Artificial Intelligence in Education: Student Perspectives on AI's Role and Impact on Teaching

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Abstract

This research aimed to capture the general attitude towards artificial intelligence technology of undergraduate and postgraduate students. This study also explored their use pattern in their academic work and perception about replacing teachers in future.

This study employed a concurrent mixed-methods research design and selected 379 undergraduate (UG) and postgraduate (PG) students using a random sampling technique. Standardised scale by Schepman and Rodway (2023) along with an open-ended questionnaire was used to collect the data from the respondents.

The study highlights a generally positive attitude towards AI among UG and PG students, with many acknowledging its potential benefits in sectors like education and future employment. While students see AI as a valuable tool for automating tasks and personalising learning, they stress that it cannot replace the emotional support, creativity, and critical thinking provided by human teachers. Concerns about job security, privacy, AI biases, and ethical implications emphasize the need for AI to complement rather than replace human educators, ensuring a balanced approach in education.

Our research findings would assist educational institutions in adopting AI technologies in teaching and learning in a simpler and more efficient manner. This paper addressed a relevant topic in the era of technology in education by understanding UG & PG students' viewpoints that added complementary information to the current body of literature.

Keywords – Artificial Intelligence (AI), UG & PG students' attitude, students' perception, higher education.

Introduction

Artificial intelligence can enhance various dimensions of digital competency, including information and data literacy as well as digital content creation. Kok et al. (2002) characterise artificial intelligence as a domain within computer science dedicated to the creation of systems that replicate human cognitive functions, including learning, reasoning, and self-correction.

Educational institutions are increasingly utilising artificial intelligence (AI) in diverse formats (Chen et al., 2020). A significant observable shift in the utilisation of AI has occurred with the onset of the Fourth Industrial Revolution. AI includes machine learning, natural language processing, and many types of algorithms (Zawacki-Richter et al., 2019). AI-powered educational systems (hereafter AIED)

provide novel opportunities, including the automation of organisational or administrative chores, the development of course content, and the evaluation and feedback of learners (Bryant et al., 2020; Chassignol et al., 2018).

According to the Horizon report of 2018, experts projected a 43% increase in the use of AI from 2018 to 2022 (Kengam, 2020). The conference conducted in the 21st century on an international scale regarding AI highlights AIED as an emerging field within educational technology (Kengam, 2020). Earlier, education lacked flexibility; however, advancements in AI have facilitated this change (Pantelimon et al., 2021). However, experts warn that the swift proliferation of AI in education has ethical hazards, including surveillance-driven learning analytics, diminished learner autonomy, and possible exploitation of student data (Regan and Jesse, 2019). UNESCO (2021) underscores the necessity of integrating human-centred and responsible AI to guarantee fairness, accountability, and inclusivity for varied learners. Researchers have increasingly emphasised that these advantages must be weighed against ethical issues, including algorithmic bias, data privacy hazards, and uneven access to AI technologies. Research demonstrates that AI systems may inadvertently replicate social biases inherent in training data, hence disadvantage specific student demographics (Holstein and Aleven, 2021). Concerns have been expressed about the openness and explainability of educational AI systems, as non-explanatory models may engender trust concerns among students and instructors (Lundberg et al., 2020).

According to Arnau and Montan'e (2010), attitudes are defined as predispositions or tendencies to act, influenced by emotive, cognitive, and behavioural responses. The cognitive dissonance hypothesis posits that individuals generally align their beliefs with their actions (Aronson, 1999). Thus, the adoption of AI from simple online learning has brought to light the issues regarding the attitude of students towards AI and their perceived opinion on its future impact holds greater importance to explore. Recent research indicates that students' impressions of AI are significantly influenced by their trust in the ethical operation of AI systems. Favorable opinions correlate with the assumption that AI improves learning efficiency, while unfavorable attitudes frequently arise from concerns around prejudice, diminished human interaction, or the potential displacement of educators (Chan and Hu, 2023; Long and Magerko, 2020). Consequently, investigating student attitudes necessitates not just comprehending usage patterns but also critically examining the ethical and socio-emotional aspects related to AI in education.

Research Questions

1. **RQ1:** What are the areas of AI tool usage among undergraduate and postgraduate students in higher education?

