A Study on using AI Chatbots in Enhancing Technological Proficiency of Teachers in Higher Education

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Abstract

The study looks into how Artificial Intelligence (AI) chatbots can improve teachers' technical competency in higher education. With the fast incorporation of AI tools in academic settings, this study looks at how AI chatbots might help educators increase digital competency and confidence in using emerging technology. The study took a qualitative approach, collecting data mostly through semi-structured interviews with higher education lecturers. Data were thematically examined, and a SWOC (Strengths, Weaknesses, Opportunities, and Challenges) analysis was performed to assess the pedagogical and technological consequences of using AI chatbots. The findings show that AI chatbots give teachers with accessible, cost-effective, and interactive platforms to develop their technological abilities, increase instructional efficiency, and stimulate innovation in teaching techniques. The study also highlights challenges related to ethical use, data privacy, and over-reliance on technology. The research concludes that AI chatbots can serve as an effective tool for promoting technological proficiency and professional growth among higher education faculty.

Keywords: AI Chatbots, technological proficiency, Higher Education

Introduction

The world's educational landscape has been drastically altered by the quick development of technology, especially in higher education. Teachers are under growing pressure to embrace and effectively integrate technology into their lesson plans as digital tools and innovations continue to spread. It is increasingly acknowledged that improving instructors' technology ability is essential for successful 21st-century skill integration in higher education institutions, better student engagement, and effective pedagogy. However, a lack of training opportunities, time constraints, and varying levels of digital literacy make it difficult for many faculty members to stay up with technology changes. Innovative strategies that offer scalable, individualized, and accessible help are crucial to resolving these problems.

AI technologies have emerged as effective facilitators in a variety of fields, including education. Among these, AI chatbots have gained popularity as interactive tools to help teachers learn and improve their technology

abilities. These AI-powered conversational agents replicate human-like discourse, providing on-demand guidance, resources, and technical assistance, potentially lowering barriers to learning new technology. AI chatbots have the potential to revolutionize professional development for higher education teachers by providing personalized guidance, allowing for self-paced exploration, and promoting experiential learning outside of traditional training environments.

Technological competency spans a wide range of skills, including the successful use of digital devices, software programs, communication platforms, and educational technology to support instructional goals. Higher education instructors must be technologically proficient not simply to provide course content, but also to construct creative learning experiences, assess student performance, and stimulate cooperation. With the growing use of online and blended learning models, instructors' ability to competently manage technology tools has become a critical component of instructional efficacy. However, research shows that many educators are hesitant or underprepared as a result of insufficient training opportunities and professional development programs that do not suit their specific requirements and schedules.

The incorporation of AI chatbots into faculty development provides various benefits. First, chatbots are available around the clock, allowing teachers to seek assistance and resources whenever necessary. This accessibility promotes ongoing learning and rapid problem solving in dynamic classroom settings. Second, AI chatbots can provide tailored learning experiences by tailoring responses to user inquiries and skill levels, increasing relevance and engagement. Third, chatbots are scalable solutions that can serve huge faculty groups without requiring the same resources as traditional in-person workshops or one-on-one mentoring. Collectively, these advantages contribute to increased acceptance and continued usage of instructional technologies.

AI chatbots can support the cognitive and emotional components of teacher learning in addition to their practical value. Chatbots can promote a growth attitude and lessen the anxiety associated with learning new technology by offering prompt feedback, explanations, and encouraging assistance. In order to encourage teachers to experiment with new tools and meaningfully incorporate them into their teaching practices, this emotional support is essential. likewise, AI chatbots can facilitate collaborative learning by directing conversations, making resource recommendations, and assisting educators in connecting with peers who have similar interests or difficulties.

Even with these encouraging qualities, there are still issues and worries about using AI chatbots in educational settings. Careful thought should be given to issues pertaining to data privacy, ethical issues, and possible over-reliance on automated systems. If teachers feel that AI-driven technologies are obtrusive or if chatbot responses are inaccurate and insensitive to context, they may be sceptical or uncomfortable using them. In addition, AI chatbots must be carefully incorporated into larger professional development frameworks to supplement rather than replace human mentorship.

