Role of AI in transforming Teacher and Student Workflows in Classroom Settings

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The term "artificial intelligence" (AI), coined by John McCarthy in 1956, has evolved to become an essential and integral part of modern life, with tools like Chat GPT, Canva's Magic Tools and Google Bard, revolutionizing interactions with technology. This study investigates AI's impact on education, focusing on underexplored areas such as its effect on students' problem-solving skills, and teaching practices. While prior research has examined AI's broader role in education, limited attention has been given to its influence on teacher and student workflows and the personal experiences associated with these tools. Using a mixed-methods approach, including surveys and interviews, the study examines AI's role in Commerce, Management and Social Science c Colleges in Kochi, Kerala. It seeks to assess both the benefits and challenges of AI integration, contributing to a nuanced understanding of its influence on educational workflows and offering insights into teachers' and students' perspectives on AI in daily academic routines.

Keywords: Artificial Intelligence, Teaching and Learning, Higher Education

1. Introduction of the study

The term "artificial intelligence" was first coined by John McCarthy in 1956 during the first academic conference on the subject. Nearly seven decades later, AI is rapidly becoming an integral part of our daily lives. For the purpose of analysing the role of AI in transforming teacher and student workflows in classroom settings, let's look into the basic definition of AI. Specifically, we define artificial intelligence (AI) as computing systems that can perform human-like tasks such as learning, adapting, synthesizing information, self-correcting, and processing data for complex decision-making. While the impact of AI on education has been widely explored, one area that remains underexplored is its effect on students' cognitive abilities and problem-solving skills, as well as its role in enhancing teaching processes. Much of the existing research has focused on the broader integration of AI in education, but fewer studies have examined the personal experiences of students and teachers in relation to the tools they use. Specifically, there is limited attention to how AI tools are perceived in terms of their positive and negative impacts on daily workflows. This gap presents an opportunity for further investigation, which this study aims to address.

By exploring the impact of artificial intelligence on the cognitive abilities and problem-solving skills of students, as well as its role in enhancing teaching practices, this study seeks to contribute to a more comprehensive understanding of AI's influence on teacher and student workflows in classroom settings. It also aims to offer new perspectives on the personal experiences of both students and teachers regarding the integration of AI tools into their daily academic routines, an area that has been largely overlooked in existing research.

2. Literature Review

Artificial Intelligence (AI) is increasingly recognized as a transformative force in education, profoundly altering both teacher and student workflows. As AI technologies continue to evolve, their integration into the classroom offers significant potential to enhance teaching, learning, and administrative processes. AI is particularly noted for its ability to adapt to individual learning needs, enabling a more personalized educational experience. Studies have shown that AI can improve student learning outcomes, streamline administrative tasks, and increase access to quality education. For example, Makinde et al. (2024) discuss how AI, in next-generation mobile management systems, can create adaptive, data-informed learning environments. This allows teachers to focus on providing more individualized instruction, while AI assists in managing repetitive tasks such as grading. AI-powered chatbots also enhance student learning by offering real-time support. Wu and Yu (2023) in their meta-analysis, found that AI chatbots had a notable positive effect on students' learning outcomes, particularly in higher education. The novelty of these tools, however, leads to a temporary spike in performance, with the effectiveness diminishing as students become more familiar with the technology.

The role of generative AI in higher education assessments is another area of growing interest. Smolansky et al. (2024) explored educator and student perspectives on AI's impact on assessments, finding concerns about academic integrity and the loss of creativity in student work. Despite these concerns, the study highlights the opportunity to adapt assessments to prioritize higher-order thinking, critical thinking, and real-world applications. This shift in focus would encourage deeper student engagement and understanding, rather than relying on traditional forms of knowledge recall. The study also suggests that assessments should be designed to foster creativity and the application of knowledge, making AI an integral part of the learning

process rather than merely a tool for completing tasks. Additionally, Chan and Tsi (2024) explored the broader question of whether generative AI could replace teachers in higher education. While some participants expressed concerns that AI might replace human teachers, most emphasized the irreplaceable human qualities of teaching, such as creativity, emotional intelligence, and critical thinking. Their research suggests that AI should complement teachers' roles by enhancing the teaching process, rather than attempting to replace the educator altogether.