2. **RQ2:** What AI tools are being used by undergraduate and postgraduate students in higher education?

3. **RQ3:** What are the perceptions of students regarding the potential of AI tools replacing human teachers in the future, and what reasons do they provide for their opinions?

Research Objectives

1. To identify the major areas in which undergraduate and postgraduate students use AI-powered tools in higher education.

2. To examine the specific AI tools currently being used by undergraduate and postgraduate students for academic and learning purposes.

3. To analyse students' attitude towards the potential of artificial intelligence.

4. To explore the reasons behind students' perceptions towards the possibility of AI replacing human teachers.

Hypothesis of the study

1. There is no significant difference in the attitude of male and female students towards artificial intelligence.

2. There is no significant difference in the attitude of urban, semi-urban and rural students towards artificial intelligence.

Methodology of the study

The researchers employed a mixed-methods research design with data collected from a total sample of 379 UG and PG students from three universities of Assam, i.e. Tezpur University, Dibrugarh University and Gauhati University through Google Form. Through random sampling techniques, the universities were selected and from every university data were collected from participants across various disciplines. A stratified random sampling method was employed to choose participants from each university, ensuring sufficient representation of students across undergraduate and postgraduate levels and various disciplines. The sample size of 379 was established based on feasibility and sufficient statistical power for evaluating mean differences among groups.

The General Attitudes towards Artificial Intelligence Scale (GAAIS), developed by Astrid Schepman and Paul Rodway (2023), was used to collect data in order to determine the level of attitude of post graduate students towards AI (Schepman and Rodway, 2023). An open-ended questionnaire prepared by the researchers was also used to understand their perception about AI replacing teachers in future as this is a matter of concern nowadays for a better understanding of students' perceptions of AI and its potentials.

Descriptive analysis, independent sample t-test, and one-way ANOVA were employed for quantitative data, with effect sizes (Cohen's d for the t-test and partial eta squared for ANOVA) provided to signify the magnitude of group differences, as advised for assessing practical significance. Thematic analysis was conducted on qualitative data using a six-step framework: familiarisation, coding, topic generation, theme review, theme definition and name, and reporting. Coding was performed manually, and themes were extracted through an inductive methodology to appropriately reflect participants' viewpoints. To augment credibility, researcher triangulation and iterative evaluation of replies were conducted.

Findings of the study

The Data Analysis and Interpretation section presents an in-depth examination of the collected data to address the research questions. This section focuses on identifying key patterns and trends through qualitative and quantitative analysis, providing insights into the attitude of students towards AI. The findings are interpreted in relation to the study's objectives, offering a clear understanding of the data and its implications.

Primary Academic Purposes for Using AI Tools in Higher Education

According to the result, it indicates that the key goals for utilising AI tools in education differ significantly among users. The leading use is exam preparation assistance (62.06%), followed by enhancing coursework or assignments (54.47%), and research projects or thesis work (40.11%). Figure 1 illustrates the primary domains in which undergraduate and postgraduate students utilize AI-driven tools in higher education.
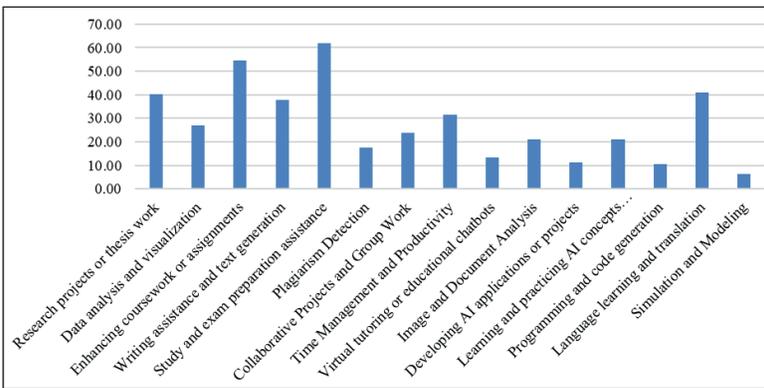

Fig-1: Distribution of AI tool usage across key academic activities among undergraduate and postgraduate students

Additional other significant applications include language learning and translation (40.92%), writing assistance and text generation (37.94%), and time management and productivity (31.44%). Furthermore, AI tools are utilised for data analysis and visualisation (26.83%), collaborative projects and group work (23.85%), image and document analysis (21.14%), and learning and practising AI concepts (21.14%). Some users employ AI for plagiarism detection (17.62%), virtual tutoring or educational chatbots (13.28%), developing AI applications or projects (11.11%), and programming and code generation (10.57%). Less number of uses include simulation and modelling (6.23%), while other uses account for 5.69% of responses. As part of RQ1, the above analysis explores how undergraduate and postgraduate students utilise AI tools across different academic contexts.

