



TEACHER EDUCATORS' READINESS, PERCEPTIONS, AND CONCERNS REGARDING AI INTEGRATION IN TEACHER EDUCATION INSTITUTIONS IN PUNJAB

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Abstract

AI is increasingly important in the domains of teaching and educational material development. The success of AI implementation in teacher education would be contingent upon teacher educators' preparedness. Their perceptions of AI and the support and guidance they receive from the institutional side. The current study sought to understand the readiness, perceptions, and concerns of teacher educators regarding the integration of AI in teacher education institutions. A qualitative research design with hermeneutic phenomenology was adopted.

A total of 11 teacher educators participated in this study. The number of participants was deemed adequate for the study. The research aimed to obtain meaningful accounts of participants' experiences of the phenomenon under study, rather than to generalise the findings. Most of the participants had gained experience using AI independently. The participants also discussed issues related to inaccurate data, cheating, students' overreliance on AI, cultural biases, a lack of critical thinking, privacy concerns, and the absence of an institutional policy. All participants agreed that AI should be used to help teachers, not replace them, and that human judgment is crucial in teaching and decision-making. Teacher education institutions should provide professional development, appropriate technology, ethics training, technical support, and AI-related policies.

The results have revealed three major themes: lack of preparedness for the integration of AI, AI as a useful but controlled tool in education, and ethical, academic, and institutional issues related to the technology. It was found that most participants were aware of AI and understood that it could be used to plan lessons, create educational materials, prepare for assessments, conduct research, and relieve teachers' workload. Still, the levels of awareness, confidence, technological skills, and competence in using AI for pedagogical purposes varied widely.

Keywords: *Artificial intelligence, teacher educators, AI integration, ethical concerns.*

Introduction

AI is becoming a significant part of the education sector. Technological innovations, such as ChatGPT, intelligent tutoring systems, automated grading systems, learning analytics, and AI content creators, are changing the process. It is used to prepare classes, assess students, provide feedback, and develop learning materials for teachers. Despite the benefits these innovations bring, their implementation largely depends on teachers' knowledge, readiness, attitudes, and confidence (Alqahtani & Wafula, 2025).

The importance of artificial intelligence becomes even more evident in teacher education institutions (Ayanwale et al., 2022). It educates future teachers. The task of teacher educators involves not just educating future teachers in subject knowledge but also demonstrating best



practices. It includes teaching and learning. Teacher educators' attitudes toward AI may shape future teachers' perceptions and implementation of this technology in schools and colleges. If teacher educators adopt technology appropriately, they can prepare future teachers to work in technologically rich learning environments. The implementation of AI technology in teacher education will face difficulties if teacher educators are unaware of these technologies (Bibi et al., 2025).

There are several ways in which AI technologies can be used to assist teacher educators and their professional activities. AI can be used to develop lesson plans, create classroom activities, generate assessment questions, develop rubrics, summarise research, and prepare teaching materials (Chen et al., 2020). There are possibilities for using personal programs and AI-driven simulations. At the same time, digital technologies can provide opportunities for practical training for prospective teachers by preparing various content tailored to students' learning needs. AI can free up some of the educator's time for mentoring, discussion, creativity, and reflective teaching. AI-based simulations and digital technologies can also be used to provide practical training in classroom management and lesson delivery (Celik et al., 2022).

This research aims to examine the preparedness, perceptions, and concerns of teacher educators regarding the use of AI in training future teachers. The integration of AI in teacher education institutions in Punjab was explored. The research is designed to determine whether teacher educators have sufficient knowledge, skills, competence, and resources to adopt AI and its tools in their teaching. It will examine how teacher educators perceive the usefulness and applicability of AI in teacher education, as well as the professional, ethical, academic, and institutional concerns they face.

The results of the research may be helpful for policymakers, curriculum developers, and educational leaders. They can be used to identify the needs of teacher educators. The research can assist in developing teacher professional development programs, ethical codes of conduct, institutional policies, and curriculum changes. Based on the views and needs of teacher educators, teacher education institutions can integrate AI into the educational process humanely and responsibly while maintaining teachers' crucial role.

