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A comparative analysis on artificial intelligence in modern education system: A general perspectives among gender and locality of academic fraternity belongs to Sonipat District, Haryana, India

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Abstract
In India, AI has rapidly transformed various regions that accomplish human aspects, yet its adoption and awareness levels are different across demographics. Nowadays artificial intelligence has become a driving force, and India is well on its way to transforming from a developing to a developed nation. This study aims to conduct a comparative analysis of artificial intelligence in the modern education system to know the general perspective of gender and locality among the academic fraternity. The study was carried out among 100 academic fraternities; selected on the basis of stratified random sampling technique, each category of gender (male vs. female) and locality (rural vs. urban) consists of 50 respondents across different colleges and universities in the Sonipat district of Haryana. The study utilized a structured questionnaire designed to assess the perspective of the academic fraternity towards practical implications on the concept, usage, and awareness of artificial intelligence technology that bridges the educational gap between disadvantaged and privileged students. The questionnaires, comprised of 25 statements, were sent to respondents through Google Form to know respondents opinions, focusing on their familiarity with AI applications, usage patterns, and attitudes towards AI-driven technologies. The findings indicate a significant disparity in AI awareness, with urban respondents demonstrating greater exposure and engagement compared to their rural equivalents. Additionally, gender differences are statistically insignificant, suggesting that AI perceptions in education and research are more influenced by experience and exposure rather than gender. The majority of respondents, regardless of gender or locality, believe AI has the potential to bridge the educational gap. The study highlights the need for inclusive AI literacy programs and improved access to AI tools in make light of communities to bridge the digital divide.

Keywords: Artificial intelligence, locality, gender, education, academic fraternity, digital literacy

Introduction
Today the pathway of developing countries is imparted through AI-driven sectors. Indeed, AI is playing a transformative role in the development of emerging economies. Many developing countries are grasping AI to enhance and strengthen their network. Artificial intelligence has become a slogan or tagline at the present day. In this contemporary era it is quite common to increase interest in AI-based technologies in existing modern western culture and trend-changing society transition. The implication of AI in education and research is growing rapidly. The integration of artificial intelligence is shaping the future, yet its impact is perceived differently across gender and locality lines, how their engagement aspect is different in AI-driven tools and technologies. Understanding these differences is crucial for fostering inclusive AI in the academic domain (Atwal & Khan. 2025) [1]. Artificial intelligence is transforming various academic and research fields, necessitating continuous learning and training, and gender disparities in AI adoption regarding access and exposure to AI tools and technologies. Studies indicate that men are more likely to have early exposure to AI technologies and data science due to social expectations and educational opportunities (West *et al*., 2019) [11]. Women, particularly in developing regions, face challenges in accessing AI resources and training programs, leading to underrepresentation in AI research (UNESCO, 2021) [10]. Youth engagement in AI research and innovation: female researchers are more inclined towards ethical AI, fairness, and applications, whereas male researchers dominate AI development (Buchanan *et al*., 2021) [2]. A gender gap exists in AI research publications; research suggests that male contribute more frequently to AI-driven academic papers (Larson *et al*., 2020) [6].

Previous research in the line of AI in education and learning style suggests that male students tend to engage more with AI-driven technical courses referring to machine learning and robotics, while female students lean towards AI applications in humanities and education (Cheryan *et al*., 2017) [3]. AI-based adaptive learning platforms show that male students often prefer competitive and analytical approaches, whereas female students excel in collaborative and discussion-based AI learning (Kizilcec & Halawa, 2019) [5].

