

Artificial Intelligence in Education: Exploring the Challenges Faced in Integration



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Brian Oommen Bino

Akshaya Rajesh

Elizhwa Vijo

Akhil P

CHRIST (Deemed to be University), Bangalore

(brian.bino@bcomh.christuniversity.in)

(akshaya.rajesh@bcomh.christuniversity.in)

(elizhwa.vijo@mcom.christuniversity.in)

(akhil.p@christuniversity.in)

The present study examines the challenges of integrating AI into the education system. With AI's growing popularity, it has made its way into students' educational activities. AI is being utilized extensively in the sector, from completing homework to conducting examinations. The study aims to identify the various challenges Artificial Intelligence poses, namely deterioration in research aptitude, decline in holistic growth, ethical concerns, and disciplinary concerns. The data was collected using structured questionnaires from 430 students in higher education. The research has utilized statistical tools such as exploratory factor analysis with the support of SPSS. The study reveals the challenging factors that act as barriers to students' educational and holistic growth. The study also shows how factors significantly vary based on the respondents' gender.

Keywords: Artificial Intelligence, Challenges, Factors, Education, Ethical Usage, ChatGPT

1. Introduction

Artificial Intelligence is now an inevitable part of one's day-to-day life. However, it is not a new term. It was coined in 1956 by John McCarthy, who followed up on Turing's work (Turing, 1937). Turing described the existence of intelligent reasoning and thinking that could go into intelligent machines.

AI has made its way into almost every sector and discipline. AI outperforms humans in terms of accuracy, efficiency, and timely execution of medical processes. (Ali et al., 2023). This rapid pace makes it a useful tool, which also aids in early detection and diagnosis of various diseases. In the business sector, AI has facilitated the development of cutting-edge technologies such as anomaly detection, demand forecasting, dynamic pricing, and enhanced customer experiences through personalisation. These provide valuable insights, enabling quick decision-making, efficient operations, and so on (Bharadiya, 2023). AI is even transforming media and entertainment content and the mode through which it is consumed (Nautiyal et al., 2023).

Technology was introduced to teaching and education in the 1970's. The use of technologies helps educational institutions build personalised platforms or applications that assist in the management and administration of student activities in an organised manner (Al Braiki et al., 2020; Chan, 2023). Disregarding the risks and concerns regarding plagiarism and creativity, AI is also being widely used by students as well as teachers. AI is becoming very useful to educators due to the increase in teacher-student ratio over time. It assists educators in various aspects, such as developing the Automatic Question Generating System. (Kurdi et al., 2020)E, which is predominantly used in language tests. Automation of evaluations, particularly Automated Essay Evaluation, is an AI tool that assists in evaluating long essay-based answers and is already being used in most US states (Ramesh & Sanampudi, 2022). These research findings show that AI is used differently in analysing students' learning styles and requirements, thereby creating an effective personalised study plan. The study by Kooli 2023, suggests several AI tools are useful in improving the accuracy, efficiency, personalisation, and accessibility of education. However, it must be used transparently, along with thorough data verification. Moreover, to effectively integrate AI into education, it is a prerequisite for teachers to have AI-specific technological and pedagogical knowledge (Celik, 2023).

The widespread popularity of ChatGPT has made it synonymous with Artificial Intelligence. This Generative AI tool was released in November 2022 and completely transformed the educational landscape. Generative AI refers to the "computational techniques that are capable of generating seemingly new, meaningful content such as text, images, or audio from training data" (Feuerriegel et al., 2024). ChatGPT and other tools, such as Gemini and Copilot, come under the category of generative AI. Students typically utilise AI for research, to brainstorm ideas, to efficiently analyse vast amounts of data (through AI-generated summaries), and to obtain feedback (Chan & Hu, 2023).

2. Literature Review

While the use of AI has become prevalent, the discussions about its ethical implications have also been significant. The COVID-19 pandemic has caused an increase in academic dishonesty, and the development of Large Language Models (a type of generative AI) and usage of generative AI is leading to a continuation of this rising trend (Perkins, 2023). The popularity of artificial intelligence (AI)-powered chatbots has raised concerns about the need to detect the authenticity of student work. These tools are being misused to plagiarise assignments, to obtain large amounts of data without thorough research, etc. The difficulty in the detection and prevention of misuse is a major concern of educators. (Crawford et al., 2023). Moreover, regular usage of

such systems is also linked to a diminished capacity for information retention and an increased reliance on these systems for information (Dergaa et al., 2023).