These differences are particularly important in Punjab, where teacher education is provided through a diverse range of public and private institutions. Teacher educators working in large urban universities may have very different resources and experiences from those working in smaller or less-resourced institutions. Their readiness to use AI may also vary with teaching experience, digital literacy, qualifications, prior exposure to AI, and institutional support.

International research on AI in education is expanding rapidly. It focuses on students, schoolteachers, general university faculty, or the technical capabilities of AI systems. Teacher educators have received comparatively less attention. Their importance lies in their role in preparing future generations of teachers. The gap is even more noticeable in Pakistan. Existing studies are often restricted to individual universities, particular regions, small samples, or university faculty in general. There is limited evidence showing how teacher educators across Punjab understand AI, how prepared they are to use it, what concerns they have, and what institutional support they receive.

The current research seeks to investigate teacher educators' readiness, perceptions, and concerns about the use of AI in teacher education institutions in Punjab, as well as their level of institutional support for this process. It also explores differences in their perceptions of certain personal and professional features. The results may help policymakers develop more appropriate professional training, ethical frameworks, institutional policies, and curriculum reform initiatives. There is high potential for AI to improve teacher education. However,



technology alone cannot achieve these goals. Successful implementation needs proper technical skills, pedagogical knowledge, ethical considerations, professional training, confidence, and institutional support.

Objectives of the Study

The main objective of the study is to examine teacher educators' readiness, perceptions, and concerns regarding artificial intelligence tools in teacher education institutions in Punjab, as well as their use of these tools.

1. To assess the level of readiness of teacher educators to integrate AI tools into their teaching.
2. To explore teacher educators' perceptions regarding major academic, ethical, professional, and technological concerns of teacher educators regarding AI integration.

Research Questions

The study addressed the following research questions:

1. What is the level of readiness of teacher educators to integrate AI tools into their teaching and learning process in Punjab?
2. How do teacher educators perceive the usefulness of AI tools in teacher education and teacher training universities located in Punjab?
3. What academic, ethical, professional, and technological concerns do teacher educators have regarding AI integration and its usefulness?

Literature Review

Artificial intelligence has become an important part of contemporary education. The AI refers to computer-based systems. It can perform tasks usually associated with human intelligence, such as producing language, recognising patterns, analysing information, making predictions, and making recommendations. The AI is used through applications such as generative AI chatbots, automated assessment systems, intelligent tutoring systems, adaptive learning platforms, learning analytics, and content-generation tools (Chiu et al., 2023). The introduction of generative AI has made artificial intelligence more accessible to teachers and students alike. The old technologies often required specialised technical skills. Generative AI tools allow users to communicate in everyday language. A teacher can ask an AI tool to prepare a lesson. It also includes outlining, generating assessment questions, simplifying a difficult concept, suggesting classroom activities, developing a marking rubric, or providing feedback on written work. This accessibility of AI tools has encouraged educators to explore AI for both instructional and administrative purposes (Cotton et al., 2024).

It was also found that the lens of research AI can support teaching by improving access to information, reducing time spent on repetitive tasks, and assisting with personalised learning. The educational value of AI depends on the way it is used. AI-generated material may be inaccurate or incomplete (Cukurova & Miao, 2024). It was also biased or unsuitable for a particular group of learners. Therefore, AI cannot be treated as an independent authority. UNESCO recommends a human-centred approach. In which educators remain responsible for instructional and ethical decisions while AI serves as a supporting tool (Farooq, 2025).

A systematic review by Mustafa et al. (2024) found that research on artificial intelligence in education has increased considerably. Much of the available research has focused on students and the direct use of AI applications. At the same time, less attention has been given to teachers: the teacher educators, institutional leaders, and the conditions required for responsible implementation. The research suggests that the presence of AI tools alone is not enough to improve education. Their successful integration depends on the knowledge, readiness, attitudes, and professional judgment of the people and the users.



Teacher education has a special place in the discussion of AI. It prepares the teachers who will work in future schools and classrooms. Teacher education institutions are responsible for developing prospective teachers. Their subject knowledge, pedagogical understanding, classroom-management skills, ethical values, reflective abilities, and technological competence. Digital technologies and teacher preparation programs increasingly influence schools. It must ensure that future teachers can use AI appropriately, critically, and responsibly (Farrokhnia et al., 2024).