In artificial intelligence integration, rural and urban locality researchers and academicians face challenges that hinder widespread AI adoption and its impact on education and research. Various investigations highlight the greater access to AI-powered educational tools; personalized learning platform are more common to the students in metropolitan cities, and academicians benefit from AI-driven research tools, automated grading systems, and advanced AI-powered data analysis techniques. Many institutions located in urban areas collaborate with tech companies and AI research centers, facilitating AI-based academic innovation, plagiarism detection, and virtual teaching assistants. (Cheryan *et al*., 2017; West *et al*., 2019) [3, 11]. Moreover, rural localities face a lack of access to AI-driven resources due to inadequate infrastructure, limited internet connectivity, and very few AI-inadequate institutions. Despite these limitations, mobile-based AI learning platforms and government initiatives are gradually increasing AI exposure among rural students. Academicians who belong to institutes situated in rural localities may struggle with integrating AI into teaching due to a lack of resources and sometimes training opportunities; traditional teaching methods are still prevalent, with minimal adoption of AI-powered education systems. (Mishra & Sharma, 2020; Kumar *et al*., 2023) [8, 4]. Government initiatives towards faculty development programs to improve AI exposure in rural localities (Rao & Iyer, 2021; Mehta, 2022) [9, 7]. India is rapidly emerging as a global AI powerhouse, with its AI-driven transformation playing a crucial role in its journey toward becoming a developed nation. The country is leveraging artificial intelligence across various sectors to drive economic growth, improve governance, and enhance the quality of life for its citizens.

To study the perspective of gender and locality towards practical implications on the usage of artificial intelligence, based on the above rationale, the study seeks to answer the following research question.

- **RQ1:** Are you familiar with the concept of Artificial Intelligence?
- **RQ 3:** What is your concern in usage of Artificial Intelligence?
- **RQ4:** Do you think Artificial Intelligence can be useful tool for boosting research performance and enhancing the Quality and Creativity?
- **RQ13:** Do you believe Artificial Intelligence technology can bridge the educational gap between disadvantaged and privileged students?
- **RQ14:** As a researcher how often you practice Artificial Intelligence technology in collecting and analyzing your personal data for educational purposes?

Methodology

The data collection procedure involved administering a structured questionnaire to the respondents. The questionnaire was designed to collect both closed-ended and open-ended responses to assemble more in-depth information about their experience and perceptions. Further, the questionnaire comprised two sections: the first section outlined the demographic profile of academic fraternity. While the second section included a total of 25 statements, it was sent to respondents through Google Form to know respondents opinions, focusing on their familiarity with AI applications, usage patterns, and attitudes towards AI-driven technologies in research and education. The study consists of 100 academic fraternities selected on the basis of stratified random sampling technique, Strata were based on gender (male vs. female) and locality (rural vs. urban) each category consists of 50 respondents, represents the academic fraternity, belonging to various colleges in the Sonipat district of Haryana, India. Further the collected data were analyzed by using statistical analysis.

