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AWARENESS, USAGE, AND PERCEPTIONS OF ARTIFICIAL INTELLIGENCE AMONG TEACHER TRAINEES OF HIMACHAL PRADESH

Manoj Kumar[1], Dr. Pooja Chaudhary[2]

1. *Assistant Professor in Computer Application, Govt. College of Teacher Education, Dharamshala, District Kangra, Himachal Pradesh, India*
2. *Assistant Professor in Commerce, Govt. College of Teacher Education, Dharamshala, District Kangra, Himachal Pradesh, India*

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ABSTRACT

Artificial Intelligence (AI) is playing an important role in modern education. It is important to understand how the future teachers perceive and engage with AI with respect to teaching learning process. Himachal Pradesh is a leading state in India to introduce the digital educational technology to improve the student learning. In order to study usage and perception of AI among teacher trainees of Himachal Pradesh, a descriptive survey was conducted using an online questionnaire. A total of 65 participants responded, representing diverse locations in Himachal Pradesh. It has been observed that a majority of participants actively use AI for personalised learning and to explore new topics. Its use for pedagogical tasks such as lesson planning remains limited. Most participants are aware of general-purpose AI tools like ChatGPT, but few are familiar with AI applications designed specifically for education. There is a strong positive perception of AI's potential to enhance teaching and learning. But teacher trainees are concerned about over-reliance on AI and its impact on critical thinking. There are also concerns over ethical issues such as data privacy. The study highlights the need for development of explainable AI for education and structured training on AI integration within teacher education programmes to support informed and effective use of these tools in future classrooms.

INTRODUCTION

Artificial Intelligence (AI) is a field of computer science, which deals with the development of systems, which are capable of performing tasks, which usually require human intelligence [1]. AI has applications in various fields including healthcare, finance, education, transportation, agriculture, and cybersecurity etc. AI in education enhances learning experiences in education through personalized content and intelligent tutoring systems [2].

There are different points of view on integrating AI in education reflecting on its potential benefits and associated challenges. One point of view is that AI can personalize learning, automate administrative tasks, and provide real-time feedback, which shall result in improving educational efficiency and outcomes. It can also help identify students' strengths and weaknesses, enabling personalised instruction. On the other hand, critics express concerns regarding data privacy, ethical use, and the risk of widening the digital divide. There are also apprehensions about over-reliance on technology and the potential reduction in human interaction, which is essential for holistic learning [3].

Teacher trainees are an important part of the change in the teaching-learning process of the future because they are the future educators who will implement innovative pedagogies, integrate emerging technologies, and address diverse learner needs. Their training equips them with contemporary skills such as critical thinking, digital literacy, and inclusive practices, which are essential for modern classrooms [4]. With the change in education system, teacher trainees play an important role in shaping and adopting to upcoming changes in the education systems to keep teaching, learner centred.

Himachal Pradesh is a state in India, where education is changing through a combination of policy reforms, digital integration, and quality enhancement initiatives. The state has historically maintained high literacy rates and wide access to schooling, but recent developments reflect a shift towards improving learning outcomes and aligning education with 21st-century needs. AI can be a supportive tool for teachers and teacher trainees as well, using AI, teachers can improve their teaching efficiency. AI can assist teachers

in handling multi-grade and multi-level classrooms effectively [5].

It is important to study the perception of teacher trainees towards AI in education because their attitudes, understanding, and readiness will significantly influence the effective integration of AI tools in future classrooms. As prospective educators, their acceptance and competence in using AI can determine how successfully these technologies are adopted to enhance teaching and learning processes. Moreover, their perceptions can highlight gaps in training programs, reveal ethical or practical concerns, and guide the development of targeted interventions to ensure responsible and meaningful use of AI in education [6].

Studying the use and perception of AI in the teaching–learning process by teacher trainees in Himachal Pradesh is important because their beliefs, attitudes, and readiness directly shape how AI tools will be implemented in future classrooms. The objectives of this study are to examine the awareness, usage and perception of AI tools among teacher-trainees. In addition to this, to identify the challenges faced by them in using AI for teaching learning process.

