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Original Research Articles

Investigating the Use of Online Platforms and Tools for More Efficient Learning

Sourasis Chattopadhyay[1]* & Hsinkuang Chi[2]

Abstract

This study looked at the growing availability of online degree programmes at colleges and universities, as well as the benefits of online education for students and teachers. Because online technologies offered students a dynamic way to participate, collaborate, and grow, institutions needed to adapt to a diverse and tech-savvy student population. With the complexity of online platforms, it was easier to provide students with technically competent and pedagogically effective learning experiences. Online education has emerged as a serious contender to more conventional classroom settings, thanks to the proliferation of portable and desktop computers, smartphones, and other electronic devices. It provided chances for learning in an interactive classroom environment where instructors may provide either immediate or delayed comments. Online courses may only be suitable for some students due to differences in aptitude, experience, and learning style. The widespread availability of digitally improved learning materials, such as smartboards, tablets, laptops, simulations, dynamic visualizations, and virtual labs, has propelled information technology to the forefront of educational reform. The Internet of Things has the potential to drastically reduce the expense of obtaining a top-notch education. It was expected that social media would swiftly become an integral part of online education, given its significance in disseminating knowledge and establishing professional connections. Based on the participants' self-confidence and the ease with which they could utilize electronic communication devices, they were well-equipped to handle technical obstacles. Challenges related to devices and internet connectivity included issues with computer and smartphone facilities, restricted internet access, limited funds, and other similar issues.

Keywords: Remote Learning; Online platform; Challenges; Online Tools; Education

Introduction

Teachers and pupils alike stand to benefit from the growing number of online learning opportunities at universities. Online technologies provide a dynamic way for students to participate, collaborate, and innovate, which is essential for institutions to consider as they adapt to a diverse and tech-savvy student population. The complexity of online platforms, such as virtual classrooms and collaborative research spaces, and their successful use in

higher education contexts is the goal of this study. Institutions must comprehend the intricacies of these online platforms to provide students with learning experiences that are both pedagogically sound and technologically competent as the educational environment goes through a digital transformation. This research recognizes the advantages and disadvantages of digital education and explores how online tools can accommodate different learning styles and preferences. To fully use online platforms for knowledge transmission, the project investigates how educators can adapt to these changing technologies and how pedagogical techniques may be improved (Dung, 2020). As a result of the fast advancement of electronic technology and gadgets, e-learning has emerged as a crucial substitute for conventional education. Based on computers, apps, and the Internet, it provides instructional experiences in an interactive teaching-learning environment. Learning and teaching go beyond the four walls of a traditional classroom, enabling instructors to provide students with real-time or delayed feedback. Despite the need for more consensus on a precise definition of e-learning in the literature, scholars do acknowledge that it enhances the educational experience. A lack of agreement on a clear definition has resulted from the fast evolution of electronic technology and gadgets (Karima, 2019).

Since every student has a unique history, set of skills, and preferred method of learning, online courses may not be the best fit for all of them. Despite the fast expansion of online learning in academic institutions, there needs to be more data on students' prior knowledge and experience with online learning (Kauffman, 2015). Education, a cornerstone of social welfare, is essential to sustainable growth. With the advent of new technology-assisted learning tools, including mobile devices, smartboards, massive open online courses (MOOCs), tablets, laptops, simulations, dynamic visualizations, and virtual labs, information technology has become a leading driver behind education changes. With the help of the Internet of Things (IoT), we can all benefit from a first-rate education for a fraction of the expense. Companies in the field of educational technology are always thinking of new ways to help students who cannot afford good schools get the education they need (Keengwe, 2014).