The use of chatbots to enhance student learning, engagement, and evaluation has been the main focus of previous research on AI in education. An increasing amount of research is looking at how AI tools can be used to empower teachers. According to studies, AI-powered apps can encourage teachers to use reflective practices,

tailored learning paths, and adaptive teaching techniques, all of which can improve the quality of instruction. AI chatbots can offer just-in-time support that fits teachers varied professional settings and objectives in higher education, where faculty responsibilities are diverse and autonomy in teaching approaches is prized.

The purpose of this study is to investigate how AI chatbots can help teachers in higher education become more technologically proficient. The study examines how these AI tools impact teachers' confidence, ability to learn new skills, and willingness to interact with new technology. It focuses on the perceptions, experiences, and results related to chatbot use. In an effort to offer a comprehensive understanding of the possibilities and constraints of chatbots, the investigation also looks at the factors that support and hinder their successful integration into faculty development.

Specifically, this study addresses the following research questions:

1. How do teachers in higher education view the value and usability of AI chatbots in increasing technological proficiency?
2. How do AI chatbots help or hinder instructors' use of educational technologies?
3. What problems and opportunities arise when adopting AI chatbot interventions for faculty professional development?

The study uses a qualitative research approach using semi-structured interviews with faculty members in higher education who have used AI chatbots for professional development in order to address these topics. The interpretation of results is guided by thematic data analysis and a SWOC (Strengths, Weaknesses, Opportunities, Challenges) framework, revealing important insights pertinent to academic leaders, instructional designers, and educational policymakers.

solutions by concentrating on AI chatbots for faculty development. Additionally, it addresses the need for creative models that close the ongoing gaps in teachers' technical ability, which is essential for the long-term transformation of teaching and learning environments in higher education. It is anticipated that the results of this study will guide the creation and execution of AI-enhanced professional development initiatives that are both successful and sensitive to the changing demands of educators.

In closing, it is critical to provide teachers with strong digital competences as higher education institutions navigate an increasingly complicated technology landscape. By providing scalable, accessible, and customized learning opportunities, AI chatbots offer a viable solution to complement this quest. This study aims to investigate the practical effects of these technologies on teacher readiness, providing important data to direct future innovation in faculty development and educational technology integration.

Background of the Study

Rapid digital innovations and shifting pedagogical expectations are causing a significant transition in the higher education scene. In this situation, a teacher's ability to use technology effectively has become crucial for providing engaging and successful instruction. Faculty are required to smoothly incorporate digital tools for

administration, teaching, and assessment as institutions adopt them. Many encounter obstacles like little exposure, insufficient training, and the rapid advancement of technology.

The ability to successfully use digital resources to support educational objectives and student learning is a key component of technological competency. This involves using communication platforms, learning management systems, and new educational tools for online and blended learning in higher education. Despite its significance, many institutions still lack organized and easily available professional development for technology integration.

Artificial intelligence (AI) has become a disruptive force in education, and chatbots with AI capabilities are particularly promising. These conversational bots, which were first created to assist students, now present opportunities for faculty development by assisting teachers in enhancing their technology proficiency. Teachers can learn at their own pace with the help of chatbots, which offer individualized, on-demand support on instructional design, troubleshooting, and reflective practice.

Their flexibility complements learner-centered educational frameworks and facilitates customized professional learning. Chatbots can help teachers explore digital tools with confidence by lowering anxiety and providing non-judgmental support. Yet, concerns about data privacy, information accuracy, and reliance on automated systems call for close monitoring to make sure chatbots complement human assistance rather than take its place.

The majority of current research focuses on the usage of chatbots for students, although there is increasing interest in using AI to empower faculty. Chatbots can provide flexible, ongoing help to fill up gaps in technological training in higher education, where teaching demands change. In order to determine best practices for institutional adoption, this study examines how AI chatbots help higher education instructors become more technologically proficient. It does this by examining both advantages and disadvantages. In the end, it helps teachers become more adept at utilizing digital innovation and raising the calibre of instruction in technologically advanced classrooms.