Results and Discussion

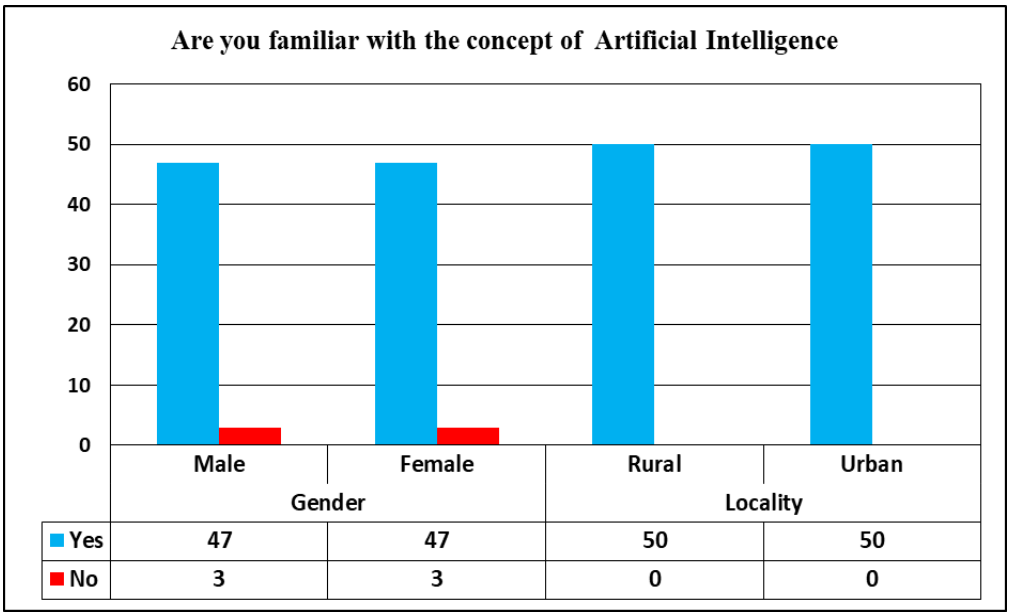


Fig 1: Familiar with the concept of Artificial Intelligence

Table 1: Gender and locality perspective of academic fraternity towards practical implications on the usage of artificial intelligence

ID	Research Questions
RQ 1	Are you familiar with the concept of Artificial Intelligence?
RQ 3	What is your concern in usage of Artificial Intelligence?
RQ 4	Do you think Artificial Intelligence can be useful tool for boosting research performance and enhancing the Quality and Creativity?
RQ 13	Do you believe Artificial Intelligence technology can bridge the educational gap between disadvantaged and privileged students?
RQ 14	As a researcher how often you practice Artificial Intelligence technology in collecting and analyzing your personal data for educational purposes?

Table 1 Examine the gender and locality perspective of academic fraternity towards practical implications on the usage of artificial intelligence. The study evidenced by RQ1: establishes the familiarity of respondents with concept of artificial intelligence. As depicted in Figure 1, gender and locality based analysis suggested that 47 male respondent indicating familiarity with AI as they marked 'yes', while a small fraction 3 respondents reported 'No'. Similarly among the female 47 answered 'Yes' while 3 respondents indicated 'No', as they unfamiliar with AI. Further study visualized as the overview based on locality highlighted that 50 respondents in each rural and urban reported 'Yes' suggest the complete familiarity with AI. Study illustrated that concept of AI is widespread regardless of gender and locality.