Due to its central role as a platform for the dissemination of knowledge and the cultivation of professional connections, social media has rapidly become an integral part of online education. If you are looking for a more immediate learning environment, quicker assessments, and greater engagement, there may be a better way to go than traditional classroom training. Technology and digital learning resources satisfy this need by offering advantages over more conventional approaches to education. As the number of people owning smartphones and other wireless devices continues to rise, it is only fair that schools and other educational institutions find creative ways to put these gadgets to use in the classroom (Vakaliuk, 2021). We are becoming less reliant on pesticides and using less water as a result of the impact of digital technology on agricultural operations. As the COVID-19 epidemic has shown, digital technologies are crucial to the survival of our educational system. With the help of technology, students can study in the comfort of their own homes, and they can focus on their studies without interruptions. Technology like computers, projectors, and other state-of-the-art tools may captivate pupils and make learning fun (Emmanuel, 2008).

Cutting costs, improving resource utilization, promoting sustainability, and expanding reach and effect for both students and instructors are all significant benefits of digital learning. Education is anticipated to transform as a result of the digital revolution, which is expected to lower tuition costs and increase accessibility, among other societal and life-enhancing effects (Cañas, 2003).

Investigating online platforms and solutions to improve instructional efficiency in higher education is the goal of the project. The ultimate goal is to find ways that can make learning better for everyone involved. To improve teaching and learning, the study also investigates how schools might use new technologies. It recognizes that there is a wide range of learning styles and seeks to examine how online platforms may meet these requirements, providing ideas for making schools more welcoming to all students. The research also discusses problems with conventional educational paradigms, including insufficient funding and difficulty in accessing the curriculum. The project aims to enhance the quality of education and address these difficulties by studying online platforms and proposing solutions. The results may help those in charge of educational policy and practice at the federal and state levels better understand how to use digital resources in classroom instruction. This research allows educators, administrators, and students to get ready for the next generation of tech-driven classrooms by shedding light on how to adapt professional development and course design to this changing educational landscape. Findings from the research provide evidence-based ways to improve education generally, and they also evaluate the effect of online platforms on student outcomes.

Literature Review

Online Learning

(Mohd Basar et al., 2021) Online learning has been embraced because of the COVID-19 epidemic, but research into its benefits and drawbacks is ongoing. In Jasin, Melaka, 99 secondary school students participated in the study by filling out a questionnaire. Students had strong proficiency with smartphones and computers but mediocre proficiency in collaborative projects and poor motivation, according to the data. Additionally, many highlighted the significance of direct, in-person instruction for their education. The research shows that good learning requires facilities with enough equipment and reliable internet connections. However, to have a deeper understanding, it suggests using a bigger sample size and students from varied backgrounds. Schools throughout the globe have had to move their lectures and lessons online because of the pandemic. Compared to traditional classroom instruction, online learning has fewer drawbacks and is better for students' well-being. It may not work as well if there is not a robust internet infrastructure. The government should improve the infrastructure that is already in place, and teachers should improve the experience that students have by using practical pedagogical approaches. The effectiveness of online learning depends on the support of school communities, parents, and administrators.

(Al-Hashimy et al., 2023) The purpose of this research is to compare and contrast different online classrooms in terms of how well they teach accounting. It is critical to assess how online learning platforms affect accounting students' academic progress since remote

education is becoming more prevalent. This study compares the efficacy of online learning environments with that of conventional classrooms using a quantitative methodology. Questionnaires and assessments are used to gather data. Accounting education may greatly benefit from online learning platforms. These platforms provide students with more independence, flexibility, and more significant contact with their instructors. Accounting courses might benefit from online learning systems that provide immediate feedback and personalized instruction, according to the research. By making lessons more approachable and piquing students' interest in the content, this technique may improve accounting education. According to the study, one way to improve conventional classroom instruction while also increasing student-teacher dialogue is to combine synchronous online sessions with discussion forums.

