



E-Learning in Higher Education with reference to Sustainable Development Post Covid-19 Era

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Abstract

Purpose- During the COVID-19 pandemic, many universities are finding that providing and utilizing online and e-learning systems is their biggest issue. There are many wonderful features in e-learning platforms like Blackboard that would be helpful to have during the COVID-19 outbreak. Although, being aware about the adoption factors as well as the initial difficulties that the present e-learning systems show, it is essential to their effective use.

Methodology- A Review based study, various research papers on e-learning post Covid-19, its relationship with sustainability and the future aspect of it was conducted. Secondary source data and research papers were analysed for the said study.

Findings- The finding indicate that e-learning or online learning is a very important aspect in higher education institutions and it serves great purpose if used with right sustainable approach. e-learning has been of immense significance especially post Covid-19 era.

Practical implications- The current study highlights the relevance of e-learning in various higher educational institutional arenas. It also focuses its importance with special reference to sustainability.

Keywords: E-learning, higher education, sustainability, sustainable development, teaching.

Introduction

Five dependent factors—instructor technology competency, instructor technology integration, instructor morale, and impact on student content achievement—and seven influencing independent factors—all related to instructional technology—are identified by a Baylor and Ritchie study from 2002. These include organisation, direction, curriculum congruence, professional growth, technological use, and teacher flexibility. The survey was used to generate models that explained each of the five dependent measures.

Dubai has quickly established an outstanding and diverse higher education system. The city's educational opportunities have multiplied since the federation's formation, when only a small part of Dubai's urban population had access to formal education. (Dukmak, 2010).

By utilising office technologies, e-learning is creating a bridge between education and job. Employees can more effectively apply their learning to their work because they employ the same technologies and tools for both. E-learning will assist bridge the expanding gap between learning and employment, as well as between work and home life, according to both employers and employees. E-learning is a tool that can be used by any business to improve the skills of its employees. Because all types of working environments, particularly those in the medical and healthcare industries, are changing so quickly, there is a continuous need to promptly train and retrain personnel in new technology, products, and services accessible within the environment. (Oye, Salleh, & Iahad, 2012).

ICT engineers and education experts are debating the necessity of integrating virtual environments and learning frameworks into the web-based platform. Evidently, the "learning-by-doing" phase was where e-learning first started. It helped people realise that e-learning refers to a lot more than just computer-based educational programmes.

E-learning now includes participant interaction after a decade. According to the topic's current prominence, e-learning is the usage of technologies and methodologies that are integrated into learning platforms. (BURINSKIENE, 2019).

In contrast to physical form of learning, e-learning gained popularity mostly as a result of its adjustability in terms of how instruction is provided and how students can access content and resources. Therefore, e-learning is essential to the e-learning approach since it may improve it by enabling students to customise and adapt their programs to their needs. Because of its versatility, online learning eliminates time and geographic limitations, gives students access to a variety of resources, promotes cooperation, lets them learn at their own speed, and motivates them to communicate with one another and share knowledge. (Coman, Țîru, Meseşan-Schmitz, Stanciu, & Bularca, 2020).

The Technology Acceptance Model (TAM) asserts that the user satisfaction and usability of the tools provided by a platform have an impact on how frequently such tools are actually used. Professors were compelled to alter their teaching tactics as a consequence to digitisation since e-learning platforms promote it. The majority of the research provided demonstrates that students normally have positive attitudes toward online learning, despite the fact that they occasionally have technological issues and think they digest information more successfully in traditional classes. (Chahal, & Rani, 2022).

According to Mahdinejad and Amoi's (2011) research of tertiary educational institutions, 54.2% of the colleges lack adequately furnished computer labs. As a result, many colleges were unable to provide the ICT infrastructure necessary for efficient curriculum delivery. This implied that only a few universities could guarantee the caliber of their methods of

teaching and learning. There is no question that this situation plays a role in the students' low academic achievement.

