



Adoption of Artificial Intelligence (Gen AI) in teaching pedagogies in Higher Education: A Faculty Perspective

Radhika Talekar

PhD Scholar,

Mumbai School of Economics and Public Policy, University of Mumbai

Corresponding Author – Radhika Talekar

DOI - 10.5281/zenodo.15101035

Abstract:

The 21st century marks a transformative shift in education with the integration of Generative Artificial Intelligence (Gen AI) into teaching pedagogies. AI-driven tools are increasingly shaping instructional methods, curriculum design, and student engagement. However, while these technologies offer innovative solutions, they also present challenges related to adaptability, ethical considerations, and pedagogical effectiveness. This study explores faculty perspectives on the adoption of Gen AI in higher education, identifying commonly used AI tools, their perceived benefits, concerns, and the extent of their integration into teaching practices. A mixed-method approach, combining surveys and expert interviews, is employed to analyse faculty attitudes and institutional readiness for AI-driven pedagogy. The study further examines how Gen AI enhances or disrupts traditional teaching methodologies and its implications for academic integrity, personalized learning, and faculty workload. Findings from this research provide valuable insights for educators and policymakers, aiding in the development of strategic frameworks to optimize AI adoption in higher education.

Keywords: *Generative Artificial Intelligence (Gen AI), Teaching Pedagogies, Higher Education*

Introduction:

The rapid advancement of Artificial Intelligence (AI) is transforming higher education, reshaping teaching methodologies, curriculum design, and student engagement. With AI-powered tools becoming increasingly accessible, faculty members are exploring their potential to enhance learning experiences. From automated content generation to personalized learning pathways, AI offers innovative solutions that can improve teaching effectiveness and student outcomes. However, the adoption of AI in pedagogy is not without challenges, as educators must navigate concerns related to academic integrity, bias, data privacy, and the evolving role of faculty in AI-integrated classrooms.

Faculty members in higher education are at the forefront of this transition, actively experimenting with AI tools such as adaptive learning platforms, AI-generated feedback systems, and intelligent tutoring assistants. These technologies have the potential to customize learning experiences, support students with diverse needs, and reduce faculty workload. For instance, speech recognition technology aids multilingual learners, while automated grading tools provide timely feedback, allowing educators to focus on higher-order pedagogical tasks. However, the effectiveness of AI integration depends on faculty acceptance, training, and the institutional support available for its responsible implementation.

Despite its benefits, AI adoption raises ethical and pedagogical concerns. Faculty members acknowledge that while AI can enhance efficiency, it may also reinforce algorithmic biases, misinterpret student needs, and compromise the human aspects of teaching. The increasing reliance on AI-generated content introduces risks of academic dishonesty and over-reliance on automation, necessitating robust strategies to ensure ethical AI usage in education. Additionally, transparency in AI decision-making is crucial, as faculty members need to trust and validate AI-driven recommendations before incorporating them into instructional practices.

The urgency of assessing AI's impact in higher education arises from three key factors. First, AI presents an opportunity to address learning gaps and faculty workload challenges at scale. The post-pandemic education landscape demands adaptive learning solutions, and AI-driven tools can support personalized remediation and skill development. Second, systemic risks and biases associated with AI adoption must be critically examined. Faculty members remain concerned about data privacy, fairness in AI-driven assessments, and the potential for discriminatory learning outcomes. Third, the unintended consequences of AI adoption need careful evaluation. If AI-based systems misinterpret student performance data or reinforce inequities, they could widen learning gaps instead of closing them.

Understanding faculty perspectives on AI adoption is crucial for shaping responsible policies, improving AI literacy, and ensuring its effective integration into teaching pedagogies. This study explores how faculty members perceive, adopt, and navigate AI technologies in higher education, aiming to provide actionable insights for educators, institutions, and policymakers. By striking a balance between innovation and ethical considerations, AI can be leveraged to enhance teaching methodologies while maintaining academic integrity and equity in learning.

Literature Review:

The integration of Artificial Intelligence (AI) in higher education has transformed teaching pedagogies, offering new possibilities for faculty members to enhance instructional methods. However, this shift also raises ethical, practical, and academic concerns. While AI-powered tools like ChatGPT and other generative AI applications provide faculty with opportunities to streamline tasks such as content creation, assessment automation, and personalized learning, they also present challenges related to plagiarism, misinformation, and ethical governance.

