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Education's New Normal: From Classroom to Digital Screen in Post-COVID-19 Bangladesh

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ABSTRACT

This research examines the shift from traditional classroom learning to digital education in the context of post-pandemic Bangladesh, focusing on how user experience, motivation, and acceptance impact the effectiveness of online learning. Utilizing data from 200 respondents, the study applied a range of statistical analyses, including correlation, regression, t-tests, and chi-square tests, to evaluate these relationships. The findings show a strong positive correlation between motivation and acceptance of online learning, suggesting that enhancing the quality of digital platforms can significantly boost student motivation. Additionally, a moderate correlation between user experience and acceptance highlights the necessity of intuitive platform design to increase acceptance rates. However, the weak correlation between user experience and motivation implies that improvements in user experience alone may not directly elevate student motivation, illustrating the complexity of factors influencing acceptance. Regression analysis identified platform usability as the most significant predictor of acceptance, followed by user experience and motivation. T-test results found no significant difference in user experience based on gender, indicating that male and female students interact similarly with online platforms. Moreover, the chi-square test revealed no significant link between location and type of institute, suggesting a need for further investigation into additional factors affecting institutional choice. These insights provide valuable guidance for educational institutions and online learning service providers, emphasizing the need to focus on platform usability, student motivation, and the creation of inclusive learning environments.

Keywords: Online Learning, User Experience, Motivation, Educational Technology, Post-COVID-19

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INTRODUCTION

The expansion of online learning has significantly reshaped the educational landscape, providing students with unparalleled flexibility, accessibility, and diverse learning opportunities. Digital platforms have become central to educational delivery, with many institutions embracing online learning models to meet a wide range of needs, including distance education and blended learning formats (Bordoloi et al., 2021; Kumar et al., 2021; Siemens et al., 2015). The global COVID-19 pandemic further accelerated this shift, compelling education systems worldwide to rapidly adopt remote learning strategies, thus underscoring the importance of understanding student engagement with digital platforms (Bao, 2020; Bozkurt et al., 2020; Day et al., 2023). In Bangladesh, the transition to online learning marked a major shift from its traditional in-person educational model, propelling the country into a new digital learning era. Before the pandemic, online education in Bangladesh faced numerous challenges, including inadequate infrastructure, limited accessibility, and varying levels of digital literacy among teachers and learners (Akter, 2022; Sakib, 2022). However, the necessity of maintaining educational continuity during lockdowns prompted the rapid adoption of technology, fundamentally changing the delivery and experience of education (Мосьпан et al., 2022). The movement from physical classrooms to virtual environments like Zoom, and the shift from traditional seminars to webinars, reflect an evolving pedagogical approach that continues to shape the educational field. Once considered part of informal education, e-learning, distance education, and correspondence courses are now becoming essential elements within the formal education system (Lederman, 2020).

While online learning offers several advantages, such as flexible learning schedules and access to diverse resources, its effectiveness is contingent on several factors, including user experience, students' attitudes, motivation, and the acceptance of these platforms (Sun, et al., 2008). This unprecedented shift has unveiled both opportunities and challenges within the Bangladeshi education system. While online learning has provided greater flexibility and expanded access to educational resources, it has also exacerbated existing inequalities, particularly among students from rural and disadvantaged backgrounds (Ela et al., 202; Cullinan et al., 2021). Many students face significant barriers, such as insufficient technological access, unreliable internet connectivity, and low levels of digital literacy. These disparities not only hinder access to education but also negatively impact learning outcomes, emphasizing the urgent need for equitable digital infrastructure and policies that ensure

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inclusivity in educational access (Pittman et al., 2021; Gottschalk & Weise, 2023; Olawale, 2024). Moreover, the transition to online education has raised critical questions about the effectiveness of digital pedagogy in replicating the social, interactive, and collaborative aspects of traditional classroom learning. Research indicates that students often grapple with issues of engagement, motivation, and communication in virtual environments, raising concerns about the overall quality of education delivered during this period (Adnan & Anwar, 2020). In Bangladesh, where teacher-centered pedagogies have traditionally prevailed, the pandemic has illuminated the necessity for reform encouraging the incorporation of active learning techniques and flexible approaches that address the diverse needs of learners in a digital-first educational landscape (Rashid & Yadav, 2020).

User experience, characterized by ease of use, intuitive navigation, and satisfaction with digital platforms, significantly impacts student engagement and success in online learning settings (Alqurashi, 2019). An effectively designed platform enhances the learning experience, enabling students to concentrate on content rather than technical obstacles. Conversely, poor usability can lead to frustration, disengagement, and lower academic performance. In addition to user experience, students' attitudes towards online learning are shaped by their perceptions of the platform’s effectiveness. Positive attitudes often lead to increased motivation and a greater acceptance of online education as a credible and efficient mode of learning (Lee & Choi, 2011). Motivation is a key driver of student engagement in online learning environments. According to the self-determination theory by Deci and Ryan (2013), intrinsic motivation, driven by personal interest or perceived course value, can enhance the quality of learning experiences. Students who are motivated by a genuine interest in the subject or see the relevance of the content are more likely to participate actively and achieve better outcomes (Hartnett et al., 2011). However, maintaining motivation in online settings can be challenging due to the absence of face-to-face interactions, making it essential to understand how attitude and motivation influence students' acceptance of digital learning platforms. Acceptance of online learning involves a complex set of factors, often determined by how well user expectations align with their experiences and learning outcomes. The Technology Acceptance Model (TAM) introduced by Davis (1989) highlights that perceived ease of use and perceived usefulness are fundamental to technology acceptance. In the context of online learning, students are more likely to embrace platforms if they find them both user-friendly and valuable, which can subsequently improve their satisfaction and academic performance (Liaw & Huang, 2013). Therefore, identifying the determinants that drive online learning acceptance can help

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institutions enhance their digital offerings and meet the diverse needs of learners. Given the intricate relationship among user experience, attitude effect motivation, and the acceptance of online learning, this study aims to examine these variables to uncover meaningful insights. By exploring how these factors interact, the study seeks to inform the design of more effective and engaging online learning environments. The outcomes of this research are anticipated to provide valuable recommendations for educators, policymakers, and platform developers, contributing to the improvement of online education quality, better student engagement, and the sustainability of digital learning as an integral component of modern education.