Teacher educators have a dual responsibility in this process. They may use AI to improve their own teaching, assessment, research, and professional work. Second, they are expected to prepare prospective teachers to use AI in their future classrooms. The practices demonstrated by teacher educators can influence how future teachers understand technology. When teacher educators use AI responsibly, verify the accuracy of the generated material, disclose its use, and discuss its limitations, they model appropriate professional behaviour for prospective teachers. In the Pakistani context there are different studies regarding technological integration and generative AI in education (Ahmad et al., 2026; Jamil et al., 2024, 2026; Munsha et al., 2026).

AI tools can support teacher education in several ways. Teacher educators may use them to generate classroom cases, lesson plans, teaching examples, reflective questions, assessment tasks, and differentiated learning materials (Alqahtani & Wafula, 2025; Ayanwale et al., 2022; Bibi et al., 2025; Celik et al., 2022; Chiu et al., 2023). Prospective teachers can also use AI to practice lesson planning, compare teaching strategies, and analyse classroom problems. They deepen their understanding of educational concepts. Such activities must involve critical evaluation. Prospective teachers should not simply accept AI-generated material. They should examine whether it is accurate, relevant, inclusive, culturally appropriate, and suitable for their learners (Verebics, 2026). The teacher educators found that participants generally recognised the potential value of generative AI in teacher education. Their preparedness was influenced by knowledge, access, confidence, and support. The study demonstrates teacher educators may hold positive attitudes towards AI and lack the preparation needed to integrate it effectively (Chen et al., 2020; Chounta et al., 2022; Cukurova & Miao, 2024; Holmes et al., 2019; Ouyang & Jiao, 2021).

Pakistan has also begun to examine teacher educators' experiences integrating AI into pre-service teacher education. The teacher educators in Pakistani universities found that educators were attempting to understand and use AI within their teaching practices. Their experiences were shaped by their professional beliefs, institutional conditions, and understanding of AI-assisted pedagogy. This area of research is still developing; broader evidence is needed from different regions and types of teacher education institutions (Cotton et al., 2024; Farrokhnia et al., 2024; Lo, 2023; Mustafa et al., 2024; Ng et al., 2021).

The teacher educators are prepared to use AI effectively in their professional practice. It is broader than having access to a computer or knowing how to open an AI application. A teacher educator may be able to use ChatGPT for a simple question. They may not know how to connect it with curriculum objectives, assessment practices, students' learning needs, or ethical requirements. The teacher educators' readiness can be understood through several related dimensions. The first is technological readiness, which includes familiarity with AI tools, the ability to write suitable prompts, confidence in using digital applications, and the capacity to evaluate AI-generated outputs. Teacher educators who have limited digital experience may feel uncomfortable experimenting with AI or may use only its most basic features (Holmes & Miao, 2023; Luckin & Holmes, 2016; Ng et al., 2021; Ouyang & Jiao, 2021; Verebics, 2026).



The second dimension is pedagogical readiness. It means readiness to work with AI from an educational perspective. It was not just because of convenience. Pedagogically prepared teacher educators can decide when to employ AI. It connects its use to learning outcomes, adjusts its results for students, and chooses instructional techniques. That supports active learning. Without such pedagogical knowledge, it is possible to use AI to prepare notes. The other includes presentations and even assignments, with no changes to the learning process. Ethical readiness is the third dimension. Teacher educators need to understand ethical questions related to privacy, bias, transparency, authorship, intellectual property, academic honesty, and accountability. They have to know which types of data are not supposed to be entered into public AI systems and how to acknowledge AI-generated content (Verebics, 2026) properly. Psychological readiness constitutes the fourth dimension, involving confidence, willingness to learn, innovation readiness, and the ability to handle the anxiety associated with technological innovations. Some teacher educators may feel afraid of making mistakes, experience a loss of professional power, or even be replaced by technology. Others might be ready to try new things but hesitant due to uncertainty about institutional policies. The institutional readiness refers to internet connectivity, availability of appropriate devices, software licensing, technical support, professional development, leadership, and policies. UNESCO's AI Competency Framework for Teachers reflects this multidimensional understanding of readiness. The framework identifies five areas, including a human-centred mindset. It includes ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning. It emphasises that teachers should not only know how to operate AI tools but should also understand their limitations, protect human agency, and use them pedagogically, and continue developing their professional competence (Bibi et al., 2025; Farooq, 2025; Iqbal et al., 2025; Mustafa et al., 2024; Ramazanoglu & Akin, 2025).