METHOD

A descriptive survey research method was employed to assess the awareness and usage of Artificial Intelligence (AI) tools, among teacher-trainees of Himachal Pradesh, in the teaching-learning process. The data was collected through a structured online questionnaire developed using Google Forms. The questionnaire included both close-ended and open-ended items designed to capture demographic details, awareness, usage patterns, and perceptions regarding AI in education. Convenience sampling was used to select participants who were accessible and willing to respond online. The data was collected in the month of June, 2025.

The survey was distributed electronically to teacher-trainees across various districts of Himachal Pradesh. A total of 65 participants responded to the questionnaire. Among them, 42 were female and 23 were male. Regarding age distribution, 44 participants were in the 20–25 years age group, 15 participants were between 26–30 years, and 6 participants were above 30 years of age. In terms of educational qualification, 36 participants were postgraduates, while 29 were graduates. The participants were enrolled in teacher education programme Bachelor in Education (B.Ed.).

RESULTS

The findings show diverse patterns in AI usage. More than 70% participants use AI for personalised learning and exploring new topics of interests. Approximately 50% (32 participants) use AI for creating presentations and assignments. While a lower number of participants i.e. 23 participants used AI for lesson planning. More than 90% students are aware of ChatGPT, while 0-2% participants are aware of the AI tools, that are built specifically for educational purposes like CuriPod, MagicSchool AI, Eduaide. AI Usage patterns show that approximately 45% use AI regularly, while 48% use occasionally. The results suggest that proper training may be provided to trainee teachers on use of AI tools to support decision making tasks in teaching learning process, in order to make teaching learning more effective.

The findings indicate a positive perception among teacher-trainees regarding the role of Artificial Intelligence in enhancing the teaching-learning process, as shown in Figure 1. Out of 65 participants, 40 (62%) agreed and 17 (26%) strongly agreed that AI can improve educational practices. This shows that a substantial majority nearly 88% recognize the potential of AI to make teaching more effective and learning more personalized and engaging. Only 8 participants (12%) remained neutral. On further inspection, it was observed that, out of 8 participants who were neutral, 1 used AI rarely, while 7 used occasionally. Indicating lower exposure to AI tools.

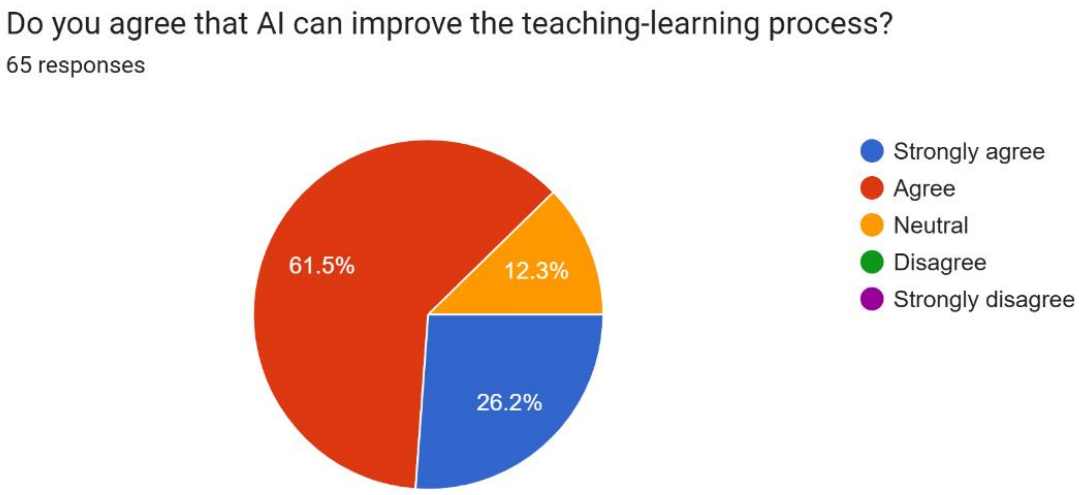

Figure 1: Perception of teacher trainees on improvement of teaching learning process using AI.

There is a strong consensus among teacher-trainees that AI tools can contribute to making learning more personalised and effective, as shown in Figure 2. Out of 65 participants, 45 (69%) agreed and 16 (25%) strongly agreed with this statement, reflecting a high level of confidence in the adaptive and student-centred capabilities of AI technologies. Only 4 participants (6%) remained neutral, suggesting minimal scepticism or limited exposure to such tools.