The evolving role of teachers in an AI-enhanced classroom has been another area of focus in recent studies. Nikitina and Ishchenko (2024) argue that AI should be viewed as a supportive tool that enhances the teacher's ability to focus on more impactful activities, such as personalized instruction and mentorship. AI can automate tasks like grading, giving teachers more time to engage with students on a deeper level. However, despite AI's growing influence in the classroom, the study emphasizes that essential human qualities, such as emotional intelligence and creativity, cannot be replicated by AI. These qualities continue to make human teachers irreplaceable, and AI should be seen as a tool to enhance, not replace, these aspects of teaching. Similarly, Bouras (2024) explored the "bad teacher dilemma" in an Algerian university, showing that while AI can enhance teaching, it should not replace teachers. The study highlights the importance of AI literacy for educators, allowing them to use AI effectively and avoid potential risks. Despite the increasing use of AI, students continue to respect and value human teachers, reinforcing the idea that AI cannot replace the expertise and personal qualities that human educators bring to the classroom.

While AI offers numerous benefits, it also presents several challenges that must be addressed. Rodzi et al. (2024) conducted a study at University Teknologi MARA in Malaysia, using DEMATEL analysis {DEMATEL- Decision Making Trial and Evaluation Laboratory is a method for analysing complex systems and identifying causal relationships between factors. It's used to visualize and solve problems in various fields, such as management, economics, and engineering}to explore the negative impacts of AI adoption on students. The study identified several issues, such as privacy concerns, reduced personal interaction, and over-reliance on technology. These negative effects point to the need for careful implementation strategies to ensure that AI integration does not hinder the educational experience. AI has the potential to diminish critical thinking skills, as students might become overly reliant on technology to solve problems. There is also concern that AI could reinforce biases in algorithms, exacerbating existing inequalities in education. Furthermore, the use of AI could reduce human interaction, limiting the development of social and emotional learning among students. These challenges emphasize the importance of using AI responsibly and ensuring equitable access for all students.

As AI continues to transform education, both educators and students must adapt to its integration in the classroom. For teachers, AI literacy is essential to ensure that these technologies are used effectively. Educators should embrace AI as a tool to enhance their pedagogical practices, allowing them to focus on higher-level activities that AI cannot replace, such as mentoring and fostering creativity. Similarly, students must learn to use AI responsibly, understanding its potential and limitations. AI should not be seen as a replacement for critical thinking or creativity, but rather as a tool that complements and enhances these abilities.

In conclusion, AI is playing an increasingly significant role in transforming both teacher and student workflows in classrooms. While concerns about AI replacing human teachers persist, the majority of studies suggest that AI should serve as a complementary tool, enhancing the educational experience rather than replacing the irreplaceable human elements of teaching. With proper integration, AI has the potential to significantly improve teaching and learning outcomes. However, its adoption must be accompanied by efforts to address ethical concerns, ensure equitable access, and preserve the essential human qualities of education. The future of AI in education looks promising, provided that it is used thoughtfully and responsibly, with a focus on supporting educators and enhancing the learning experience for students.

3. Objectives of the Study

1. To understand the role AI tools on students' thinking skills, and classroom activities.
2. To assess the role of AI in enhancing teaching practices and teacher workflows, and examine perceptions of its positive and negative effects on daily academic routines**.**

4. Study Methodology

The study employed both primary and secondary data sources. The primary data was collected from two distinct samples. The first sample consisted of undergraduate (UG) students enrolled in various arts, commerce, and social science courses across colleges within Kochi, Kerala. The second sample comprised teachers from whom data was gathered through interviews. In total, 136 students and 10 teachers participated, resulting in a total sample size of 146 respondents. A purposive sampling technique was utilized, selecting individuals who had prior experience using AI tools. Data collection was carried out using a combination of questionnaires for the student sample and interviews for the teacher sample. The data collection process occurred from 9th November to 25th November 2024. Data analysis was performed using Excel. Secondary data for the study was sourced from PhD theses, academic journals, articles, and other relevant publications.

Analysis and Result

The sample -students

A total of 136 responses were analysed using excel and the following table 1 shows its demographic details.

Table 1 *Demographic Details of Students*

Group		Percentage
Gender	Male	54.4%
	Female	45.60%
Age	17-19	68.38%
	20-22	30.14%
	23-25	0.73%
	26 & above	0.73%
Program of the study	Bcom	29.41%
	BSw	25.73%
	BBA	23.5%
	BSc Psychology	21.32

