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Research Article:

Integrating Artificial Intelligence into Higher Education: Students' Perceptions and Prospects at Jashore University of Science and Technology

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ABSTRACT

This article examines the perceptions of students towards the inclusion of Artificial Intelligence (AI) at tertiary level institutions, with a keen focus on perceived opportunities, barriers, accessibility, and the future of AI at Jashore University of Science and Technology (JUST). Using a quantitative survey design, the researchers collected data from a large group of respondents through surveys and analysed them to determine the prevailing attitude towards AI adoption–the barriers to adoption, and the indicators of readiness to adopt. The opinions show that AI is considered to be an advantageous method of teaching, which can facilitate a deeper comprehension, differentiated learning, and educational performance. However, participants singled out the priority to be given to blended learning patterns, whereby AI is used as a tool not an alternative to conventional instructional processes. Academic stress, lack of digital literacy, affordability barriers, and usability issues were considered as the key challenges; therefore, capacity building actions, as well as equal access policies, should be provided. The respondents gave high ratings to guided AI training, infrastructure, and institutions' readiness as the pillars of integration effectiveness. This paper states that pedagogical integrity, ethical governance, and inclusivity are the prerequisites to sustainable adoption of AI in learning institutions. The study findings provide actionable information on policy and practice to put in place innovative, accessible, and contextually responsive approaches that can support sustainable higher education in Bangladesh and the Asia-Pacific region.

Keywords: Artificial Intelligence in education, Higher Education in Bangladesh, personalised learning, accessibility, student perspectives

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INTRODUCTION

Artificial Intelligence (AI) in global higher education has consequently emerged as a transformative phenomenon which introduces new possibilities to redefine teaching, learning and administrative processes (Maluleke, 2025). AI technologies such as automated grading systems and AI based chatbots are being used in the intelligent tutoring system and adaptive learning system to optimise academic processes and enable personalised learning (Schei et al., 2024; Nuong Deri et al., 2024). By offering a range of learning styles and real-time feedback, these technologies can improve student engagement, retention, and academic success (Zawacki-Richter et al., 2019; Wang et al., 2024). With the pace of digital transformation, AI is emerging as an essential part of the modern higher education systems.

In recent scholarship, several aspects of AI integration in education have been studied, such as pedagogical innovation, institutional preparedness and ethical governance. Studies suggest that AI can contribute to a significant boost in personalized learning, academia that provides better support systems for educators, and reduced administrative workloads for educators (Holmes et al., 2019; Aguado-García, 2025). Adaptive learning platforms and AI tutoring systems tailor the path of instruction by analysing the student performance data and dynamically adjusting the content of the material according to student learning requirements.

Despite all these developments, the successful implementation of AI in education is highly dependent on the acceptance and perceptions of students who directly interact with these technologies. Students are key stakeholders in the adoption of educational technologies as their attitudes, expectations, and concerns affect how well technological innovations are integrated into learning environments. Studies suggest that the acceptance of AI tools by students is determined to a large extent by elements such as perceived usefulness, accessibility, digital literacy, and trust in technological systems.

Although studies about AI in higher education have grown substantially in recent years, much of the existing literature is concerned with technologically advanced forms of higher education in North America, Europe, and East Asia. Empirical studies on AI adoption in the context of developing higher education are still relatively unexplored. In South Asia, and especially Bangladesh, scholarly research on AI integration in universities is still emerging. Existing studies often focus on online learning environment or digital infrastructure instead of focusing specifically on how students perceive AI-supported learning systems and what they struggle with while adopting such technologies (Tarafdar et al., 2025; Vaidya, 2024).

This gap is especially important given the unique challenges faced by universities in developing regions on issues of digital infrastructure, affordability, digital literacy, and institutional readiness. Without empirical evidence on the basis of these contexts, the policy discussions on the adoption of AI may miss some important socio-technical reality

that impacts the effectiveness of technology integration in institutions of higher education. Understanding these contextual challenges is therefore important in designing equitable and sustainable strategies for implementation of AI in education.

In this context, the examination of perceptions of students about integration of AI is important. Educational perception and technological readiness play an important role in shaping sustainable and inclusive learning environments. Students' acceptance, motivation and trust in AI technologies can play a significant role in the success of institutional adoption strategies (Schei et al., 2024; Idroes et al., 2023). Their perceptions give useful insights on how the students rate the usefulness, accessibility, and shortcomings of the AI tools within their academic experiences. Such insights can be useful in ensuring that AI technologies complement traditional teaching practices while supporting flexible, inclusive, and ethically responsible learning environments (Maphalala & Ajani, 2025).

Against this backdrop, the current study focuses on the perception of students on the integration of AI in the higher educational setting at Jashore University of Science and Technology (JUST). The focus of the research is on students' perceived benefits, challenges, accessibility issues, and expectations about AI-supported learning environments. By contributing localised empirical evidence, this study adds to the growing discourse on the topic of digital transformation in higher education and contributes to the policy development and institutional planning relevant to the South Asian context. Specifically, the research examines the student perception towards AI supported learning in higher education, the perceived benefits, challenges, and accessibility issues surrounding AI integration and give empirically grounded recommendations to the higher education stakeholders concerning effective AI adoption. According to these objectives, this study can be seen to address three key research questions:

1. How do students perceive AI supported learning in higher education?
2. What are the barriers and accessibility issues faced by students in the use of AI tools?
3. What are the implications of the integration of AI for the future of teaching and learning at higher education?

This study is conceptually guided by the Technology Acceptance Model (TAM) which has been widely used in explaining the issue of individual's accepting and adopting new technologies in educational and organisational contexts. According to TAM, two main factors determine users' attitude towards technological system and intention to adopt it, which are perceived usefulness and ease of use (Davis, 1989). In the context of AI supported learning, perceived usefulness may be understood as the beliefs that students have about the nature of AI tools to enhance academic understanding, engagement, and learning performance, while perceived ease of use is linked to the accessibility, usability, and user-friendliness of AI technologies in the learning environment. The framework offers a structured foundation for analysing how students are judging AI tools and how

these perceptions are influencing the possible adoption of AI-supported learning systems in higher education.