Most Commonly Utilised AI Tools in Higher Education

The data on AI tool utilisation offers significant insights into the deployment of diverse AI-powered technologies across multiple disciplines. The predominant usage is attributed to OpenAI's ChatGPT-3.5 or GPT-4 (62.87%), signifying its pre-eminence in AI-assisted activities including content creation, problem resolution, and research. Figure 2 illustrates the distribution of AI tools utilised by undergraduate and postgraduate students to enhance their academic and learning endeavours.
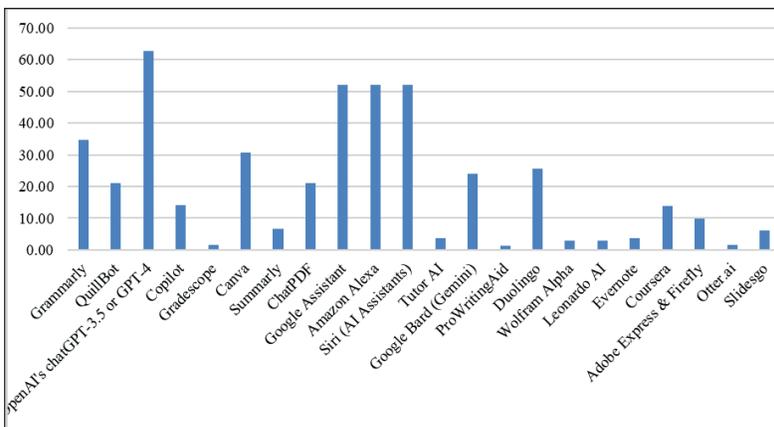
Fig. - 2: Most widely used AI tools among students

This discovery corresponds with recent research highlighting the increasing dependence on big language models for scholarly and professional endeavours (Lund et al., 2023). Voice assistants such as Siri, Google Assistant, and Amazon Alexa (52.03%) demonstrate considerable adoption, underscoring their function in daily information acquisition and job automation (Hoy, 2018). Grammarly (34.69%) and ProWritingAid (1.35%) demonstrate a significant inclination towards AI-driven writing enhancement tools, corroborating prior studies on AI's influence on linguistic competence and document improvement (Song and Song, 2023). Canva (30.62%) and Adobe Express and Firefly (9.76%) exemplify the growing influence of AI in creative domains, optimising design processes through automated improvements.

The existence of programs such as Google Bard (24.12%), QuillBot (21.14%), and ChatPDF (21.14%) indicates a desire for AI-based paraphrase, summarising, and document analysis tools (Ruiz-Rojas et al., 2023). AI-driven educational platforms like Duolingo (25.47%) and Coursera (13.82%) signify a transition towards AI-enhanced education and individualised learning experiences, reinforcing the idea that AI is revolutionising pedagogy (Huertas-Abril and Palacios-Hidalgo,

2023). Copilot (14.09%) signifies the increasing incorporation of AI in coding and professional productivity software. The diminished adoption rates of tools such as Leonardo AI and Wolfram Alpha (2.98% each) indicate that domain-specific AI applications continue to cater to a specialised audience. The category "Other AI tools" (10.30%) indicates the variety of AI apps accessible to users. This distribution of AI tool usage highlights AI's significance across multiple industries, corroborating prior literature on the proliferation of AI in education, creative endeavours and productivity improvement (Owoc et al., 2021). As a contribution to RQ2, the analysis highlights the types of AI tools currently employed by students for academic purposes.

To answer RQ3, we performed various studies, including comparisons by gender and area, and conducted a survey to assess students' attitudes toward AI. The study utilised the General views towards Artificial Intelligence Scale (GAAIS) created by Schepman and Rodway (2023), a validated tool for evaluating favourable views towards AI.