Conceptual Overview

The foundation of this research is the nexus of artificial intelligence (AI), teacher professional development, and educational technology. The ability to use digital resources to enhance teaching and learning processes is a key component of technological proficiency for educators. Faculty members need ongoing skill development to meet changing pedagogical demands and enhance student results as higher education increasingly incorporates digital platforms and cutting-edge technologies. AI chatbots are interactive, AI-powered conversational agents that can help teachers receive individualized, scalable, and accessible professional development. By using natural language processing, these chatbots offer real-time support, resources, and feedback, allowing educators to develop their technology abilities at their own convenience and leisure. Chatbots facilitate technological troubleshooting, pedagogical innovation, and knowledge acquisition by mimicking tutoring or coaching interactions.

The conceptual basis acknowledges that learners, in this case, teachers actually benefit from adaptive and learner-centered support settings by integrating ideas of self-regulated learning, constructivism, and technology adoption. By providing easily available, low-pressure assistance, AI chatbots can lower affective barriers to technology adoption, boosting teacher enthusiasm and confidence. besides, professional development frameworks that prioritize ongoing, contextualized learning over one-time training sessions are compatible with AI chatbots.

The constraints and ethical issues surrounding the usage of AI chatbots, such as protecting data privacy, preserving the quality and applicability of the information offered, and avoiding an excessive reliance on automated systems, are also acknowledged by this conceptual framework. In order to ensure quality, social-emotional factors, and ethical oversight, human facilitation is still necessary to supplement AI support. Through these conceptual lenses, the study explores how AI chatbots function as enablers of technological proficiency, addressing key factors influencing teacher uptake and effectiveness in higher education contexts.

Need and Significance

The necessity and importance of this study stem from the increasing requirement for professors in higher education to become technologically proficient in the face of quickly changing digital environments. Teachers must develop and maintain the skills necessary to use digital technologies effectively as educational institutions increasingly use technology into teaching, learning, and administration. Many educators face obstacles that prevent them from keeping up with technology advancements, such as time constraints, inadequate training, and disparities in digital literacy.

Artificial intelligence (AI) chatbots provide teachers with scalable, individualized, and easily available support, making them a timely and promising alternative. AI chatbots allow self-paced learning and real-time support, which makes technological upskilling easier and more flexible for busy educators than traditional professional development forms. This study is important because it explores how AI chatbots can be useful tools to improve technological competency, which is essential for high-quality instruction, creativity, and student engagement in higher education.

By concentrating on faculty development, an area that has received less attention than AI's student-facing applications, the study fills a crucial need. Institutional policies for faculty training and technology integration can be informed by an understanding of the advantages and disadvantages of chatbot-supported learning. The results can help academic leaders, politicians, and instructional designers embrace AI-enhanced professional development frameworks that encourage ethical and efficient technology usage, lower affective barriers, and support ongoing learning. This study supports the sustainable digital transformation of higher education institutions globally, advances pedagogical methods, and improves educational outcomes by increasing instructors' technology proficiency through the use of AI chatbots. As a result, it is highly valuable to the academic community and to educational innovation in general.

Objective of the Study

- To analyse how AI chatbots could enhance technological proficiency in higher education

Materials and Methods

The study sample was composed of a sample of 30 teachers of different colleges in Kozhikode district. The sampling technique used was purposive in nature.

Instrument

Data collecting is primarily an important aspect of the research procedures in which the interference, hypothesis, or generalization, tentatively held, may be identified as true, verified as correct, or discarded as untenable Koul (1984). The choice of right tools is critical for any successful research. To collect data from the participants, an interview schedule was created in accordance with the objective set.

Process

The investigative process began with the administration of the interview to facilitate the respondents to provide detailed view point. The data were taken following the ethical principles of anonymity and objective treatment. The interview schedule consisted of 15 items included ideas on technological proficiency and usage of AI Chatbots in higher education. After pilot testing of the instrument, the interview was conducted and analysis were done according to the objective put up.

Data Analysis

The data collected from the interview schedule were analyzed in two methods. At first a thematic analysis was conducted and then a SWOC analysis was conducted to explain the use of AI Chatbots in higher education.

Results and Findings

This section aims to present the fundamental findings of the study in organized manner.