Though AI has revolutionized the education sector, students’ over-dependence on AI tools to address their academic challenges unknowingly has a lot of consequences on their critical thinking abilities (Suriano et al., 2024). There are also concerns regarding the deterioration of study habits and overall discipline. Over-reliance on AI has an adverse impact on students’ cognitive abilities, particularly academic writing. Over-reliance refers to the acceptance of AI-generated recommendations without verification and this can impair one’s decision-making and analytical thinking skills (Zhai et al., 2024). Using ChatGPT, Copilot, Gemini, and other AI tools for academic purposes by students makes it difficult for the teacher to assess correctly where the student stands in his/her academic journey and help them out effectively.

In the Indian context, (Agarwal, 2005) states that inflexible education structure, unplanned implication of rules, and low level of funding are degrading higher education standards. The new teaching and learning in India are constituting a paradigm shift (Menon et al., 2014). According to Croxford and Raffe (2015) Implementing AI and other new technologies is very important in the Indian education system. AI-powered libraries and reading materials can provide the latest and most advanced level of knowledge to students(Cox et al., 2018). The focus must be given to designing AI tools specifically for education.

AI's role in a student's academic life is well recognised, but there remains significant concern about how AI chatbot usage affects students' perception of academic integrity(Niloy et al., 2024). Given the advantages of an AI Chatbot, we must look into the drawbacks, such as a lack of deep understanding, higher-order thinking skills, and more. There are many threats to education too, some of them being a lack of knowledge of the context and democratising plagiarism(Farrokhnia et al., 2024). This study aims to critically examine the challenges of incorporating AI into the education system and identify the various ethical, disciplinary, creative, and inquisitive challenges that AI presents. This study would also identify the challenging factors that act as barriers to students' educational and overall development.

3. Methodology

The study utilises a quantitative approach. The research sampling was done on a convenient sampling basis. According to Krejcie and Morgan (1970), a minimum of 384 samples are required for an indefinite population. However, to have a detailed study that aims to contribute to generalisation, this study used 430 samples. The selected sample size represents the population (higher education students who utilise AI in education). The tool used was a structured electronic questionnaire circulated to the participants. The questions were formulated using the Likert scale to better understand the respondents’ opinions and beliefs. All respondents were ensured anonymity and confidentiality of their responses. Exploratory factor analysis is conducted on the results with the support of SPSS. An independent sample t-test was also conducted to assess the difference in responses based on the respondents' gender.

4. Results

Table 1 KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.853
Bartlett's Test of Sphericity	Approx. Chi-Square	1408.895
	Df	78
	Sig.	0.000

Table 1 shows the derived results of the KMO and Bartlett's Test of Sphericity. The Kaiser-Meyer-Olkin Measure is 0.853, which is above the minimum value of 0.7, indicating the adequacy of the sample size. The Bartlett’s Test is found to be highly significant. This indicates equality of variance in all samples.

Table 2 Exploratory Factor Loading of Challenges

Factor	Variables	Factors loading	Variance
Deterioration in Research Aptitude	AI reduces the ability to think outside the box	0.755	21.130
	AI hinders creativity	0.729	
	AI hampers the development of writing skills	0.671	
	AI deteriorates the desire to research	0.578	
	The use of AI leads to increased laziness in individuals	0.548	
Decline in Holistic Growth	The use of AI leads to an information overload	0.741	38.413
	The usage of AI leads to biased decision-making	0.662	
	Over-dependence on AI adversely affects social skills	0.643	
	AI reduces the curiosity to learn	0.604	
Ethical concerns	AI-generated information can be incorrect	0.806	51.317
	Usage of AI leads to data privacy concerns	0.778	
Disciplinary concerns	The use of AI leads to plagiarism	0.784	61.053
	AI adversely affects discipline (Time Management)	0.556	

*Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.*

Table 2 indicates the results of the Exploratory Factor loading of Challenges. The first factor is 'Deterioration in Research Aptitude'. The research aptitude of a student discusses their initiative, ability, and desire to conduct research studies. Research allows students to gain elaborate knowledge about a particular subject. To conduct research successfully, students must possess higher-order thinking skills, innovative ideas, a passion for research, and good writing skills, among many other qualities. A fall in the Research Aptitude of students implies reduced inquisitiveness and zeal to acquire more knowledge.