(Abuhassna et al., 2020) Academic success and contentment with online learning environments are examined in this research. In this research, 243 college students were polled using Bloom's Taxonomy and Transactional Distance Theory. Online learning systems are well-received by students for eleven reasons, according to quantitative research. Contentment was favourably affected by students' backgrounds, experiences, partnerships, relationships, and autonomy, according to the study. Academic success was positively associated with students' abilities to apply, recall, comprehend, analyze, and feel satisfied with their work. Results show that students' academic performance and happiness are both enhanced by the combined use of TDT and BTT theories. Online learning platforms may be better planned, evaluated, and implemented with the support of this study. Additional information on student happiness and academic success is provided by the research, which is a contribution to the area of online learning platforms. Researchers may improve their findings by using TDT and BTT together.

(Iqbal et al., 2022) Online education has quickly become a popular and practical method of getting a degree in the present day. Institutions and schools have embraced this technology to provide high-quality online learning opportunities for students. The purpose of this article is to investigate what makes online learning appealing to students and what variables influence their choice of platform. Two hundred and fifty students from the Indian cities of Kolkata, Mumbai, Delhi, and Chennai filled out the survey. A trifecta of variables was isolated: "Knowledge," "Mixed Learning," and "Cognizance." Findings show that students' preferences for online learning platforms are heavily influenced by knowledge, dimensions, and blended learning. A more comprehensive understanding of students' choice for virtual classrooms throughout India requires the inclusion of other cities in the research since it only gathered data from several metropolitan areas. Students' growing awareness of the value of online education in today's technologically advanced society has boosted its profile. Many in the education sector see online learning as the wave of the future.

Students Views on Online Education

(Rueda-Gómez et al., 2023) Using a qualitative approach, this research seeks to examine the elements impacting the effectiveness of online learning assistance systems. From 2018 through 2021, eleven mathematics professors taught nine thousand two hundred and forty new students across three courses for the study. Open coding and axial coding helped identify 17 elements, with five groups explaining the interrelationships between them:

challenges, instructor input, student response, reinforcement, and platform. An implementation methodology for the web platform was created by integrating and redefining the major categories via selective coding. Focus groups and grounded theory were the primary methods used in the research, which led to its significant shortcomings. To understand discourses and viewpoints, the study uncovered preexisting phenomena, attitudes, and hidden preferences and values. The results may make future university-level events like this a success.

(Almahasees et al., 2021) In Jordan, online learning has replaced traditional classroom instruction due to the widespread effects of the COVID-19 epidemic on educational institutions. The purpose of this research was to examine the views of both teachers and students on online education by surveying 280 students and 50 teachers. According to the data, Zoom, Microsoft Teams, and WhatsApp are some of the most popular online platforms in Jordan for interactive online classrooms. While online education has had its uses during the pandemic, both students and teachers acknowledge that it is less successful than traditional classroom instruction. Some of the problems that might arise with online education include student need for more interest or motivation, problems with the Internet and technology, and concerns about the safety and privacy of their personal information. On the other hand, self-study, affordability, accessibility, and adaptability are some of the benefits of online education. Since online learning cannot replace in-person instruction, the research suggests blended learning as a means of creating a challenging learning environment.

(Acquaro, 2021) Choosing and deploying online learning systems in higher education is no easy feat; it calls for a delicate balancing act between robust pedagogy, user-friendliness, data security, privacy, and training. Examining the pedagogical and pragmatic demands, as well as identifying trends and best practices, in the development of online learning environments was the goal of research carried out in the autumn of 2016 by specialists in the field of higher education. This chapter delves into the study's findings to get a better understanding of the obstacles encountered by leaders in higher education while trying to create efficient online learning spaces.

(Al-Maroof et al., 2021) Whether students plan to stick with online learning platforms for both face-to-face and virtual sessions throughout the epidemic is the question this research seeks to answer. Considering user happiness, information richness, and educational system quality, the study employs a conceptual model. Researchers polled 768 college students on their experiences in classrooms that used both traditional and online methods of instruction. The following independent factors were examined using a structural equation modelling (SEM) test: situational awareness, perceived ease of use, usefulness, satisfaction, information richness, education system quality, and information quality. An online questionnaire was administered to gather information on students' intentions to utilize accessible online platforms in a face-to-face learning setting. The findings demonstrated that students choose more content-rich online platforms when using situation awareness aspects. Learners' contentment and embraceability were profoundly affected by TAM components. Students favoured a high-quality educational system and information-rich learning platform. A more favourable attitude towards utilizing online learning systems was seen among students who reported greater levels of satisfaction.

