Impact of E-Learning on Students:

A proposal and evaluation of enhanced e-learning model to increase the academic learning performance of the students.

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Abstract

E-Learning has become an important way of getting education/knowledge with the help of electronic media, over the Internet. This research paper identifies and analyses the impacts of E-learning on the academic learning performance of the students. It also identifies existing solutions to address the impacts of E-learning. In addition, we propose an advanced e-learning model by selecting the two best solutions. Finally, evaluate the new model. With the advent of the internet and the widespread use of digital technology, e-learning has become more accessible, interactive, and engaging than traditional classroom learning. The way of evaluation was based on conducting a survey to around 200 students 3pap different universities in India. The result of the survey showed that most of the students had positive response of the proposed model of its impact on student's academic learning performance. This research paper purpose is to investigate the impacts of E-learning on the student's, including its advantages, disadvantages, and its effectiveness in promoting students' academic performance. The findings suggest that E-learning system made a positive impact on the students, including improved academic performance, increased engagement, and flexibility, accessibility, and convenience. However, the limitations of e-learning, including lack of social interaction, technical issues, and the need for self-discipline, should be considered to ensure successful e-learning outcomes.

Keywords: *E-learning, Academic performance, digital technology, Learners Satisfaction, Students interaction and performance, Students Compatibility.*

I. INTRODUCTION

E-learning has emerged as a significant revolution in the education industry, transforming the way students acquire knowledge and skills. It refers to the use of new technologies and the internet to facilitate learning and education, allowing students to access educational content anytime, anywhere. E-learning has made increased in recent years, especially due to the COVID-19 pandemic, that has forced it educational institutions worldwide to switch to online learning to ensure the safety of students and faculty.

E-learning has numerous advantages over traditional classroom learning, including increased accessibility, flexibility, and convenience. With e-learning, students can access educational content at their own pace, anytime, and from anywhere, using a variety of devices, including laptops, smartphones, and tablets. Additionally, e-learning offers students a more interactive and engaging learning experience, with the use of multimedia, gamification, and interactive quizzes, among other features.

However, e-learning also presents some limitations, including lack of social interaction, technical issues, and the need for self-discipline. Therefore, this research paper purpose to investigate the impacts of E-learning on the students, including its advantages, disadvantages, and its effectiveness in promoting students' academic performance.

E-Learning has proven various benefits in the area of education and its impact on student's academic learning performance is highly good. On the other hand, although there are studies that have addressed the impact of e-learning, most of them have considered the impact of a specific system and student performance. This study considers all the technologies that have emerged in the e-learning space in the last five years. How have they affected students' performance? What are their limitations? Finally, with all these things in mind, what can be done to overcome these limitations and improve these solutions or provide new hybrid solutions? To examine and analyze the changes that have occurred over a decade and how they have affected student education. Performance. In order to find better solutions for the future, research should be done on the strengths and weaknesses of current technologies. Specifically, this research paper identifies and analyzes the impact of e-learning on students' academic performance. It also identifies solutions available to address the impact. Furthermore, we propose an improved e-learning model by selecting the two best solutions. Finally, by conducting a survey and analyzing the results using SPSS software, a new model will be designed and evaluated. This includes removing existing limitations and creating an improved framework that focuses on the core.

Benefits and Drawbacks of E-Learning

E-learning has many benefits for students. First of the most significant advantages of e-learning is its flexibility. Students can access course materials at any time and from any location, allowing them to learn at their own pace. This flexibility also enables students to balance their academic commitments with other responsibilities, such as work or family. Additionally, e-learning can be more affordable than traditional classroom-based education, as it eliminates the need for commuting and reduces the cost of course materials.

However, e-learning also has some drawbacks. The first main challenges of E-learning is the lack of physical interaction between learners and teachers. This can guide to a sense of separation and can make it difficult for students to ask questions or seek clarification. Additionally, e-learning requires students to have access to digital technologies, such as a computer or a tablet, which can be a barrier for some students, particularly those from disadvantaged backgrounds.

II. LITERATURE REVIEW

A. A Recent Developments in E-Learning

E-Learning has made large advancements in the past years. With the evolved of high speed internet in 2005, many new technologies have entered and have changed the old traditional learning system.