To examine the perceptions in a particular institutional context, a purposive sampling strategy was used and data was collected from 77 undergraduate and postgraduate students in different faculties of this university and they were from Faculty of Engineering and Technology, Faculty of Biological Science and Technology, Faculty of Applied Science and Technology, Faculty of Health Science, Faculty of Science, Faculty of Arts and Social Science, and Faculty of Business Studies. This approach ensured representation from diverse academic disciplines in which digital technologies and AI based tools are increasingly relevant. Although the sample size is relatively small, it is appropriate for an exploratory perception-based study that was carried out in one university setting. The inclusion of students from different faculties allows the study to gain different experiences with AI-supported learning and get context-specific insights into institutional readiness, accessibility challenges and the student attitude towards AI adoption within a Bangladeshi public university.

LITERATURE REVIEW

AI in Higher Education: Global Overview

The integration of AI in higher education has been widely recognised as a transformative development that reshapes teaching, learning, and administrative processes. Existing studies highlight the potential of AI-driven technologies such as intelligent tutoring systems, adaptive learning platforms, and learning analytics to support personalised learning and data-informed decision-making (Rong et al., 2023). However, much of this literature is primarily situated within technologically advanced contexts, including North America, Europe, and parts of East Asia, where institutional capacity and digital infrastructure are comparatively well developed. As a result, the applicability of these findings to developing higher education contexts remains limited and requires further empirical validation.

The COVID-19 increased the implementation of AI and digital learning technologies in higher education (Cannon, 2023). When the universities moved to the online and hybrid learning models, AI-enhanced tools were required to enable remote education, tracking student interaction, and providing adaptive learning settings. Yet, AI implementation in education has yet to be evenly spread around the world, with the difference in technological facilities, financial resources, and institutional preparedness across regions.

Benefits of AI in Learning

The literature on the pedagogical benefits of the AI integration in higher education is emerging. The most important advantages of AI are:

1. The opportunity to facilitate individual learning processes (Alwy & Baso, 2024; Crain et al., 2024) because the educational systems that are run by AI are able to analyse data about learners and modify learning materials based on the learning speed, knowledge level, and learning styles (Dilmi & Sakri, 2024);

2. The timeliness and quality of the feedback delivered to the students is also increased in the case of AI technologies (Pandey, 2025).

Delays in the feedback mechanism can impair the learning process in traditional classroom setting because students might not necessarily notice mistakes or misunderstandings in time but formative assessment AI assistive tools have the potential to provide high-speed, personalised feedback on learners, allowing them to make corrections and sharpen their knowledge in real-time (Maluleke, 2025).

The other significant pedagogical benefit of AI is the possibility of improving the level of student engagement. The most common interactive elements of AI-helped educational platforms are gamification, virtual assistants, and learning in a simulated environment (Zhou et al., 2024). These tools allow the level of difficulty to be varied, information to be given in various formats, and varied styles of learning, which enhance more inclusive and engaging learning experiences (Kassaye, 2024).

Besides improving learning among students, AI technologies can be of great help both to teachers and institutions. Facilitating AI in automating repetitive administrative duties like in grading assignments and managing course schedules can decrease faculty workloads and provide more time to do other productive pedagogical tasks with students. On the institutional level, AI-based learning systems can be useful in strategic planning by enabling universities to detect the trends in student performance and adjust the academic programme to the changing demands of the labour market (Sozon et al., 2025).

While these studies emphasise the pedagogical advantages of AI, they often adopt a predominantly optimistic perspective and pay limited attention to the contextual constraints and implementation challenges faced by institutions in developing regions. This creates a gap in understanding how such benefits are experienced in resource-constrained educational environments.

Barriers to AI Adoption

Even though AI integration in higher education can be quite advantageous, a number of obstacles still impede its usage. The problem of digital literacy is one of the most serious challenges (Jafari & Keykha, 2024). Learners and teachers need to be technologically competent enough to make productive use of artificial intelligence devices and, in that regard, comprehend their functionality, capabilities and, most crucially, ethical considerations (Schachter, 2024; Abdurohman, 2025). The AI technologies can also be

poorly used or unused in learning institutions without proper training and professional development avenues (Kuleto et al., 2021).

Another important challenge to implementation of AI is infrastructure limitations, especially in developing areas. The use of AI technologies usually presupposes stable internet access, sufficient infrastructure and computing power, as well as the presence of compatible online devices. Educational institutions that have minimal technological platform might thus find it hard to implement the use of AI systems in their learning programmes. The financial implication of applying AI technologies and support can also be a hindrance to resource-strained universities.

The ethical governance and trust issues also complicate the use of AI in the educational process. Students and educators can also be suspicious of the accuracy, transparency, and the possibility of bias of AI-generated outputs (Ajani et al., 2024). Data privacy and security matters are specifically sensitive in educational institutions, where educational institutions are required to safeguard a significant amount of information about their students. Without well-defined regulatory schemes and ethical standards, such issues can cause the opposition to the implementation of AI. Additionally, AI technologies may cause more cognitive and emotional loads on both students and instructors. The new digital tools can necessitate major changes in both teaching and learning. Unless these transitions are supported with proper institutional support, these transitions can lead to more stress in academics, technological anxiety, or technological change resistance (Chaka, 2023).

Although existing research identifies digital literacy, infrastructure, and ethical concerns as key barriers, there is limited consensus regarding which factors are most influential across different contexts. In many developing countries, the relative importance of these barriers may vary depending on institutional capacity, socio-economic conditions, and students' prior exposure to digital technologies. Therefore, context-specific empirical studies are necessary to better understand how these challenges manifest in particular educational settings.

Availability and Support at Institutions

The availability and institutional facilitation are important factors that can define the potential of AI technologies in the integration process into the higher education systems. The availability of the devices and internet, the affordability of digital tools, and the friendly platforms are key factors that determine individual student capability to engage in the AI-enhanced learning environments.

Access to educational technologies in most developing countries, such as Bangladesh and other areas in Asia-Pacific is still being defined by digital inequalities. Learners with low socioeconomic status or in the rural population might not have access to good internet connectivity, personal computers, or smartphones to access AI-based learning

platforms (Kumar & Anburaj, 2024). The cost of the internet and the lack of technological infrastructure can thus limit the use of AI tools in learning institutions. It is also necessary to have institutional backup in ensuring fair access to AI technologies.

However, the literature often treats accessibility primarily as a technological issue, while overlooking the role of user readiness and institutional support systems in shaping effective engagement with AI tools. This suggests the need for a more integrated approach that considers both technological access and human capability factors.

