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Research Article

A study on prospective teachers of Kalyan Karnataka region usage of AI in the training course.

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ABSTRACT

The present study aimed to investigate the effect of AI as fifth industrial revolution learning among prospective teachers of Kalyan Karnataka. The study consists of 300students from Kalyan Karnataka districts of Karnataka state, divided equally into groups based on the pedagogy type and gender. The survey method has been used for this study. Statistical analysis involved mean, standard deviation, and t-tests. Findings indicate significant differences in pedagogy of teaching in Social Science, Science Mathematics and languages Additionally, sociodemographic factors like institution type, gender, and medium of instruction influence AI among prospective teachers in Kalyan Karnataka. The paper discusses implications andrecommendations based on these results.

Keywords: prospective teachers, fifth industrial revolution, pedagogy subjects,

Introduction

The current era is marked by a broad spectrum of challenges across diverse fields, with the educational sector particularly affected by the rapid development of artificial intelligence (AI) technologies (Luan et al., 2020). The revolution in information technology (IT) and the expansion of software design have profoundly transformed pedagogical approaches and learning paradigms (Chiesa, 2020; Golubev & Testov, 2015). Recent advancements in AI across various sectors have not only redefined industry standards but have also brought substantial changes to academia by improving teaching and learning processes and fostering innovation in educational methodologies. In this context, the Fifth Industrial Revolution (5IR) represents a pivotal turning point in technological evolution, emphasizing human–machine collaboration and re-centering human agency in the development and application of technological tools (Atanasoski & Vora, 2019). This shift underscores the urgent need to redefine roles within higher education institutions to align with the evolving technological landscape.

As IT becomes an integral component of higher education, it has been closely linked to improvements in institutional quality and design. Cantú-Ortiz et al. (2020) emphasized that universities are increasingly benefiting from innovations in computing and software systems, particularly through transformative technologies such as AI. As a multidisciplinary field that encompasses computer science, mathematics, philosophy, biology, and engineering (Mohaghegh, 2024), AI is designed to simulate human intelligence in complex problem-solving and decision-making scenarios. Liu et al. (2025) and Albahiri and Alhaj (2024) affirmed that AI-driven systems are capable of applying adaptive strategies to address multifaceted academic challenges. The integration of AI within academia has yielded numerous advantages, including enhanced faculty performance and streamlined administrative functions (Nadimpalli, 2017). AI has further improved educational dynamics by enabling adaptive, individualized learning opportunities and facilitating seamless virtual communication, thereby enriching the academic experience.

Several scholars have highlighted the educational benefits of AI. Popenici and Kerr (2017) asserted that the availability of personalized, on-demand instruction—irrespective of time or location—substantially enhances student learning outcomes. Abu Zaqia (2018) concurred, noting that AI assists teaching faculty in addressing diverse learner needs, efficiently presenting material, and tailoring interventions based on student performance. Moreover, Aithal et al. (2024) advocated for instructional frameworks that integrate AI, promoting a shift toward knowledge-based, technology-enhanced learning environments. The university faculty today are expected to fulfill increasingly interdisciplinary roles, including teaching, conducting research, contributing to community engagement, and participating in institutional administration (Altbach,

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2014; Doğan & Arslan, 2024). Abu Zaqia (2018) further expanded on these evolving roles, emphasizing the need for faculty members to possess advanced skills in information sourcing, lifelong learning, and future-oriented cognitive competencies such as reasoning, memory, and critical thinking. In response, Dzogovic et al. (2024) recommended expanding AI applications across educational fields and promoting the integration of humanities with applied sciences for nuanced and impactful outcomes.

The emergence of the 5IR marks a paradigm shift from automation and digitization to a more human-centered integration of technologies, where AI, empathy, ethics, and creativity coexist. Within this evolving framework, educators are no longer mere facilitators of knowledge but are expected to assume roles as innovators, collaborators, and ethical leaders. At Gulbarga university Kalaburagi this technological and pedagogical transformation is reshaping the role of teaching faculty, with AI serving as a model for innovative practice and institutional development. In this context, the present study seeks to explore the innovative roles that faculty members at GUK perceive for themselves in light of the technological advancements of the 5IR, with particular attention to AI integration

Despite the increasing attention to AI in educational settings, empirical studies have revealed varying levels of AI adoption in higher education institutions. Luo (2018) highlighted institutional trends that stress the importance of AI integration to enhance organizational efficiency. However, Al- Muqayti (2021) found that AI utilization among the faculty in Jordanian universities was moderate, a finding echoed by Al-Yazji (2019) in the Saudi context. Al-Subhi (2020) reported even lower levels of AI application at Najran University, prompting Al-Hukami (2023) to call for the development of practical frameworks and standards to support effective AI adoption in Saudi higher education. Drawing on the researcher's professional experience in postgraduate education and the observed transformative potential of AI in academic settings, this study aims to investigate how the faculty at KKU perceive their evolving roles within the broader context of the 5IR.

