

# ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION: A CROSS-SECTIONAL STUDY AMONG COLLEGE AND UNIVERSITY-LEVEL STUDENTS OF ASSAM, INDIA

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Himashree Dutta<sup>1</sup>, Gourab Kalita<sup>2</sup>, Dr. Aditi Das<sup>3</sup>

<sup>1,2,3</sup> Department of Mathematics-Statistics, Gauhati Commerce College, 781021, India

## ABSTRACT

**Background:** Artificial Intelligence is an evolving technology in the education sector. In India, with the prevailing digital divide among various sections of the society, it is feared that a 'AI Divide' would further aggravate the situation. **Objectives:** This paper aims to assess the perspective and level of awareness among college and university-level students in Assam, India, regarding AI and to assess the association between AI usage in academic purpose and the socio demographic characteristics of these students. **Materials and Methods:** Simple Random Sampling has been used for data collection from 200 respondents using a structured questionnaire. Chi square test is used for analysis. **Results:** Familiarity with AI and AI-related courses reveals that 14.5% is 'not familiar at all' and 15.5% is "very familiar" with AI and its usage. 7% have undergone AI-related courses, indicating a potential gap in AI education. Male students show a significantly higher usage of AI for academic purposes compared to female students in Assam. Urban students exhibit a significantly higher usage of AI compared to rural students. Literacy level of parents and the monthly income of parents do not show a significant association with AI usage among students in Assam. Students who are more familiar with AI tend to use it more for academic purposes. Whether students have undergone any AI related course does not significantly influence their usage of AI for academic purposes.

**Keywords:** Artificial Intelligence, Simple Random Sampling, p-value, Chi square test.

## 1. INTRODUCTION

Artificial Intelligence (AI) is a branch of study which deals with simulation of intelligence in machines. It mainly deals with the study as to how the human brain thinks, learns and works. According to the father of AI, John McCarthy, "AI is the science and engineering of making intelligent machines, especially intelligent computer programs". At early times people wondered as to whether machine could think and work like human beings. As such, around the year 1950, a computer pioneer named Alan Turing started to examine and determine whether a computer could demonstrate the same level of intelligence as human beings. He introduced a test called Turing Test. In 1956 at the first-ever AI conference, John McCarthy first developed the term 'Artificial Intelligence' and also the first-ever AI software program was created later that year by Allen Newel, J.C. Shaw and Herbert Simon. The main goal of AI is to create an expert system and also to implement human intelligence in machines.

### 1.1 Uses of AI

In modern times, AI has emerged as one of the most evolving technologies which encompasses various sub fields, including machine learning and deep learning, thereby performing complex tasks that historically only a human could perform, as far as reasoning, making decisions or solving problems is concerned. AI is extensively used in the following fields:

**1.1.1 AI in Gaming:** AI is used in gaming industries. There are many automatic games like chess, poker, carom etc where machines are playing with humans. Machine can think large number of possible moves and can play against humans.

**1.1.2 AI in natural language processing:** AI can provide digital assistance or virtual assistance like Alexa, Siri, etc whereby machines can understand human languages.

**1.1.3 AI in Healthcare:** AI has a significant effect on healthcare. Mainly AI helps in fast diagnosis of any health issue or illness, thereby making treatments easier. Doctors can perform a surgery from staying at a different place by using certain robots (robotic surgery).

**1.1.4 AI in finance:** AI is used in finance with adaptive intelligence which helps in making automatic chat box and also in algorithm trading.

**1.1.5 AI in data security:** AI helps in making data or application more secure. Mainly with the help of AI we can prevent any cyber-attack.

**1.1.6 AI in speech recognition:** AI helps in extracting the meaning of a sentence in a human conversation. Basically, it is used for slang removal, noise removal etc.

**1.1.7 AI in E-commerce:** AI is used in various fields of E-commerce, such as automatic recommendation, where AI can identify the choices and patterns of the users and then make recommendations accordingly.

**1.1.8 AI in education:** AI has made a massive impact in education. AI is mainly used in education as a problem solving assistant.