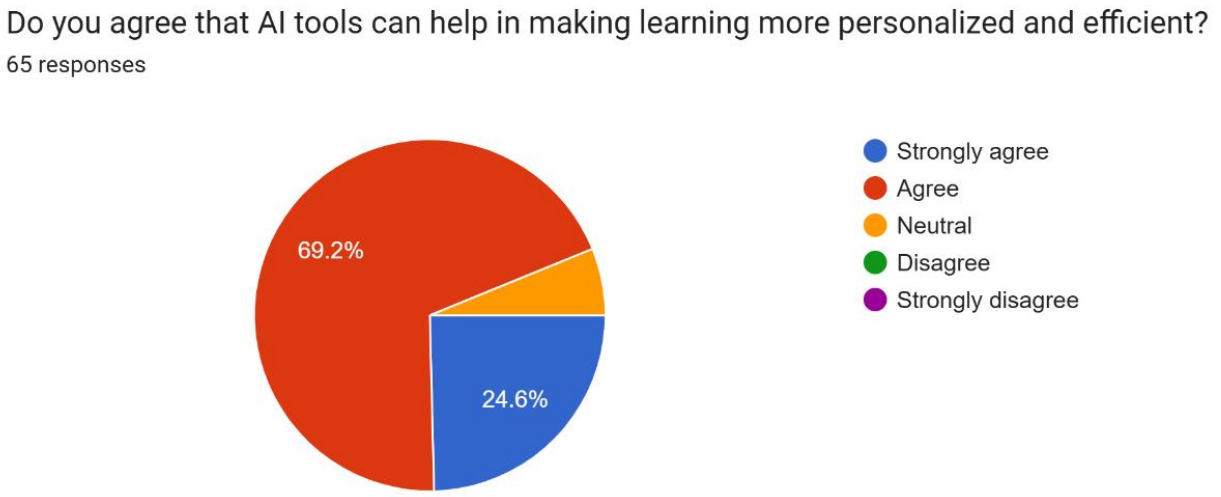

Figure 2: Perception on personalisation of learning.

The responses regarding the concern that over-reliance on AI tools may lead to a decline in the quality and richness of educational content, 29 participants (45%) agreed and 9 (14%) strongly agreed, indicating that a majority recognize the risk of AI diminishing the depth and originality of learning materials, as shown in Figure 3. However, 20 participants (31%) remained neutral, and 7 (11%) disagreed, suggesting that opinions are somewhat divided, with a portion of respondents either uncertain or not perceiving it as a significant issue.

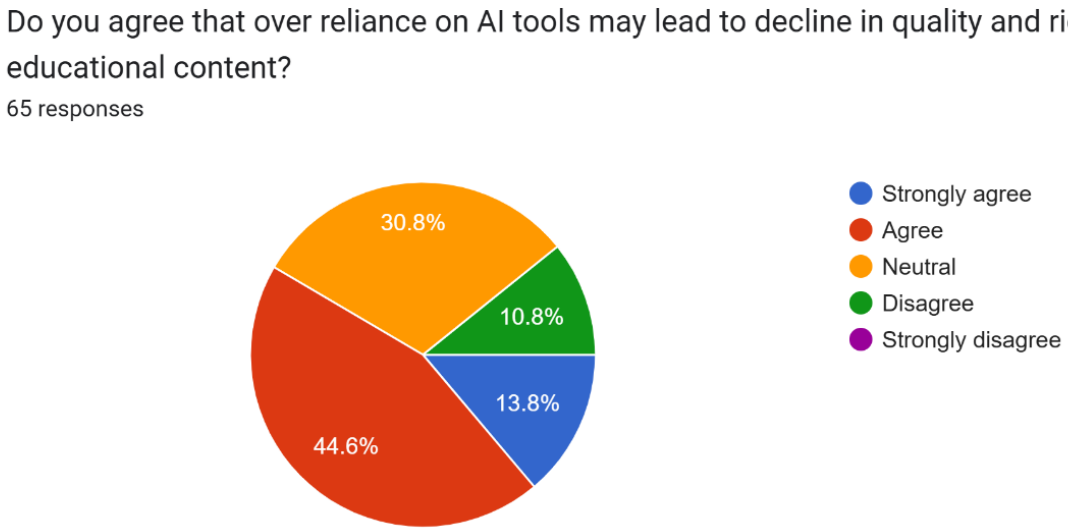

Figure 3: Perception of over reliance on AI

Similarly, when asked whether AI is affecting the critical thinking skills of human beings, the concern appeared more pronounced, as shown in Figure 4. A larger proportion i.e. 31 participants (48%) agreed and 22 (34%) strongly agreed, believing that increasing dependence on AI may hinder the development or exercise of independent thought and reasoning. Only 10 participants (15%) remained neutral, and 2 (3%) disagreed, indicating minimal resistance to this view. These findings suggest that while teacher-trainees acknowledge the usefulness of AI, many also express concerns about its possible long-term effects on creativity and integrity of educational content.