Review of related literature

5IR marks a shift away from the automation-focused agenda of the Fourth Industrial Revolution (4IR) toward a paradigm that places human creativity and ethical values at the center of technological progress. 4IR emphasized digitization, automation, and efficiency, while 5IR is defined by empathy, ethics, inclusivity, and sustainability. Xu, David, and Kim (2018) argue that this new paradigm repositions humans at the core of innovation, fostering technology that complements rather than replaces human potential. According to Schwab and Zahidi (2020), 5IR promotes human-centered innovation in which AI serves not only as a tool for optimization but as a co-creative partner advancing human well-being and societal flourishing.

In higher education, this reorientation demands that faculty roles evolve beyond technological proficiency to include the cultivation of ethical reasoning, socioemotional learning, and personalized instruction. As AI systems become increasingly prevalent in instructional delivery and student assessment, educators are increasingly called upon to foreground human capacities, such as empathy, mentorship, and moral judgment, that machines cannot replicate. Thus, the faculty are now envisioned as facilitators of human AI collaboration, aligning pedagogical practices with the broader objectives of 5IR.

Previous studies on the evolving roles of the university faculty within the context of AI and the 4IR and 5IR offer critical insights into the challenges and opportunities educators face as they navigate rapidly changing educational landscapes. For instance, Baker et al. (2019) explored how AI technologies, particularly intelligent tutoring systems (ITSs), support instructors by offering real-time feedback to students. Notably, the latter enables personalized learning. This capability allows the faculty to shift their focus from routine instructional tasks to fostering higher-order cognitive skills such as critical thinking. A central finding of the study was that faculty roles are transitioning from traditional knowledge transmitters to facilitators of learning, as AI increasingly automates assessments, grading, and rudimentary tutoring functions. In this evolving framework, educators are reimagined as mentors and coaches rather than lecturers.

Woolf (2010) conducted a foundational study on ITSs, demonstrating how AI-driven systems can tailor instructional content, feedback, and pacing based on individual learner performance. This adaptability renders AI particularly effective in addressing diverse learner needs, including variations in learning speed, style, and comprehension. Woolf emphasized that the individualized nature of AI-enhanced education improves overall instructional efficiency and learning outcomes. Mhlanga (2022) further contributed to the discourse by advocating for a human-centered AI approach. His study emphasized the importance of the Human-in-the-Loop (HITL) model, which ensures that AI systems are designed to serve human well-being and maintain ethical accountability. Mhlanga also stressed the need for policies that promote AI awareness and responsible autonomy, particularly in educational and corporate settings.

Redecker (2017) emphasized that AI integration necessitates a shift in the educator's identity from knowledge dispenser to learning facilitator. This transition requires the development of strong digital pedagogical competencies to effectively leverage AI tools for personalized learning. Luckin et al. (2016) also highlighted the potential of AI to support adaptive learning environments and real- time feedback mechanisms. Their work underscored the need for faculty involvement in the co- design of AI tools to ensure pedagogical alignment and relevance. The OECD (2021) stressed the necessity for the faculty to acquire AI literacy and data fluency to remain effective in a tech-driven academic environment. However, the report also identified

substantial professional development gaps, especially in low- and middle-income countries, where resources and training opportunities may be limited.
Zawacki-Richter et al. (2019) reinforced this concern, revealing that many faculty members feel underprepared to integrate AI into curriculum delivery and assessment. They called for structured training programs and interdisciplinary collaboration to bridge this skills gap. Finally, Selwyn (2019) cautioned that whereas AI and automation can enhance instructional delivery, the irreplaceable role of the educator lies in fostering empathy, creativity, and ethical reasoning—capacities that machines cannot replicate. Collectively, these studies affirm that while AI offers substantial potential for improving educational processes, the evolving role of the faculty must be supported through targeted training, ethical guidance, and a reaffirmation of the human elements in teaching and learning.

Objectives of the study
1. To obtain the knowledge and usage of AI in prospective teachers.
2. To obtain the knowledge usage of AI in B.Ed. training.

Hypothesis of the study
1. There is a significant difference between the usage of AI tools among male and female.
2. There is a significant difference among the usage of AI tools among their Subjects.