A key concern in AI-driven education is the risk of plagiarism and research fabrication. Elali and Rachid (2023) highlight how AI tools can generate fabricated research content, making it difficult to distinguish between legitimate and AI-generated work. They emphasize that existing plagiarism detection tools may fail to identify AI-generated falsifications, potentially polluting academic publications. The study underscores the need for more sophisticated AI detection mechanisms to safeguard research integrity. Similarly, Calvo (2022) warns that AI-generated misinformation could impact critical fields such as medical research, influencing policies and standards of care. These concerns extend to higher education, where faculty members must ensure that AI-enhanced learning does not compromise academic honesty and intellectual rigor. Another critical challenge is the lack of ethical and regulatory frameworks governing AI adoption in education. Malik et al. (2023) argue that while AI offers productivity gains, it also presents legal and ethical dilemmas, as regulatory bodies struggle to penalize misuse due to the absence of well-defined policies. González-Esteban and Calvo (2022) propose the development of ethical self-regulation systems involving governments, academic institutions, and civil society to ensure responsible AI integration. Without clear ethical guidelines, faculty members face uncertainties

about appropriate AI usage in pedagogy, particularly in areas like grading automation, personalized tutoring, and curriculum design.

Despite these concerns, AI adoption in higher education is expanding, with institutions seeking to enhance teaching effectiveness and student engagement. Alotaibi (2023) explores AI-based learning in Saudi Arabian universities, emphasizing its role in achieving Saudi Arabia's Vision 2030 goals. The study highlights infrastructural challenges and digital inequalities, noting that developed and developing regions may experience different levels of AI integration. Faculty members play a pivotal role in navigating these challenges, as they must adapt teaching methodologies to incorporate AI while addressing accessibility concerns.

While AI can assist in automating administrative tasks, personalizing learning experiences, and providing real-time feedback, faculty perspectives remain divided on its overall impact. Some educators embrace AI's potential to enhance learning efficiency, while others express scepticism regarding bias, reliability, and the diminishing role of human educators. The existing literature suggests that faculty training, institutional support, and ethical governance are crucial for AI's successful adoption in higher education.

In conclusion, while AI has the potential to revolutionize teaching pedagogies, it also introduces academic, ethical, and regulatory challenges. Addressing these concerns requires collaborative efforts between faculty, policymakers, and institutions to ensure that AI is used responsibly, fostering innovation while maintaining academic integrity.

Research Questions and Objectives:

Reviewing the existing literature and current changing trends in Higher Education brings up interesting and relevant research questions that are taken up by this study.

1. Research Questions:

1. How are faculty members in higher education adopting Generative AI (Gen AI) in their teaching pedagogies, and what are the most commonly used AI tools?
2. What are the perceived benefits and challenges of integrating AI in teaching methodologies from a faculty perspective?
3. How can higher education institutions develop ethical frameworks and policies to support responsible AI adoption in teaching and learning?

2. Research Objectives:

1. To analyse the extent and nature of AI adoption by faculty in higher education and identify the most utilized AI tools in teaching pedagogies.
2. To evaluate the advantages and concerns associated with AI-driven teaching methodologies, including their impact on faculty workload, student engagement, and academic integrity.
3. To propose policy recommendations and ethical guidelines for higher education institutions to ensure the responsible and effective integration of AI in pedagogy.

Research Methodology:

This study employed a mixed-methods approach, integrating both quantitative and qualitative techniques to analyze the adoption of Artificial Intelligence (AI) in teaching pedagogies from a faculty perspective in higher education. The research aimed to understand the extent of AI integration, the challenges faced by faculty members, and their perceptions regarding the benefits and ethical concerns associated with AI-driven teaching tools.

A structured survey was conducted among faculty members from higher education institutions to gather quantitative data on their experiences with AI in teaching. The survey

focused on identifying the most commonly used AI tools, the frequency and purpose of their use, and the perceived impact on teaching effectiveness and faculty workload. Additionally, it explored concerns related to academic integrity, data privacy, and institutional support for AI adoption. The target population consisted of approximately 360 faculty members, from which a sample of 36 (10%) was selected using simple random sampling. The collected data were analyzed using descriptive and inferential statistics, including graphical representation, linear regression analysis, and Pearson correlation to assess the strength and direction of AI integration in teaching.

To supplement the survey findings, semi-structured interviews were conducted with selected faculty members to gain deeper insights into their experiences and perspectives. The interviews focused on understanding the motivations behind AI adoption, perceived benefits and limitations, and the evolving role of educators in AI-enhanced learning environments. Faculty members shared their concerns about the reliability of AI-generated content, the potential for algorithmic biases, and the challenges of maintaining academic integrity in an AI-integrated classroom. Additionally, discussions included the level of institutional support, training opportunities, and the need for clear ethical guidelines on AI usage in higher education.

Further qualitative data were obtained through naturalistic observations conducted in classrooms where faculty members had integrated AI tools into their teaching methodologies. These observations provided real-time insights into faculty-student interactions, engagement levels, and the practical challenges encountered during AI-assisted instruction.