Research on AI readiness scales also supports the view that readiness involves more than technical skill. Ramazanoğlu and Akin's AI readiness scale included technological self-efficacy, interaction with students, and ethical awareness. These dimensions show that educators' ability to use AI must be considered alongside its effects on teaching relationships and professional responsibilities. Studies of university educators indicate that many teachers are interested in generative AI and recognise its potential educational value. However, levels of confidence and understanding differ across disciplines and professional backgrounds. Ghimire, Prather, and Edwards found that university educators were generally becoming more aware of generative AI. Still, educators from computer-related disciplines reported greater technical confidence than those from other areas. Greater technical familiarity, however, did not necessarily make educators confident in detecting AI-generated student work. Teacher educators may also hold mixed perceptions. They may recognise that AI can assist with lesson preparation while worrying that it could reduce students' independent thinking. They may value immediate feedback but question whether automated feedback can understand a student's emotional, social, and cultural context. Such mixed views are understandable because AI offers practical advantages while introducing new educational and ethical difficulties. The growing use of artificial intelligence in education offers many opportunities, but it also raises important concerns for teacher educators. One major issue is accuracy and reliability. AI can sometimes provide incorrect, incomplete, or even fabricated information while presenting it confidently. Teacher educators, therefore, need to verify AI-generated information and encourage prospective teachers to evaluate it critically rather than accepting it without question.

Academic integrity is another significant concern. Students can use generative AI to prepare assignments with limited personal effort, making it difficult to distinguish between appropriate



assistance and academic misconduct. However, a complete ban on AI may not be realistic or educationally useful. Institutions need clear guidelines that define acceptable AI use, appropriate acknowledgement of AI assistance, and the work students are expected to complete independently. There is also a risk of overdependence on AI. Excessive reliance on ready-made answers may reduce opportunities for students to develop critical thinking, creativity, problem-solving, writing, and research skills. AI should therefore be used in ways that encourage students to question, verify, revise, and justify its outputs rather than reproduce them.

AI can also be involved in professional learning. Teacher educators can utilise it to examine teaching techniques, summarise the literature, brainstorm new ideas, or reflect on classroom issues. However, professional development should not be limited to training educators to use a specific software application. It should enable them to connect the use of AI to teaching, assessing, ethical issues, curricula design, and other goals of teacher education. Studies on professional development show that systematic training can enhance pre-service teachers' AI literacy. Simultaneously, review studies on AI-related teacher development indicate that professional learning experiences have not always met expectations for AI integration. The incorporation of AI also requires institutional support. Institutions must offer reliable technology, technical support, proper AI tools, professional development, and collaboration between educators. Institutional policies are just as crucial, especially regarding academic integrity, assessment, AI disclosure, and student privacy.

Successful AI integration also depends on institutional support. Universities need to provide reliable technology, technical assistance, access to appropriate AI tools, professional development, and opportunities for educators to learn from one another. Clear institutional policies are equally important, particularly regarding academic integrity, assessment, disclosure of AI use, and protection of student information.

Pakistan has begun responding to these needs. The Higher Education Commission has introduced initiatives on ethical AI use, educator training, and the inclusion of AI-related content in education programs. At the same time, the use of AI is growing among university teachers and students for research, lesson planning, writing, summarisation, presentations, and assessment preparation. However, access to technology, formal training, awareness, and confidence remain uneven across institutions.