Source: *Primary Data*

Table 2 *Role of AI in Transforming Student Workflows in Classroom Settings*

Questions		Percentage
How often do you use AI-based tools (like Chat GPT, AI tutors, chatbots or automated learning platforms)?	Very Frequently	50.73%
	Occasionally	41.91%
	Rarely	7.35%
	Never	0
Do you feel that AI tools have made it easier for you to find quick answers or solutions ?	Yes, very easy	68.38%
	Somewhat easier	30.88%
	No significant change	0.76%
	It has not made any difference	0
Has using AI tools for assignments or research reduced the need for you to think critically or problem-solve independently ?	Yes, I rely less on my own thinking	37.5%
	Somewhat, but I still engage in critical thinking	55.14%
	No, I can think critically and solve problems myself	7.35%
Do you find yourself using AI tools more often to complete tasks or assignments because it saves time or effort ?	Yes, I use AI tools to save time	68.38%
	Sometimes, but I still make an effort to understand the concepts	29.41%
	No, I prefer to complete tasks without relying on AI	0.74%
	I don't use AI tools at all	1.47%
How has AI helped better understand difficult subjects or concepts ?	AI has significantly improved my understanding	39.71%
	AI has somewhat helped me understand concepts	44.85%
	AI has had no real effect on my understanding	8.82%
	I don't use AI tools to understand subjects	6.62%
Do you think relying on AI for quick solutions has negatively affected your ability to think critically or develop your problem-solving skills ?	Yes, it has reduced my thinking ability	30.15%
	Somewhat, but I am still able to think critically	50%
	No, I feel that enhances my critical thinking	14.71%
	I am unaware, but I rely on AI often for answers	5.15%
In your opinion, has AI improved your academic performance ?	Yes, my grades and understanding have improved	33.08%
	It has somewhat helped, but not significantly	55.15%
	No, I haven't seen much improvement	10.29%
	It has had a negative impact on my performance	1.47%
How often do you feel that using AI- based tools has given you the "easy way out" instead of doing the hard work yourself ?	Often, I rely on AI instead of putting in effort	44.85%
	Sometimes, but I still try to work hard	42.65%
	Rarely, I usually try to understand concepts on my own	11.03%
	Never, I prefer not to use AI for shortcuts	1.47%
Looking ahead, do you think AI will help or hinder your ability to learn effectively in the future ?	It will help me learn more efficiently	28.68%
	It will be useful, but I will need to balance it with traditional learning	62.5%
	It may hinder my learning if overused	6.62%
	I'm unsure about the impact of AI on future learning	2.21%

Source: *Primary Data*

Interviews were conducted with 10 teachers using 5 open ended questions and the summary of the responses were given in following table 3.

Table 3 *Summary of Responses from the Teachers*

Questions	Summary of responses
Q1-Experience with AI Tools: Can you share your experiences using AI tools in your teaching? How have these tools influenced your teaching methods or classroom management?	• Respondents had mixed experiences with AI tools in education. • Positive Experiences (6 respondents): Tools such as adaptive learning platforms, chatbots for student inquiries, and automated grading systems were emphasized. Teachers loved how these technologies saved time while personalizing the learning experience for students. • Limited or No Experience (4 replies): Some respondents were unfamiliar with AI tools but expressed an interest in learning more about them.
Q2-**Impact on Teaching Practices**: In what ways do you think AI has improved or could improve your ability to deliver lessons and engage students?	• Enhanced Lesson Delivery (5 respondents): Teachers said AI-powered technologies made lessons more interesting, with visual aids and adaptive quizzes that tailored content to student needs. • Data-Driven Insights (3 respondents): Tools for analysing student performance helped teachers uncover learning gaps and alter their approach. • Neutral Impact (2 respondents): Some believed that AI had little impact on their basic teaching approaches, perceiving it as a supplemental tool.
Q3-**Efficiency and Workflows**: How has AI impacted your daily teaching workflows, such as lesson planning, grading, or administrative tasks? Can you describe specific tools or processes that have been particularly helpful?	• Time Savings (7 respondents): Automated grading and attendance tracking were mentioned as important workflow improvements, allowing teachers to concentrate more on teaching and mentoring. • Improved Organization (3 respondents): Some emphasized the importance of AI in organizing lesson preparations and offering easy access to educational resources.
Q4-**Support and Challenges**: What kind of support or resources do you believe are necessary to effectively integrate AI into your teaching? Have you faced any challenges while using AI tools?	• Support Needs (6 respondents): Respondents highlighted the importance of training seminars and user-friendly AI tools. They believed that better training would increase trust in adopting AI. • Challenges (four respondents): Concerns included possible over-reliance on AI, and ethical issues such as data privacy.
Q5-**Future Possibilities**: Looking ahead, what potential roles do you see for AI in enhancing both teaching practices and classroom workflows? What changes or innovations would you like to see?	• Teachers(7 respondents) showed an interest in AI solutions that can provide students with real-time feedback, assist in the creation of bespoke content, and encourage collaborative learning settings. • Concerns (3 respondents): Some were concerned about the balance between AI and human touch in education, fearing that misuse of AI might depersonalize instruction.