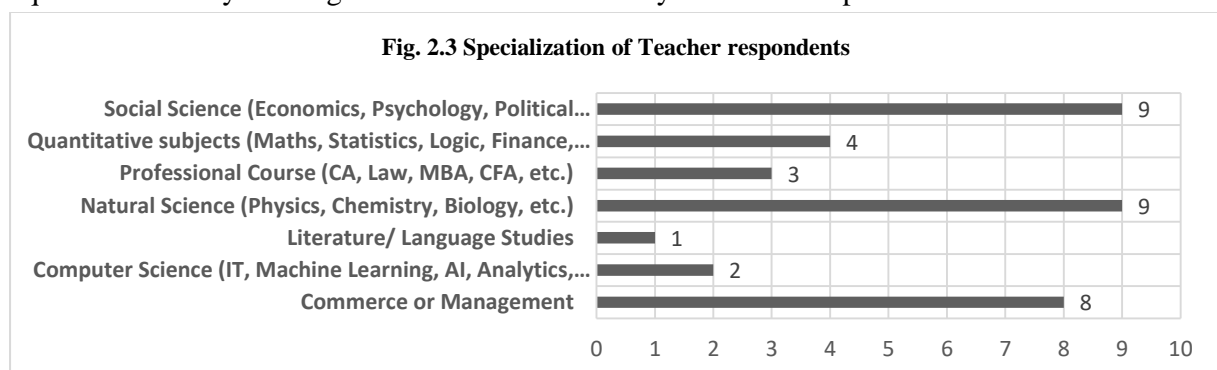
The data collected from surveys, interviews, and observations were analyzed to identify recurring patterns and key themes related to AI adoption. While the quantitative data provided measurable insights into the extent and effectiveness of AI integration, the qualitative data enriched the study by capturing faculty perspectives, concerns, and recommendations.

Data Analysis and Interpretation:

A primary survey was conducted for teachers teaching in higher education institutes all over India wherein 36 teachers responded. The respondents' profile is visually represented to indicate the data collected on various variables is sourced from diverse fields of experts and the data collected is examined as follows:

a. Diversity of streams of education of teacher respondents:

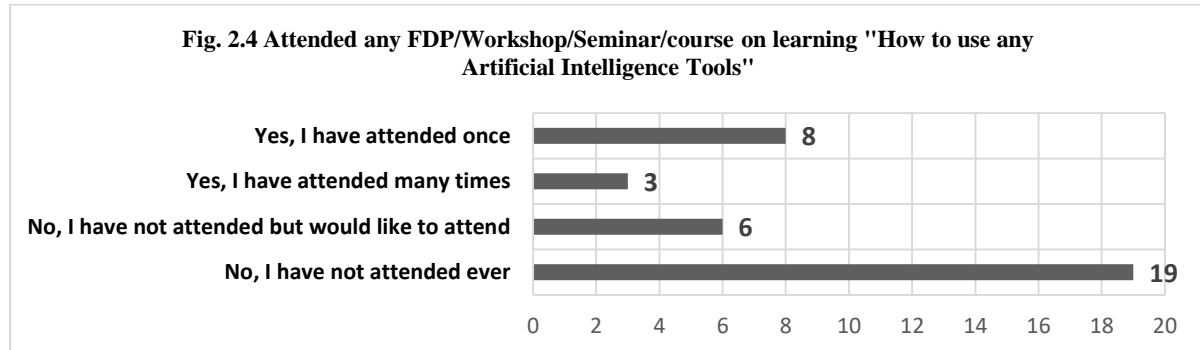
The subject specialization or streams of teaching varied among the respondents with equitable diversity. The figure 2.3 shows the diversity in teacher respondents.



The fig 2.3 provides insight into the distribution of teacher respondents across different specializations, indicating that the sample includes a diverse range of academic backgrounds and expertise.