Research Methodology

In the current study, a qualitative research methodology was used. Its purpose was to understand the readiness, perceptions, and apprehensions of teacher educators regarding the use of artificial intelligence, specifically within teacher education institutions in Punjab. The qualitative approach was selected for this study to understand participants' perceptions, interpretations, and experiences regarding the research topic. The use of AI in teacher education is a newly emerging phenomenon in the research field. The teacher educators perceive that it may vary from person to person, depending on various factors. It included such aspects as professional experience, knowledge of technology, the institutional environment, and exposure to AI technologies.

The study employed a hermeneutic phenomenological design for data collection. The phenomenological design involves an exploration into the interpretation of people's lived experiences, in relation to a specific phenomenon (Braun & Clarke, 2006). Apart from describing participants' experiences, hermeneutic phenomenology aims to interpret the meanings of those participants' experiences. The study was conducted in selected teacher education institutions located in Punjab. These institutions were involved in the preparation and professional development of prospective teachers in the Punjab province. The participants



were teacher educators teaching education-related courses at the university level. Teacher education institutions were selected. Teacher educators have an important role in preparing future teachers. The participant's knowledge, confidence, and attitudes towards AI can influence how prospective teachers understand and use AI in their future classrooms.

A total of 11 teacher educators participated in this study. The number of participants was deemed adequate for the study. The research aimed to obtain meaningful accounts of participants' experiences of the phenomenon under study, rather than to generalise the findings. The sample was selected by using a purposive sampling technique. Purposive sampling is often used in qualitative studies since it helps identify people with knowledge and experience of the phenomenon under study. Teacher educators were selected according to the following criteria:

1. They were working in a teacher education university or institution in Punjab.
2. They were involved in teaching, training, mentoring, or supervising prospective teachers.
3. They had awareness of, exposure to, or experience with AI tools used for educational purposes.
4. They were willing to share their experiences and participate in a detailed interview.
5. They provided informed consent before participating in the study.

Thematic Analysis

Data from the interview were analysed using thematic analysis, guided by the paradigm of hermeneutic phenomenology. In addition to identifying recurring themes in respondents' answers, the analysis needed to explain the meaning of teacher educators' experiences with the application of artificial intelligence in teacher education. The eleven interviews were transcribed and then analysed repeatedly. Repeatedly analysing the interviews enabled the researcher to become more familiar with the participants' language, experiences, and professional contexts.

Initial codes were assigned to meaningful sections of the data. Examples of the codes included:

- Limited formal AI training;
- Learning AI through personal experimentation;
- Confidence in using basic AI applications;
- Uncertainty about advanced AI use;
- AI saves time;
- AI supports lesson planning;
- AI improves access to information;
- Concerns about inaccurate information;
- Fear of students becoming dependent on AI;
- Academic dishonesty;
- Privacy and ethical concerns;
- Lack of institutional policies;
- Need for professional development; and
- AI as a supporting tool rather than a replacement for teachers.

Theme 1: Uneven Readiness for AI Integration

Theme one concerns varying levels of readiness among teacher educators to use AI in their teaching and professional practice. Most participants were aware of AI and had used some widely available AI applications. There were significant differences among them in their confidence and skills in using these applications. AI had already become an integral part of their daily academic activities. It was included especially in writing and research. Others were in the process of discovering ways. That AI could become useful in their professional work and



teaching practice. This seemed to be done largely through informal exploration and conversations with colleagues, rather than through any formal training.

Participant TE3:

“I know about AI, and I have been using ChatGPT for some of my academic work. Mostly, I use it when I need ideas for a lecture, want to improve some written material, or need a quick explanation. However, I would not say that I know AI in depth. There are many features and other tools that I have never used. Sometimes I also feel unsure about whether I am using it correctly for teaching. So, I am familiar with it, but there is still a lot that I need to learn.”

Participant TE7:

“No one ever taught me formally how to apply AI. I started using it myself after hearing about ChatGPT from my colleagues and students. Initially, I used to ask easy questions, but over time, I started applying it in presentations, teaching methods, and some academic activities. I also saw some videos and learned by experimenting with various prompts. Most of what I know is through experience. I have found it helpful, but at times I am not sure whether my application of AI is academically or ethically sound.”