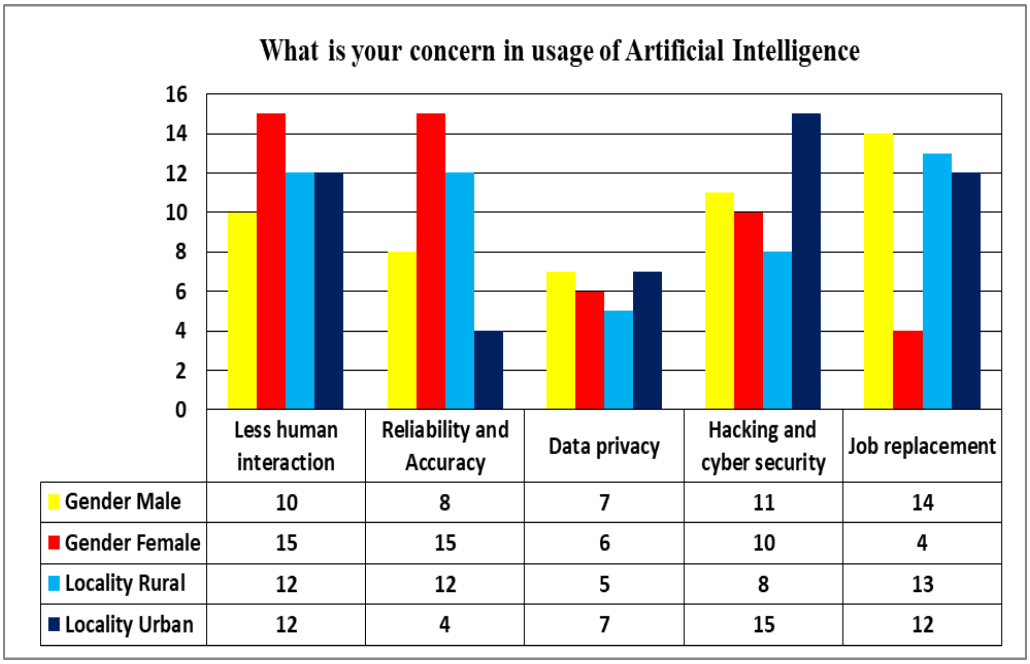
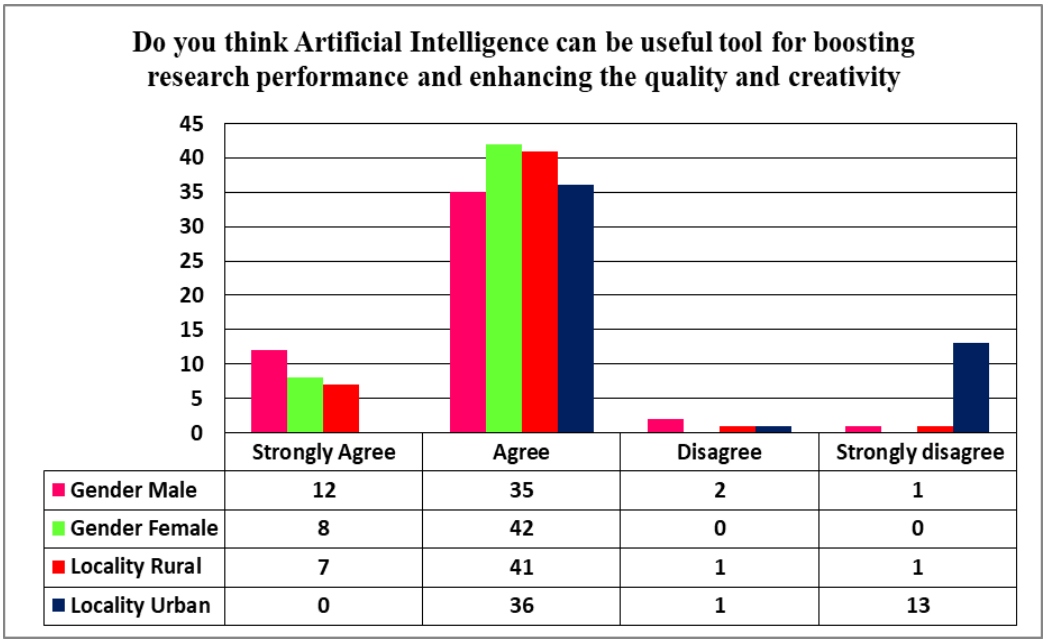


Fig 2: Concern in usage of Artificial Intelligence

Table 1 represented the gender and locality perspective of the academic fraternity towards practical implications on the usage of artificial intelligence, highlighted through RQ3: The study determines the concern of respondents in usage of artificial intelligence categorized into five: Less human interaction, reliability and accuracy, data privacy, hacking and cyber security, and job replacement each section represents the percentage of respondents in usage of AI amongst gender and locality: The collected responses were visualized in Figure 2, which illustrates that the highest concern was reported among 15 female respondents, indicating that they are more worried about AI reducing human interaction. Whereas 12 respondents in each category, rural and urban highlight that they value personal interactions over automation. Further study depicts that 15 Female respondents expressed the most concern about AI's reliability and accuracy, as compared to 8 male respondents. Rural respondents seem more worried than urban. A study conjointly depicts that 12 respondents from rural and 4 respondents from urban localities suggest concern about reliability and accuracy. The study concerns about data privacy were relatively balanced, with 7 male over 6 female respondents with minor variations. 7 urban and 5 rural respondents marked their opinion; urban respondents were slightly more concerned than rural respondents, likely due to more exposure to AI-powered digital services where privacy issues are more apparent. Study demonstrate from the above report that over rural and urban respondents, 15 urban respondents reported the highest concern regarding hacking and cyber-security over rural respondents, as very minor 8 respondents showed their concern regarding cyber security threats. Gender-based observation regulates that 11 male and 10 female respondents indicate a nearly equal perception among the concern. Greater concern about AI replacing jobs amongst gender males as compared to females: 14 male over 4 female respondents expressed their extremely different opinion might be due to job nature, where males predominantly work in AI-disruptive fields. However, with almost equal portions amongst locality, 13 rural and 12 urban respondents; it seems that rural suggests slightly more concern than urban respondents, possibly due to fear of automation in traditional job sectors.