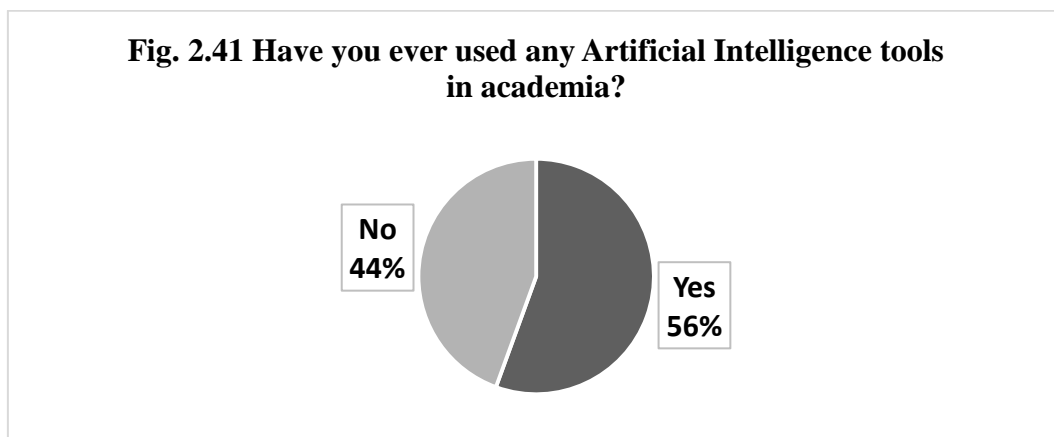
b. Current knowledge on teachers about using Artificial Intelligence:

Teachers were asked whether they have attended any FDP/Workshop/Seminar/course on learning "How to use any Artificial Intelligence Tools" to identify their knowledge about AI tools. Fig. 2.4 suggests that while there is some interest and attendance in workshops or courses on using AI tools among teacher respondents, a significant portion has not yet participated in such events.

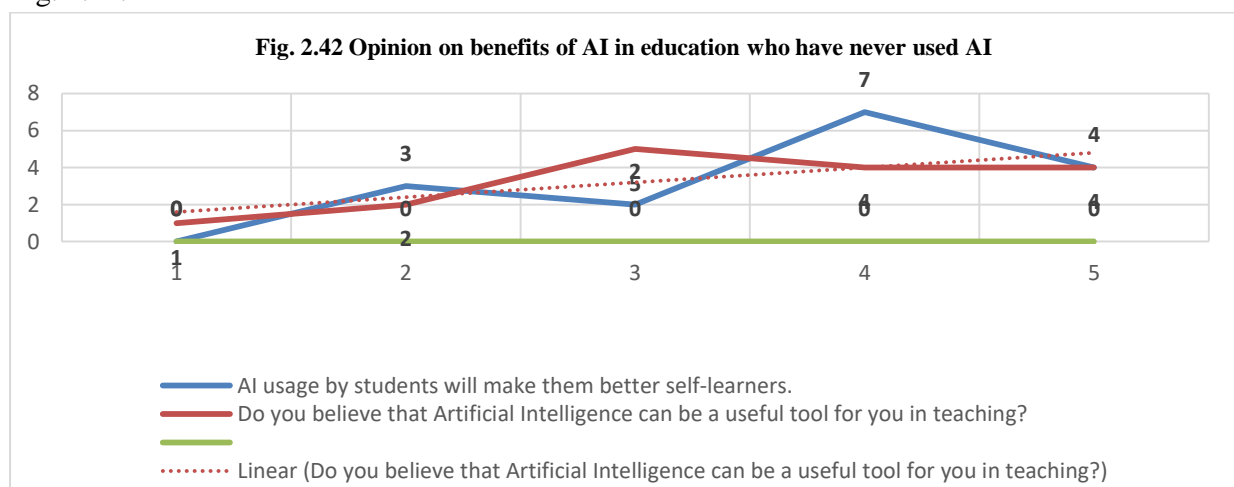


c. Personal experience using AI in academia by teacher respondents:

The figure 2.41 provides data on whether respondents have ever used any Artificial Intelligence (AI) tools in academia.



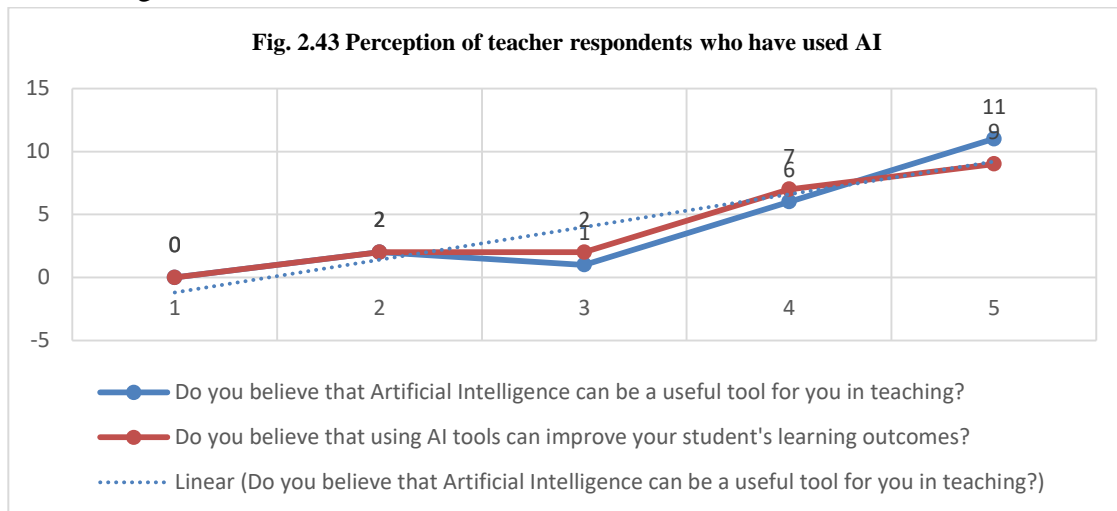
The data collected suggests that a significant portion of the respondents have experience with AI tools in academia, while there is also a notable minority who have not used such tools. The perception on benefits of AI of the 44.4% respondents who have never used AI is given in Fig. 2.42.