**1.1.9 AI in social media:** AI is used in various social media platform such as Facebook, Instagram, Twitter and most recently in Whatsapp. AI shows the things of our choice automatically according to our previous watch and search history.

## **1.2 AI in Education**

In today's world, technology is advancing at a very rapid pace. Technology has always played a very important role in education but its current use is more prevalent than ever. Thanks to the increased availability of smart devices and web base curriculum. A new dimension has been added with swift advances in the field of AI. The New Education Policy, 2020 recognizes the immense potential of AI and has recommended its integration into the education system. To increase technology integration in schools, CBSE has introduced AI in school curriculum from class 6<sup>th</sup> to 10<sup>th</sup> standards. AI has the potential to transform education by making it more efficient, effective, and accessible to students worldwide. However, the crucial part is to ensure that the use of AI is Edu effective, ethical, and responsible and that it complements the work of human teachers rather than replacing them. **Zhai et al(2021)**<sup>[1]</sup> in their study on '*Review of Artificial Intelligence (AI) in Education from 2010 to 2020*', offered a content analysis of studies with the goal of revealing the ways in which AI has been used in the

field of education and investigating future directions and obstacles in this area of study. The main goal of introducing AI application in education is to enhance the learning experience of the students so that outcomes are enhanced, thereby making the students more creative, innovative and productive.

One of the ways in which AI is being used in education is through personalized learning. With personalized learning, AI algorithms are used to analyze a student's performance and provide customized lesson plans and recommendations for what the student should study next. This can be especially useful for students who may be struggling in a particular subject, as the AI can identify the specific areas where the student needs targeted instruction. Another way in which AI is being used in education is through the development of virtual tutors and teaching assistants. These AI powered tools can help students with tasks such as homework help, answering questions, and providing feedback on assignments. AI is also being used in education to assess student progress and identify areas for improvement. One of the potential benefits of using AI in education is that it can help to reduce the workload for teachers. With AI powered tools, teachers can spend less time on tasks such as grading assignments and providing feedback, and more time on tasks such as lesson planning and providing one-on-one support to students. This can allow teachers to be more effective in their roles, as they are able to focus on the tasks that are most important for student learning.

However, there are also a number of potential challenges to using AI in education. One concern is the potential for AI algorithms to perpetuate biases that are present in the data used to train them. It is important to be aware of these biases and take steps to address them when using AI in education. Another challenge of using AI in education is the potential for it to replace human teachers. While AI can certainly be a useful tool in the classroom, it is important to remember that it cannot replace the role of a human teacher. **Guilherme (2017)**<sup>[2]</sup> in his paper '*AI and education: the importance of teacher and student relations*', evaluates the current technologicalization of education and the effects it has had on relationships within the classroom. He conducted a thought experiment to determine whether the advancement of artificial intelligence (AI) could eventually successfully replace human teachers in the classroom. **Holmes et al (2022)**<sup>[3]</sup> offered an overview of the pedagogical and instructional presumptions of the AI systems now in use in education. In their research, they created a typology of AIED systems, outlining various applications of AI in learning and education, and demonstrated how they are based on varying conceptions of

what AI and education are or may be. **Fitria (2021)**<sup>[4]</sup> conducted a study on Artificial intelligence (AI) in education: using AI tools for teaching and learning process. The study revealed that AI has been extensively used in a number of educational technology platforms, including, Virtual Mentor, Voice Assistant such as Google Assistant (Google), Siri (Apple), Cortana (Microsoft), Intelligent Content, etc. **Limna et al (2022)**<sup>[5]</sup>. Their study found that AI helps educators and learners in many ways, such as providing students with access to a vast array of educational resources tailored to their individual subject areas and learning requirements.

2. OBJECTIVES OF THE STUDY

The main objectives of the present study are:

- i. To assess the level of awareness among college and university-level students in Assam regarding AI.
- ii. To study the perspective of these students as regards AI in education.
- iii. To assess the association between AI usage in academic purpose and the socio demographic characteristics of these students.