Higher Education in Bangladesh and the Asian-Pacific Settings

Higher education in Bangladesh has experienced significant growth in recent years, supported by national initiatives such as the Digital Bangladesh agenda, which promotes technological innovation and digital literacy (Shohel et al., 2023). While these initiatives have facilitated the expansion of digital learning, existing research suggests that structural challenges, including disparities in infrastructure, faculty preparedness, and digital access continue to shape the effectiveness of technology integration in higher education. Notably, most studies in the Bangladeshi context focus on online learning environments rather than specifically examining the role of artificial intelligence in shaping students' learning experiences.

The extent of integration of AI in higher education in the larger region of Asia-Pacific also differs significantly. As technologically advanced nations are starting to implement AI in their teaching and research approaches, a significant number of developing countries balance such problems as affordability, infrastructure, and institutional preparedness. Scholars in Bangladesh have underscored the necessity to have inclusive technological systems that accommodate assistive and Universal Design for Learning (UDL) technologies to help students with different learning requirements (Ali et al., 2024).

The local experience indicates that the effective application of AI is based on the holistic approach, which implies the integration of technological infrastructure, institutional capacity building, fair access to digital resources, and supportive national education policies. In the case of Bangladesh, (Rahman et al., 2026) and other developing states in the Asia-Pacific region, these issues will be critical in order to make sure that AI technologies will help facilitate sustainable, inclusive, and competitive higher education systems.

Despite the fact that the global literature covers the use of AI applications in higher education extensively, there are a number of significant gaps within this field. To begin with, a significant part of the current research was devoted to digital education systems in the North American, European, and East Asian regions, and only a few studies have been carried out to investigate the role of AI in higher education institutions in the developing world (Zawacki-Richter et al., 2019). Second, a significant number of studies focus on technological potential or institutionalisation instead of studying the perceptions and

experiences of AI-supported learning of students, which is essential to comprehend the practical aspects of AI integration in learning settings.

The adoption of AI in higher education in Bangladesh is under-researched. The existing literature concentrates on the digital learning infrastructure or online learning instead of the investigation of how students feel about AI technologies and the issues faced when using them (Vaidya, 2024; Tarafdar et al., 2025). Additionally, the empirical data that has been collected regarding particular institutional settings is still sparse, especially in the context of public universities where resource limitation and infrastructural differences can be determining factors in the use of AI.

Despite the growing body of research on AI in higher education, several important gaps remain. First, the majority of existing studies are concentrated in technologically advanced regions, with limited attention to developing contexts such as Bangladesh. Second, much of the literature emphasises technological potential and institutional perspectives, while comparatively fewer studies examine students' lived experiences and perceptions of AI-supported learning. Third, there is a lack of context-specific empirical research that integrates technological, pedagogical, and socio-economic dimensions of AI adoption within individual institutional settings.

To address these gaps, the present study investigates students' perceptions of AI integration at JUST, focusing on perceived benefits, challenges, accessibility issues, and future expectations. By providing localised empirical evidence, this study contributes to a more nuanced understanding of AI adoption in developing higher education contexts and offers insights for policy and institutional planning.

CONCEPTUAL FRAMEWORK

To render a theoretical basis to the analysis of students' perception of AI in higher education, this study uses Technology Acceptance Model (TAM) as developed by Davis (1989), one of the most popular models of explaining how people accept and adopt new technologies in education and organisation. As per TAM, two main constructs, perceived usefulness and perceived ease of use, determine the behavioural intention of the individuals to use a technological system. As perceived usefulness is the level of the belief in the users of the technology that the technology improves performance, and perceived ease of use is the level of the belief in the people that the technology is available and easy to use.

Perceived usefulness in the context of AI-assisted learning can be manifested in the beliefs of students that AI tools improve their academic knowledge, activities, and grades. In a similar manner, the perceived ease of use is associated with aspects like availability of AI platform, digital literacy, and usability of AI-based learning systems. It has been shown that the perceptions play a key role in determining the attitudes of students towards the

educational technologies and their readiness to use them in the learning process (Zawacki-Richter et al., 2019; Schei et al., 2024).

The conceptual framework of the current study expands TAM by developing four key constructs based on the existing literature, which are represented in the study questionnaire:

1. Perceived Advantages of AI in Learning: such as personalised learning, better comprehension of complex subjects, engagement, and better academic results.
2. Obstacles to AI Adoption: such as technology obstacles, academic burnout, and reliability and trust issues.
3. Accessibility and Institutional Support: such as the availability of devices, affordability, digital literacy and infrastructural preparedness.
4. Future Prospects of AI Integration: expectations about the AI introduction into the curricula and its application in combination with traditional teaching practices.

All of these constructs determine the attitudes of students towards AI-supported learning settings and their willingness to use AI technologies in higher education.

METHODOLOGY

Research Design

This research design was quantitative and used a structured questionnaire to study how students perceive AI in higher education. The quantitative approach can be used in the studies that examine attitudes, perceptions, and behavioural dispositions in a specific population since it enables researchers to gather and analyse numerical data systematically (Creswell & Creswell, 2018). Data was gathered with the help of a structured questionnaire on various aspects of AI use among students in learning settings, such as perceived advantages, problems, access concerns, and future projections on AI-assisted learning. Descriptive statistical analysis, including mean, standard deviation, and frequency distributions, was used to summarise participants' responses.

Participants

Undergraduate and postgraduate students from Faculty of Engineering and Technology, Faculty of Biological Science and Technology, Faculty of Applied Science and Technology, Faculty of Health Science, Faculty of Science, Faculty of Arts and Social Science, and Faculty of Business Studies at JUST, Bangladesh participated in the survey. A total of 77 valid responses were collected, ensuring representation across different academic disciplines and levels of study.

Sampling Strategy

The purposive sampling methodology was used, and it helped the researchers to choose those individuals who were experienced using digital learning tools and were likely to be well-acquainted with AI-based educational technologies. It was believed that this method was fitting, since the study was meant to investigate the perception of students towards AI-enhanced learning, but not to generate statistically accurate findings on the whole population of university students.

Although purposive sampling restricts the statistical externalisation of results, it is common in the field of exploratory research of education when the researcher wishes to attain context-oriented information of the research subject with pertinent experience. The sample size of the respondents represented various faculties to enable the collection of data that would represent various experiences of the students in the institutional context.