Analysis

Although interviewing on a meaning level is often more difficult, a qualitative research interview seeks to address both factual and meaning issues (Kvale, 1996). When a researcher wants to fully understand the interviewee's perceptions and feelings in their own words, a qualitative interview is the best approach. Forty higher education academics from different universities were interviewed. Structured open-ended and closed-ended questions were posed on a variety of AI themes, including attitudes toward use, chatbots' role in fostering inclusive education, and machine-based socializing, and expert responses were reviewed and their implications recorded. It's encouraging to see that all of the experts believe that chatbots are the best way to improve technological proficiency right now.

All the experts felt that machine-based learning models could be a very good alternative to many other tools in teaching learning process. Few opinions of the teachers are presented as follows:

1. AI chatbots can quickly capture the interest of higher education teachers, their major target audience.
2. AI chatbots improve technological skills among teachers in higher education.
3. Unregulated use of AI chatbots may impact teachers' socialization processes in academic contexts.
4. Providing tools and support helps teachers adopt AI chatbots with favorable attitudes.
5. Limited coverage of regional languages in AI chatbot solutions creates challenges for varied linguistic situations.
6. AI chatbots can motivate teachers to adopt technology by facilitating language acquisition procedures.
7. Promoting proactive thinking in educators leads to more effective and meaningful usage of AI chatbots for professional development.

The second round of examination entailed evaluating the initial codes. The investigator then explored how to maintain the diversity of the initial codes and higher-level sub-themes. The third stage involved the investigator's analysis of quotes, followed by a review of the themes before characterizing and labelling them. The report's writing began once the themes had been finalized.

Thematic analysis and SWOT analysis techniques were used and the data and results are presented below:

Thematic Analysis

- **Accessibility and Usability of AI Chatbots**: Teachers' opinions of how AI chatbots offer timely, easily accessible, and user-friendly technical support are captured in this theme. It emphasizes the allure of chatbot design, which quickly attracts the attention of academics in higher education as useful tools for troubleshooting and self-paced learning. Teachers value the individualized support and round-the-clock accessibility that lower obstacles to acquiring digital skills.
- **Impact on Technological Proficiency and Pedagogical Innovation**: This topic illustrates how AI chatbots support real-world skill development, self-assurance, and creative teaching methods. Teachers agree that including chatbots into their professional development encourages proactive use of technology in the classroom and helps them acquire pertinent digital competencies. Aspects of motivation and how chatbots support continuous learning and adaptation are also covered in this area.
- **Challenges and Limitations**: The limited coverage of regional languages, possible over-reliance on automated tools, and sociocultural ramifications including the impact on teacher socialization are some of the crucial themes surrounding chatbot utilization. Included are data privacy concerns, ethical

considerations, and disparities in chatbot relevance and accuracy, highlighting areas that require caution or development.

- **Institutional Support and Resource Provision**: This theme highlights how crucial it is to provide sufficient institutional resources and training structures to encourage instructors to adopt more positive attitudes. It emphasizes that in order to enhance faculty involvement and long-term use, the efficacy of chatbot interventions depends on extensive support systems, including infrastructure, incentives, and additional human coaching.

SWOC Analysis

Analysis and interpretation of the experts' comments, of the present study are presented below

	Features
Strengths	• AI chatbots offer cost-effective and user-friendly platforms for teachers to continuously upgrade their technology skills. • Personalized on-demand support enhances engagement and practical learning by adapting to individual learning paces and demands. • Chatbots promote self-directed learning, increasing confidence and motivation to use technology in higher education. • Integrating AI chatbots can enhance instructional efficiency and innovation by promoting digital competency development.
Weaknesses	• Limited regional language support hinders inclusivity and effectiveness for instructors with varied linguistic origins. • Relying too much on AI chatbots may hinder professional development by reducing human connection and mentoring. • Teachers may be skeptical about chatbots due to unfamiliarity or concerns about technology replacing personalized assistance. • Technical constraints and occasional mistakes in chatbot responses can disrupt learning experiences.
Opportunities	• AI chatbots can help educational institutions scale professional development programs efficiently, saving time

	and resources. • Chatbots can integrate with other institutional learning management systems to provide a comprehensive digital support ecosystem. • Awareness and training can influence attitudes towards AI chatbots, leading to increased acceptance and strategic use. • Chatbot integration can help policymakers and academic leaders create creative faculty development frameworks that correspond with digital transformation goals.
Challenges	• Ensuring data protection, ethical AI use, and trustworthiness of chatbot systems remains a top priority. • Institutional preparation, including IT infrastructure and ongoing technical assistance, is crucial but frequently inadequate. • Balancing automated support with human monitoring is a hard implementation challenge. • Systematic and ongoing research is necessary to monitor and evaluate the long-term influence on teacher proficiency and student outcomes.

