, including the experienced, had to learn new ways of teaching, and hence their perspectives played a key role in the uptake of Open and distance learning (Zhang, Wang, Yang, & Wang, 2020). During the pandemic, local and external stakeholders such as parents, school support system, school heads, and teacher educators were a focus of study (Murray, et al., 2020). Clear guidelines on the application of online learning from the government were given by both the school principals and teachers (Burke & Dempsey, 2020). Teachers required support from non-teaching staff to provide effective learning (Huber & Helm, 2020) as digital content, including textbooks (some were freely accessible) were provided by different organizations (Burke & Dempsey, 2020).

**Technology**

One of the platforms through which educators, students, school administrators, and parents communicated was social media (Bozkurt, et al., 2020). Facebook, one of the social media platforms, has tools such as groups and forums, which are used to create online communities through which interaction, sharing resources, and expert support can be provided (Staudt, Clair, & Martinez, 2013).

Synchronous e-learning is done through videoconferencing and chats, often in real-time. Its real-time nature allows students to ask questions and get feedback instantly through technology such as instant messaging. Asynchronous learning, on the other hand, does not require the immediate presence of students. Technology such as emails, web, and message boards are used to post e-learning content (Dangwal, 2018).

Technology such as Open Educational Resource (OER) is used due to its ease of access and low cost. OER refers to learning through freely accessible educational content available in the public domain under open licenses such as Creative Commons. The license allows free distribution of copyrighted work. OER includes textbooks, course materials, modules, software, projects, animation, videos, and audio (Satinder & Monika, 2020).

Another form of e-learning is blended learning, which combines traditional face-to-face learning (where educators and students are physically present) and virtual learning (supported by information and communication technology infrastructure). It allows collaboration irrespective of location and time (Satinder & Monika, 2020).

Course content and material can be accessed outside the normal setting of a classroom by implementing flipped classrooms. Flipped classrooms are a type of blended learning in which students get online lectures, collaborate through online discussions, and are allowed to research at home with the aid of lecturers available (Bajunury, 2014)

Virtual classes are used through the web-based portal by an institution's learning management system to provide massive open online courses (MOOCs). Electronic gadgets such as laptops, desktops, smartphones, and tablets are used to access them. Content within the MOOCs is logically arranged, sorted, and categorized to meet specific learning outcomes. Online quizzes, examinations, live chats and videos, and discussion forums are also provided (Chatterjee & Nath, 2014).

**Content**

There are types of online courses such as partially online courses and fully online courses. The partially online course refers to the integration of the existing resources and materials in either print or non-print with e-learning, while a fully online course is completely done online (Dhull & Sakshi, 2017).

The models used are the wrap-around model and integrated model. The wrap-around model uses online study guides, synchronous and asynchronous discussions, and activities "wrapped" around publications. It is a resource-based approach that employs the use of relatively unchanging materials. Therefore, courses once developed can be repeatedly used by different tutors different from the course developers. The integrated model imitates a full online course since it leverages comprehensive learning management systems. Most of the content is in electronic format. Virtual conferencing is used for interaction, online assessment, and performing activities that require collaboration (Dhull & Sakshi, 2017).

There are levels of e-learning in terms of mode of display; text-driven, interactive, and simulation. Text-driven content has text graphics, test questions, and audio. Resources are non-interactive; hence students can only read or watch content. An example of such are compliance courses. Interactive contents are similar to text-driven but with an advanced feature that allows users to interact with it (Chitra & Raj, 2018). They often have milestones, explanations of content, feedback, questions, glossaries, etc. It has a linear sequence with a predefined order or branching approach, allowing students to take different paths according to their preferences (Food and Agriculture Organization of the United Nations, 2021). Simulation content combines both characteristics of text-driven and interactive content. In addition to this, it relies on graphics, audio, video, and gasification while using custom simulations of physical processes. It may also incorporate 3D technology (Chitra & Raj, 2018).

**Strategies**

A report by the New Media Consortium (2017) gives an overview of major trends that drive technological adaptation in higher education, including technological advancement and obstacles to technological adaptation.

The strategic framework of the European Union vouches for modernization of education. Using available technology and proper framework development for open digital content at all levels of education to encourage innovative solutions to e-learning challenges (High-Level Group on the Modernisation of Higher Education, 2014). Integration of new technology into the learning process allows institutions to accommodate a broader range of students. Innovation that targets blended learning enables students to learn from anywhere. Collaboration among stakeholders to drive such innovation will have a positively significant socio-economic impact. Carefully curated changes in institutional governance are required. These changes should be done to foster e-learning activities.