Instrument

Data were collected using a close-ended questionnaire consisting of 23 items measured on a five-point Likert scale items (1 = Strongly Disagree to 5 = Strongly Agree). The questionnaire was developed following an extensive review of literature on AI integration in higher education and covered four thematic areas:

1. Benefits of AI in Learning: Personalisation, engagement, timely feedback, and performance improvement.
2. Challenges in AI Adoption: Technological barriers, digital literacy, and academic stress.
3. Accessibility and Institutional Support: Device access, affordability, usability, and infrastructure readiness.
4. Prospects for AI Integration: Expected roles of AI in higher education and its relationship with traditional teaching methods.

Data Collection Procedures

The survey was conducted through Google Forms so as to make the online participation to be convenient and secure. The connection was spread via institutional communication systems and faculty networks as it was possible to reach as many as possible. To guarantee that students of all faculties were included in the sample, data collection was held in 2025 with the help of a purposive sampling approach.

The relevant review authority in the university provided ethical clearance. The online form showed an informed consent statement on the goals of the study, voluntary participation,

and confidentiality on the first page. Only those who gave informed consent were allowed to fill out the questionnaire.

Content Validity

On the basis of an extensive literature review related to AI integration in higher education, the researchers prepared a questionnaire for the survey. The items of the questionnaire focused on four major themes: benefits, challenges, accessibility, and prospects of AI integration in higher education. Two experts in the field of education and technology revised the statements in the questionnaire in order to ensure that items cover the intended goals of the study.

Construct Validity

The survey items focusing on the constructs of technology adaptation research, like perceived usefulness, digital literacy, institutional preparedness, etc., support construct validity of the study. The Cronbach's alpha value (0.991) reports that the items are inherently consistent and coherent in measuring the underlying constructs.

Reliability

Internal consistency of the instrument was assessed using Cronbach's alpha, which yielded a reliability coefficient of 0.991 across the 23 survey items. This high value indicates strong internal consistency among the items, suggesting that the instrument reliably measures students' perceptions of AI integration in higher education.

Data Privacy and Security

The data of this study were collected using Google Forms with restricted access settings. To ensure the anonymity of student responses, no names, emails, or other detailed identifiers were collected. The data were accessible only to the researchers.

Psychological Stress

The survey items included statements that are non-sensitive, objective, and concise. The questionnaire avoids any personal information or any uncomfortable topics. Participation was voluntary and respondents could withdraw at any point without explanation.

Justification of Small Sample Size

As the research focuses on students' perceptions within a single university, the sample size of 77 students at JUST offers adequate depth and breadth to draw effective and context specific insights. Additionally, respondents included students from six different faculties,

which ensures sufficient representation of diversity. This sample size also indicates the availability of respondents, the feasibility of reaching students, voluntary nature of participation.

Ethical Considerations

Throughout the study, ethical considerations were strictly maintained by the researchers. Prior to survey, we conducted a pilot test taking comments from fifteen students from different faculties at JUST and corrected and modified them accordingly. The participants were informed of their voluntary responses and anonymity. They were informed of the study's goals, risks and prospects. All these procedures are in line with the ethical considerations of social science and educational research.

Data Analysis

Data from the completed questionnaires were exported into statistical software for processing. Descriptive statistics (mean, standard deviation, and frequency) were used to summarise participant responses.

Limitations and Generalisability

Despite the valuable insights given in the study on perceptions of AI integration by the students, some limitations are to be considered. The study was carried out in one institutional setting and there was a study sample of 77 students who were identified using purposive selection. Consequently, the results may not be generalised as it is an exploratory and context-specific study as opposed to being applicable to all institutions of higher learning.

However, the findings of this research can have a wider applicability. The University Grants Commission (UGC) tends to regulate the structure of the curricular program, regulatory frameworks, and practices in public universities in Bangladesh, which tend to follow similar structure. Therefore, the findings cannot be taken as the statistical representative of all the universities; the tendencies found in this study can be the tendencies of similar settings of the Bangladesh populace universities. Further studies with bigger multi-institutional samples would be useful in confirming the results and generalising them on the wider higher education sector.

FINDINGS AND ANALYSIS

This section presents the empirical findings derived from the survey conducted among students at Jashore University of Science and Technology. The analysis is based on responses collected through a structured questionnaire using a five-point Likert scale.

Descriptive statistical techniques, including mean values, standard deviation, and frequency distributions, were applied to examine students' perceptions of artificial intelligence in higher education. The findings are organised into four thematic areas: (i) advantages of AI in learning, (ii) challenges in AI adoption, (iii) accessibility issues, and (iv) future prospects of AI integration. These results provide a clear overview of students' attitudes, experiences, and expectations regarding the use of AI tools in the learning process.

To understand the demographic composition of the participants involved in the study, the gender distribution of respondents was examined. Gender diversity among participants is important because it helps provide a balanced representation of perceptions regarding the use of artificial intelligence in higher education. Figure 1 presents the gender distribution of the students who participated in the survey conducted at Jashore University of Science and Technology.

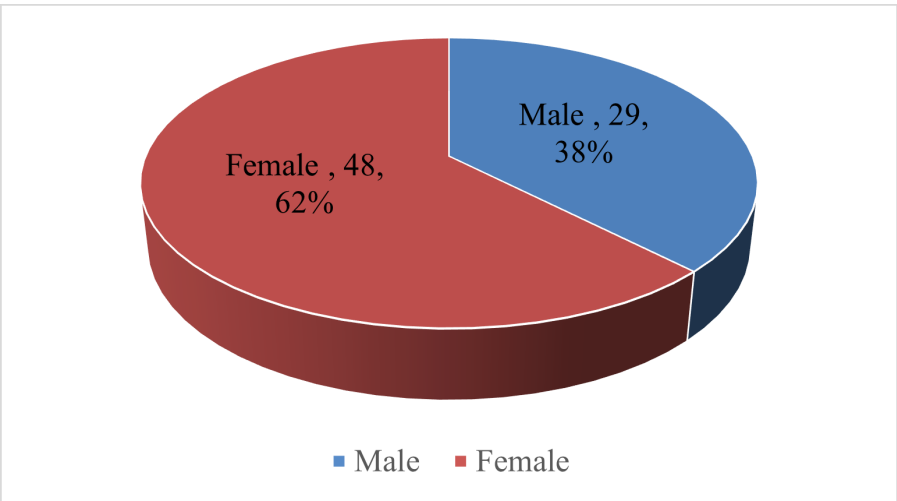

Figure 1. Number of respondents

Figure 1 shows that total 77 students participated in this research survey where 29 students (38%) were male and the rest 48 were female (62%).