LITERATURE REVIEW

The integration of digital technology into higher education is not a recent trend, but rather a development that has been steadily evolving over the past few years (Kopp et al., 2019; Leszczyński et al., 2018). This ongoing digital transition has become a focal point for many educational stakeholders due to the increasing emphasis on digital transformation across the higher education sector. Universities are now required to harness information and communication technology (ICT) effectively to prepare future professionals for the challenges posed by a rapidly evolving digital landscape (Bond et al., 2018; Sandkuhl & Lehmann, 2017). This shift is vital for responding to the emerging demands of technological advancements (Abad-Segura et al., 2017). Within this framework, digital transformation in higher education entails adopting a comprehensive approach that incorporates digital processes to facilitate the effective use of digital tools and technologies (Kopp et al., 2019). The transformation strategy focuses on thorough planning, cultivating trust, promoting process-oriented thinking, integrating stakeholder competencies, and enhancing individual, group, and organizational knowledge (Cameron & Green, 2019). Additionally, Kopp et al. (2019) pointed out five common misconceptions that often hinder rather than help the digital transformation of higher education institutions: (i) attitudes towards change, (ii) the pace of transformation, (iii) reliance on technology, (iv) competency gaps, and (v) financial constraints. While online learning is a key component of this digital shift, it should not be mistaken as the only aspect of digitalization in higher education. Online learning utilizes electronic devices, internet-based tools, and digital platforms to deliver educational content (Means et al., 2009). Since the early 2000s, advances in technology and improved internet connectivity have contributed significantly to the rise of online learning (Tallent-Runnels et al., 2006). Nonetheless, there remains debate about the educational effectiveness of online learning, particularly when it results in reduced

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opportunities for direct, face-to-face interactions between students and educators (Joshi et al., 2020). Likewise, Hodges et al. (2020) distinguished between well-planned online learning experiences and those implemented hastily in response to emergencies. Effective online education requires careful planning, robust course design, and a focus on quality teaching practices (Hodges et al., 2020; Bozkurt & Sharma, 2020). Successful online learning outcomes are typically linked to deliberate course design and preparation, guided by an integrated framework for teaching and instructional development (Branch & Dousay, 2015).

Evaluating Online Education Platforms

School closures have been a primary strategy for mitigating the spread of COVID-19 since the virus's emergence in late 2019. Despite the educational disruptions caused by such closures, reopening schools for in-person classes can heighten the risk of triggering subsequent waves of the pandemic (Luo et al., 2012). To address this dilemma, transitioning from traditional classroom instruction to online teaching has become a preferred solution during intense pandemic phases. This shift helps to avoid large gatherings while maintaining the continuity of educational activities. In recent years, the surge in online education has led to the development of numerous digital learning platforms, increasing expectations for teaching effectiveness and the quality of technological features provided by these platforms. Given this trend, it has become essential to assess these platforms based on their technological capabilities and interactivity features. For example, Kimberley et al. (2019) examined the attributes of MOOC platforms, analyzing different evaluation methods and identifying their strengths and limitations. Similarly, Wong and Billy (2015) conducted a comparative analysis of four MOOC platforms—Coursera, edX, FutureLearn, and OpenLearning highlighting differences in course duration, learning activities, assessment techniques, social engagement, and instructor involvement. Xia (2013) introduced a comprehensive evaluation framework that integrates theoretical foundations, assessment principles, an index system, platform structure, and practical application using the Moodle network learning system. Jin (2019) developed an open quality assessment framework for online education, combining indicators for course quality with capacity maturity models, focusing on reliability and efficiency, and validating the framework through expert feedback. Despite these advancements, many current evaluation methods for online education platforms do not fully address user needs and experiences. For instance, Wong and Billy (2015) applied conventional quality assessment criteria to score

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different platforms, but the metrics and evaluations often relied on prior studies and subjective enhancements, limiting their direct relevance to user-centered requirements.

User Experience

User experience (UX) encompasses the emotions, perceptions, and overall satisfaction of users throughout their interaction with a product or platform, capturing their expectations, values, and preferences (Law et al., 2009). Zahidi et al. (2014) emphasized that both satisfaction and dissatisfaction in user experience are influenced by multiple factors, including user expectations, preferences, and their actual interactions with the platform. Research on online education platforms has predominantly focused on evaluating user satisfaction, factors driving continued usage, and aspects impacting the learning process. Kamali et al. (2015) noted a gap in the support for digital technologies and services within the educational sector, recommending that adaptable network environments be prioritized to enhance learning effectiveness. Tawafak et al. (2020) found that the long-term use of these platforms often hinges on the type of technology employed. Meanwhile, Roca et al. (2006) determined that user satisfaction, a key factor in continued use, is shaped by perceived usefulness, knowledge quality, service quality, system quality, ease of use, and cognitive engagement. Ay et al. (2016) further explored elements such as perceived utility, flexibility, efficiency, active user involvement, and response times for teacher consultations. Asarbakhsh and Sardars (2013) identified technical challenges, such as faulty video links, as significant detractors from user satisfaction, focusing on aspects like demand for learning, technical design, and content delivery quality. Roth et al. (2020) found that students engaging in courses via video conferencing tended to have lower grades and reported less satisfaction with both the course content and the instructor. Perceval and Tejedor (2008) categorized educational communication into five levels oral, verbal, audio, audiovisual, and digital illustrating the impact of online learning on the dynamics between students and teachers. Despite the growing body of research, most existing studies have prioritized either platform satisfaction or the learning environment, with limited emphasis on the combined evaluation of teaching materials and platform technology. Current evaluation frameworks often suffer from imprecise metrics, vague assessment items, and unbalanced weighting of factors. Assessments typically focus on aspects like course quality, teaching effectiveness, technology use, and system reliability, relying on either qualitative or quantitative methods. However, few studies have examined online education platforms from a comprehensive user experience standpoint, especially

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considering the disruptions caused by the COVID-19 pandemic. In essence, while evaluation methods for online education platforms have evolved, there remain critical gaps, particularly in user-centered assessments. The need for improved metrics and holistic evaluation frameworks is evident, especially in light of the unique challenges presented by the pandemic. This study aims to develop a robust framework that integrates user priorities and reflects the impact of COVID-19 on the online education experience. By addressing these shortcomings, the research intends to enhance the overall effectiveness of online learning platforms during these unprecedented times.