The creation of a virtual learning space should be done. This space allows a community to receive support from experts in their learning journey. Online training is packaged in response to employer-student needs to develop digital skills, work experience, and tools to meet international standards to encourage innovation (Berecz, 2018).

Proper implementation of online learning should be encouraged by institutions transforming courses into online completely. This increases the potential of diversity and market opportunities. Installing infrastructure that enables online programs to be taught efficiently involves proper planning, aggressive marketing, and capable technology support (Berecz, 2018).

The aim of e-learning should be to make learning fun, easily accessible, and comprehensible; as a consequence, students get motivated to consume more. Therefore, a fundamental strategy involves understanding the student's motivational foundations (McCleskey, 2021). Once the source of motivation and enjoyment is determined, learning can be tailor-made for each student with the help of artificial intelligence systems.

The structure of the curriculum should be listed and well organized to serve the objectives of the course. A breakdown of long lectures to shorter entertaining ones is encouraged using portable document formats (PDFs) for complex units (Berecz, 2018). E-learning is made more intriguing by using visually appealing content such as photos, videos, animations, and graphics (McCleskey, 2021).

Invoking emotions in the learning process improves the memory of concepts learned. This strategy plays two roles, making the content engaging and also memorable. Stories or events integrated with e-learning provide a solid base for content enjoyment. Moreover, anecdotes in the illustration of abstract concepts improve comprehension (Berecz, 2018).

Providing training on the use of e-learning systems helps deal with resistance to technological changes, thus its implementation. Training is focused on developing human resources in utilizing online learning technology such as Zoom, Microsoft Teams, Google Classroom, Learning Management Systems, etc. Ensuring enough people can maintain these systems allows an efficient and uninterrupted learning process (Ghavifekr, Afshari, & Salleh, 2012).

**Challenges**

Learning is a social cognitive task and sometimes requires physical interaction. For this reason, it is not capable of completely replacing traditional learning techniques. Students get bored looking at the computer screen for a long time, especially in preparatory classes (Al-Jardani, 2020). It poses a challenge for tactile learners who are used to conventional classroom socialization since they do not get to experience real-time sharing of ideas, knowledge, and information (Ullah, Ashraf, Shanza, & Ahmed, 2021).

Students’ inadequate capacity to participate in open distance learning is attributed to insufficient access to reliable internet and lack of latest technology such as smartphones due to financial limitations (Karademir, Yaman, & Saatçioğlu, 2020). Relevant information regarding online courses is often discussed by emails. Response time to a question asked may vary hence proper interaction becomes a challenge (Zhong, 2020).

E-learning is dependent on technology such as the internet and computers; therefore, students who have no access to these may not benefit from the vast amount of content offered. Technology at times suffers system errors and interruptions; these affect student's organization of study time, leading to a decrease in motivation. Moreover, physical interaction absent in online learning brings the feeling of isolation to the student. Computer ergonomics-related health effects may also result from prolonged hours of screen time (Coman, Laurentiu, Luiza, Stanciu, & Bularca, 2020).

Online learning assessment and practices are limited in the modes through which they are relayed. Students switching to e-learning from traditional classroom environments find it hard to adapt to the technology, resulting in learning being a frustrating task (Williams, Morgan, & Cameron, 2011). Internet infrastructures are not well established in developing countries, especially the rural regions making them expensive. Moreover, technology-based literacy is a barrier to the consumption of virtual learning resources. Teachers also struggle to manage feedback from individuals within the classes. In essence, the online environment is a challenge for both students and teachers (Ullah, Ashraf, Shanza, & Ahmed, 2021)

The success of any e-learning system is dependent on the stakeholders' attitudes and perceptions of the technology. If their views are negative, virtual learning technology is abandoned, thus hampering its benefits and consequently causing losses on the institution's effort to maintain such systems (Almaiah & Jalil, 2014).

**Conclusion**

E-learning refers to uses electronic communication provided by technology such as computers and smartphones. Institutions have implemented this form of learning due to its flexibility and location, especially during the COVID-19 pandemic to stay in contact with their students. As technology advances, the use and need for e-learning systems increases. The various categories of technology improve learning experience include blended learning, flipped classrooms, synchronous and asynchronous learning, open education resource, and massive online open courses. This literature focuses on students, governments, parents, and educators as the stakeholders. Implementation of strategies is heavily reliant on the perspectives and attitudes of stakeholders involved. Human resource training on using online learning systems is essential in ensuring that both students and educators reap the full benefits. The major advantages derived from using online learning platforms are that it is flexible, allows asynchronous learning, and can be accessed from any part of the world with an internet connection. Major limitations being that the learning process mostly tends towards training than education. However, despite the various setbacks, e-learning is still an efficient and effective method of knowledge acquisition.

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