In response to the question whether they agree that the use of AI tools raises ethical concerns, such as the risk of personal data being accessed or exposed to third parties, 15 participants (23%) strongly agreed and 39 (60%) agreed, indicating that a substantial

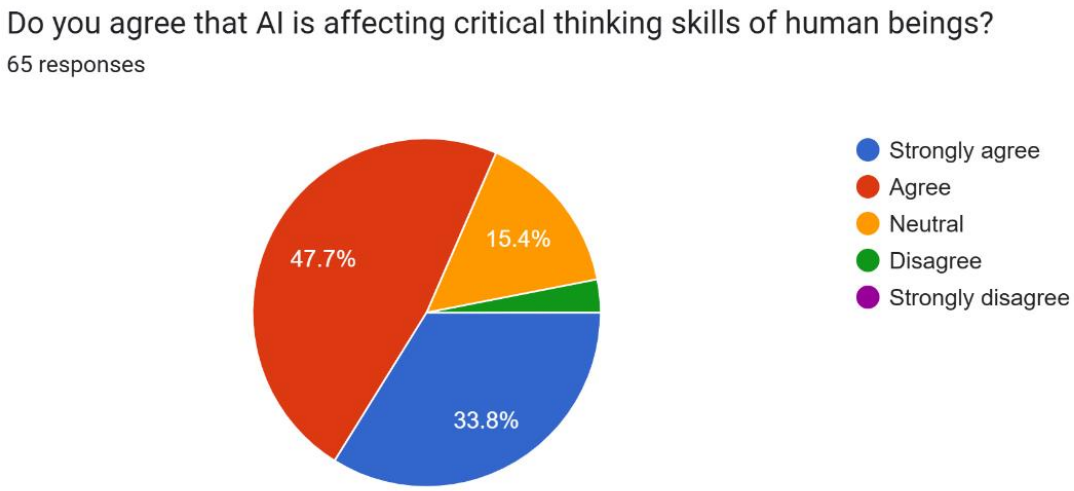

Figure 4: Perception of effect of AI on critical thinking skills

majority (83%) are conscious of the potential privacy and data security risks associated with AI technologies, as shown in Figure 5. Meanwhile, 11 participants (17%) remained neutral, suggesting that some may lack sufficient knowledge to form a definite opinion on the issue.

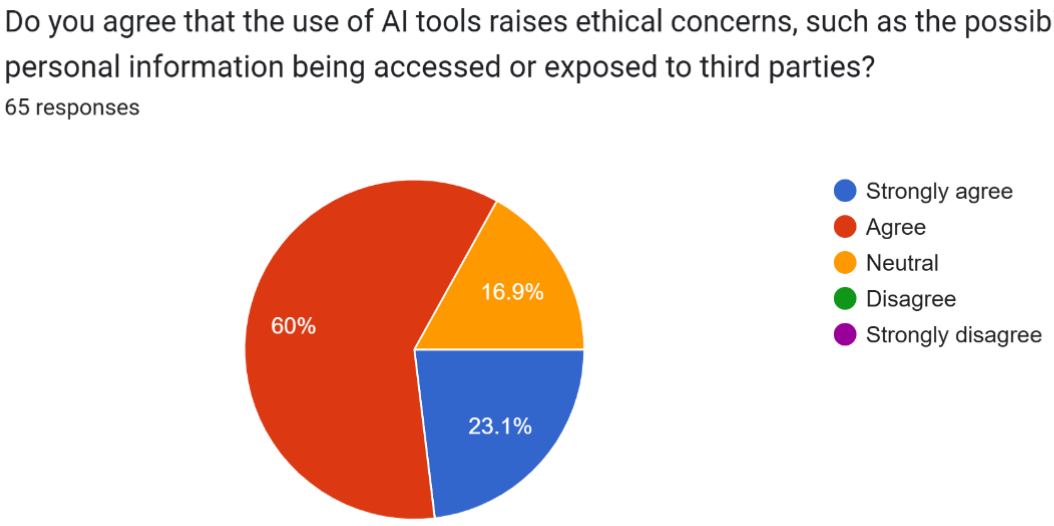

Figure 5: Ethical considerations.