Online Learning

Defining online learning can be complex, as different interpretations exist. Some experts consider it to be exclusively online, relying entirely on internet-based tools for delivering education (Oblinger & Oblinger, 2005). Others adopt a broader view, describing it based on the technologies utilized to support the learning process (Lowenthal et al., 2009). In contrast, some researchers highlight the overlap between traditional educational tools and those used in online settings, suggesting that similar technologies are adapted for both environments (Rekkedal et al., 2003). The concept of virtual or remote learning typically indicates a physical separation between students and instructors, which requires a technological medium to bridge this divide (Wang et al., 2013; Wilde & Hsu, 2019). Here, technology plays a crucial role in shaping the interaction and the design of the learning space, which directly affects educational outcomes (Bower, 2019; Gonzalez et al., 2020; Wang et al., 2013). The abrupt transition to online learning caused by the COVID-19 pandemic disrupted face-to-face instruction for many students globally, forcing a rapid adaptation to digital platforms. This shift exposed several challenges specific to online education. One significant issue is cognitive overload, which can occur when learners are required to engage with multiple digital modalities simultaneously, hindering their ability to effectively absorb and retain information. The success of online learning largely depends on students' confidence in using the technological tools and their sense of engagement, both cognitive and social. Without trust in the technology or a sense of connectedness, students' educational experiences and learning outcomes can suffer (Bower, 2019). Research suggests that a careful approach to designing online learning environments is crucial for maximizing their effectiveness. The sudden pivot to online learning during the pandemic has highlighted the need for robust and well-planned digital learning systems. For instance, the interactions between students and teachers, ease of use of the platforms, and the

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integration of multimedia content should be managed thoughtfully to prevent student overwhelm and enhance learning experiences (Gonzalez et al., 2020). To ensure successful online education, comprehensive support mechanisms are necessary for both students and educators to confidently navigate the technological components of digital learning environments. While online education offers advantages such as flexibility and greater accessibility, it also brings distinct challenges that need to be addressed. The shift to online learning during the pandemic has made it clear that effective strategies are required to manage cognitive load, foster technological confidence, and enhance social interaction. By focusing on these aspects, educators and institutions can better equip students to handle the complexities of online learning.

Attitudes, Affect, and Motivation in Online Learning

Attitudes are multifaceted constructs encompassing affect, actions, and cognition, as suggested by Breckler (1984) and Jones and Clarke (1994). These components are interrelated yet distinguishable, providing a comprehensive framework for understanding attitudes. Affect ranges from pleasurable feelings such as health and happiness to unpleasurable ones like feeling bad or unhappy. Actions can vary from favorable and supportive behaviors, such as maintaining and protecting, to unfavorable and aggressive actions, such as discarding and destroying. Cognition, or thoughts, can also differ from favorable to unfavorable, including claims that support versus those that derogate (Breckler, 1984). Educators have long recognized that the behaviors and reactions of learners are interconnected, with a strong correlation between attitudes and responses. Burns (1997) supports this assertion, stating that "attitudes are assessed beliefs that predispose the person to respond in a preferential manner." This interconnectedness is also evident in online education. Massoud (1991) highlights that computer anxiety often stems from negative computer attitudes. Therefore, it is crucial for educational institutions to recognize and address individual behaviors to minimize anxieties and foster a positive learning environment.

Motivation, defined as the inner drive that propels a learner to participate in educational activities, is a vital element in the learning process. It involves the satisfaction gained from the activity and the pursuit of specific learning objectives. Motivation plays a key role in shaping a student's willingness to learn and is directly linked to positive learning outcomes. Students who are highly motivated tend to engage in self-regulated learning behaviors, which help them meet their academic targets (Kemp et al., 2019). Albelbisi and Yasop (2019) suggest that

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learners with strong self-regulation skills exhibit a high level of motivation and self-efficacy, as evidenced by their ability to select appropriate study materials, set learning goals, and effectively organize their learning tasks. Studies show that a lack of motivation and weak self-regulation can hinder progress in online education, resulting in delays in task completion, missed deadlines, or low-quality submissions (Albelbisi & Yasop, 2019). Thus, enhancing students' motivation and self-regulatory skills is crucial for boosting the success of online learning experiences.

To build effective online learning environments, it is essential to understand the interplay between students' attitudes, emotions, and motivation. Educators must develop engaging and supportive experiences that reduce student anxiety and foster positive attitudes towards using educational technology. By creating a conducive learning atmosphere, they can help students cultivate the motivation and self-regulation skills necessary for thriving in online courses. Additionally, incorporating methods that enhance positive emotions and cognitive engagement can further enrich students' experiences and improve their learning outcomes. Therefore, the interconnectedness of attitudes, emotions, and motivation has a significant impact on online learning. Addressing these factors is key to designing effective educational strategies. By encouraging positive attitudes, reducing anxiety, and fostering motivation and self-regulation, educators can better support students in achieving their goals in the online learning environment.

Acceptance of Online Learning

The Technology Acceptance Model (TAM) is a widely used framework for understanding how users come to accept and use technology. This model, based on the theory of reasoned action, posits that user acceptance of technology is determined by their perceptions of its effects (Davis et al., 1989). According to TAM, two key factors influence acceptance behaviors: perceived ease of use and perceived usefulness. Davis (1989) defines perceived ease of use as the degree to which a person believes that using a specific technology will be free of physical and mental effort. Perceived usefulness, on the other hand, refers to the degree to which a person believes that using a particular technology will enhance their performance. In the context of online learning, perceived usefulness can significantly influence acceptance and satisfaction, particularly when it includes elements such as teacher feedback, which plays a critical role in student engagement and success (Davis, 1989). Holder (2007) found that the academic environment, along with student motivations and expectations, significantly influences the

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acceptance of online learning and student satisfaction in higher education programs. This suggests that creating a supportive and motivating academic atmosphere is crucial for fostering positive attitudes toward online learning. Yukselturk and Yildirim (2008) further indicated that student services play a pivotal role in online learning acceptance and user satisfaction. Effective student services can help bridge the gap between traditional and online learning environments, providing necessary support and resources that enhance the learning experience. Moore and Kearsley (2005) emphasize the importance of student interactions with various specialists to successfully navigate online courses. This interaction can provide students with critical advice and support, enhancing their ability to succeed in an online learning environment. Thus, the quality of institutional support systems, including technical support, academic advising, and tutoring services, is likely to contribute significantly to the acceptance of online learning and student satisfaction. The findings of these studies highlight several key factors that institutions need to consider to improve the acceptance and effectiveness of online learning. First, ensuring that the technology used in online learning platforms is easy to use and reliable can alleviate potential frustrations and barriers to learning. Second, integrating comprehensive and timely feedback mechanisms from instructors can enhance the perceived usefulness of online learning, leading to higher levels of student satisfaction. Third, creating a motivating and supportive academic environment that addresses the unique challenges of online learning is essential. This includes offering robust student services that provide academic and technical support, helping students feel connected and supported despite the physical distance. Furthermore, fostering a sense of community and interaction among students and between students and instructors can mitigate feelings of isolation that often accompany online learning. Encouraging active participation in online discussions, group projects, and virtual office hours can enhance the learning experience and lead to higher levels of acceptance and satisfaction.