It is required to further study the sufficiency, use, and maintenance of ICT facilities in order to advise participants in the higher education sector to enhance on delivery, potential use, and sustainability of Ict infrastructure in higher education establishments.

Benefits of Online Learning in 2020, according to UNESCO, include the following:

Better information assimilation, flexibility in course design, student-centric, and the removal of time and space constraints are just a few of the benefits.

The key characteristics that influence the usage of e-learning systems, according to the responses, are technology factors, e-learning platform quality attributes, cultural issues, self-efficacy variables, and trust factors. Universities should take these into account while formulating future plans. The findings also revealed that the three main barriers to adopting the system are concerns with change management, technical issues with both the online learning platform, and issues with monetary assistance. (Almaiah, Al-Khasawneh, & Althunibat, 2020).

The idea of e-learning that has existed for decades is one of the most significant contemporary advances in the information management industry. E-learning is also known as internet education, Web education, accelerated distributive education, internet education, virtual education, and online courses that are flexible. (Zhang, 2003).

E-learning can be a foundation for providing a variety of delivery modalities for diverse types of learners, in contrast to traditional classrooms. E-learning is a valuable tool as well because it can provide unique learning methods and improve students' academic outcomes. Students can actively participate in an online classroom where they can polish their independent learning abilities and build their critical thinking abilities. Students can gain from organised courses because the material and assignments are delivered through animations, audio, and videos. (Miller and Dumford, 2018). skill, social relationship and environment. Schenck et al. (2018) conducted a study using the SLF of the livelihoods of landfill waste pickers in South Africa. He found that the high levels of

unemployment in South Africa have engaged many people to work in the informal sector. Despite the difficulties of living in unbearable working conditions and low income, landfill waste pickers have maintained their livelihoods. The study recommended that it is crucial to incorporate waste pickers into the waste management system but not formalise or control them because formal structure depends only on documentation and process rather than working independently. But the main limitation of this study was that it only focused on landfill workers in South Africa and did not consider other categories of waste pickers. We argue that in Bangladesh, a study on waste pickers deploying SLF can present many aspects of waste pickers. Hence, our study attempts to fill in the literature gap by including waste pickers working in landfills and other dumping sites. In addition, the study analyses the livelihood and health conditions of the waste pickers.

Methodology

This is an exploratory study based on a qualitative interpretation. The qualitative research aims to present the participants' real-life situations in the form of narratives (Ahmmed and Hossain, 2016). For this study, which was conducted in the Sylhet city corporation area, we have used two stages (2-Stage) sampling method to draw the sample.

In the first Stage, Sylhet city was divided into five clusters based on incinerator and landfill, namely Shahi Eidgah point, Tilagarh point, Rikabibajar point, Uposhohor point (main road), and South Surma landfill site where the concentration of waste pickers was supposed to be high. Then, twenty respondents were



Literature Review

S.No	Author(s)	Description
1	Fang's (2007)	According to Fang's (2007) study on what polytechnic students in Singapore find helpful, enjoyable, and effective in their e-learning context, youthful Singaporeans who were introduced to rapid technological progress use within schools, at home, and in society did like Internet Culture among other activities.
2	Al- Fadhli's (2008)	As per students from Kuwait who took part in Al- Fadhli's (2008) research, "E-learning is better than the conventional teaching method and is more engaging than the traditional technique of teaching."
3	Oye, Salleh, & Iahad (2012).	It states that how can e-learning become a knowledge management tool. It also highlights the e-learning tools like, Interaction in learning, digital library tool, knowledge representation tool. In the end, it emphasises the need for synchronous (traditional) tools to be incorporated into asynchronous (new/out of the world) settings in order to accommodate the "Indefinite" learning model. The majority of this environment would be asynchronous (new/out of the world), with background chat, assignments, and evaluation being managed by synchronous (new/out of the world) systems that connect into the asynchronous environment.
4	Mothibi, G. (2015)	Due to the availability and use of alternate learning methods, e-learning can therefore help students demonstrate their abilities and skills quite a bit faster. ICT further increases meaningful learning and academic accomplishment by integrating content and information literacy, which are frequently presented in written and visual forms. Higher education institutions must comprehend the significance of e-learning to the processes of learning and teaching as a result. Students' educational performance is greatly improved by e-learning, with a moderate effect size of 0.712. The fact that the average effect size is inside the confidence interval validates the significant positive impact that e-learning has on academic attainment.
5	Gokah, T. K., Gupta, N., & Ndiweni, E. (2015)	The notion that education may be easily moved out from school and textbooks towards the electronic world is referred to as e-learning and has gained popularity due to the present technology's rapid growth. This teaching strategy provides teachers with the tools to encourage students to widen their perspectives through the use of web and other digital tools. Students have the opportunity to interact and converse with one another during the process while exchanging knowledge. Societies can grow and establish their personalities as societies of learners in that setting. In other words, technology-based education is beginning to alter how colleges and universities in Dubai operate.