(Jabbar Alkubaisi et al., 2021) Worldwide, 1.6 billion pupils have had their education interrupted by the COVID-19 epidemic. Recorded lectures have become an integral component of online e-learning systems, which have primarily supplanted traditional classroom instruction. Finding out how well Sultanate of Oman universities' online learning platforms work is the primary goal of this research. Questionnaires were used to gather data descriptively. There are statistically significant variations in the quality of e-learning programmes, but overall, the results are promising. The continuation of education throughout the epidemic has been dramatically facilitated by e-learning systems, which were initially developed to assist the education process. Tech giants like Google and Microsoft have created and launched these platforms for use in classrooms of all sizes, from elementary school to college. The survey confirms what was already known about e-learning and demonstrates that, according to both students and teachers, the Sultanate's programmes are of good quality and that everything runs smoothly with quality overall.

Materials and Methods

Determining the study kind, developing a technique, choosing an online platform, and collecting data are all steps in the research process. After deciding who to survey, interview, or observe, the proper procedures are selected. The validity and reliability of the instruments are examined. After getting informed permission and thinking about ethical issues, the data-gathering phase may begin. The advantages and disadvantages of online education, as well as the difficulties it poses to students' capacity to learn, are investigated in this case study. Pupils may exhibit altered behaviour and responses in online classrooms as a result of the abrupt shift in instructional delivery. Respondents' first-hand accounts, thoughts, and feelings about the matter were elicited using a survey questionnaire. The 99 participants were chosen at random from a single secondary school in Delhi, India, and their ages ranged from fifteen to sixteen. Finding out how students feel about the benefits and drawbacks of their online learning environments was the primary goal of the research. The data from the survey was entered into Microsoft Excel and analyzed according to the method proposed by Nurul and Suziyani (2018) for interpreting percentage scores. Finding out how students feel about online learning and the difficulties it brings was the main goal of the research.

Results

Table 1: Gender-wise Distribution of Respondents

Gender	No. of Responses	Percentage (%)
Male	67	67.8
Female	32	32.2
Total	99	100

According to the statistics, 32.2% of the participants were female, and 67.8% were male. For the study's interpretation and generalizability, this gender distribution is very critical. One should use care when extrapolating the study's findings to a broader population

due to the disproportionate number of men who participated. Both the researchers and the readers of the study need to be alert to the possibility of gender bias in the data and how it may affect the results. To better understand the dynamics of the sample population, it would be beneficial to delve further into the causes of the gender distribution.

Table 2: Educational Qualification

Qualification	No. of Responses	Percentage (%)
Masters/Post Graduate	71	71.7
Research Scholars	28	28.3
Total	99	100

According to the results, out of the 99 people who took the survey, 71.7% hold a master's degree or above, and 28.3% are research scholars. There is a heavy concentration of people with PhDs and other highly educated degrees, which might skew the results. Results may be more indicative of individuals with more credentials. Thus, researchers should keep this distribution in mind when they analyze the data. According to the research, to include a wider variety of credentials, specific outreach or inclusion efforts are needed. To put the study's findings in perspective and spot any biases, it is essential to understand the qualification distribution.