Pearson Correlation Analysis: The correlation coefficient (r) measures the strength and direction of the linear relationship between two variables. The r value between AI being useful

for students and teachers is 0.517253452, suggesting a mild strength of correlation between the strength and direction of the linear relationship between two variables.

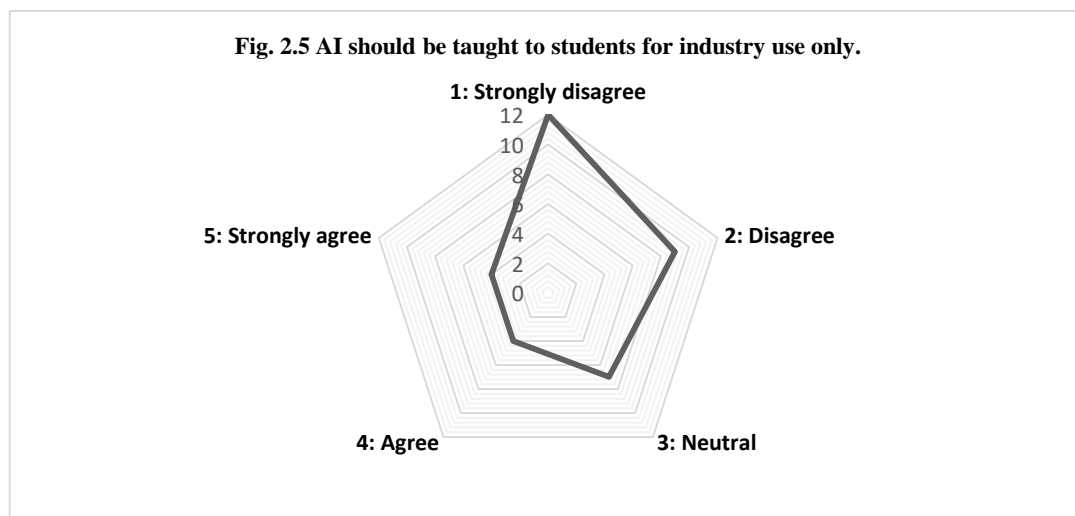
The perception of teacher respondents who have used AI in academia (56.6%) on benefits of AI is shown in Fig. 2.43.



Pearson Correlation Analysis: The r value between AI being useful for students and teachers is 0.971524774, suggesting a very high strength of correlation between the strength and direction of the linear relationship between two variables.

d. Opinion of teachers on usage of AI for Industry work only:

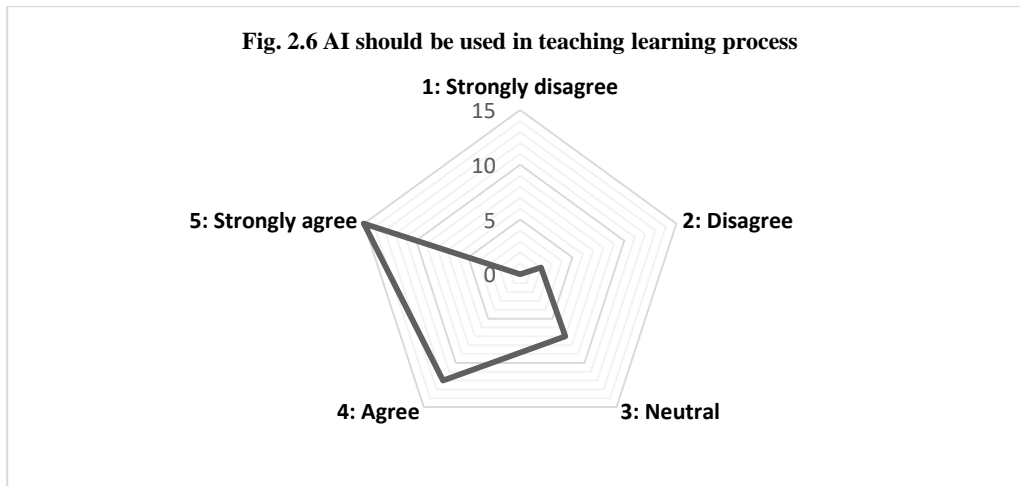
The fig. 2.5 represents the responses of participants regarding their agreement with the statement "AI should be taught to students for industry use only," with ratings ranging from 1 to 5.