6	Górska, D. (2016)	This essay claims that e-learning in Poland offers all educators and students a variety of educational options and communication chances. The environment for learning was also changed. The Ministry of Science and Higher Education, which has long recognised the need of integrating ICT in education, gave its approval and support for this. It states that with due support of government, e-learning can be adopted in University of Poland. Teachers are guided regularly. Progress reports of both students and teachers are checked on regular basis. This model can be used as a success story to adopt e-learning system everywhere.
7	Smith, S. U., Hayes, S., & Shea, P. (2017)	The core notion of with regards to CoP theory of Wenger's is that learning occurs when individuals participate in social practises. Despite this, articulation of the epistemic and discursive practises typical of the communities that make up a social practise is lacking in the literature. Social practises are crucial for enacting and maintaining learning and knowledge within a CoP.
8	Rashida (2017)	This article delivers that Universities now have to use e-learning since it improves the atmosphere for teaching and learning. Several studies were reviewed to understand e-learning in a much better way, its positive impact on universities and how to improve e-learning.
9	Dhawan (2020)	This article emphasises the value of SWOT analysis and virtual education during emergencies. In addition, this article showcases Ed-Tech startups in outbreaks and other natural catastrophes and offers advice on how institutions of higher learning should address issues related to online learning. A descriptive study and the descriptive research methodology were utilised to analyse the data that was gathered from various sources for this study. The utilisation of secondary data and consideration of the qualitative element of the research are both utilised. The study demonstrates how crucial it is to have the infrastructure necessary to sustain online learning during and after a natural disaster.
10	Coman, Țîru, Meseșan-Schmitz, Stanciu, & Bularca, (2020)	The research focuses on how universities during the Coronavirus pandemic were forced to immediately modify the learning system for entirely online learning and teaching. Therefore in regard, we examined students' perceptions of online learning, their capacity for knowledge processing, and their e-learning tool usage. An online survey was made using a semi-structured questionnaire. The data was submitted by 762 graduates and undergraduates from two of Romania's largest institutions. The results of the study demonstrated that universities of higher education in Romania weren't prepared for total and complete virtual learning.