In addition to gender distribution, the academic level of respondents was also analysed to understand how perceptions of artificial intelligence may vary across different stages of undergraduate education. Students at different academic levels often possess varying levels of digital exposure, technological familiarity, and academic experience. Figure 2 illustrates the educational level of the participating students, showing the distribution of respondents across different academic years.

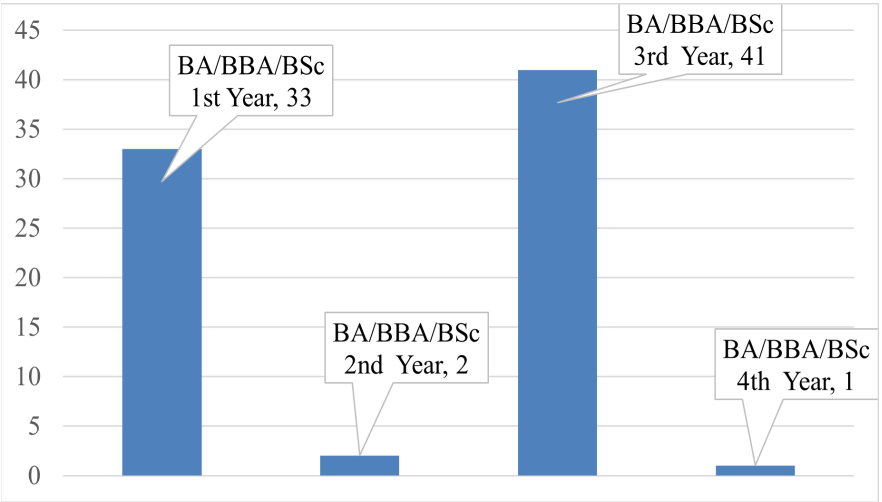

Figure 2. Education level of the respondents

Figure 2 shows the education level of the participated students. Total 33 students belonged to 1st year (BA/BBA/BSc), 2 students to 2nd year, 41 students to 3rd year, and the rest 1 student to 4th year.

Advantages of AI in Learning

To explore students' perceptions regarding the benefits of AI in the learning process, a series of survey statements were developed under the theme of advantages of AI in learning. The responses were measured using a five-point Likert scale ranging from "strongly disagree" to "strongly agree". Descriptive statistical analysis was applied to evaluate the overall tendency of students' responses. Table 1 presents the descriptive statistics, including minimum value, maximum value, mean, and standard deviation, for statements related to the perceived advantages of AI tools in learning.

The findings of Table 1 reveal that there is generally a positive impression of the students at Jashore University of Science and Technology concerning the use of AI tools in learning enhancement. The most appreciated benefit was that AI can assist them in comprehending challenging topics more conveniently (M = 4.32, SD = 0.616) in describing complicated matters in a simplified way by using adaptive explanations and feedback. The other outstanding benefits were: a personalised learning experience (M = 3.97, SD = 0.827) and enhanced academic performance (M = 3.87, SD = 0.750), which cite AI as having a personalised learning experience and an academic performance enhancer. The engagement also increased with medium level mean (M = 3.78, SD = 0.853), meaning that AI was associated with active learning, but to a lesser extent than personalisation or performance. The capability of AI to increase confidence and autonomy present the lowest score (M

= 3.66, SD = 0.968). Although these values are still positive, it implies that the students might still be dependent on the traditional teaching methods when developing their self-confidence and the ability to learn independently. In general, the mean scores are all above 3.5 which reflects a positive perception and due to the low standard deviation of the responses, there appears to be a consensus of the participants.

Table 1. Descriptive statistics of Theme 1 (Advantages of AI in learning)

No	Statement	*N*	Min	Max	Mean	SD
1	The use of AI tools gives me a personalised learning experience.	77	1	5	3.97	0.827
2	My engagement in learning has increased by using AI tools.	77	1	5	3.78	0.853
3	I understand complex issues more easily by using AI tools.	77	3	5	4.32	0.616
4	The use of AI tools in learning enhances my academic score and performance.	77	2	5	3.87	0.750
5	AI tools enhance my confidence and autonomy.	77	1	5	3.66	0.968
	Valid *N* (list wise)	77				

Challenges of Using AI in Learning

While AI offers numerous educational benefits, students may also encounter several challenges when integrating these tools into their learning practices. Table 2 presents the descriptive statistical analysis of students' responses regarding the challenges associated with the use of AI tools in learning. Table 2 summarises key statistical indicators that reflect students' experiences with technological limitations, reliability concerns, academic stress, and other potential barriers to effective AI usage.

Based on the findings of Table 2, it is apparent that students encounter quite a number of challenges in using AI tools in the study process. Among the most significant issues was greater academic stress (M = 4.04, SD = 0.616), which states that even despite all the positive features the use of AI can bring, their implementation can cause academic pressure due to new learning requirements or new technologies unfamiliar to the person. Low digital literacy was also an obstacle, with technology knowledge averaging at M = 3.96 with SD = 0.785, thereby implying that poor tech literacy can negatively affect the successful application of AI. The fact that there is some level of scepticism of automated responses is exhibited in the responses given in regard to the validity (M = 3.70, SD = 0.974) and reliability of these results. The reported results indicated the moderate difficulties in using AI tools (M = 3.38, SD = 0.974), whereas the poor internet connectivity received the lowest rating (M = 2.47, SD = 1.008), which means that, in the majority of students, the speed of access was not as significant barrier as the issue of skills and trust.