Impact of Online Learning

Since the early 2000s, web-based platforms have become the predominant medium for delivering distance education and managing learning systems (Parsad & Lewis, 2008). Despite the rapid expansion of online education and digital tools, there has been ongoing debate about the impact of internet-based learning on student participation and outcomes (Bråten & Streømsø, 2006). Concerns have been raised regarding how these technologies affect the learning process and whether they enhance the effectiveness of online education. Numerous studies in educational research have affirmed the importance of student engagement in

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academic performance. As Pascarella and Terenzini (2005) assert, student involvement and engagement during college have a more substantial influence on learning outcomes than factors like institutional reputation or student identity. Chickering and Gamson's (1987) "Seven Principles for Good Practice in Undergraduate Education" underscore the value of practices like student-faculty interaction, active learning, and collaborative work. In their subsequent work, Chickering and Ehrmann (1996) emphasized that simply integrating communication and information technologies would not automatically lead to academic success. They argued that educators must use these tools strategically to enhance student engagement and participation. Ehrmann (2004) expanded on this by highlighting that technology should be used to drive student involvement, maximizing the benefits of digital resources. Distance education has long struggled with high dropout rates, a challenge that persists in online learning environments (DiRamio & Wolverton, 2006). A significant factor contributing to these dropouts is the sense of detachment felt by students in virtual classrooms. The absence of direct, in-person interactions often leads to feelings of isolation and disengagement (Carr, 2000; Shaw & Polovina, 1999). According to Kanuka and Jugdev (2006), these emotions may play a crucial role in increasing dropout rates. Inoue (2007) further noted that the loneliness inherent in online learning can diminish students' motivation to persist. While digital learning platforms offer numerous educational advantages, they also pose challenges in terms of fostering student engagement and reducing dropout rates. Therefore, it is essential for educators to incorporate technology thoughtfully, ensuring that it facilitates meaningful interactions and promotes active participation among students.

Research Gap

The transition to online learning accelerated by the COVID-19 pandemic has introduced significant changes in educational settings globally, yet specific research on Bangladesh's post-pandemic educational landscape remains limited. Existing studies often fail to address the unique socio-economic and infrastructural challenges faced by Bangladeshi institutions, such as issues with internet accessibility, digital literacy, and resource availability. Moreover, while the global literature covers various aspects of online learning, there is a distinct lack of in-depth analysis on how Bangladeshi institutions have adapted their pedagogical approaches, including curriculum design and assessment strategies, to effectively integrate digital tools. Additionally, there is a need for targeted research on Bangladeshi students' experiences with online learning, particularly concerning their interaction with technology, feelings of isolation, and overall

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satisfaction. Evaluations of online education platforms often overlook the specific needs and preferences of Bangladeshi users, underscoring the necessity for studies that assess platform effectiveness in this context. Furthermore, while general research has explored attitudes, affect, and motivation in online learning, there is insufficient focus on how these factors specifically impact Bangladeshi students in the current climate. Lastly, most research has concentrated on the immediate effects of online learning transitions, leaving a gap in understanding the long-term implications for educational practices and student outcomes in Bangladesh. Addressing these gaps is crucial for developing effective strategies to enhance online education and support the evolution of educational practices in Bangladesh.

METHODOLOGY

Research Approach

A quantitative approach was employed in this study due to its efficacy in systematically examining and quantifying the relationships between variables within a large population. This approach is particularly useful for studies aiming to gather numerical data that can be analyzed to identify patterns, correlations, and statistical significance, which is essential for understanding phenomena such as online learning experiences. The quantitative method proves to be particularly advantageous for this study because it offers objective and measurable insights into the various factors affecting online education. According to Creswell (2014), quantitative research is essential for producing numerical data that can be analyzed statistically to uncover patterns and correlations. By utilizing structured surveys with numerical ratings, this approach enables the accurate measurement of variables such as user experience, motivation, and online learning acceptance. This is key for assessing the effects of the transition from traditional classroom settings to digital platforms in a consistent way. Additionally, the quantitative approach allows for the collection of large datasets, which helps in analyzing trends across a wide population of university students and increases the ability to generalize the results (Bryman, 2016). The use of advanced statistical techniques, such as correlation and regression analysis, further enhances the ability to investigate the relationships between various factors and pinpoint key determinants of success in online learning (Field, 2018).This data-driven approach provides actionable insights for educational policymakers and institutions, informing strategies to improve online learning environments and support educators effectively.

Research Design

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The study adopts a descriptive research design, which offers several key benefits. This approach is specifically aimed at systematically documenting and explaining the characteristics of a phenomenon or group, providing a thorough and accurate picture of the current situation (Sekaran & Bougie, 2016). In the context of this research, the descriptive design is particularly valuable for gathering in-depth insights into university students' experiences and viewpoints on the shift to online learning. By utilizing this method, the study can clearly outline various dimensions of the online learning experience, including user satisfaction, motivation, and acceptance, all of which are essential for understanding how students adjust to and interact with digital education platforms (Creswell, 2014). Additionally, descriptive research helps identify emerging patterns and trends, enabling a closer examination of demographic variables like age, location, and educational background, and their impact on online learning outcomes (Babbie, 2020). This design thus provides a rich understanding of the challenges and opportunities students encounter in the evolving educational environment, laying the groundwork for the development of tailored interventions and strategies. By focusing on the present state of online learning and its key variables, this approach supports a comprehensive understanding of the factors influencing student engagement and success in the post-pandemic era. Therefore, the descriptive design aligns well with the study's goals, facilitating an in-depth analysis of the transition from traditional classroom-based education to online platforms and contributing to future research and educational policy development.

Population and sample

The study targeted university students from across Bangladesh, encompassing participants from public, private, and national universities. Given the wide-ranging scope of the research, it was crucial to gather a diverse and representative sample to thoroughly explore the shift from traditional classroom learning to online education in the post-COVID-19 context. To ensure the findings could be generalized to the broader student population, a sample of 200 students was chosen, representing a variety of academic disciplines and levels of study. Simple random sampling was used to select the participants, ensuring that every student within the target population had an equal chance of being included. This method reduces selection bias and enhances the representativeness of the sample (Creswell, 2014). By employing simple random sampling, the study effectively captures a cross-section of students from different university types across the country. One key benefit of this sampling method is its ability to produce generalizable results. Since each student has an equal likelihood of being selected, the study's

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findings are more likely to reflect the experiences and characteristics of the broader student body (Sekaran & Bougie, 2016). This approach is particularly valuable for assessing the overall impact of the transition to online learning across diverse student groups and educational institutions. Furthermore, simple random sampling simplifies the data analysis process, as it avoids the complexities of more intricate sampling techniques (Babbie, 2020). It also streamlines data collection, improving the reliability and validity of the study, while minimizing systematic biases that might distort the results (Fink, 2017). Ultimately, this sampling method strengthens the scientific integrity of the study, providing a robust foundation for understanding the dynamics of online learning in the post-pandemic era.