Table 3: Online Teaching Platforms

Platform	No. of Responses	Percentage (%)
Zoom	35	35.4
MS Teams	28	28.3
Google Meet	21	21.2
Cisco WebEx	9	9.1
Others	6	6.1

According to the results, 35.4% of those surveyed utilized Zoom, with 27.3% using Microsoft Teams and 21.2% using Google Meet. Twenty-one respondents utilized Google Meet, and nine respondents utilized Cisco WebEx, making up the remaining 6.1% of the platform users. Zoom, Google Meet, Microsoft Teams, and Cisco WebEx were the platforms most often mentioned by respondents. Based on the results of the poll, Zoom is the platform of choice for online communication and collaboration. Google Meet and Cisco WebEx were the top three platforms, with Microsoft Teams coming in second. There may be more platforms or tools not explicitly included in the data, which highlights the wide range of possibilities available. Data like this may help academics and teachers figure out which

platforms are most popular, which might lead to better platform integration, training, and support programs tailored to individual users' tastes. Insights gained from the data may also be used to identify which features and capabilities are most valued by consumers, as well as where the platform can need some enhancement or more assistance.

Table 4: Perceptions of the efficacy of online learning by students

No.	Item	Frequency	Total of agreement	Interpretation
1	I possess the necessary computer skills.	38 (38.4%)	92 (92.9%)	High
2	Using electronic communication devices is comfortable.	33 (33.3%)	93 (93.9%)	High
3	Online learning is as effective as traditional learning.	33 (33.3%)	28 (28.3%)	Low
4	I am motivated when engaging in online learning compared to traditional methods.	34 (34.3%)	41 (41.5%)	Low
5	I can successfully collaborate on group assignments using online platforms.	21 (21.2%)	66 (66.7%)	Average
6	Face-to-face learning with instructors is crucial to me.	0 (0%)	97 (98.0%)	High

The study looked at how people felt about things like computer skills, e-communication tools, the efficacy of online learning, the importance of face-to-face instruction, the ability to work together on group projects through online platforms, and the motivation to learn online as compared to more conventional methods. Participants' viewpoints on various educational components were illuminated by the data, which revealed differing degrees of agreement across many areas of learning and technology usage. With an overall agreement rate of 92.9%, most participants feel confident in their computer abilities. Additionally, a large percentage of people (33.3%) reported feeling at ease while using electronic communication devices. While a smaller percentage of people (28.3% to be exact) believe that online learning is just as successful as conventional learning, a more substantial percentage (33.3%) agree. There was an opportunity for development in online learning motivation, as 34.3% agreed and 41.5% agreed. A total of 66.7% agreed, with 21.2% saying that it was possible to work on collaborative projects using online platforms. A high overall agreement rate of 98.0% indicates that there was widespread agreement on the significance of in-person instruction.

Table 5: The difficulties faced by respondents' online learning facilities

No.	Item	Frequency	Total	Interpretation
1	I need help with internet access at home due to a broadband Internet line.	93 (93.9%)	30 (30.6%)	High

2	I encounter difficulties with internet access at home due to a smartphone Internet data line.	63 (63.3%)	-	-
3	I am okay with internet access at home.	6 (6.1%)	6 (6.1%)	Low
4	I experience issues with computer facilities at home.	77 (77.8%)	29 (29.3%)	High
5	I share computer facilities with family members.	-	48 (48.5%)	-
6	I am okay with computer facilities at home.	22 (22.2%)	22 (22.2%)	Low
7	I face challenges with smartphone facilities at home.	97 (98%)	77 (77.8%)	High
8	I share smartphone facilities with family members.	20 (20.2%)	-	-
9	I am okay with smartphone facilities at home.	2 (2.0%)	2 (2.0%)	Low
10	I need more internet access due to high financial costs.	14 (14.7%)	14 (14.7%)	Low
11	I experience limited internet access due to signal problems or access limitations.	61 (61.1%)	61 (61.1%)	Moderate
12	I have limited internet access for other reasons.	24 (24.2%)	24 (24.2%)	Low

The information in this paragraph shows the difficulties that participants had with things like internet connection, computer facilities, and smartphone facilities and the causes of their little online access. The "Total" column shows what proportion of respondents encountered each difficulty, whereas the "Frequency" column shows how many people encountered each difficulty. This column's "Interpretation" section evaluates how serious these difficulties are.