The second factor is 'Decline in Holistic Growth'. Holistic growth refers to the overall development of a student, including decision-making abilities, societal skills, and intellectual fervour. By seeking knowledge and carrying out academic activities in an organic manner, students undergo development in several facets apart from the educational aspect. For example, speaking to experienced people from a particular field to obtain information improves social skills. The usage of AI deteriorates holistic growth, implying a dilution of the positive effects of obtaining knowledge organically.

The third factor is 'Ethical Concerns'. Ethical concerns about AI refer to the moral conflicts and challenges linked to using AI. Blind dependence on AI-generated information without verification seriously threatens the credibility of students' work. Data confidentiality concerns and misleading information are serious concerns, and a downfall in the ethics of a student can lead to distrust and will put a taint on their record. To develop enhanced ethical integrity, a student must keep his principles high and should not take expedient solutions.

The fourth factor is the Disciplinary Concerns raised. Generally, disciplinary issues are concerned with the misconduct of an individual. The discipline of a student is closely linked to his/her behaviour, quality of work, characteristics, etc. Over-dependence on AI can lead to a laid-back attitude, with students procrastinating their work until the last moment. This mismanagement of time is directly related to the availability and almost instant access to abundant information through AI tools. They directly obtain information from AI with no reference or acknowledgement to the original source of content or its context, leading to plagiarism.

Table 3 Descriptive Statistics

	Gender	N	Mean	Std. Deviation
Deterioration in Research Aptitude	Male	140	13.8000	3.27669
	Female	290	14.7172	2.89063
Decline in Holistic Growth	Male	140	11.8786	2.97343
	Female	290	12.5379	2.90810
Ethical Concerns	Male	140	7.2071	1.48613
	Female	290	7.1793	1.47021
Disciplinary Concerns	Male	140	6.2214	1.60515
	Female	290	6.6069	1.46373

Table 4 Independent Sample T-Test

Factor	t-value	df	Sig. (2-tailed)
Deterioration of Research Aptitude	-2.95	428	.003***
Decline in Holistic Growth	-2.187	428	.029**
Ethical Concerns	0.183	428	0.855
Disciplinary Concerns	-2.479	428	.014**

For the gender to significantly impact a factor, the Sig. (2-tailed) the value must be less than 0.05. The above tables indicate that the effects of the Deterioration of Research Aptitude, Decline in Holistic Growth, and Disciplinary Concerns differ based on the respondents' gender. Female respondents consider the effect of AI on the deterioration of research aptitude to be a greater concern than male respondents. Females tend to be more sensitive to the effect of AI on the decline in holistic growth than males. The effect of disciplinary concerns is considered more significant among the female respondents than the male respondents. Overall, the challenges of utilizing AI are better understood and valued by female respondents.

5. Conclusion

Integration of AI into education is inevitable. The positive contributions of AI in the sector must be embraced while considering its limitations. The present study examines the challenges and underscores critical areas that require attention to ensure AI's ethical, practical, and holistic application in educational systems. This study identifies four factors as the significant constraints. Firstly, the deterioration in research aptitude arises from over-reliance on AI-driven tools, which may inadvertently stifle critical thinking and creativity. Students become passive recipients of information rather than active contributors to knowledge creation. It is crucial to strike a balance in the reliance on AI by conducting independent inquiries and verifications. While AI excels in delivering knowledge, it lacks the human touch essential for nurturing well-rounded individuals. The study found a decline in holistic growth that reflects the challenges of fostering emotional intelligence and interpersonal skills in an AI-driven educational landscape. This concern can be addressed by designing a hybrid approach, i.e., combining AI tools with human guidance. Another study finding relates to the ethical concerns in using AI in education. AI's integration into education raises serious data privacy and plagiarism concerns. Strong and comprehensive policies regarding AI usage by the government, educational institutions, or even AI tool developers can help solve this problem to a large extent. Lastly, the study found disciplinary concerns for the potential erosion of classroom dynamics. Using AI as a complementary tool rather than the primary source of information will ensure that students' discipline will remain intact in the long run.

Addressing the identified concerns through policy interventions and commitment to ethical practices is vital in leveraging the full potential of AI tools. AI must be considered a complementary tool rather than a replacement for human expertise. Balancing traditional sources and AI-generated information is essential to facilitate sustainable integration for an enriched learning experience.

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