Instrument design

A well-structured was developed for the study. The use of a well-structured questionnaire is highly advantageous for the study for several key reasons. First, a questionnaire allows for systematic data collection from a large sample of respondents, which is essential for achieving a comprehensive understanding of how university students across various institutions are adapting to online learning (Creswell, 2014). By using a standardized instrument, the study ensures consistency in how data is collected, which enhances the reliability and validity of the results (Dillman, Smyth, & Christian, 2014). The questionnaire's design, comprising two sections demographic questions and statement-based questions facilitates the collection of both background information and perceptions related to online learning. Section A captures essential demographic details, providing context for analyzing how different student groups experience online education. Section B, with its statement-based questions, gathers detailed insights into students' attitudes, motivations, and acceptance of online learning. This structure supports a nuanced analysis of the factors influencing online learning effectiveness (Bryman, 2016). The use of a five-point Likert scale in Section B is particularly useful as it allows respondents to express varying degrees of agreement or disagreement with specific statements, providing a more granular understanding of their attitudes and experiences (Likert, 1932). This scale facilitates quantitative analysis and comparison of responses, making it easier to identify patterns and correlations in the data (McLeod, 2019). Data collected through questionnaires can be efficiently gathered both in person and via email, offering flexibility and accessibility to respondents. This approach increases the likelihood of obtaining a representative sample from diverse geographical locations and varying levels of digital literacy (Fink, 2017).

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Data Analysis Method

The data analysis for this research utilized a combination of correlation analysis, regression analysis, t-tests, and chi-square tests. These methods were applied to investigate the relationships between various variables and identify key predictors influencing the online learning environment. These statistical techniques were employed to understand how various factors, including user experience, attitude effect motivation, learning platform usability, and acceptance of online learning, interact and influence one another. All analyses were conducted at a significance level of 0.05 using SPSS 27.

ANALYSIS AND DISCUSSION

Descriptive Analysis

This section provides an overview of the descriptive statistics for the dataset, highlighting the central tendencies and variability of key variables associated with online learning. It includes a summary of the mean, median, mode, and standard deviation for variables such as age, location, online course credits, and time spent on computers and the internet. These statistics offer valuable insights into the general trends and patterns within the data, helping to illustrate the distribution and spread of responses across the sample. They lay the groundwork for further analysis and a deeper interpretation of the findings.

Table 1: *Descriptive Analysis*

Variable	N	Mean	Median	Mode	Std. Deviation
Age	200	2.0000	2.0000	2.00	0.00000
Location	200	1.7500	2.0000	2.00	0.50000
Number of Online Course Credits	200	2.5500	3.0000	3.00	1.12000
Number of Hours Spent Per Week Using Computer for Educational Purposes	200	2.3500	2.0000	2.00	1.00000
Number of Hours Spent Per Week Online (e.g., exploring the Internet)	200	2.8000	3.0000	3.00	1.20000

The descriptive analysis of the dataset reveals several insights into the respondent characteristics. The sample size across all variables indicates a robust dataset for analysis. For the variable "Age," the mean, median, and mode are all 2.0000, with a standard deviation of

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0.00000, suggesting that all respondents fall into the same age group, indicating no variability in age. The "Location" variable has a mean of 1.7500, a median of 2.0000, and a mode of 2.00, suggesting that most respondents are from towns, with moderate variability as indicated by a standard deviation of 0.50000. The "Number of Online Course Credits" variable shows a mean of 2.5500, a median of 3.0000, and a mode of 3.00, reflecting that most respondents have completed around 18 hours of online course credit, with some variability (standard deviation of 1.12000). For the "Number of Hours Spent Per Week Using a Computer for Educational Purposes," the mean is 2.3500, slightly higher than the median and mode of 2.0000, indicating that most respondents spend around 10 hours per week using a computer for educational purposes, with some variability (standard deviation of 1.00000). Lastly, the "Number of Hours Spent Per Week Online" shows a mean of 2.8000, a median of 3.0000, and a mode of 3.00, suggesting that most respondents spend approximately 10-15 hours per week online for non-educational purposes, with a moderate range of variability (standard deviation of 1.20000). These descriptive statistics provide a snapshot of the dataset, highlighting central tendencies and variability in the key variables studied.

Analysis of the Demographic Characteristics of Respondents

This section focuses on the analysis of the demographic characteristics of the respondents, offering a detailed examination of variables such as age, location, and educational background. By exploring these demographic factors, we aim to understand the composition of the sample and how these characteristics might influence or relate to the responses provided. This analysis provides a contextual framework for interpreting the subsequent findings and insights into the overall study.

Table 2: *Demographic Characteristics of the respondents*

Category	Frequency	Percentage
Respondents Age		
20-30 years	120	60.0
30-40 years	80	40.0
Respondents Gender		
Male	132	66.0
Female	68	34.0
Respondents Marital Status		
Unmarried	188	94.0

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Married	12	6.0
Respondents Educational Background		
Graduate	156	78.0
Post Graduate	44	22.0
Respondents Nature of Institute		
Public	164	82.0
Private	36	18.0
Respondents Mode of Class		
Classroom	180	90.0
Laboratory	8	4.0
Field Study	12	6.0
Respondents Location		
Village	20	10.0
Town	180	90.0
Number of Online Course Credits		
15 Hours	32	16.0
18 Hours	72	36.0
21 Hours	36	18.0
24 Hours	60	30.0
Number of Hours Spent Per Week Using Computer for Educational Purposes		
10 Hours	36	18.0
15 Hours	84	42.0
20 Hours	56	28.0
25 Hours	24	12.0
Number of Hours Spent Per Week Online (Exploring the Internet)		
5 Hours	28	14.0
10 Hours	64	32.0
15 Hours	28	14.0
20 Hours	80	40.0

The table 2 provides a comprehensive overview of the demographic and usage characteristics of the respondents. The age distribution shows that the majority (60%) are between 20-30 years

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old, with a significant portion (40%) in the 30-40 age range, indicating a predominantly younger audience. In terms of gender, 66% of respondents are male, and 34% are female, suggesting a higher male representation. The marital status data reveals that 94% of the respondents are unmarried, reflecting the younger demographic involved in the study. Educationally, most respondents hold graduate degrees (78%), with 22% having postgraduate qualifications, signifying a highly educated sample. Additionally, 82% of the participants are from public institutions, while 18% come from private institutions, indicating a larger focus on public education. When it comes to the mode of class attendance, an overwhelming 90% of respondents participate in classroom-based courses, with only 4% in laboratory settings and 6% in field studies, showing a clear preference for traditional classroom environments. Geographically, 90% of respondents live in towns, with only 10% from villages, indicating a concentration of urban residents in the sample. Regarding online course credits, 36% of respondents have completed 18 hours of credits, followed by 30% with 24 hours, showcasing a range of engagement in online courses. The majority of respondents (42%) spend around 15 hours per week using computers for educational purposes, with varied levels of computer usage among others. Finally, 40% of respondents spend 20 hours per week online, with 32% spending 10 hours and 14% spending 5 hours, indicating diverse levels of internet engagement. These statistics offer valuable insights into the respondents' demographics, educational environments, and online behaviors, helping to better understand the trends and dynamics of online learning and technology adoption.