Gender wise analysis

H_1: There is no significant difference in the attitude of male and female students towards Artificial intelligence.

Table 1 presents Levene's Test for Equality of Variances Among Groups. The study examined gender differences in attitudes towards AI among undergraduate students. The results from the Levene's test (Table 1) for equality of variances indicate that the assumption of equal variances holds, as the F-value (0.012) and significance level (p = 0.91) are both greater than 0.05.

Table 1: Levene's Test for Equality of Variances Across Groups

	Gender	N	M	Std. deviation	df	F	Sign	t	sig
Attitude towards artificial intelligence	Male	119	38.09	6.06	367	.012	0.91	1.058	.291
	Female	250	38.79	5.87			0.64	1.047	.296

An independent sample t-test was conducted to compare the mean scores of male and female students. The results indicate no statistically significant difference in their attitudes towards AI (t(367) = 1.058, p = 0.291 > 0.05). The mean scores of attitudes are 38.09 (SD = 6.06) for males and 38.79 (SD = 5.87) for females, showing a negligible mean difference of 0.70 points. These findings suggest that gender does not significantly influence students' attitudes towards AI, implying that both male and female students hold comparable perspectives regarding AI. This result aligns with previous studies indicating that exposure to AI technologies, educational experiences, and digital literacy levels might play a more significant role in shaping attitudes than gender alone.

Area wise analysis

H_2: There is no significant difference in the attitude of urban, semi-urban and rural students towards artificial intelligence.

Table 2 illustrates ANOVA findings on AI attitudes among urban, semi-urban, and rural students. The results indicate that there is no statistically significant difference in AI attitudes based on locality (F(2, 366) = 0.320, p = 0.726 > 0.05).

Table 2: ANOVA results comparing AI attitudes across urban, semi-urban, and rural students

	Sum of Squares	df	Mean Square	F	Sig
Between groups Within groups	22.660	2	11.330	.320	.726
Total	12945.964	366	35.371		
	12968.623	368			

The p-value (0.726) is well above the 0.05 threshold, suggesting that the differences in mean scores between urban, semi-urban, and rural students are not substantial enough to be considered statistically significant.

Additionally, the sum of squares for within-group variance (12,945.964) is much higher than the between-group variance (22.660), indicating that most of the variability in AI attitudes exists within each locality rather than between different localities. These findings suggest that students' locality does not significantly impact their attitude towards AI. This could indicate that access to digital technologies, exposure to AI-related education, and personal interest in AI are more influential factors than geographical background.

Item-Level Analysis of Positive AI Attitude Responses

Figure 3 presents the item wise analysis of positive statements. The findings highlight a generally positive student attitude towards AI, with a significant proportion recognising its benefits and potential applications. A substantial majority (70.6%) acknowledge AI's beneficial applications across domains like education and healthcare, which should reassure the audience about AI's potential.
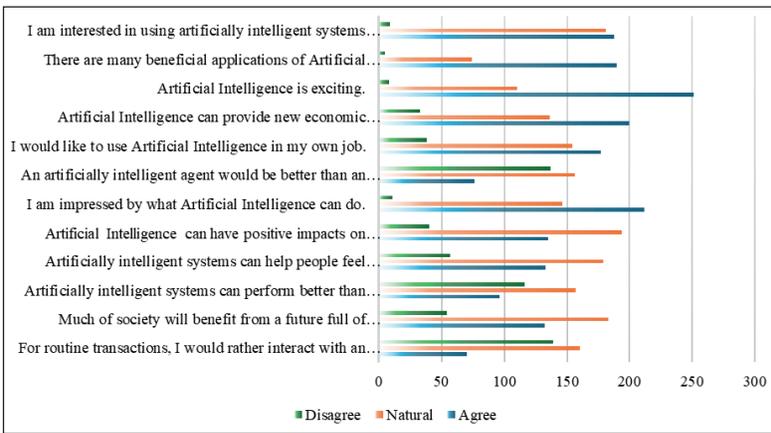

Fig. 3: Item wise analysis of positive statement

Nearly half of the respondents (49.7%) show interest in using AI in daily life, while only 2.4 per cent express disinterest. 68 per cent find AI exciting, and 54.2 per cent believe it can create new job opportunities, though 8.9 per cent remain sceptical about its impact on employment. Additionally, 48 per cent of students express a willingness to integrate AI into their careers, demonstrating an acceptance of AI's role in the future workforce.