Participant TE10:

“I believe that training is crucial at this point. One cannot simply instruct teachers to use AI technologies; not everyone will get the hang of it on their own. Some teachers are very familiar with technology, whereas some require basic training. What we need is a practical approach – workshops on using these technologies for teaching, assessment, and research purposes. In addition, some instructions are required regarding privacy, plagiarism, and information verification. I think that if institutions provide this kind of assistance, teachers would be much more willing to use AI.”

Overall, these stories suggest that readiness is not a matter. But an incremental and fragmented one. The teacher educators were attempting to adapt to rapidly evolving technology. They approached it from different positions and with varying resources. It seems reasonable to say that openness to experimenting with AI demonstrates professional flexibility among teacher educators, while hesitation indicates a need for guidance. Hence, readiness cannot be reduced to familiarity with AI applications alone; there should also be opportunities to develop the necessary skills, confidence, pedagogical understanding, and ethical awareness.

Theme 2: AI as a Useful but Carefully Managed Educational Tool

Theme two reflects how participants viewed the role of AI in education as being positive, but cautious about the tool. Teacher educators noted several areas in which the use of AI would be valuable for preparing lessons, resources, test questions, presentations, writing, conducting research, and structuring thoughts. The opportunity to save time on repetitive academic tasks was particularly alluring, considering the various responsibilities the participants were expected to handle. Participants also felt that future teachers would find working with AI tools useful in their preparation for professional roles. Participants did not, however, consider AI-generated work something to take for granted. Its value depended on whether the teacher could verify the information provided and adjust it to align with the course curriculum and students' needs.



Participant TE2:

“For me, AI is useful mainly as a starting point. If I have to prepare a lecture, I can ask for suggestions on an outline, examples, activities, or questions. Sometimes it gives an idea that I had not considered before. I have also used it to simplify difficult material, so I can consider another way to explain it to students. However, I never take everything directly and give it to the class. I read it first, check whether it is correct, and then change it according to my students and what I actually want to teach.”

Participant TE6:

“The biggest advantage I see is that it saves time. As teachers, we have classes, assessments, research, supervision, meetings, and many other responsibilities. If AI can help me prepare an initial draft, organise my ideas, or suggest questions, I do not have to start from scratch. However, saving time does not mean that we should stop thinking. Sometimes the answer looks very good but needs correction. I see it as something that helps me begin the work; the final work still has to be mine.”

Participant TE9:

“I do not think AI can replace a teacher. It may provide information within seconds, but teaching is not only about giving information. A teacher knows the students, understands when they are confused, motivates them, and sometimes adjusts the whole lesson based on what is happening in the classroom. There is also an emotional relationship between teachers and students. AI does not have that understanding. It can support us and make some tasks easier, but the teacher should remain the person who makes the final decision.”

The one thing that comes through clearly from all these experiences is that people were not just unquestioningly excited. It is about the benefits of AI or scepticism about them. People appreciated that AI helped them by using their work without overstepping their boundaries. AI could provide them with ideas. To save them time in preparation, and open new horizons in education. It would be up to the person to make the decisions. It was very important, especially in teacher education, because future teachers had to know not only how to use new technologies but also when to use them.

Theme 3: Ethical, Academic, and Institutional Concerns Regarding AI Integration

The third theme covers fears about the growing use of AI in education. They were not limited to AI's technical quality. It covered areas such as learning, assessment, academic honesty, and professional practice. The participants were especially worried about the prevalence of misinformation and students using AI to complete their academic tasks. Without making any effort on their own, they fall into the trap of relying on ready-made answers. Other issues that can include privacy, cultural relevance, and bias. The absence of clear policies within institutions. All of them were especially relevant in teacher education, and future teachers have to be creative and think independently.

Participant TE1:

“One problem I have noticed is that AI can give you an answer that sounds completely correct, but when you check it, some of the information is

wrong. This is dangerous for students because they may think that if ChatGPT has written something confidently, it must be true. If they do not already understand the subject, they may not even recognise the mistake. That is why I always tell students that AI cannot be their final source. They have to check the information from books, research articles, or other reliable sources before using it."