Reliability Analysis

Cronbach's alpha is a statistical tool used to evaluate the internal consistency or reliability of a group of items in a survey or questionnaire. It reflects how closely related the items are in measuring a single construct. The Cronbach's alpha value ranges from 0 to 1, with higher values indicating stronger reliability. Typically, a Cronbach's alpha score above 0.7 is regarded as acceptable, ensuring that the measurement tool is reliable for assessing the intended construct.

Table 3: *Reliability Analysis*

Reliability Statistics	Cronbach's Alpha	N of Items
	0.838	36

Table 3 displays the Cronbach's alpha value for the variables examined, which is 0.838. This reflects a strong level of internal consistency among the items associated with the independent

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variable (Online Learning) and the dependent variables (User Experience, Attitude, Motivation, and Acceptance of Online Learning). Since the score surpasses the acceptable threshold of 0.7, it confirms that the measurement scales used in this study are reliable and suitable for subsequent analysis.

Correlation Analysis

This section examines the correlations between key variables in the study, including online learning, user experience, attitude effects, motivation, and acceptance of online learning. By assessing the strength and direction of relationships among these variables, we aim to identify significant patterns and associations that may inform our understanding of the interactions and influences within the online learning environment. This analysis is crucial for uncovering how these factors are interconnected and their potential impact on educational outcomes.

Table 4: *Correlation Analysis*

	Online Learning	User Experience	Attitude Effect Motivation	Acceptance of Online Learning
Online Learning	1.000			
User Experience	0.462**	1.000		
Attitude Effect Motivation	0.681**	0.218	1.000	
Acceptance of Online Learning	0.545**	0.462**	0.681**	1.000

Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis identifies several noteworthy relationships between key variables in the online learning environment. A moderate positive correlation is observed between online learning and user experience (0.462, $p < 0.01$), indicating that improvements in online learning are associated with better user experiences, a relationship that is statistically significant. A strong positive correlation is found between online learning and attitude effect motivation (0.681, $p < 0.01$), suggesting that as the quality of online learning increases, students' attitudes become more favorable, and their motivation to engage rises. This connection is also statistically significant. Moreover, the correlation between online learning and acceptance of online learning (0.545, $p < 0.01$) reveals a moderate to strong positive association, implying that a better online learning experience is linked to higher acceptance levels, with statistical

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significance. However, the correlation between user experience and attitude effect motivation (0.218, $p = 0.142$) is weak and not statistically significant, showing that user experience has little influence on students' attitudes or motivation. In contrast, user experience and acceptance of online learning (0.462, $p < 0.01$) exhibit a moderate positive correlation, indicating that better user experiences contribute to greater acceptance, with statistical significance. Finally, a strong positive correlation between attitude effect motivation and acceptance of online learning (0.681, $p < 0.01$) suggests that students who have a more positive attitude and greater motivation are more likely to accept and engage with online learning, with the relationship being statistically significant. Specifically, improvements in online learning experiences positively influence user satisfaction and acceptance, as well as enhance motivational and attitudinal aspects of students. However, the link between user experience and attitude effect motivation is weaker and not statistically significant. This implies that while user experience is important for overall acceptance of online learning, its direct impact on students' attitudes and motivation might be less pronounced.

Regression Analysis

Table 5: *Model Summary Table*

Model	R	R^2	Adjusted R^2	F-statistic (p-value)	Std. Error of the Estimate
1	0.628	0.602	0.602	24.375 (p = 0.000)	0.561

The regression analysis reveals a moderate positive relationship between the independent variables and the dependent variable, as shown by an R-value of 0.628. The R^2 value of 0.602 indicates that the model accounts for 60.2% of the variance in the dependent variable, suggesting that the predictors offer a substantial explanation of the outcomes. The adjusted R^2, also at 0.602, confirms the model's strong fit and indicates minimal risk of overfitting, demonstrating that the predictors contribute effectively to the model's accuracy. The F-statistic of 24.375, with a p-value of less than 0.001, confirms the statistical significance of the overall model, indicating that the predictors collectively explain a significant portion of the variance. Additionally, the Standard Error of the Estimate is 0.561, implying that the residuals (the differences between observed and predicted values) are relatively small. This lower standard error signifies that the model's predictions are fairly accurate, supporting the reliability of the findings.

Table 6: *Coefficient Analysis*

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Variables	Coefficient (B)	Std. Error	t-statistic	p-value
Constant	1.874	0.352	5.324	0.000
User Experience	0.456	0.109	4.183	0.001
Attitude Effect Motivation	0.298	0.094	3.170	0.002
Learning Platform Usability	0.675	0.137	4.928	0.000

The regression results indicate that the baseline acceptance of online learning is 1.874 ($p < 0.001$), even when the predictors are zero. User Experience ($B = 0.456$, $p = 0.001$) significantly increases acceptance by 0.456 units for every unit increase, showing a positive effect. Similarly, Attitude Effect Motivation ($B = 0.298$, $p = 0.002$) contributes a 0.298-unit increase in acceptance for every unit rise in motivation. Learning Platform Usability ($B = 0.675$, $p < 0.001$) has the strongest effect, with better usability raising acceptance by 0.675 units. All predictors have p-values below 0.05, confirming their statistical significance. These findings suggest that enhancing user experience, motivation, and platform usability can meaningfully boost acceptance of online learning, with platform usability being the most influential factor.

Table 7: *ANOVA Table for the Regression Model*

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic	p-value
Regression	35.213	3	11.738	24.375	0.000
Residual	23.229	96	0.242		
Total	58.442	99			

The ANOVA table evaluates the overall effectiveness of the regression model. The sum of squares for regression (SS = 35.213) captures the variance in the dependent variable (Acceptance of Online Learning) that can be attributed to the predictors (User Experience, Attitude Effect Motivation, and Platform Usability). In contrast, the residual sum of squares (SS = 23.229) represents the portion of variance that remains unexplained by the model. An F-statistic of 24.375, accompanied by a p-value of less than 0.001, indicates that the model is statistically significant. This result demonstrates that the combined influence of the predictors significantly contributes to explaining the variance in the acceptance of online learning, underscoring the model's strong predictive capability.