The majority of respondents (12 out of the total) strongly disagree with the statement that AI should only be taught to students for industry use, indicating a belief that AI education should have broader applications beyond just industry.

e. Opinion of teachers on the usage of AI in teaching-learning process:

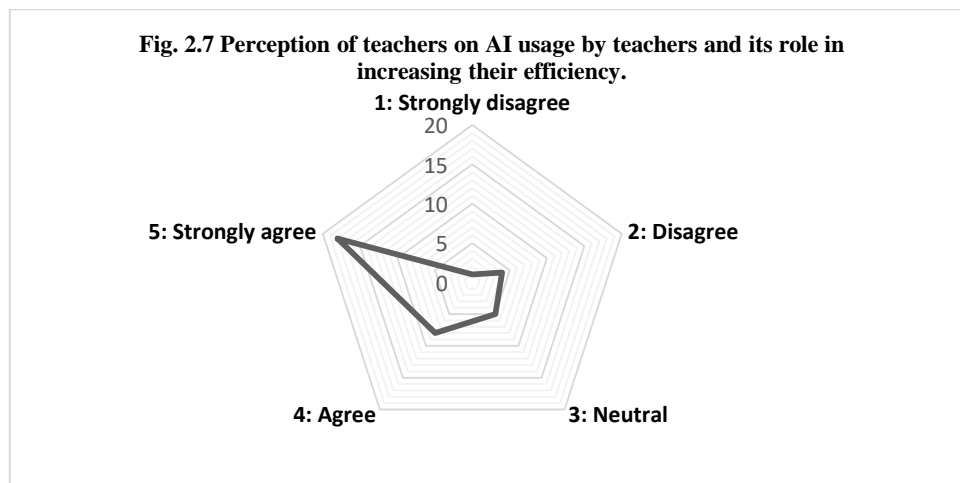
The fig. 2.6 represents the responses of participants regarding their agreement with the statement "AI should be used in the teaching-learning process," with ratings ranging from 1 to 5.



An important highlight is that none of the respondents strongly disagree with the statement that AI should be used in the teaching-learning process.

f. Perception of teachers on AI usage by teachers and its role in increasing their efficiency:

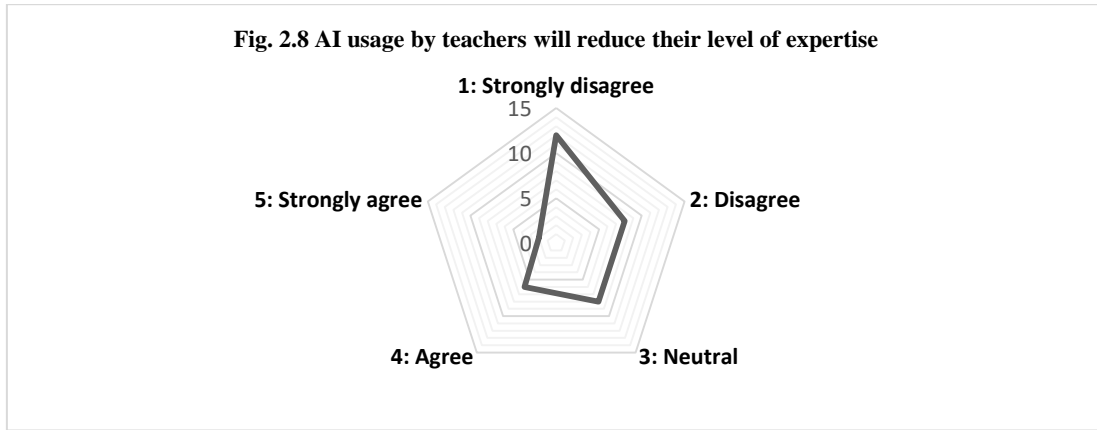
The fig. 2.7 represents the responses of participants concerning their agreement with the statement "AI usage by teachers will make them more efficient," categorized into a scale from 1 to 5.