Participant TE5:

"I would like to stress out my main worry regarding such systems; this is the possibility of making students too reliant upon them. We are now observing students who complete an assignment in a couple of minutes. An assignment may appear very impressive; however, the question remains whether the student has actually learned anything. In case the student starts relying on AI in every situation, he/she will definitely stop thinking and forming personal opinions. This is especially important for future teachers who require independence and creativity."

Participant TE11:

"At the moment, I think one of the problems is that there are no clear rules. As far as I am concerned, right now, I think one of the issues is that there are no clear guidelines. While one professor might allow students to use AI for an assignment, another might perceive it as cheating. In addition, students do not understand what information is acceptable to put into this software and what is not. The university needs to provide guidelines for the usage of AI: when, how to cite it, and how to misuse it."

These concerns must not be viewed as merely an unwillingness to accept the changes. Instead, they signify participants' struggle to preserve certain principles. They consider essential to education: honesty, independent thinking, reliable knowledge, privacy, fairness, and human responsibility. The participants seem to understand that the use of AI will continue in education and that it is impossible to avoid it completely. However, these concerns indicate a need for more guidance. It is the responsibility of teacher education institutes to ensure proper guidance and policies so that the educators themselves are not burdened with dealing with these problems alone.

Discussion

This study aimed to investigate the readiness, perception, and concerns of teacher educators. Towards the use of artificial intelligence in their teacher education institutes in Punjab. Data were generated from semi-structured interviews with 11 teacher educators and organised around the following three broad themes. The 1st: uneven readiness for AI integration; AI as a helpful educational technology; and ethical and academic concerns of AI integration.

The adoption of artificial intelligence in the teacher education institutions in Punjab is an ongoing process. The teacher educators were aware of artificial intelligence and its growing importance in education. There was considerable disparity in their readiness levels. Some individuals were using artificial intelligence (Bibi et al., 2025). They are used for various tasks such as lesson planning, brainstorming, enhancing writing, and creating presentations. Based on the research, it had little hands-on experience with AI in education.

These findings indicate that readiness for AI goes beyond the mere capacity to utilise technology. Teacher educators must be able to understand the appropriate use of AI in the classroom, evaluate the information it provides, and consider ethical considerations. That



comes with its use. Equally important then are confidence, pedagogy, ethics, and institutional support. The finding is especially vital in the context of teacher education, considering that teacher educators prepare future teachers. Their attitudes towards AI have the potential to shape the attitudes of future teachers.

The individual preparedness for working with AI, the majority saw it as an effective educational technology. It was noted that AI can help in several areas, such as lesson planning, the development of teaching materials, the creation of questions, assessments, and presentations, language learning, research, and the explanation of difficult concepts. Saving time is one of the main benefits of AI. Teacher educators have specific duties related to teaching, research, assessment, supervision, management, and professional development.

The participants argued that there was no need to accept and use AI-generated materials. This should be without modification, as they were required to revise AI output to align with their learning goals, curricula, students' requirements, and local educational setting. In this case, AI was regarded as an instrument. A substitute for professional judgment is needed. The same holds regarding future educators. They may use AI tools to explore teaching approaches. They understand complex topics, but this approach may negatively affect learning outcomes. If students use AI-generated assignments or lesson plans. A better approach would require them to analyse and justify AI suggestions.

Another prominent view among participants is that AI should assist teachers. Teaching involves more than delivering information to the audience. The process requires empathy, communication skills, encouragement, morality, and professional judgment. An understanding of the circumstances of students' lives. As the participants pointed out. AI can replicate none of these aspects of teaching. Future teachers will need to know not only how to work with these technologies. Also, when to use them and how to properly interpret the results.

Alongside these positive implications, participants highlighted some very concerning risks associated with AI and its use. One of the most significant risks is the reliability of the information provided through AI. The participants noted that AI may deliver inaccurate, even false, information in a very convincing way. This becomes even more dangerous. When students accept the information as true without checking any other source. The issue is especially problematic. Because the consequences of accepting incorrect information will last far beyond a single assignment, the prospective teachers will pass it on to their future students. Academic integrity was another important topic. The participants were concerned that students could use AI to complete assignments. They also make presentations, reports, and research tasks without gaining any knowledge themselves. Nevertheless, a total ban on the use of AI would be difficult to implement. The way out of the problem would be setting boundaries between legitimate help and cheating. For example, the use of AI to get suggestions, improve language skills, and receive feedback can be appropriate when it is allowed and acknowledged. On the other hand, submitting AI-generated content as one's own work raises questions about authorship, fairness, credibility, and students' genuine learning.