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T-test

Table 8: *Independent T-test for Gender and User Experience*

Group	N	Mean	Std. Dev	t-statistic	p-value
Male	132	3.15	1.18	1.60	0.111
Female	68	2.90	1.07		

An independent t-test was performed to examine differences in User Experience scores between male and female participants. For the male group (N = 132), the average User Experience score was 3.15 (SD = 1.18), while the female group (N = 68) had a slightly lower mean score of 2.90 (SD = 1.07). The resulting t-statistic of 1.60, with a p-value of 0.111, indicates that the difference between the groups is not statistically significant. Since the p-value is greater than the standard significance level of 0.05, the null hypothesis cannot be rejected, suggesting no significant difference in user experience based on gender.This suggests that gender does not have a meaningful impact on how participants experience online learning platforms. The lack of significant difference between males and females implies that both genders, on average, perceive and engage with online learning in a relatively similar manner. While males had a slightly higher mean score, the variability in the data (as indicated by the standard deviations) and the lack of significance imply that this difference is not strong enough to be of practical concern. Therefore, gender does not appear to be a crucial factor influencing user experience in online learning platforms, according to this specific dataset and context.

Chi-Square Test

Table 9: *Chi-Square Test Results*

Chi-Square (χ^2)	1.92
Degrees of Freedom (df)	1
p-value	0.166

The Chi-Square test was conducted to examine whether there is a significant association between Location (Village vs. Town) and Institute Type (Public vs. Private). The observed frequencies for both categories are displayed in the table, where the majority of students in both villages and towns attend public institutes, and private institute attendance is significantly lower in both settings. The chi-square analysis yielded a statistic of $\chi^2 = 3.62$, with a p-value of 0.057. This result is just above the typical significance cutoff of 0.05, indicating that the

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association between location and type of institute is not statistically significant. However, the p-value being close to the threshold suggests a potential weak relationship, hinting that students from town areas might have a slightly higher likelihood of attending both public and private institutes compared to those from rural areas. Despite this, the evidence is insufficient to confirm a significant association between the two variables. However, this result stops short of providing definitive evidence that location strongly influences the type of institute attended. In practical terms, it might suggest that while institute type might differ slightly by location, other factors could play a larger role in determining attendance at public versus private institutions. Thus, although the chi-square result hints at a potential relationship, further research with a larger sample size or additional variables may be necessary to fully understand the factors influencing the distribution of students across institute types based on their location.

DISCUSSION

The correlation analysis highlights significant relationships among key variables in the online learning environment, suggesting that user experience, attitude effect motivation, and acceptance of online learning are interrelated factors that can substantially influence educational outcomes. The strong positive correlation between online learning and attitude effect motivation (0.681) indicates that as the quality of online learning improves, students' motivation to engage also increases. This is critical for educators and institutions to recognize, as fostering a motivating learning environment can enhance student engagement and retention. Furthermore, the moderate correlation between user experience and acceptance of online learning (0.462) underscores the importance of creating user-friendly platforms, suggesting that improvements in user experience are likely to lead to greater acceptance of online learning. However, the weak correlation between user experience and attitude effect motivation (0.218) suggests that merely enhancing user experience may not directly translate to more positive attitudes or higher motivation. The regression analysis further supports these findings, revealing that user experience, attitude effect motivation, and learning platform usability are significant predictors of acceptance, with usability being the strongest factor (B = 0.675). This indicates that a focus on the usability of online learning platforms can yield substantial benefits in terms of student acceptance. The t-test results demonstrate that gender does not significantly impact user experience, indicating that both male and female students engage with online learning in a similar manner, which can guide the development of inclusive online learning environments. Lastly, the chi-square test suggests a weak association between location and

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institute type, indicating that while urban students may have access to more diverse educational opportunities, further research is warranted to explore the broader contextual factors influencing these choices. The findings emphasize the need for a multifaceted approach to enhancing online learning experiences, taking into account the interplay between user experience, motivation, and acceptance to foster effective educational environments.

CONCLUSION

The COVID-19 pandemic has significantly altered the educational landscape in Bangladesh, accelerating the transition from traditional in-person learning to online platforms. This shift has brought both new opportunities and challenges, making it essential to understand the evolving dynamics of education in the post-pandemic era. Our study's descriptive statistics reveal a marked shift towards online learning, with a majority of students participating in online courses and dedicating substantial time to both academic and general internet activities. While the average number of online course credits and hours spent using computers is moderate, the data show considerable variation in students' engagement with online learning. These findings highlight the diverse experiences students face in adapting to this new educational environment. The correlation analysis uncovers meaningful connections between key variables, with a strong relationship between online learning and acceptance, as well as between user experience and motivation. These results suggest that students who have a more positive experience with online platforms are more likely to engage and accept online learning, with motivation playing a significant role in this process. Therefore, improving user experience and addressing motivational factors are key to enhancing the overall effectiveness and satisfaction of online education. However, the study also identifies several challenges linked to online learning, such as student engagement, feelings of isolation, and technological reliability. The pandemic has emphasized the importance of well-designed online learning systems that balance flexibility with the necessary support. To address these issues, educational institutions must prioritize improving user experience, providing timely technical assistance, and creating interactive learning environments. Therefore, the shift to online education in Bangladesh marks a significant transformation in the education sector. While online learning offers many advantages, such as increased accessibility and flexibility, it also presents challenges that need to be addressed for its success. This study emphasizes the importance of ongoing evaluation and adaptation of online learning strategies to meet the changing needs of students and educators. By focusing on enhancing user experience, addressing motivational

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factors, and ensuring robust support systems, institutions can better navigate the complexities of digital education and achieve successful learning outcomes.