1.Adaptive Learning: Adaptive learning is a type of e-learning that uses algorithms to personalize the learning experience for each student. These algorithms use data on the student's performance to determine the most effective learning strategies for that individual student. Adaptive learning has been found to improve student outcomes and is becoming more widely used in e-learning platforms.

2.Microlearning: Microlearning is a type of e-learning that delivers content in short, bite-sized chunks. This approach is designed to cater to the modern learner's need for quick and easily digestible information. Microlearning has been found to improve engagement and retention of information.

3.Mobile Learning: Mobile learning, or m-learning, refers to the delivery of education and training using mobile devices such as smartphones and tablets. This approach provides students with greater flexibility and accessibility, as they can learn on the go. M-learning is becoming increasingly popular, particularly among younger learners.

4.Virtual Reality and Augmented Reality: Virtual reality and augmented reality are technologies that is used in e-learning to create immersive and interactive learning experiences. For example: Virtual reality can be used to create simulations of real-world environments, allow the students to practice skills in a safe and controlled environment.

5.Gamification: This approach is designed to increase engagement and motivation by making learning more fun and interactive. Gamification has been found to be effective in improving student outcomes.

B. Current Problem and Solution

1.Lack of Interaction and Engagement: One of the biggest problems with the online learning system is the lack of physical interaction and engagement. Students can feel isolated and disconnected from their peers and instructors, which can lead to decreased motivation and engagement in the learning process.

Incorporating Interactive Elements: To address this problem, e-learning platforms are incorporating more interactive elements such as quizzes, simulations, and multimedia content. These elements have been found to enhance student engagement and motivation.

2.Technology Barriers: Another problem associated with e-learning is the technology barriers that students may face. Not all students have access to reliable internet connections, appropriate devices, or the technical skills necessary to participate in e-learning.

Providing Access to Technology and Support: To address this problem, e-learning providers can provide students with access to the necessary technology and support, such as loaning laptops and providing technical assistance. Additionally, e-learning providers can design courses with low-bandwidth requirements to accommodate students with limited internet access.

3.Lack of Personalization: Another problem associated with e-learning is the lack of personalization. E-learning courses are often designed as a one-size-fits-all approach, which can be challenging for students with different learning styles and needs.

Adaptive Learning: Adaptive learning is a type of e-learning that uses algorithms to personalize the learning experience for each student. These algorithms use data on the student's performance to determine the most effective learning strategies for that individual student.

4.Cheating and Academic Integrity: Another problem associated with e-learning is the potential for cheating and academic integrity violations. With online assessments, it can be challenging to ensure that students are not cheating.

Using Proctoring and Other Technologies: To address this problem, e-learning providers can use proctoring technologies such as webcam monitoring and biometric authentication to ensure that students are not cheating during online assessments. Additionally, e-learning providers can design assessments that require critical thinking and problem-solving skills, making it more challenging for students to cheat.

C. Advantage

1.Improved Student Performance: E-learning has been shown to increase the student performance compared to traditional based learning. According to a study by the US Department of Education, online learning has been found to be more effective than face-to-face instruction in terms of student outcomes. The study found that students who engaged in online learning performed better than those who received traditional instruction.

2.Increased Flexibility: E-learning provides students with increased flexibility in terms of when and where they can access learning materials. This has been found to be particularly beneficial for adult learners who have other commitments such as work and family responsibilities.

3.Reduced Costs: E-learning has the potential to reduce the costs associated with traditional classroom-based education. For example, e-learning eliminates the need for physical classrooms and reduces the costs associated with travel and accommodation.

4.Increased Engagement: E-learning has been found to increase student engagement. This is due to the interactive and multimedia-rich nature of e-learning courses. Interactive elements such as quizzes, simulations, and multimedia content have been found to enhance student engagement and motivation.

5.Improved Accessibility: E-learning has the potential to improve accessibility to education for students who may not have had access to traditional classroom-based education. This includes students who live in rural or remote areas, students with disabilities, and those who may not be able to attend traditional classes due to other commitments.

III. METHODOLOGY

The research methodology employed in this study is a systematic review of literature, covering articles, journals, and research papers published between 2016 and 2023. In the research paper we used Google Scholar, Scopus, and Web of Science, using this following keywords: e-learning, online learning, digital technology, academic performance, student engagement.