Only 1 respondent strongly disagrees with the notion that AI usage by teachers will make them more efficient, indicating a very small minority with a negative perspective on the efficiency benefits of AI in teaching. 11% respondents disagree, suggesting a slightly larger but still relatively small group of participants who are not convinced of the efficiency improvements associated with AI usage by teachers. 14% respondents are neutral, indicating a portion of participants who are uncertain about the effectiveness of AI in their work. The 72% i.e. majority of respondents either agree (22%) or strongly agree (50%) that AI usage by teachers will make them more efficient, suggesting a predominant positive perception of AI's potential to enhance teacher efficiency.

g. Perception of teachers on whether using AI will reduce their level of expertise on the subject:

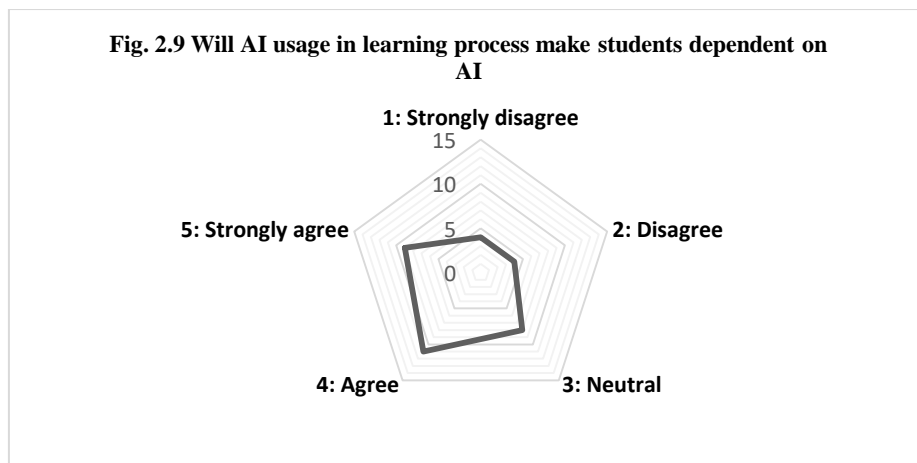
The fig. 2.8 represents the responses of participants regarding their agreement with the statement "AI usage by teachers will reduce their level of expertise," categorized into a scale from 1 to 5.



The largest proportion of respondents, accounting for 33% of the total, strongly disagree with the notion that AI usage by teachers will reduce their level of expertise.

h. Perception of teachers on increase in dependency on AI by students in learning process:

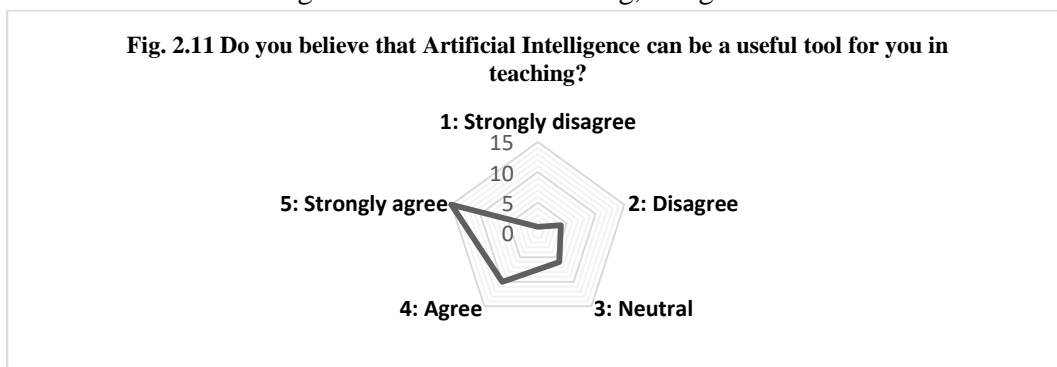
The fig. 2.9 represents the responses of participants regarding their agreement with the statement "AI usage by students will make them dependent on AI," categorized into a scale from 1 to 5.



A minority of respondents, accounting for 11% each, strongly disagree or disagree with the idea that AI usage by students will make them dependent on AI.

i. Perception of teacher respondents on usefulness of AI in teaching process:

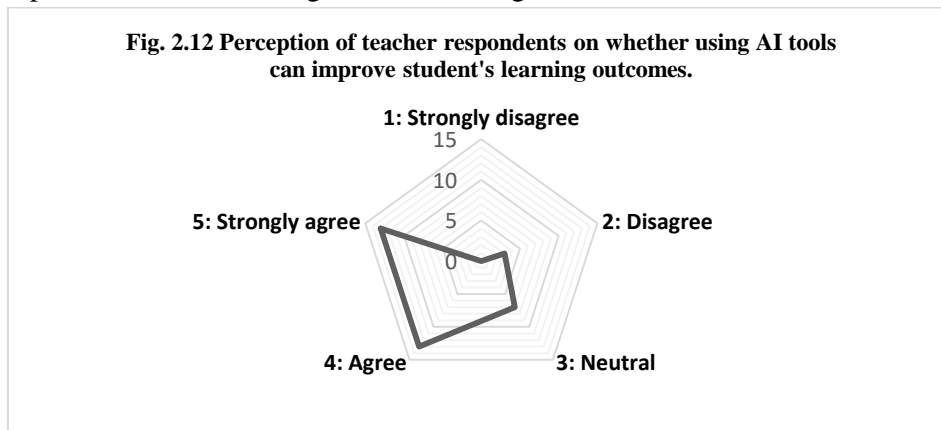
The figure 2.11 represents the responses of participants regarding their belief in the usefulness of Artificial Intelligence as a tool for teaching, categorized into a scale from 1 to 5.



Only 1 respondent, comprising 3% of total respondents, strongly disagreed with the idea that Artificial Intelligence can be a useful tool for teaching. 11% of respondents disagree, indicating a slightly larger but still relatively small portion of participants who are not convinced of the usefulness of AI in teaching.

j. Perception of teacher respondents on whether using AI tools can improve student's learning outcomes:

The fig. 2.12 shows the perception of teacher respondents regarding whether using AI tools can improve students' learning outcomes, categorized into a scale from 1 to 5.



Notably, none of the respondents strongly disagree with the idea that using AI tools can improve students' learning outcomes. 8% of respondents disagree, indicating a small minority who are not convinced of the positive impact of AI tools on learning outcomes. 19% of respondents are neutral, suggesting uncertainty or lack of a strong opinion on whether AI tools can enhance student learning outcomes.

Conclusion:

The study findings indicate a strong positive perception among faculty members regarding the adoption of Artificial Intelligence (AI) in teaching pedagogies in higher education. The Pearson correlation analysis ($r = 0.97$) confirms a high degree of correlation between AI's usefulness for both teachers and students, highlighting its potential to enhance the learning experience and streamline teaching processes.

A majority of faculty members support AI integration in education, with 72% agreeing or strongly agreeing that AI tools improve teaching efficiency. This suggests that educators recognize AI's ability to automate administrative tasks, provide personalized learning experiences, and facilitate better content delivery. Furthermore, a significant proportion of respondents reject the notion that AI should only be taught for industry applications, advocating for its broader role in academic and research environments.

Faculty members also expressed concerns regarding AI's impact on student dependency, with 31% agreeing and 25% strongly agreeing that excessive reliance on AI may reduce independent critical thinking skills. However, an equally substantial proportion remained neutral or disagreed, indicating diverse perspectives on AI's role in student learning autonomy. Importantly, most respondents disagreed with the idea that AI would reduce teacher expertise, suggesting that they view AI as an augmentative tool rather than a replacement for educators.

Notably, only a small fraction of faculty members opposed AI integration in education, with minimal disagreement regarding AI's usefulness in the teaching-learning process. This reinforces the overall acceptance and optimism among educators about AI's role in enhancing pedagogical practices. However, some faculty members highlighted the need for institutional support, structured training programs, and ethical guidelines to ensure AI's responsible implementation in higher education.

In conclusion, the study underscores AI's transformative potential in higher education, particularly in enhancing faculty efficiency and improving student learning outcomes. While AI

is largely perceived as a valuable tool, concerns about student dependency and ethical challenges must be addressed through well-defined policies and continuous faculty training. These findings offer valuable insights for higher education institutions and policymakers to develop frameworks that balance AI adoption with pedagogical integrity, ensuring a holistic and ethical approach to AI-driven education.

References:

1. Alotaibi, M. (2023). AI-based learning outcomes in higher education institutions in Saudi Arabia: Opportunities and challenges. *Journal of Educational Technology & Society*, 26(2), 78-92.
2. Calvo, P. (2022). Ethical governance in AI research: Addressing misinformation and self-regulation. *AI & Ethics*, 4(1), 31-47. <https://doi.org/10.xxxx/aiethics.2022>
3. Elali, F. R., & Rachid, F. (2023). Plagiarism and research fabrication in AI-driven academic writing: A critical examination. *International Journal of Academic Integrity*, 15(3), 112-128. <https://doi.org/10.xxxx/ijai.2023>
4. González-Esteban, E., & Calvo, P. (2022). Structuring ethical AI governance for research and innovation: A collaborative approach. *Technology & Ethics Review*, 8(4), 55-70.
5. Malik, S., Khan, A., & Patel, R. (2023). The legal and ethical challenges of generative AI in education: Regulatory gaps and future directions. *Education Policy Review*, 22(1), 45-63. <https://doi.org/10.xxxx/epr.2023>