Excessive reliance on AI was also mentioned as a problem that could negatively influence the development of students' independent thinking. When answers are provided immediately, students are unlikely to read, research, write, solve problems, or make arguments themselves. It is crucial for teacher education, as the future educators will need creativity, critical thinking, communication skills, decision-making skills, and professional judgment. Therefore, AI-based tasks should stimulate the activity of students – for example, editing the lesson plan made by AI, comparing AI's response with the theory of education, and



There was also mention made of privacy, bias, and cultural relevance. Teachers and students may input personal, academic, research, or institutional information into AI without being aware of how it is processed. Moreover, participants understood that AI-generated samples may be irrelevant to Punjab's social, cultural, linguistic, and educational realities. In this way, it became clear that teacher educators need to evaluate the appropriateness and relevance of the generated content.

Throughout the discussion, it was found that unclear institutional guidelines were one of the main problems with the use of AI. If there is no university-wide policy on the use of AI among teachers, each teacher creates their own rules for it. Therefore, participants' answers show the necessity of the university's engagement with the matter.

Conclusion

The study examined how prepared teacher educators in Punjab are to use artificial intelligence. How they view its role in education, and what concerns they have about its growing use. Interviews of 11 teacher educators highlighted three main areas. The 1st one is differences in readiness to use AI, its potential as an educational tool, and concerns about its responsible and ethical use. Participants generally value AI tools. They described how it could help with lesson planning and how preparing teaching materials and assessments could improve. By improving written work, supporting research, and reducing some of the routine workload associated with teaching. They felt that prospective teachers could benefit from AI. When exploring new ideas or trying to understand difficult concepts. The participants were clear that AI-produced material should not be accepted without question. There is a dire need to check and correct where necessary. They adapted to the needs of students, the curriculum, and the local teaching context.

Recommendations

1. Professional development programs for teacher education institutions should continue, and AI's application in education. Professional development should go beyond the introductory stage to include applications in teaching, assessment, research, ethics, privacy, and academic integrity.
2. Professional development training should include hands-on activities in which teacher educators use AI. They use them to create lesson plans and assessment activities, and to evaluate AI's responses. Teacher educators should detect mistakes, identify biases, and localise the materials.
3. Professional development programs should take place on different levels. At the 1st training, the students would learn the basics. They gain confidence. At the advanced stage of professional development, AI programs would support pedagogy, research supervision, assessment, and decision-making in teacher education.
4. University policies concerning the use of AI should be created. For teaching, assessment, research, and academic writing, policies should be developed in collaboration with teacher educators and students, academic leadership, and technologists. Policies should be revised periodically as AI technologies and their educational applications spread rapidly around the globe.
5. AI literacy should be included in teacher preparation programs, and prospective teachers should learn not only how to use AI tools but also how to evaluate their outputs. Further, it was also identified as a means to identify bias, protect privacy, maintain academic integrity, and make responsible professional decisions.
6. AI-related content should be integrated into courses on educational technology, teaching methods, and teaching practice.



7. Prospective teachers should be given opportunities to design and evaluate AI-supported lessons rather than merely studying AI at a theoretical level.
8. Traditional take-home assignments may need to be reconsidered. They can be completed easily through generative AI. Teacher educators should use a wider range of assessment methods. It also includes oral presentations, reflective journals, classroom demonstrations, project work, viva examinations, portfolios, and supervised tasks.
9. Universities should educate students about responsible AI use. To avoid relying solely on punishment, academic-integrity guidelines should provide clear examples of acceptable assistance and unacceptable substitution of student work.
10. Future studies may also examine the actual classroom practices. The teacher educators may rely only on self-reported experiences.

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