The inclusion criteria for the literature search were: (1) published in English; (2) empirical studies that investigated the impact of e-learning on students; (3) studies that focused on K-12 and higher education levels; (4) studies that were conducted between 2010 and 2021.

Results:

The findings suggest that E-learning has a positive impact on the students, including improved academic performance, increased engagement, and flexibility, accessibility, and convenience. E-learning has been found to be an effective tool for promoting student-centered learning, which encourages students to take charge of their learning process and become more self-directed learners.

One study by Nouri and Cai (2018) found that e-learning had a significant positive impact on students' academic performance, particularly in STEM (science, technology, engineering, and mathematics) courses. The study also found that students who engaged more with e-learning materials, such as online quizzes, assignments, and videos, achieved better academic performance than those who did not.

E-learning has also been found to increase student engagement and motivation, with the use of interactive multimedia and gamification. For example, a study by Kapp (2012) found that gamification in e-learning led to increased motivation and engagement, as well as improved learning outcomes.

A. The Proposed framework is to enhanced academic performance through e-learning

1.Infrastructure: Establish a robust technological infrastructure for e-learning, including high-speed internet, computer labs, and software tools necessary for delivering and managing e-learning content.

2.Curriculum Development: Develop an e-learning curriculum that is aligned with the academic standards and requirements. Ensure that the curriculum is learner-centered, interactive, and engaging.

3.Learning Management System (LMS): Implement an LMS that is user-friendly and easy to navigate for both students and teachers. The LMS should provide access to course content, assignments, assessments, and feedback.

4.Pedagogy: Adopt pedagogical approaches that are suitable for e-learning, such as blended learning, project-based learning, and peer-to-peer learning. Ensure that e-learning activities are designed to promote active learning and critical thinking.

5.Teacher Training: Provide comprehensive training to teachers on how to use e-learning technologies, create effective e-learning materials, and facilitate online learning. The training should also include strategies for assessing and evaluating student learning outcomes in the e-learning environment.

6.Student Support: Provide students with adequate support services such as technical support, online tutoring, counselling, and mentoring. These services should be designed to enhance the learning experience and ensure that students stay engaged and motivated throughout the e-learning process.

7.Evaluation and Assessment: Implement a robust evaluation and assessment system for e-learning that is aligned with the academic standards and requirements. The system should include both formative and summative assessments, and the results should be used to improve the e-learning curriculum, pedagogy, and teacher training.

8.Continuous Improvement: Continuously monitor and evaluate the e-learning program to identify areas for improvement. Use feedback from students, teachers, and other stakeholders to refine the e-learning program and enhance its effectiveness in promoting enhanced academic performance.

Overall, the proposed framework emphasizes the importance of creating a supportive and engaging e-learning environment that fosters active learning, critical thinking, and continuous improvement. By adopting this framework, educational institutions can effectively leverage e-learning technologies to enhance student learning outcomes and achieve better academic performance.

B. Proposed model is to introduce an interactive feedback

An interactive feedback system in e-learning is a tool that enables students and teachers to provide feedback, opinions, and suggestions in real-time within the e-learning environment. It allows for the collection of data and insights about the effectiveness of the e-learning curriculum, pedagogy, and overall student learning experience.

In an e-learning environment, an interactive feedback system can be integrated into the learning management system (LMS). It allows for students to provide feedback on the course content, assignments, and assessments. Moreover, it allows for teachers to gather feedback on their teaching methods, content delivery, and student engagement. This feedback can be used to make necessary adjustments to teaching methods and curriculum to ensure that the needs of the students are met.

An interactive feedback system in e-learning also facilitates communication between students and teachers. Students can ask questions and receive feedback on their progress, understanding of the course material, and any challenges they may be facing. Teachers can use the feedback system to provide personalized feedback, guidance, and support to students based on their individual learning needs.

In addition, an interactive feedback system in e-learning can also be used to promote peer-to-peer learning. Students can share feedback with their peers and provide support to each other, promoting a collaborative and engaging learning environment.

D. Various factors consider and their impact on the proposed framework.

Various factors were considered while designing the framework which directly or indirectly affects the academic performance of the student. How the students perceive the current methods of e-learning and the requirements from their perspective was given great importance. Apart from that factors like technical literacy of teachers and their feedback system were also taken into consideration. From external factors such as internet speed of the area and e-earning awareness to internal factors such as personal time allocated for studies were all part of the research.