	Strongly Agree	Agree	Disagree	Strongly disagree
Gender Male	12	35	2	1
Gender Female	8	42	0	0
Locality Rural	7	41	1	1
Locality Urban	0	36	1	13

Fig 3: Artificial Intelligence tools for enhancing the quality and creativity in research

Table 1, Observe the gender and locality perspective of the academic fraternity towards practical implications on the usage of artificial intelligence, depicted through RQ 4: Artificial intelligence can be useful tool for boosting research performance and enhancing the quality and creativity. The respondents, based on gender and locality, to identify potential differences in perception, suggested their opinion into four categories: strongly agree, agree, disagree, and strongly disagree. As presented in figure 3, a significant majority of males 12 respondents and fewer females 8 respondents, strongly agreed that AI is a useful tool for boosting research performance and enhancing creativity. Whereas 7 rural respondents advocate the same opinion, interestingly no urban respondents strongly agreed; hence, it is signifying a relatively lower enthusiasm for AI among urban individuals compared to rural respondents. Additional study conveys that the majority of respondents across both gender and locality agreed that AI can boost research and creativity. Amongst all 42 female and 35 male respondents, highly agreed, it showed that females exhibited a slightly higher agreement level compared to males. Whereas the level of agreement in locality suggests that 41 rural and 36 urban respondents marked their opinion, it is stated that rural respondents agreed more strongly than urban respondents, indicating a broader belief in AI's positive impact on research. Further study depicts that only a very small number of respondents marked disagreement with AI being a useful research tool. Female respondents, showed no disagreement at all, while 2 male respondents along with a very minor number 01 respondents in each rural and urban area, expressed their distrust. The most remarkable observation is that 13 urban, followed by 01 rural, respondents strongly disagreed with AI being beneficial for research. This could indicate concerns over AI replacing human creativity and originality in research or ethical concerns regarding AI-generated content. The rural showed almost no strong disagreement, over 01 urban respondent, suggesting a more optimistic perception of AI's benefits.

Table 1, Examine the gender and locality perspective of the academic fraternity towards practical implications on the usage of artificial intelligence, evidenced by RQ 13: Do you believe that artificial intelligence technology can bridge the educational gap between disadvantaged and privileged students? As illustrated in Figure 4, it accentuates that artificial intelligence (AI) has the potential to transform education by enhancing the quality of learning, providing personalized education, and bridging the educational gap between disadvantaged and privileged students. The study explores the gender and locality of the respondent's perceptions regarding the AI role. A considerable proportion of respondents strongly agreed-39 males marked 'yes' that AI can help bridge the educational gap and enhance research quality. Among them, 11 females expressed 'yes' with strong agreement, showing a general confidence in AI. A minor percentage of participants, 11 male versus 16 female, expressed 'No' as they showed disagreement with AI as a useful tool in education. This could be due to concerns regarding over-reliance on AI and potential biases about its ability to replace traditional learning methods. Whereas, a smaller portion 13 rural and 14 urban respondents answered 'No' on the other side, a significant proportion of 37 rural and 36 urban respondents answered 'yes'. Study suggests that both rural and urban participants show higher levels of support in perceive AI as a means of overcoming educational barriers.