3. DATA AND METHODOLOGY

Quantitative research has been used to investigate the prevalence of AI usage among college and university-level students in the North-Eastern state of Assam in India. A cross-sectional survey design is employed to collect data from a sample of 200 students selected randomly from various educational institutions during the month of April, 2024 across Assam. Data have been collected through a structured questionnaire from the selected participants using Simple Random Sampling technique.

Key variables examined in the study include demographic characteristics of selected participants such as age, gender, place of residence, academic year and other variables such as use of AI for academic purpose, literacy level of parents, monthly income of parents, possession of computer/laptop/mobile phone, etc., infrastructure access, knowledge and usage of AI and whether they have you undergone any AI related course.

Descriptive Statistics has been employed to analyze the prevalence of AI usage among college and university-level students in Assam based on the sample of 200 participants. Chi-square analysis is conducted to examine the association between demographic variables and usage of AI in academic purpose. The significance level is set at  $\alpha=0.05$

and p-values are calculated to determine the strength of association.

4. ANALYSIS AND RESULTS

TABLE 1 provides the demographic and technical landscape among a sample of 200 college and University-level students in Assam. A notable observation is that about 66.5% of students utilize AI for academic purpose, while 33.5% do not incorporate AI for their academic activities. Among the student sample, males comprise a majority, representing 65% of the total, while females comprise 35%. The data indicates a higher concentration of students residing in urban areas (63%) compared to rural areas (37%). Most parents of the sampled students possess at least a secondary education level (30%) or Higher (39%), with a small proportion (9.5%) being illiterate. As far as family income is concerned, families across various income brackets are represented, with each segment accounting for roughly one-fourth to one-third of the total. Nearly all sampled students (95%) own essential technical devices such as computer, laptop and mobile phones.

Regarding familiarity with AI and AI-related courses, 14.5% is ‘not familiar at all’, while a significant portion falls into the ‘moderately familiar’ (38.5%) and the ‘somewhat familiar’ (31.5%) categories. Only a minority (15.5%) claim to be “very familiar” with AI concept. Moreover, only a small fraction (7%) of the sampled students has undergone any AI-related courses, indicating a potential gap in AI education.

TABLE 1- DISTRIBUTION OF COLLEGE AND UNIVERSITY LEVEL STUDENTS IN ASSAM BY THEIR BACKGROUND CHARACTERISTICS:

Background Characteristics		Frequency	Percent
Do you use AI for academic purpose	Yes	133	66.5
	No	67	33.5
Gender	Male	130	65.0
	Female	70	35.0
Place of residence	Urban	126	63.0
	Rural	74	37.0
Literacy of parents	Illiterate	19	9.5
	Basic	43	21.5
	Secondary	60	30.0
	Higher	78	39.0
Monthly income of parents	Below 15000	60	30
	15000-30000	57	28.5
	30000-60000	32	16.0
	Above 60000	53	26.5

Continued Table 1			
<b>Do you possess computer/laptop/mobile phone?</b>	<i>Yes</i>	190	95.0
	<i>No</i>	10	5.0
<b>Knowledge &amp; usage of AI</b>	<i>Not at all familiar</i>	29	14.5
	<i>Somewh at familiar</i>	63	31.5
	<i>Moderately familiar</i>	77	38.5
	<i>Very familiar</i>	31	15.5
<b>Have you undergone any AI related course?</b>	<i>No</i>	186	93.0
	<i>Yes</i>	14	7.0

TABLE 2 represents the prevalence of AI usage among college and university-level students of Assam. From the table it is seen that male students show a significantly higher usage of AI (p value= 0.021<0.05) for Academic purposes compared to female students in Assam. This indicates a potential gender gap in AI adoption for educational activities. While urban students exhibit a significantly higher usage of AI (p value=0.037<0.05) compared to rural students. This may be attributed to better technology and resources available in urban areas. However, there is no significant association between literacy level of parents and AI usage among students (p value=0.771>0.05) in Assam. This suggests that parental literacy may not be barrier to accessing AI technology for educational purposes. Similarly monthly income of parents does not show a significant association (p value= 0.129>0.05) with AI usage in education among students. This suggests that even students from lower-income group have access to AI technology, possibly through educational institutions or other means. Moreover, students who possess computers, laptops or mobile phones are significantly more likely to use AI for academic purposes. From the variable Knowledge and usage of AI, it is seen that, students who are more familiar with AI tend to use it more for academic purposes (significant at 0.03<0.05). This underscores the importance of education and awareness in fostering AI adoption among students in Assam. However, whether students undergo any AI related course does not significantly influence their usage of AI for academic purposes (p value=0.142>0.05).