In comparison, 10.3 per cent are apprehensive, possibly due to job security concerns. Despite AI's growing capabilities, only 20.6 per cent consider AI agents superior to humans for routine tasks, while 37.1 per cent disagree, favouring human employees. A notable

57.4 per cent of students are impressed by AI's capabilities, and 36.6 per cent believe AI can positively impact well-being, particularly in healthcare, though 10.8 per cent disagree. Furthermore, 36 per cent agree that AI can contribute to happiness, whereas 15.4 per cent remain sceptical. Views on AI's efficiency vary, with 26 per cent believing AI outperforms humans, while 31.4 per cent disagree, emphasising human strengths in creativity and emotional intelligence. Students' optimism about AI's societal benefits is evident in 35.8 per cent of students, though 14.6 per cent express concerns over privacy and automation dependency. However, students vastly prefer human interaction in routine transactions, with only 18.9 per cent favouring AI-based systems.

In comparison, 37.7 per cent strongly prefer human involvement, highlighting the continued value of human touch in service-oriented roles. These insights underscore a generally favourable perception of AI while revealing areas of scepticism that warrant further discussion and reassurance.

Item-Level Analysis of Negative AI Attitude Responses

Figure 4 shows the item wise analysis of negative statements. The results of the survey reveal a notable lack of concern among the 369 students regarding AI, with none (0%) explicitly agreeing that AI is dangerous, sinister, or likely to spy on individuals, indicating a general confidence in AI as a non-threatening technology. A majority of students (58.5%) disagree with the idea that AI is dangerous, 31.2 per cent reject the notion that it is sinister, and 54.2 per cent do not perceive AI as a surveillance tool, reflecting trust in ethical practices and regulations.
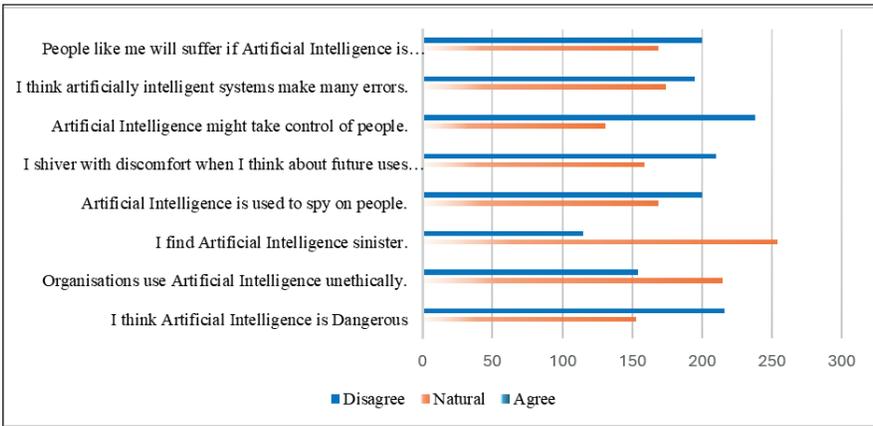
Fig. 4: Item wise analysis of negative statement

Furthermore, 56.9 per cent express comfort regarding the future uses of AI, while 64.5 per cent believe it will remain under human control rather than becoming dominant. Lastly, a significant number (52.8%) do not view AI as highly inaccurate, affirming their confidence in its reliability, and 54.2 per cent feel that the increasing use of AI will not negatively impact their lives, suggesting that most students see AI as a beneficial advancement rather than a threat.

When looking into whether AI will take over human roles as a teacher, the qualitative data gathered from participants shows a variety of viewpoints. The responses showed different concerns and hopes, with participants sharing detailed thoughts on how AI fits into our society. By analysing the data thematically, we found six key themes that show the complicated relationship between the possible advantages and disadvantages of AI. Themes like these highlight the complex nature of the debate, showing how different people have different levels of trust, scepticism, and acceptance when it comes to AI's abilities and limitations. Here are the themes we found in the analysis, which help us understand how people feel about AI possibly taking over human teachers.

A survey with one open-ended question was given to find out why students think AI could replace human teachers. The replies were subjected to thematic analysis, and the resultant themes are outlined below.