Table 1 illustrates the gender and locality perspective of the academic fraternity towards practical implications on the usage of artificial intelligence, insights from RQ14: How often you practice artificial intelligence technology in collecting and analyzing your personal data for educational purposes. To assess the overview regarding the adoption of AI technology in education and research among different demographic groups categorized in gender and locality. Figure 5 presents a clear emphasis on respondent opinions into three categories: never, rarely, and always regarding the practice of AI technology in research. The findings are presented that almost equal proportions of respondents in both gender and locality, i.e., 2 males and 5 females over 2 rural 5 urban respondents indicated that they never use AI for collecting or analyzing personal data. Interestingly, a slightly higher proportion of 15 males and 12 females, whereas 11 urban and 16 rural respondents, admitted to

rarely practicing AI, suggesting a potential gap in access to AI tools or awareness. Further study suggests that the majority of participants, 33 male and 33 female, as well as 32 rural and 34 urban respondents, indicated that they always use AI for research purposes. This shows a widespread adoption and reliance on AI technology for data collection and analysis.

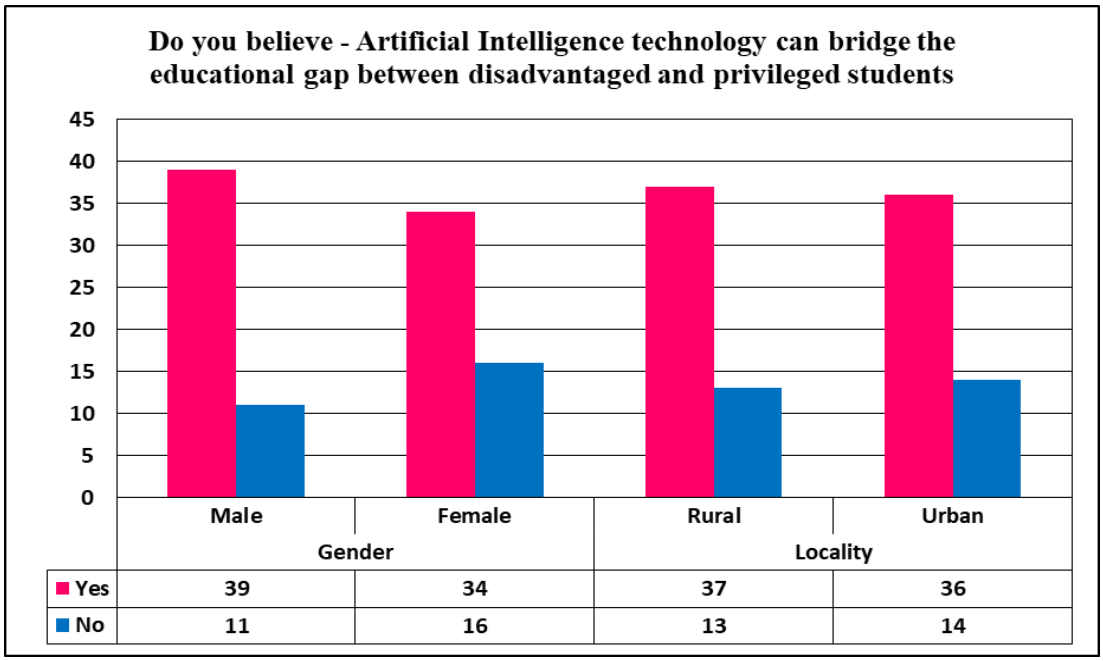


Fig 4: Artificial intelligence technology can bridge the educational gap between disadvantaged and privileged students