Table 2. Descriptive statistics of Theme 2 (Challenges of using AI in learning)

No	Statement	*N*	Min	Max	Mean	SD
1	I sometimes face difficulties while using AI tools in learning.	77	1	5	3.38	0.974
2	My inadequate technology knowledge limits my use of AI tools in learning.	77	2	5	3.96	0.785
3	I feel concerned about the validity and reliability of automated responses given by AI tools.	77	2	5	3.70	0.974
4	Poor internet connection hinders my motivation and actual use of AI tools.	77	1	5	2.47	1.008
5	My academic stress has increased due to AI tools.	77	2	5	4.04	0.616
	Valid *N* (list wise)	77				

Accessibility Issues of AI Tools

Apart from challenges related to usage, accessibility issues can significantly influence the effectiveness and adoption of artificial intelligence technologies in educational environments. Factors such as digital literacy, device accessibility, platform usability, and institutional support play a crucial role in determining how effectively students can engage with AI tools. Table 3 presents the descriptive statistics of survey responses related to accessibility issues surrounding AI tools in higher education. Table 3 highlights students' perceptions regarding affordability, technological competence, user-friendliness of AI platforms, and the level of logistical support provided by the university.

Table 3 results also showcase some of the accessibility issues impacting how students can use AI tools to learn. Insufficient digital literacy (M = 3.81, SD = 0.779) was found to be the most important problem as it stated that there were multiple students, who said that they lack the proper skills to use AI efficiently. The affordability of AI tools got a moderate score (M = 3.48, SD = 0.926), indicating that it is not the most acute hindrance but it is, nevertheless, an issue to some. The ease of reaching the AI learning platforms through personal devices received the lowest score (M = 2.88, SD = 1.100), and views about the accessibility of AI platforms to the users scored even lower (M = 2.71, SD = 1.255) suggesting some usability problems that could impede adoption. Reliance on AI instead of teacher lectures (M = 3.13, SD = 1.116) and being able to learn without any additional instructions (M = 2.84, SD = 0.988) were comparatively low, which indicates that the students are not ready to give up the idea of being taught traditionally by their teachers. Logistic support within the department was considered moderately (M = 3.38, SD = 0.889), which means that the institution is prepared, but its readiness can be enhanced. These findings overall mean that affordability is partially under control, yet, skill gaps, usability considerations, and unwarranted platform accessibility continue to be a huge impediment to AI availability in learning.

Table 3. Descriptive statistics of Theme 3 (accessibility issues of AI tools)

No	Statement	*N*	Min	Max	Mean	SD
1	I can easily get access to AI learning platforms with my device.	77	1	5	2.88	1.100
2	I can afford the cost of AI tools.	77	1	5	3.48	.926
3	We do not have enough digital literacy to use AI tools.	77	1	5	3.81	.779
4	AI platforms are very user-friendly.	77	1	5	2.71	1.255
5	I sometimes depend more on AI tools than the teachers' lecture.	77	1	5	3.13	1.116
6	As I use AI tools in learning, I do not always need instructions to understand a topic.	77	1	5	2.84	.988
7	My department has enough logistic support to use AI tools.	77	1	5	3.38	.889
	Valid *N* (list wise)	77				

Prospects and Implementation

To evaluate students' perspectives on the future role of artificial intelligence in higher education, several survey statements were designed to examine expectations regarding AI integration, institutional readiness, and the potential transformation of teaching methods. These items aim to capture students' attitudes toward the long-term implementation of AI technologies in the academic environment. Table 4 presents the descriptive statistical findings related to students' perceptions of the future prospects and institutional implementation of AI-based learning.

The outcomes of Table 4 indicate ambivalent faculty views on the future of AI in higher education and its future. The majority of students were in strong agreement that AI tools should be adequately trained in universities (M = 4.00, SD = 0.918) because effective adoption requires relevant skills training. The creation of the infrastructure of AI learning was also positively rated (M = 3.82, SD = 0.899), which is a sign of understanding that there should be institutional readiness. The idea that AI tools will prepare students in the global career market was rated moderately (M = 3.38, SD = 0.918), and the expectations of applying AI to the curricula show slightly smaller expectations (M = 3.04, SD = 0.952), showing uncertainty on institutional intentions. There was also mixed reaction to whether AI will completely replace the universities typical form of teaching worldwide (M = 3.64, SD = 1.134) or whether it will partially be replaced by some of the methods (M = 3.47, SD = 1.083), with an attitude of open-mindedness approaching change. In general, students welcome the idea of adopting AI, but it needs to be accompanied by training, infrastructure and planning that augments rather than completely take the place of traditional teaching methods.

Table 4. Descriptive statistics of Theme 4 (prospects and implementation)

No	Statement	*N*	Min	Max	Mean	SD
1	The use of AI tools in learning prepares us for the global job market.	77	1	5	3.38	0.918
2	Our university will integrate AI-based learning in the curriculum.	77	1	5	3.04	0.952
3	The university should provide comprehensive training on the use of AI tools.	77	1	5	4.00	0.918
4	The university should develop infrastructure for AI-based learning.	77	2	5	3.82	0.899
5	In the near future, AI tools will replace traditional teaching methods in the world.	77	1	5	3.64	1.134
6	I expect AI tools to replace some traditional teaching methods.	77	1	5	3.47	1.083
	Valid N (list wise)	77				

Table 5 presents the case processing summary, indicating the number and percentage of valid and excluded responses used in the statistical procedures. This information helps ensure transparency in data processing and confirms the reliability of the dataset used in the study.

Table 5. Case processing summary

		N	%
Cases	Valid	76	98.7
	Excluded[a]	1	1.3
	Total	77	100.0

Note: a = list wise deletion based on all variables in the procedure.

Table 5 indicates that, out of the 77 total responses received, there was 76 valid responses (98.7%), one (1.3%) excluded because it missed or lacked important data. These are very high rates of completion which shows good levels of engagement on the side of the participants and low nonresponse bias is such cases and resultant data set will be representative and reliable in future analysis.

Reliability analysis is an important step in quantitative research to assess the internal consistency of survey instruments. Table 6 presents the reliability statistics of the survey instrument using Cronbach's alpha coefficient. This analysis evaluates the overall reliability of the 23 survey items used in the study.

Table 6. Reliability statistics

Cronbach's alpha	*N* of items
0.991	23

Cronbach's alpha for the 23-item survey instrument is 0.991 as demonstrated in Table 6. This remarkably high value indicates a great internal consistency, i.e., high internal consistency among the items as well as a stable measure of the constructs intended. This finding underscores the validity of the instrument and enhances the credibility of the reliability of quantitative findings of the study.

DISCUSSION

The results of this research are useful in understanding student perception of AI integration in higher education at Jashore University of Science and Technology. The findings present a picture of rather favourable views on AI-based learning and, at the same time, acknowledge crucial obstacles associated with the digital literacy, academic stress, accessibility, and institutional preparedness.