To summarize, Strengths need to be maintained, built upon or leveraged, Weaknesses need to be remedied, changed or stopped, Opportunities need to be prioritized, captured, built on and optimized and Challenges need to be countered or minimized and managed.

Discussions

Recent educational research and real-world applications demonstrate the great potential of using AI chatbots to improve teachers' technology competency in higher education. With the help of AI chatbots, educators may overcome typical obstacles including time limits, a lack of training opportunities, and disparities in digital proficiency. This approach to professional development is accessible, personalized, and scalable. The chatbot's user-friendly design and 24/7 availability were emphasized in the theme analysis as advantages that facilitate faculty members' adoption of technology and make it more engaging.

AI chatbots immediately improve technological proficiency, enabling educators to more confidently incorporate cutting-edge digital tools into their teaching. This is in line with more general objectives in higher education to promote digital competences that enhance student learning and the efficacy of instruction. Sustained skill development is also greatly aided by the motivational advantages of chatbots, such as lowering anxiety associated with learning new technology and encouraging proactive thinking.

Successful chatbot integration has been found to depend critically on institutional support. The results indicate that offering necessary infrastructure, resources, and continuous technical support encourages instructors to adopt chatbots and changes their attitudes. AI chatbots can greatly improve the scalability and efficacy of training in digital skills when integrated into a professional development ecosystem. AI chatbots may customize learning support, expedite administrative procedures, and offer data-driven insights that guide curriculum improvement, as shown by real-world implementations in numerous colleges. These many advantages highlight chatbots' transformative potential as both technical tools and catalysts for reconsidering faculty development in an increasingly digital higher education setting.

Even if AI chatbots are not a cure-all, they can significantly improve technological proficiency when used strategically in teacher professional development. The study highlights a well-rounded strategy that makes use of AI's advantages while resolving pedagogical, linguistic, and ethical issues through extensive institutional frameworks. To further evaluate and improve chatbot-supported faculty development, future studies should examine long-term effects on instructional strategies and student results.

Conclusion

The study on the use of AI chatbots to improve teachers' technology skills in higher education emphasizes the transformative potential of AI-driven conversational agents as excellent tools for faculty development. AI chatbots provide various distinct benefits, including accessibility, personalized support, and scalability, allowing educators to engage in self-paced learning based on their specific requirements and schedules. These characteristics are crucial in overcoming typical constraints, such as limited training opportunities and different levels of digital literacy among higher education teachers.

Empirically, AI chatbots help to improve technological abilities and pedagogical innovation by encouraging proactive thinking and motivation in educators. Their capacity to provide real-time assistance, reduce anxiety about technology adoption, and facilitate continuous learning gives instructors more confidence in incorporating digital technologies into their teaching practices. This, in turn, improves teaching quality and student engagement.

Nevertheless, the study identifies significant limitations and concerns. Institutions must carefully negotiate issues such as regional language coverage limitations, ethical concerns about data privacy, potential over-reliance on AI systems, and the need to preserve human mentorship. Institutional support in the form of

infrastructure, training, and resource allocation is critical for maximizing the benefits of chatbot integration while minimizing dangers.

AI chatbots are emerging as beneficial additions to standard faculty development frameworks, rather than alternatives for human engagement and directed education. Their planned deployment within supportive institutional ecosystems has the potential to significantly improve teacher technology competency and pedagogical innovation in higher education. Future study should focus on long-term impacts, best practices for implementation, and frameworks to ensure ethical use, inclusion, and maximum educational benefit.

This study adds to the expanding body of information on AI in education by focusing on faculty development, a key but underexplored aspect, and gives practical insights for policymakers, educators, and academic leaders seeking to manage the digital transformation.

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