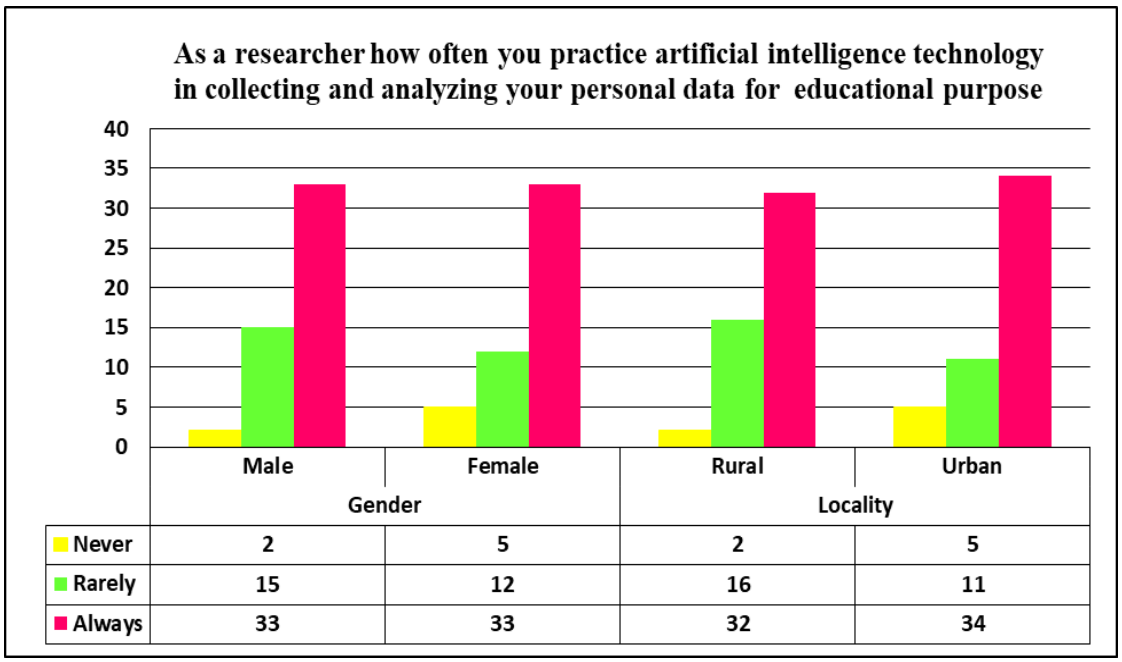


Fig 5: Practice of artificial intelligence in collecting and analyzing personal data for Educational purpose

Conclusion

In light of the above, it is evident that AI awareness, usage, and perception in education and research are rapidly evolving. While AI enhances learning, automates research processes, and improves academic efficiency, its ethical implications and limitations require continuous evaluation. Subsequently, the present study emphasizes a comparative analysis of artificial intelligence in the modern education system and general perspectives among gender and locality of the academic fraternity. The study concludes that females show greater concern about less human interaction and reliability & accuracy, indicating disbelief about AI's decision-making capabilities. Males worry more about job replacement, showing concern about automation-driven unemployment. Urban respondents are significantly more concerned about hacking and cyber-security, likely due to their reliance on AI-integrated online systems. Rural respondents worry more about reliability and job replacement, possibly due to AI's impact on agriculture and labor markets. A significant number of urban respondents indicate concerns about AI's impact on research quality, creativity, or potential job threats. Rural respondents reflect a more optimistic view of AI's ability to improve research in resource-limited settings. Following that, the majority of

respondents across all categories believe AI can bridge the educational gap. Moreover, both rural and urban participants show similar levels of support. Despite these differences, there is a shared optimism across groups regarding AI's potential to enhance educational access and research capabilities, especially in bridging institutional and geographic disparities. The study carries important implications for educational policymakers, institutional leaders, and curriculum developers, targeted awareness and training programs should be developed to address specific concerns related to AI adoption such as job security, data privacy, and system reliability personalized to the needs of different demographic groups. Furthermore, the shared belief in AI's capacity to bridge educational gaps calls for inclusive AI integration strategies, especially in underserved rural regions. By acknowledging the diverse perspectives within the academic fraternity, stakeholders can promote equitable, responsible, and effective implementation of AI in the modern education system.

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