11	Mpungose, C. B. (2020)	Despite the challenges students face when transitioning from physical learning to online courses, in specific the huge popularity of the digital divide as the biggest obstacle to students having realized effective e-learning; adapting the Moodle LMS to accommodate local needs of disadvantaged students is beneficial to recognise e-learning overall. Due to the rapidly shifting technology environment in the twenty-first century, college professors "have been forced to adapt their teaching approaches without even a concrete plan for responding to students' different expectations." Connectivism is a possible starting point for the construction of learning in the digital world since it has qualities that span physical learning and e-learning.
12	Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A (2020)	The use of e-learning teaching methods during the COVID-19 outbreak is impacted by several problems and circumstances, some of which are discussed in this study. Such a technique covers every aspect of an e-Learning system that hasn't been looked at before. This study used an interview technique with theme description and analysis with the help of NVivo software to address the research topics. Students, faculty members, a representative of the department of Jordan Higher Education, and four experts as part of the creation of e-learning systems participated in the interview. The research's final suggestions and conclusions were also taken. Six publicly funded universities participated in this investigation. This study offers some significant, useful insights into how e-learning systems are used and adopted in emerging nations like Jordan and Saudi Arabia. When adopting an e-learning system, for instance, there are additional issues than infrastructure that could come up, like technical issues with the mechanism, issues with change in the management, issues with curriculum planning, issues with computer self-awareness, and issues with monetary support.
13	Fabriz, S., Mendzheritskaya, J., & Stehle, S. (2021)	Analyzing the influence of asynchronous and synchronous virtual education and adaptability on student factors requires consideration of the purpose of certain teaching strategies as well as the fundamental philosophy of the online courses. According to the study, students prefer asynchronous channels of communication like discussion boards and email, but they still value the chance to receive immediate instructor feedback in synchronous environments. Furthermore, student-topic communication (such as watching the videos, reading engaging text messages, and finishing coursework) and student-teacher interaction (includes providing feedback, giving assessments and shaping assessments, and describing students' progress) both significantly affect how well-liked and well-perceived learning is, especially in asynchronous configurations.

14	Crawford, & Cifuentes - Faura (2022)	According to this paper, sustainability has become increasingly important in education over time. It is defined as the creation of scalable or appropriately sized educational institutions that don't unduly deplete resources or exclude particular groups of people. Education for sustainability is the practise of incorporating instructional strategies that aid in the advancement of sustainable learning in academic contexts (EfS). The aim of this research was to analyse how the pandemic is altering actors' and institutions' goals in higher education as they cope with COVID-19 and to better understand the sustainable environment in university education during the outbreak. Many institutions spent a lot of time developing and implementing sustainability before the global outbreak of the COVID-19 outbreak in 2020.
15	Gama, L. C., Chipeta, G. T., & Chawinga, W. D. (2022)	The systematic literature study of e-learning in higher education institutions in Malawi is presented in this report, along with comparative analyses of results from other developing nations throughout the world. The purpose was to draw attention to the advantages and difficulties of adopting a long-term e-learning programme in higher education institutions. The question, the inclusion and exclusion criteria, the suggested techniques, and a comprehensive search technique were all taken into consideration when incorporating the items preferred for the systematic review technique and technique of Meta-Analyses. A qualitative study of the literature, NVIVO 10.0 for the purpose of analysis of data and administration, the Bandara et al. framework and a thorough search strategy were also used in the review's methodology. The article focuses on hardships faced in Malawi due to lack of technology, knowledge and other factors.
16	Shahzad, A., Hassan, R., Aremu, A. Y., Hussain, A., & Lodhi, R. N. (2021)	Through Google surveys, 280 students from various colleges in Malaysia provided empirical data that was then analysed using partial least squares structural equation modeling. The whole model was further separated into two domains, male and female. There are five main components in this article. The DeLone and McLean Model were used to show how the learning curve has changed in favour of online portals in the first segment. The research methodology and the general procedure for gathering and analysing data were described in detail in the next section. One section covers the Multi-Group Analysis (MGA) as well as the results' interpretation. This study proposes and investigates the factors that influence the E-learning portal by broadening D&M model to include elements which are more associated with IS Achievement and E-learning amongst university students. The Delone and mclean approach is taken into account because the practical qualities of IS could aid universities in strengthening and improving their courses. The study's main contribution is how the behaviour of the model varies as it is divided into several pieces (Male and Females).