The responses on challenges faced while using AI tools reveal multiple concerns among teacher-trainees. The most common issue cited was privacy and security, with 44 (67.7%) participants expressing concern over how their data might be used or exposed. This was followed by 38 (58.5%) participants who reported a fear of dependency on AI, indicating apprehension about over-relying on

technology for academic or cognitive tasks. Additionally, 25 (38.5%) participants mentioned a lack of trust in AI, reflecting doubts about the reliability or accuracy of AI-generated content. 21 (32.3%) participants identified lack of technical knowledge or training as a barrier, suggesting the need for structured support and skill development. Limited internet access was also noted by 17 (26.2%) participants, highlighting infrastructural limitations, especially in rural areas. A smaller group of 4 (6.2%) participants pointed to language barriers as a challenge.

DISCUSSION

There are diverse patterns in the awareness, usage, and perceptions of Artificial Intelligence (AI) tools among teacher-trainees in Himachal Pradesh. A significant majority of participants have begun integrating AI into their academic practices, although the nature and frequency of usage vary widely. One of the most notable observations is the extensive use of AI for personalised learning and exploring new topics, with over 70% of participants engaging in these activities. This reflects a growing trend towards student-centred learning, where AI supports independent study and differentiated instruction.

More than 90% of respondents were familiar with widely known AI tools like ChatGPT. But, the awareness of AI tools specifically designed for education such as CuriPod, MagicSchool AI, or Eduaide or GradeGuardian, which was mentioned in the report [5] was extremely low (0–2%). This gap suggests the need to introduce teacher-trainees in educational technologies beyond general-purpose AI tools.

A combined 88% of participants agreed or strongly agreed that AI can improve educational practices. Further analysis revealed that neutral responses (12%) were more common among those who use AI less frequently, indicating that exposure may play a significant role in shaping perception. Similarly, 94% of participants believed that AI contributes to personalised and effective learning, showing confidence in the adaptive capabilities of AI tools.

Despite these positive views, participants also expressed critical concerns regarding the overuse of AI. Nearly 59% of respondents agreed or strongly agreed that over-reliance on AI could negatively affect the quality and richness of educational content. An even larger proportion (82%) believed that AI use might hinder the development of critical thinking skills, suggesting concerns about the diminishing role of human reasoning and intellectual engagement in learning.

Ethical concerns were also prominent. A substantial 83% of respondents acknowledged the potential risks of data privacy and security breaches associated with AI use. This awareness is encouraging, as it points to a responsible and reflective approach to technology use among future educators. However, the 17% neutral responses suggest that not all trainees fully understand the ethical dimensions of AI, underlining the need for digital ethics education.

The challenges faced in using AI tools are privacy and data security, followed by a fear of dependency on AI and a lack of trust in AI-generated content, focussing on the need for development of explainable AI in education. Additionally, technical barriers such as limited training, poor internet access, and language issues were also identified. These findings emphasize the importance of infrastructure development, digital literacy, and capacity-building programmes to support the effective and ethical use of AI in education.

Conclusion

AI is increasingly being adopted for personalised learning and exploring new topics, its integration into core teaching tasks such as lesson planning remains limited. A majority of participants expressed positive attitudes toward the role of AI in enhancing the teaching-learning process, particularly in terms of making learning more efficient, engaging, and student-centred. However, the study also uncovered critical concerns among teacher-trainees, particularly related to over-reliance on AI, its impact on critical thinking skills, and ethical issues such as data privacy and security. Challenges such as lack of technical training, limited awareness of educational AI tools, and infrastructural barriers further hinder the effective and responsible use of AI in education. These findings highlight the urgent need for development of explainable AI in education, and structured AI training within teacher education programmes, with a focus on pedagogical applications, digital ethics, and critical engagement. By equipping future educators with the necessary knowledge and skills, AI can be meaningfully integrated to enhance teaching effectiveness, while safeguarding the integrity and richness of educational content.

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