Source: Primary Data

The study highlights the transformative role of AI in classroom workflows for students and teachers, showcasing both its potential and associated challenges.

Students reported a substantial reliance on AI tools for academic tasks, with **50.73%** using them "very frequently" and **41.91%** using them "occasionally." This widespread adoption has led to mixed outcomes in their learning experiences. **68.38%** of respondents stated that AI tools made finding quick answers "very easy," significantly reducing the time and effort required for assignments and research. However, this convenience raised concerns about critical thinking: **37.5%** admitted to relying less on their own reasoning, while **55.14%** said they still engaged in critical thinking despite using AI. Only **7.35%** maintained that AI tools did not affect their ability to think independently.

When asked if AI had improved their understanding of difficult concepts, **39.71%** felt it had significantly enhanced their comprehension, and **44.85%** said it had somewhat helped. Nonetheless, **8.82%** reported no noticeable impact, and **6.62%** did not use AI for understanding subjects. This indicates a divide between those who leverage AI to supplement learning and those who either underutilize or fail to see its benefits.

The influence of AI on academic performance was similarly nuanced. While **33.08%** reported improvements in their grades and understanding, **55.15%** saw only marginal benefits, and **10.29%** noted no improvement. A small proportion (**1.47%**) even felt AI negatively impacted their performance, possibly due to over-reliance or inappropriate use. Furthermore, **44.85%** admitted to frequently relying on AI as a shortcut, potentially bypassing deeper engagement with the material, while **42.65%** struck a balance by using AI for efficiency but still making efforts to grasp concepts.

Looking ahead, students expressed optimism tempered with caution. **62.5%** believed AI would be useful if balanced with traditional learning methods, while **28.68%** were confident AI would enhance learning efficiency. Concerns persisted, however, with **6.62%** warning of potential hindrances from overuse and **2.21%** unsure about AI's long-term impact. These findings underscore the need for guidance in using AI responsibly to balance efficiency with the development of critical thinking and problem-solving skills.

For teachers, AI adoption varied significantly, reflecting diverse levels of familiarity and utility. While some reported frequent use of AI tools, others were less experienced, highlighting a gap in adoption. Among those with positive experiences, six

respondents emphasized how AI tools such as adaptive learning platforms, chatbots, and automated grading systems saved time and personalized the learning experience. These tools allowed educators to focus more on teaching and mentoring while improving classroom management. Conversely, four respondents noted limited or no experience with AI but expressed interest in learning more, suggesting that unfamiliarity with AI remains a barrier to its broader adoption.

AI's impact on teaching practices was notable. Five respondents indicated that AI enhanced lesson delivery by introducing dynamic elements such as visual aids and adaptive quizzes tailored to student needs. Additionally, three respondents appreciated AI's ability to provide data-driven insights into student performance, enabling them to identify learning gaps and adjust their approaches. However, two respondents felt AI had a neutral impact, viewing it as a supplementary tool rather than a transformative one. This indicates that while AI has the potential to enhance teaching, its effectiveness depends on how well it integrates with existing pedagogical methods.

Efficiency in daily workflows was a recurring theme. Seven respondents praised AI for automating time-consuming tasks such as grading and attendance tracking, which freed up time for more meaningful interactions with students. Three respondents highlighted improvements in organization, particularly in lesson planning and accessing educational resources. These benefits were tempered by challenges such as a lack of institutional support and ethical concerns.

When discussing support needs, six respondents emphasized the importance of training programs and user-friendly AI tools to build trust and confidence in using these technologies. Challenges, however, persisted, with four respondents citing concerns about over-reliance on AI, ethical issues like data privacy.

Looking to the future, teachers showed optimism about AI's potential to enhance teaching and workflows. Seven respondents envisioned AI providing real-time feedback, creating customized content, and fostering collaborative learning environments. However, three expressed concerns about striking the right balance between AI and the human element in teaching, warning against the risk of depersonalization and over-reliance.

The findings suggest that while AI holds immense potential to transform classroom workflows, its impact varies based on how it is used. For students, AI offers efficiency and personalized learning but raises concerns about over-reliance and diminished critical thinking. Teachers benefit from streamlined workflows and data-driven insights but face barriers such as limited training and ethical challenges. Both groups agree on the need for a balanced approach: leveraging AI for its strengths while ensuring it complements, rather than replaces, traditional methods of teaching and learning. Ethical guidelines, and targeted training programs will be crucial in realizing AI's full potential in educational settings.