**TABLE 2- PREVALENCE OF AI USAGE AMONG COLLEGE AND UNIVERSITY LEVEL STUDENTS IN ASSAM BY SOCIO DEMOGRAPHIC CHARACTERISTICS:**

Background Characteristics	Do you use AI for academic purpose?		p-value
	No	Yes	
<b>Gender</b>			
<i>Male</i>	32(24.3%)	98(75.7%)	0.021 (*)
<i>Female</i>	35(50%)	35(50%)	
<b>Place of residence</b>			
<i>Urban</i>	28(22.2%)	98(77.8%)	0.037 (*)
<i>Rural</i>	39(52.4%)	35(47.6%)	
<b>Literacy of parents</b>			
<i>Illiterate</i>	11(61%)	8(39%)	0.771
<i>Basic education</i>	11(22%)	32(78%)	
<i>Secondary education</i>	21(35%)	39(65%)	
<i>Higher education</i>	25(32%)	53(68%)	
<b>Monthly income of parents</b>			
<i>Below 15000</i>	32(53.3%)	28(47%)	0.129
<i>15000-30000</i>	18(32%)	39(68%)	
<i>30000-60000</i>	11(34.3%)	21(65.6%)	
<i>Above 60000</i>	7(13.2%)	46(86.8%)	
<b>Do you possess computer/laptop/mobile phone</b>			
<i>No</i>	10(100%)	0(0%)	0.03 (*)
<i>Yes</i>	57(30%)	133(70%)	
<b>Knowledge &amp; usage of AI</b>			
<i>Not at all familiar</i>	18(62.5%)	11 (37.5%)	0.05 (*)
<i>Somewhat familiar</i>	28 (44.4%)	35 (56.6%)	
<i>Moderately familiar</i>	14 (18.2%)	63 (81.8%)	
<i>Very familiar</i>	5(16%)	26(84%)	
<b>Have you undergone any AI related course?</b>			
<i>No</i>	67(36%)	119(64%)	0.142
<i>Yes</i>	0(0%)	14(100%)	

(\*) denotes significant at 5% probability level

## 5. LIMITATION AND SCOPE FOR FUTURE RESEARCH

A major limitation of this study is that the researchers had to restrict the sample size to 200 respondents only. It is believed that a bigger sample size would yield more robust results. Moreover, type of AI used by the students in the academic pursuits was not included, which could have broadened the scope of the study. As such, study on “Type of AI used by the student community in association with their socio-demographic characteristics would open a newer field for future research.

## 6. CONCLUSION AND POLICY PRESCRIPTION:

AI is emerging as the most discussed and debated subject as far as its usage in the education sector is concerned. It is overcoming enormous challenges as it must face a completely new era of customized learning with the help of advanced support systems. Though the student community is trying their level best to reap the benefits of AI in education, yet in a developing country like India, where there exists high level of digital divide among various sections of the society in regards to their socio-economic and demographic characteristics, it is feared that a newer divide which we may refer to as the 'AI Divide' would further act as a catalyst in aggravating the already existing digital divide. It is the need of the hour for targeted government interventions, so that the students belonging to the lower economic class and residing in the rural areas get the benefits of AI usage in education. For this, awareness programmes on abundant usage of AI in the education sector should be made available to all students. Moreover, curriculum on AI should be made compulsory for all UG and PG level students of our country. Infrastructure in colleges and universities should be so developed that the students can use AI for personalized learning and innovation through easy access to resources. Though there are certain hazards connected to the development and use of artificial intelligence, including worries about privacy, security, and safety, yet its responsible utilization can go a long way in the education industry, thus making learning more successful and entertaining.

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