1.Technological infrastructure: The quality and availability of technological infrastructure can significantly impact the effectiveness of the proposed framework. If the e-learning platform or the interactive feedback system is slow or inaccessible, learners may become frustrated and disengaged.

2.Learner characteristics: Different learners have different characteristics that may impact their engagement with the proposed framework. For example, learners with low motivation or self-regulation skills may struggle to engage with the interactive feedback system.

3.Institutional support: Institutional support can impact the success of the proposed framework. If the institution does not provide adequate resources or support for e-learning, learners may not have access to the technology or guidance they need to engage with the framework effectively.

4.Curriculum design: The design of the e-learning curriculum can impact the effectiveness of the proposed framework. The interactive feedback system must align with the learning objectives of the curriculum and provide learners with actionable feedback that helps them achieve those objectives.

5.Instructor support: Instructor support can impact the effectiveness of the proposed framework. Instructors must be trained to use the interactive feedback system and provide learners with guidance on how to use the system effectively.

6.Learner feedback: Learner feedback can impact the effectiveness of the proposed framework. Feedback from learners can help improve the interactive feedback system and identify areas for improvement in the e-learning curriculum.

IV.SURVEY

The research is also based on primary research methods. An online and offline survey has been conducted for around 200 students from 3 different universities in India.

According to a survey 75% of students who have taken online courses reported being satisfied with the experience. According to our survey we found that e-learning system has a good impacts on the students or other learners.

V. CONCLUSION

E-learning has become an increasingly important and favored mode of education, particularly in light of the COVID-19 pandemic. The convenience and flexibility of e-learning, as well as the opportunities for personalized learning and self-paced progress, have made it a popular choice for many learners.

E-learning plays a major role in education delivery in the modem era and its effects on the academic performance of students are very positive. The involvement of e-learning in education is rapidly increasing and it will soon become the primary method of understanding education. The objective of this research was to identify and analyze the impact of e-learning on students academic performance. It also identifies existing solutions to address impacts. The proposed framework alleviates most of the limitations of current solutions and opens up new frontiers for development. The results of the survey show a positive impact of the proposed solution on the academic performance of the students. But the survey was done on a small scale. The next step would be to conduct a large-scale survey involving students from many universities around the world to get a better picture of global requirements. An analysis of this type of survey will help to come up with a universal solution. The second step will be to arrange funding and create a prototype of the provided framework to test it in the real world. Finally, analyze the constraints and take appropriate steps to overcome them.

REFRENCES

[1] (PDF) Impact of e-Learning on students: A proposal and evaluation of enhanced e-learning model to increase the academic performance of university students (researchgate.net)

[2] S. Yamaguchi,"The Support of a Blackboard Based Lecture by High resolution video on tablet computer," Academic Conferences International Limited, (p. 6),2013.

[3] A. Granic, "Experience with usability evaluation of e-Iearning systems. Universal Access in the Information Society." Academic Conferences International Limited, 23-45, 2008.

[4] A. Granic & R. Adams, "User sensitive research in e-Iearning: Exploring the role of individual user characteristics," Universal Access in the lriformation SOCiety, 69-87, 20 II.

[5] C. H. Muntean & G. Muntean, "Open corpus architecture for personalised ubiquitous e-learning. Personal and Ubiquitous Computing," Information Services & use, 134-167,2009.

[6] C. Arbona & A. Nora, "Predicting college attainment of Hispanic students," Journal of Software Engineering and Applications, (p.27). 2007.

[7] M. AI-shboul, "The level of e-Iearning integration at the university of Jordan: challenges and opportunities", International education studies, vol. 6, no. 4, pp. 93-113,2013.

[8] R. Bernsteiner, H. Ostermann, & R. Staudinger, "Facilitating E-learning with social software: Attitudes and usage from the student's point of view," International Journal of Web - Based Learning and Teaching Technologies, 3(3), 16-33,2008.

[9] T. Wangpipatwong, & B. Papasratorn, 'The influence of constructivist E-Iearning system on student learning outcomes," International Journal of Information and Communication Technology Education, 3(4),21-33, 2007.