5. Limitations of the Study

The study has several limitations that must be considered. First, the sample size and scope are relatively limited, focusing primarily on students and teachers from specific programs (BBA, BSW, BCom, and BSc Psychology). This narrow focus may not fully capture the experiences of a broader range of students and educators across different disciplines or institutions. Additionally, the study relies on self-reported data, which can be prone to bias, as participants may overstate the benefits of AI or downplay its drawbacks. Another limitation is the lack of long-term data, as the study provides only a snapshot of AI usage at a single point in time, without tracking changes in attitudes or behaviors over a more extended period. The study is also small in scale, with a limited number of respondents, which may not fully reflect the diversity of opinions and experiences in a larger population. Finally, the research did not delve into the particular AI tools used, making it difficult to assess the impact of specific technologies on learning outcomes. These limitations suggest that future research could benefit from a larger, more diverse sample, a longer-term approach, and a more in-depth analysis of specific AI tools and their effects.

6. Discussion and Conclusion

The findings of this research underscore the complex role AI plays in reshaping workflows for both students and teachers in educational settings. By examining their experiences, the study sheds light on both the opportunities and challenges associated with incorporating AI into the classroom.

The analysis reveals that a majority of students have integrated AI tools into their academic routines, emphasizing their growing importance in education. These technologies have proven effective in improving efficiency, particularly in tasks requiring quick answers or simplified explanations of difficult concepts. Many students acknowledged enhanced comprehension and academic performance through the use of AI tools.

However, concerns emerged regarding the potential over-reliance on AI, which might hinder the development of critical thinking and problem-solving skills. While a large number of students claimed to engage in independent reasoning, a significant minority admitted to relying heavily on AI for cognitive tasks. This finding highlights the importance of encouraging responsible AI usage to balance its benefits with the need to foster analytical skills. Students expressed optimism about AI’s role in the future, coupled with concerns about overuse, signalling the need for structured guidance on its application in education.

Teachers reported varying degrees of AI adoption, with those familiar with the tools citing several benefits. AI applications were found to enhance classroom instruction, streamline repetitive tasks, and provide data-driven insights to improve student learning outcomes. For instance, adaptive quizzes allowed teachers to focus more on mentorship and personalized teaching.

However, the data also pointed to barriers such as limited exposure to AI and ethical considerations. Some teachers expressed concerns about losing the personal connection with students, emphasizing the importance of human interaction in education.

Many educators called for comprehensive training programs and user-friendly tools to enhance their ability to integrate AI into their workflows effectively.

Both students and teachers recognized the value of AI in improving efficiency and creating personalized educational experiences. However, they also expressed concerns about its potential misuse. Teachers highlighted the need for AI to complement their roles rather than replace them, reinforcing the importance of preserving the human aspect of education.

Notably, a gap was observed in AI adoption and literacy levels, with students often being more adept at using these tools compared to their teachers. Bridging this divide is critical to fostering an educational environment where both groups can effectively utilize AI for mutual benefit.

The findings emphasize the importance of addressing challenges such as ethical considerations, privacy concerns, algorithmic biases, and equitable access to AI resources. If left unresolved, these issues could hinder the effective use of AI in education and exacerbate existing inequalities.

On the other hand, AI presents significant opportunities for innovation. From personalizing learning experiences to automating routine tasks and providing actionable insights, AI has the potential to transform education. With appropriate support systems, educators can maximize these benefits while mitigating risks.

This research highlights the transformative potential of AI in education, portraying it as a tool that enhances efficiency while simultaneously posing risks to traditional practices. For students, AI serves as a valuable resource for simplifying complex concepts and improving academic outcomes but raises concerns about the erosion of critical thinking. For teachers, AI facilitates the delivery of lessons and automates administrative tasks, yet adoption remains uneven due to limited training and ethical challenges.

The study underscores the importance of a balanced approach to AI integration, ensuring that its use complements rather than replaces essential human elements in education. Institutional initiatives, including training programs, ethical frameworks, and accessible resources, are necessary to overcome barriers and foster responsible AI usage.

As AI continues to evolve, its role in education is set to expand, offering opportunities for personalized learning and innovative teaching methods. However, the success of this integration will depend on strategies that promote the holistic development of students and empower educators to embrace AI responsibly. Future research should focus on larger, more diverse samples, longitudinal studies, and an evaluation of specific AI tools to provide a more comprehensive understanding of its long-term impact in education.

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