Perceived Benefits and Technology Acceptance

The results indicate that students strongly acknowledge the academic benefits of AI tools in learning environments. The highest mean score was recorded for the statement that AI helps students understand complex topics more easily (M = 4.32), followed by personalised learning experiences (M = 3.97) and improved academic performance (M = 3.87). These findings suggest that students perceive AI as a useful instructional support tool capable of simplifying complex knowledge and facilitating adaptive learning.

From the perspective of the Technology Acceptance Model (TAM**)**, these results reflect a strong perception of perceived usefulness, which is considered one of the most influential predictors of technology adoption (Davis, 1989). When students recognise that AI tools enhance comprehension and learning outcomes, they are more likely to accept their integration into educational environments. The relatively moderate scores for engagement (M = 3.78) and confidence/autonomy (M = 3.66) indicate that although AI contributes to learning efficiency, students still rely significantly on teacher guidance and human interaction within the learning process.

Thematic Comparison between Benefits and Prospects of AI Integration

Although the dataset primarily reports descriptive statistics, a thematic comparison of the findings indicates that students who reported higher perceived benefits of AI also tended to express more positive expectations regarding its future integration. For instance,

students who rated AI learning benefits highly also demonstrated relatively strong support for institutional AI training (M = 4.00) and infrastructure development (M = 3.82). This pattern suggests that students who perceive AI as academically useful are generally more supportive of its institutional implementation.

This pattern is consistent with findings from previous studies, where perceived usefulness has been associated with positive attitudes toward technology adoption in higher education environments (Schei et al., 2024; Idroes et al., 2023). In the context of the present study, the alignment between high benefit perception and strong support for training programs suggests that students expect universities to provide institutional frameworks that facilitate responsible and effective AI integration.

Challenges and the Role of Digital Literacy

The analysis of challenges reveals that academic stress (M = 4.04) and insufficient technological knowledge (M = 3.96) are the most significant barriers affecting students' engagement with AI tools. The strong presence of these factors suggests a pattern between digital literacy and perceived difficulty in AI adoption. Students who lack sufficient technological competence may experience greater cognitive pressure when attempting to use unfamiliar AI systems.

A conceptual association can therefore be observed between digital literacy limitations and academic stress, suggesting that insufficient technical skills increase the psychological burden associated with AI-supported learning. This finding aligns with existing research indicating that technological competence significantly influences students' ability to effectively engage with digital learning tools (Ajani et al., 2024).

Interestingly, infrastructural constraints such as poor internet connectivity recorded the lowest mean score (M = 2.47), indicating that infrastructure is not the primary barrier in this institutional context. Instead, the findings suggest that human capability factors—particularly digital skills and technological confidence—play a more critical role in determining AI adoption outcomes.

An alternative interpretation of these findings is that the perceived academic stress associated with AI tools may not solely result from technological complexity but also from students' adjustment to new learning environments that require greater autonomy. In traditional teacher-centred systems, students often rely on guided instruction; however, AI-supported learning environments may demand more independent engagement, which can initially increase cognitive and emotional pressure. This suggests that the challenge lies not only in technological barriers but also in the transition toward more self-directed learning models.

Accessibility Factors and Institutional Support

The results related to accessibility demonstrate that students experience moderate limitations regarding device access ($M = 2.88$) and usability of AI platforms ($M = 2.71$). These findings suggest that although AI technologies are increasingly available, their accessibility remains uneven due to usability challenges and device constraints. Exploratory interpretation of these variables suggests a cluster of factors related to accessibility, including device access, affordability, usability, and institutional logistical support. Conceptually, these variables form an underlying dimension that may be interpreted as institutional readiness for AI integration.

Factor analysis in similar educational technology studies often identifies such clusters as core determinants of digital adoption environments (Rong et al., 2023). In this study, accessibility indicators collectively suggest that effective AI implementation requires not only technological infrastructure but also supportive institutional policies, training opportunities, and user-friendly platform design.

Descriptive Interpretation of Factors Influencing AI Adoption Expectations

The thematic comparison of the dataset allows a descriptive interpretation of factors that may influence students' expectations regarding AI integration in higher education. The findings indicate that perceived benefits, digital literacy, and institutional support appear to shape students' expectations regarding the future role of AI in education. Students who reported strong academic benefits from AI also expressed greater support for institutional training and infrastructure development. In contrast, barriers related to limited digital literacy and academic stress appear to influence students' attitudes toward AI adoption.

These observations are based on descriptive patterns in the data and should be interpreted cautiously, as no inferential statistical analysis was conducted to establish predictive relationships.

Institutional and Policy Implications

The findings offer several implications for higher education policy and institutional planning. The strong student demand for AI training programs ($M = 4.00$) indicates that universities should prioritise the development of structured AI literacy initiatives. These programs should focus not only on operational skills but also on critical evaluation of AI outputs and ethical considerations related to algorithmic decision-making.

Furthermore, the relatively moderate perception of institutional readiness ($M = 3.38$) suggests that universities should invest in digital infrastructure, technical support systems, and AI-enabled learning environments. Providing accessible devices, multilingual AI

platforms, and reliable technical assistance could significantly improve students' confidence in using AI technologies.

Pedagogical Implications

The results also suggest that students prefer blended learning models rather than complete technological replacement of traditional teaching methods. While AI tools are perceived as effective for personalisation and feedback, students continue to value the motivational, social, and interpretive roles performed by human instructors.

Consequently, the most effective pedagogical approach may involve integrating AI technologies as augmentative tools that support but do not replace human-led instruction. In such environments, AI can provide adaptive learning pathways and real-time feedback, while instructors guide critical thinking, discussion, and contextual interpretation.

Regional Relevance in the Asia-Pacific Context

Within the broader Asia-Pacific context, the findings demonstrate that AI adoption in higher education must be adapted to regional socio-technical realities. Although infrastructural barriers appear relatively limited in the JUST context, many universities across the region continue to face challenges related to affordability, digital literacy, and policy frameworks. Developing inclusive AI adoption strategies will therefore require coordinated efforts among governments, universities, and technology providers. Such strategies should prioritise equitable access, culturally responsive technologies, and institutional capacity-building programs.