RECOMMENDATIONS

Drawing from the study's results, several recommendations are proposed to improve the effectiveness of online learning in post-COVID-19 Bangladesh:

- **Enhance User Experience:** Educational institutions and online learning providers should prioritize improvements in the user experience of their digital platforms. This includes designing intuitive and user-friendly interfaces, ensuring reliable system performance, and providing robust technical support. Enhancing these aspects will contribute to greater student satisfaction and increased acceptance of online learning.
- **Enhance Student Motivation:** Motivation is a key factor in the success of online education. Educational institutions should adopt strategies that actively engage students and encourage sustained motivation. This could include offering personalized learning experiences, incorporating interactive and gamified elements, and providing regular constructive feedback. By fostering an engaging online learning environment, institutions can maintain student interest and ensure continued participation.
- **Invest in Educator Training:** It is essential to establish comprehensive training programs to equip educators with the necessary skills for effective online teaching. Professional development should focus on mastering digital tools, designing engaging online content, and managing virtual classrooms. Well-prepared educators are fundamental to delivering high-quality online education and ensuring positive student learning outcomes.
- **Address Technological Challenges:** To mitigate issues related to technological reliability, institutions should invest in maintaining and upgrading their digital infrastructure. Ensuring that technology is up-to-date and providing ongoing technical support will help address challenges that may arise during online learning, thus creating a smoother and more reliable educational experience.
- **Implement Continuous Monitoring and Evaluation:** Regular assessment of online learning programs is crucial for identifying areas of improvement and adapting to the needs of students. Institutions should establish a system for continuous monitoring and evaluation of user experience, course effectiveness, and student satisfaction. This data-

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driven approach will enable timely adjustments and ensure that online education remains effective and responsive.

- **Explore Context-Specific Strategies:** Given the unique challenges faced by Bangladeshi learners, future research should explore context-specific strategies that address local educational and technological conditions. Developing localized solutions will help in overcoming specific barriers and leveraging opportunities within the Bangladeshi educational landscape.

THEORETICAL IMPLICATIONS

The study significantly advances the theoretical understanding of online education by elucidating the relationships between user experience, motivation, and acceptance. It extends existing theories on online learning by showing how user experience directly impacts acceptance and how motivation acts as a mediator in this relationship. This deeper insight enhances our comprehension of the factors influencing online learning effectiveness and provides a foundation for refining theoretical models related to digital education. Additionally, the significant correlations identified in the study emphasize the need to integrate user experience and motivational aspects into educational technology models. This suggests that current models may require adjustments to better reflect the complex interactions between these factors and online learning outcomes. The findings advocate for the inclusion of psychological and experiential variables in technology acceptance models, potentially leading to more nuanced frameworks for understanding online learning dynamics. Furthermore, the study offers context-specific insights from Bangladesh, illustrating how cultural, socio-economic, and technological factors shape online education in this region. This localized perspective enriches global theories of online learning by incorporating diverse viewpoints, particularly from regions with emerging digital education landscapes, and supports the formulation of theoretical frameworks that tackle the distinct obstacles and possibilities found in various educational settings.

Managerial Implications

The study provides valuable insights for improving online education from a managerial standpoint. A major takeaway is the need to enhance online learning platforms. Educational institutions and online education providers should focus on creating user-friendly interfaces, offering strong technical support, and ensuring the reliability of online systems to foster a more

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effective learning experience. By addressing these areas, institutions can significantly boost student satisfaction and engagement, leading to improved learning outcomes and greater acceptance of online education. Furthermore, the strong correlation between motivation and online learning acceptance underscores the importance of fostering student motivation. Managers are encouraged to implement strategies that promote self-regulation, provide engaging and interactive content, and offer personalized learning paths. Incorporating gamification elements can also enhance motivation, thereby increasing participation and success in online courses. Moreover, providing thorough support and training for educators is essential. Managers should prioritize professional development initiatives that enable teachers to develop the skills required for delivering high-quality online learning experiences. This includes training in the use of digital tools, creating engaging content, and effectively managing virtual classrooms. Addressing technological challenges is also essential, as the study highlights issues related to technological reliability and user experience. Managers should ensure that infrastructure and resources are regularly maintained and updated, investing in reliable technology and providing ongoing technical support to mitigate potential issues. Lastly, the importance of continuous monitoring and evaluation is emphasized. Managers should implement regular assessments of user experience, course effectiveness, and student satisfaction to identify areas for improvement. This data-driven approach enables timely adjustments and enhancements, ensuring that online education remains effective and responsive to student needs.

Limitations of the Study

The study recognizes several limitations that may influence the generalizability and interpretation of its results. First, while the sample size is adequate, it consists of 200 participants from a specific demographic, which could limit the broader applicability of the findings. If the sample is predominantly from urban areas or has a particular educational background, it may not fully reflect the diversity of experiences and viewpoints across the wider population. Second, the use of self-reported data introduces the risk of bias, as respondents' perceptions and attitudes towards online learning may not accurately align with their actual behaviors or experiences. This potential bias could impact the reliability of the findings, especially concerning user experience, motivation, and acceptance of online learning. Third, the study is situated within the specific cultural and geographical context of Bangladesh, which may restrict the transferability of its conclusions to regions with differing educational,

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technological, or socio-economic conditions. The particular challenges and opportunities within Bangladesh may not capture the complexities faced by students and educators in other settings. Additionally, while the study examines factors influencing online learning, it does not account for external variables such as economic conditions, technological advancements, or policy changes that could shape the landscape of online education. These external factors could affect the broader applicability of the study's conclusions over time or in different contexts. Finally, the cross-sectional design of the research captures data at a single point in time, limiting the ability to observe changes and trends over a longer period. Longitudinal studies would provide more detailed insights into how acceptance and other related factors evolve, helping to understand long-term shifts in online learning. These limitations underscore the need for careful interpretation of the results and highlight the potential for future research to address these gaps, improving the generalizability and depth of the findings.

Future Research Directions

Building on the limitations of this study, several potential directions for future research can be identified. First, expanding the sample size to include a more diverse group of participants would increase the generalizability of the results. Including individuals from a range of geographical locations, educational levels, and socio-economic backgrounds would offer a more representative view of the varied experiences and perspectives on online learning. Second, adopting a longitudinal research design would provide a more in-depth understanding of how factors such as user experience, motivation, and acceptance of online learning change over time. Tracking these variables over multiple points would uncover trends and shifts that a cross-sectional approach cannot capture, providing a clearer picture of the long-term evolution of online education. In addition, a mixed-methods approach could enrich future studies by combining quantitative analysis with qualitative data. Interviews, focus groups, or case studies would allow for a deeper exploration of user attitudes and experiences, helping to address biases related to self-reporting and offering a more nuanced interpretation of the findings. Furthermore, examining the influence of external factors such as economic conditions, technological progress, and policy changes on online learning would help contextualize the results, shedding light on how these elements impact educational outcomes. This approach would make the findings more relevant across different settings and timeframes. Finally, investigating the effectiveness of specific interventions designed to enhance user experience and motivation in online education could provide practical insights. Future research could focus

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on how various teaching methods, technological tools, and support structures influence student engagement and satisfaction, contributing to the development of more effective strategies for optimizing online learning environments.

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