17	Al Rawashdeh, A. Z., Mohammed, E. Y., Al Arab, A. R., Alara, M., & Al-Rawashdeh, B. (2021)	Especially in the university environment, students are increasingly having access to the vast world of online learning. Thanks to efforts to advance technology in university across the UAE, students now have greater opportunities to take courses in a variety of subjects online. The increasing popularity of online courses at colleges may also be influenced by how tough admissions are. Students enroll in college-level courses in order to maintain their competitive advantage. A large number of university-level courses that are offered online are open to students. The study has examined the advantages and disadvantages of e-learning in an effort to assist e-learners in becoming effective students through interactive online learning.
18	Kabir, Tonmon, Hasan, Biswas, Chowdhury, Hasnat, & Mitra (2022)	A cross-sectional research study was conducted taking into consideration the female nursing students to assess reported e-learning readiness in the sub categories of visibility, technological usage, self-confidence, acceptability, and instruction. To ascertain the frequency of e-learning choice, the connection between choice and e-learning preparedness amongst female student nurses, and any other variables, if any, related to e-learning preparedness of female student nurses in Bangladesh was held in the said research paper.



OBJECTIVES

Following are objectives of our study:

- To find the past and current position of online e-learning taking into consideration of higher education system.
- To study the influence of e-learning on teaching learning experience.
- To study sustainable aspect of e-learning and to see if there is anything of relevance.

METHODOLOGY

It is a review based study, various research papers on e-learning post Covid-19, its relationship with sustainability and the future aspect of it was conducted. Secondary source data and research papers were analyzed for the said study.

FINDINGS AND CONCLUSION

The research is based on the idea that the shift towards. The educational approach and students' opinions of how to utilize the digital learning and teaching environment may be significantly impacted by e-learning. It is also relevant that sustainable development must always be kept in mind while making such progression.

By making adverse educational possibilities more accessible and upgrading their quality at minimal expense, the integration of ICT into traditional systems will undoubtedly influence substantially the overall education system. The right strategies and policies are expected to be put in place to assimilate the local technology with educational system that is prevailing in order to maximize the benefits of e-learning at the lowest possible cost. In order to meet the rising demand for flexible learning systems in the local and international markets today, the University Grants Commission (UGC) has chosen to use ICTs to enhance digital education through E-learning in the majority of higher institutions of learning in India. (Babu & Sridevi, 2018)

All the research papers studied focuses on the fact that how we can improve teaching learning experiences during situations like Covid-19. It also states that the current condition of infrastructure for e-learning is not up to the mark. As far as sustainability is concerned, it is a subjective approach and it depends on each higher educational institute throughout the area

of our study that how they are willing to adopt it. It has been seen that sustainability can improve the area of teaching and learning experiences.

SUGGESTIONS

As far as suggestions are concerned, following aspects affect online learning environment's educational process quality, so we can improve on these areas:

We may gain a lot from a long-term study that tracked how institutions changed their curricula to focus solely on online instruction.

Universities could create programmes or training sessions for educators whose goal would be to improve student achievement and, indirectly, teacher performance.

- Teachers still need to adjust teaching methods to online options; technical proficiency alone is not enough.
- Another challenging aspect includes the way teachers and students interact and communicate.
- As far as online learning in the higher education system is concerned, it has been starting to confront problems with regards to students' lack of thought-provoking abilities to think, reduction in the urge to debate and skills to express views, and lack of active learning.
- Teachers must be approachable and receptive for the students' requests in order to improve their involvement and participation in the educational system, which is less in an online context.
- Teachers should discover answers to students' technical issues so they can access the material covered in class (recording and uploading the course on the online platform, providing supplemental study materials, etc.), teachers should at least be understanding and refrain from punishing pupils for these kinds of issues if solutions cannot be found.
- Teachers in the system of higher education often find it challenging to say that they are not aware about the usage of a particular online platform tool, which is why they don't ask for help.

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Conflict of Interest Statement

The authors of this article declare that there is no conflict of interest in relation to the research, authorship, and publication of this article.



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Authors' Contribution Statement

Nidhi Verma (corresponding author): Conceptualisation; methodology; collecting data; developing the first draft, cross-checking for references and writing the final draft.

Kapil Kumar: Conceptualisation; methodology; literature searching; collecting references, reviewing the literature work and reviewing the final draft.

Both the authors read and approved the final manuscript prepared for submission.