Given that the study relies primarily on descriptive statistical analysis, the findings should be interpreted as indicative patterns rather than statistically tested relationships. Future research may employ inferential statistical methods to further examine these associations.

While previous studies (e.g., Ajani et al., 2024; Idroes et al., 2023) emphasise infrastructural limitations as a primary barrier to AI adoption, the present study indicates that human capability factors—particularly digital literacy and technological confidence—play a more significant role in shaping students' experiences. This finding highlights a context-specific variation in developing higher education environments, where access to basic infrastructure may be improving, but effective utilisation remains constrained by skill gaps. Therefore, the study extends existing literature by emphasising the importance of user readiness alongside technological availability.

Despite providing valuable insights, this study has several limitations that should be acknowledged. First, the study is based on a relatively small sample size from a single university, which limits the generalisability of the findings to broader higher education contexts. Second, the study relies on self-reported data, which may be subject to response bias and subjective interpretation. Third, the analysis is primarily based on descriptive statistics,

and no inferential statistical methods were employed to establish causal relationships or predictive patterns. Future research should consider larger, multi-institutional samples and employ advanced statistical techniques to validate and extend these findings.

These findings should therefore be interpreted as context-specific insights rather than universally generalisable conclusions

RECOMMENDATIONS

Based on the empirical findings of this study, some significant recommendations can be proposed to support effective and context-sensitive integration of AI in higher education at Jashore University of Science and Technology and similar institutions in Bangladesh.

Strengthening Digital Literacy and AI Competency Training

The survey findings indicate that insufficient technological knowledge (M = 3.96) and limited digital literacy (M = 3.81) are among the most significant barriers to effective use of AI tools in learning. In addition, students expressed strong support for institutional training programs on AI usage (M = 4.00).

Based on these findings, universities should introduce structured AI literacy and digital competency training programs for both students and faculty members. These programs should focus not only on technical skills for operating AI tools but also on critical evaluation of AI-generated outputs, ethical awareness, and responsible academic use of AI technologies**.**

Improving Institutional Infrastructure for AI-Supported Learning

Students also highlighted the importance of institutional readiness for AI integration. The survey results show relatively strong support for AI infrastructure development (M = 3.82) and moderate perceptions regarding departmental logistical support (M = 3.38).

To address these concerns, universities should invest in digital learning infrastructure, including reliable campus internet access, AI-enabled learning platforms, and dedicated digital learning support centres. Institutional planning should also consider integrating AI tools into existing learning management systems (LMS) to ensure seamless access for students across academic departments.

Enhancing Accessibility of AI Tools and Devices

The results reveal moderate challenges related to device accessibility (M = 2.88) and the usability of AI platforms (M = 2.71)**.** These findings suggest that technological access remains uneven among students. To address this issue, universities should implement

initiatives such as device loan programs, student technology grants, and campus-based AI learning labs where students can access AI tools without financial barriers. Additionally, the development of mobile-friendly and low-bandwidth AI platforms could improve accessibility for students from resource-constrained backgrounds.

Promoting Ethical and Responsible Use of AI in Academic Contexts

The study also identifies concerns regarding the validity and reliability of AI-generated responses (M = 3.70). This suggests that students remain cautious about the academic reliability of AI tools.

Universities should therefore establish clear institutional guidelines for the ethical use of AI in academic work**,** including policies related to academic integrity, responsible AI-assisted learning, and transparency in AI-supported assessment practices. Incorporating AI ethics modules into digital literacy programs could help students develop critical awareness of the strengths and limitations of AI technologies.

Adopting Blended Learning Approaches for AI Integration

The findings indicate that students do not strongly support the full replacement of traditional teaching methods by AI technologies. For example, agreement levels regarding reliance on AI instead of teacher lectures remain relatively moderate (M = 3.13), while expectations for full AI replacement of traditional teaching methods are also cautious (M = 3.64).

These results suggest that students prefer AI-supported blended learning environments, where AI tools complement rather than replace human instruction. Universities should therefore encourage pedagogical models that combine AI-based learning support with instructor-led teaching, allowing AI to assist with personalised feedback, adaptive learning pathways, and automated support functions.

Addressing Academic Stress Associated with AI Adoption

Another important finding of the study is the relatively high perception that AI tools may increase academic stress (M = 4.04). This suggests that students may experience pressure when adapting to new technological learning systems.

To mitigate this issue, universities should provide gradual implementation strategies, clear usage guidelines, and adequate technical support for students. AI technologies should be introduced as supportive learning aids rather than additional performance pressures, ensuring that students feel confident and comfortable using AI-based learning tools.

CONCLUSION

This study examined students' perceptions of AI integration in higher education at Jashore University of Science and Technology (JUST), focusing on perceived benefits, challenges, accessibility issues, and future expectations. The findings indicate that students generally perceive AI as a valuable educational tool that enhances understanding of complex topics, supports personalised learning, and contributes to improved academic performance. At the same time, significant barriers remain, particularly in relation to digital literacy, usability challenges, and academic stress associated with adapting to new technological environments.

From a theoretical perspective, the findings reinforce the relevance of the Technology Acceptance Model (TAM), particularly in demonstrating the importance of perceived usefulness and ease of use in shaping students' attitudes toward AI-supported learning. However, the study also extends TAM by highlighting the critical role of contextual factors such as institutional support, digital skills, and socioeconomic accessibility in influencing technology adoption within developing higher education systems.

Importantly, the results suggest that students do not perceive AI as a replacement for traditional teaching but rather as a complementary tool that enhances existing pedagogical practices. This highlights the importance of adopting blended learning models that integrate AI technologies with human-led instruction to maintain pedagogical effectiveness while leveraging technological innovation.

However, the findings should be interpreted with caution due to several limitations. The study is based on a relatively small, single-institution sample and relies on descriptive statistical analysis, which limits the ability to establish causal relationships or generalize the findings across broader contexts. Future research should incorporate larger and more diverse samples, as well as inferential statistical techniques, to further examine the dynamics of AI adoption in higher education.

Overall, this study contributes to the growing body of literature on AI in higher education by providing context-specific empirical insights from Bangladesh, a setting where research on AI integration remains limited. The findings underscore the need for balanced, inclusive, and context-sensitive strategies that combine technological advancement with digital skill development, ethical considerations, and institutional preparedness to ensure sustainable and effective AI integration in higher education.

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