Human interaction and emotional support

One of the most significant aspects of teaching is the emotional bond between students and teachers. Teachers provide encouragement, motivation, and personal guidance—elements that AI lacks. Many students emphasized that learning is not just about absorbing information but also about being inspired and guided by a mentor. AI, being emotionless, cannot understand individual student struggles, provide moral support, or foster a nurturing learning environment.

Some responses:

"AI cannot replace teachers because students need human interaction to learn effectively."

"Emotional support and mentorship from a teacher cannot be replaced by a machine."

AI as a supplement, not a replacement

Many students acknowledged the advantages of AI in education but viewed it as a supportive tool rather than a complete replacement for teachers. AI can automate tasks such as grading, providing quick responses, and offering additional learning resources. However, it lacks the ability to engage with students on a deeper level, adapt dynamically, and respond to non-verbal cues. Students generally agreed that AI should complement teachers, assisting in improving efficiency while teachers handle the core aspects of education.

Some responses:

"AI can help teachers by automating tasks, but it should not replace them."

"It can be used as a teaching aid, but it cannot fully take over the role of a teacher."

Lack of creativity and critical thinking

One of the major limitations of AI is its inability to think creatively or engage in complex problem-solving the way human teachers do. Students highlighted that AI follows programmed algorithms, whereas teachers bring real-life experiences, improvisation, and innovative teaching methods to the classroom. Teaching often requires adaptability, contextual understanding, and fostering original thought—areas where AI currently falls short.

Some responses:

"Teachers use real-life experiences and creativity to explain concepts, which AI cannot do."

"Critical thinking and deep discussions require human intuition, which AI does not have."

Ethical and social concerns

Students expressed concerns regarding the ethical implications of AI replacing teachers. AI systems can be biased based on their training data, leading to potential discrimination in education. Additionally, the increasing reliance on AI could result in a decline in human jobs, raising unemployment concerns. Some students also worried about data privacy, misuse of AI, and the potential dehumanisation of the learning experience.

Some responses:

"AI can be biased based on the data it is trained on, which may lead to unfair learning experiences."

"There are ethical concerns about AI taking over jobs that require human judgment."

"AI lacks moral responsibility and could be misused in education."

AI efficiency and advantages

Despite concerns, some students acknowledged the efficiency of AI in certain aspects of education. AI can process large amounts of information quickly, provide instant feedback, and personalise learning experiences for students. The use of AI-driven tools can enhance learning through interactive elements and adaptive learning techniques. However, while these advantages are useful, they do not equate to AI being capable of fully replacing human teachers.

Some responses:

"AI is faster in processing data and can help students get instant responses to their questions."

"It can analyse student performance and provide personalized learning recommendations."

Concerns About AI Replacing Teachers

Some students directly voiced concerns about AI replacing human teachers and the possible negative consequences. They feared that replacing teachers with AI could result in job losses, a decline in the quality of education, and a lack of human connection in classrooms. Over-reliance on AI could also lead to students losing critical problem-solving skills and becoming passive learners who depend solely on technology.

Some responses:

"AI may make teachers redundant, leading to job losses."

"If AI replaces teachers, the education system will lose its human touch."

"Students might rely too much on AI and lose critical learning skills."

Conclusion

The conclusion of this research work indicates a predominantly favourable perspective on AI among both UG and PG students, with numerous individuals acknowledging its prospective advantages in the areas of education, healthcare, and future job opportunities. A significant percentage of students demonstrate excitement regarding the integration of AI into everyday academic work. Nonetheless, students underscore that AI is unable to replicate the emotional support, creativity, and critical thinking that human educators offer, thereby emphasising the significance of human interaction in cultivating impactful learning experiences. Concerns regarding job security, privacy, and biases in AI were highlighted by the students, emphasising the importance of AI serving as a complement to, rather than a replacement for, human educators. With only a small percentage of students expressing concerns about its possible threats, the results also show a general confidence of AI as a beneficial technology. Students hope AI will remain under human control. Given these positive views, there is still a significant preference for human involvement in regular classroom transactions and an understanding of AI's ethical and innovation constraints. The efficiency and ability to automate tasks of AI support teachers, not to replace them. The findings demonstrate the necessity for a balanced strategy to include AI to improve education and maintain human teachers.

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