A hefty 30.6% of participants, or 93.9% of the total, reported issues with home broadband internet connection as a consequence of a broadband Internet line. Action and improvement are needed to address this widespread problem. Also, 63.33 per cent of people needed help connecting to the Internet at home using their smartphone's data connection. Only 6.1% of participants reported no problems with connection, suggesting that this was a tiny subset of the total. Secondly, a substantial proportion of 29.3% of participants (77.8% to be exact) experienced problems with their home computer facilities. Among the most challenging aspects of computer sharing, 48.5% of respondents reported having to share their

computers with relatives. It seems that only a tiny percentage of participants had unfettered access to personal computer resources since no problems were observed with home computer facilities.

In a low overall proportion of 14.7%, seventeen per cent (14.7%) said they had restricted internet access because of high financial charges. Connectivity was affected by 61.1% of participants due to reported signal difficulties or access limits. Finally, a small total percentage of 24.2% was achieved when participants reported having restricted internet access for various reasons. The data shows that there are significant problems with internet connection, computer facilities, and smartphone facilities and that these problems affect the questioned people to different degrees.

Discussion

During their time spent studying online, most participants reported feeling entirely at ease with the use of computers and other forms of Internet communication. Feeling in charge, how easy it was to use, and how effective it was all played a role in creating this confidence and comfort. Their opinions on online education are based on their own experiences with online learning and the abrupt closure of institutions. One possible explanation for students' apparent ease and comfort while studying online is their familiarity with various devices and computers (Samat et al., 2020). There is a significant improvement in the quality of instruction and student engagement when using social learning platforms online. The ability to adapt and learn was maintained even when pupils used devices that belonged to other family members. Online learning was chosen by just a tiny minority of respondents, who mostly preferred traditional classroom techniques. Teachers should take the lead in creating intriguing and engaging lessons for their students since intrinsic motivation is a predictor of students' intent to utilize online learning. Poor infrastructure and expensive internet plans hampered students' ability to study online. The majority of students complained about interruptions in class and unreliable internet connection. Since almost 40% of those who took the survey call a rural location home, it is reasonable to assume that this demographic may be to blame for some of these problems (Rahiem, 2020). Because of these obstacles, pupils lacked the facilitating circumstances that are essential to their drive to study. Since students are still getting used to online learning, they may be resistant to the change due to the novelty of the setting and the difficulty of the assignments. Teachers should take the lead in creating fascinating and engaging learning environments since students' perceptions of their learning are influenced by personal interactions.

Conclusion

The survey looked at how people felt about certain aspects of technology, internet access, and device facilities, as well as their preferences when it came to the classroom setting. The majority of participants were very comfortable with electronic communication devices and had high levels of trust in their computer abilities, which indicates that they are technologically prepared. Participants' views on the relative merits of online and more conventional forms of education were, however, mixed. Online learning was seen as successful by a considerable number of people, whereas some thought otherwise. Many students reported feeling averagely confident while working on group projects using online

platforms, and both their motivation and cooperation levels were moderate when taking classes online. This points to potential areas for improvement in online learning motivating tactics and collaboration tools. Conventional teaching techniques are still relevant since participants strongly agreed on the necessity of face-to-face learning with instructors.

Limited internet access, budgetary restrictions, and problems with computer and smartphone facilities were among the highlighted challenges associated with device and internet access. The need to resolve infrastructure and accessibility difficulties for a more inclusive learning environment is highlighted by these obstacles, which may lead to discrepancies in online learning experiences. A more complex picture of the dynamics of online learning platforms and tools is painted by the research. It stresses the need for deliberate actions to improve online education in terms of equity and efficiency. The elements impacting participants' views may be better understood in future studies, which may also investigate more specific ways to overcome these obstacles.

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