Methodology

Research design
This study employed a survey study design with a quantitative approach. The survey method was selected owing to the research focus on B.Ed. colleges of Kalyan Karnataka region. and the purposive nature of the sampling. Although numerical data were collected using a structured questionnaire, the specificity of the institutional context limits the generalizability of the findings, making the case study framework appropriate for an in-depth exploration.

Sample Size
The research population comprised all prospective teachers of Kalyan Karnataka region. A purposive sampling technique was used to select participants based on their relevance to the research objectives. Specifically, B.Ed. trainees in higher education with experience or interest in AI integration were targeted.

Findings
As Faculty role in **AI-driven educational content** the highest-rated aspect within this dimension was "Summarizing educational content" (mean= 3.267), indicating that the faculty are comfortable utilizing AI tools for content synthesis. This finding could be attributed to the availability of AI-powered summarization tools, such as natural language processing applications that facilitate efficient content management.
As Faculty role in **AI-driven teaching strategies** and methods the results reveal that prospective teachers of Kalyan Karnataka region hold a moderate perception of their role in integrating AI into teaching strategies and instructional practices, with an overall mean score of 2.752. Although practical implementation remains limited and underdeveloped, this finding indicates a growing recognition of AI's potential in education.
As faculty role in **in AI-driven educational technologies** mean = 3.000), reflects a moderate level of engagement. This finding suggests that faculty members are increasingly adopting AI tools to support their own professional development, aligning with contemporary trends in lifelong learning and self-directed growth.
As faculty role in **AI-driven support for learners** as moderate, with an overall mean score of 2.939. This finding suggests an emerging awareness and interest in leveraging AI to enhance student learning experiences, although substantial opportunities for deeper integration and optimization remain.
As faculty role in in **AI-driven assessment processes** as relatively limited, with an overall mean score of 2.496. This low level of perceived involvement suggests that AI tools have not yet been widely adopted or integrated into the assessment processes of the university, underscoring the need for strategic efforts to enhance the role of AI in modernizing evaluation methods.

Discussion

The findings from this study reveal that prospective teachers of Kalyan Karnataka region hold a moderate perception of their roles in integrating AI into higher education. Across domains such as educational content, teaching strategies, educational technologies, learner support, and assessment, the average engagement level remained moderate. Notably, the highest engagement was seen in student support, whereas the lowest was in assessment processes. These results suggest that although faculty members acknowledge AI's potential, their practical application remains limited and exploratory in nature (Zawacki-Richter et al., 2019).

Regarding teaching strategies, the faculty demonstrated moderate usage of AI, particularly in supporting active learning approaches. However, difficulties were reported in managing AI-supported student interactions, pointing to a need for pedagogical training.

Conclusion

This study examined the perceptions of prospective teachers of Kalyan Karnataka region regarding their roles in integrating AI across five educational domains. Addressing:
Research Question 1 on educational content, this study confirmed the faculty's moderate engagement, showing comfort with AI- supported content summarization but limited involvement in adapting materials to AI-related challenges, consistent with Maqaiti's (2021) findings
Research Question 2 on teaching strategies and methods, the faculty moderately incorporated AI, especially in promoting active learning, although they faced difficulties in managing AI-mediated student interactions, underscoring the need for pedagogical training as noted by Luckin et al. (2016). Regarding
Research Question 3 on educational technologies, participants demonstrated an emerging use of AI tools for continuous learning, but less adoption in virtual conferencing and digital presentations, reflecting the barriers highlighted by Zawacki-Richter et al. (2019). In
Research Question 4, faculty engagement in learner support was relatively higher, particularly in analyzing student behaviors and providing academic and psychological guidance; however, the faculty were less inclined to encourage student use of AI tools for assignments, which Holmes et al. (2019) identify as a missed opportunity to foster digital literacy Finally,
Research Question 5 revealed the lowest faculty engagement in AI-driven assessment processes, with challenges rooted in technical proficiency, ethical concerns, and institutional limitations, as discussed by Popenici and Kerr (2017). These results collectively emphasize a moderate yet cautious acceptance of AI among faculty members, highlighting critical areas such as assessment and curriculum redesign that require targeted professional development, institutional support, and clear policies to foster effective AI integration.
This study acknowledges its limitations, including a small purposive sample of 100 prospective teachers of Kalyan Karnataka region members from a single institution, which restricts the generalizability of the findings. Future research should consider larger, more diverse samples to better understand faculty roles in integrating AI across various educational contexts

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