Chapter-I

Introduction

1.1 Introduction

In the modern era, Artificial Intelligence (AI) has become a defining feature of technological advancement and societal transformation. Originally developed to simulate human intelligence through machines, AI now permeates nearly every sphere of life, including healthcare, transportation, finance, and increasingly, education. In the field of education, AI has emerged as a powerful tool for enhancing teaching and learning processes through innovations such as adaptive learning platforms, intelligent tutoring systems, automated assessments, and virtual teaching assistants. These technologies provide real-time feedback, personalize learning pathways, and support teachers in curriculum planning and student evaluation.

The 21st-century education landscape is characterized by rapid digitalization, demanding a new set of competencies from both learners and educators. Teachers are no longer mere transmitters of knowledge but are facilitators and guides in complex, technology-rich environments. AI, in this regard, offers numerous benefits—it can analyse student data to provide individualized learning experiences, identify learning gaps, automate routine administrative tasks, and even suggest pedagogical strategies tailored to specific learner profiles. These capabilities hold immense promise for transforming conventional classrooms into inclusive, efficient, and personalized learning spaces.

However, the successful integration of AI into educational settings hinges upon teachers' awareness, understanding, and readiness to adopt such tools. Unfortunately, there is a growing concern that pre-service teachers—those currently undergoing formal teacher education—are not adequately prepared for this transformation. Studies across various countries have indicated a lack of awareness and training regarding AI applications among pre-service teachers, making it difficult for them to appreciate its significance or apply it in pedagogical contexts.

The COVID-19 pandemic brought these challenges into sharp focus. As schools and colleges transitioned abruptly to online platforms, the digital divide and gaps in teacher preparedness became evident. While many educators adapted to basic digital tools like Zoom or Google Meet, the utilization of advanced AI-driven educational technologies remained limited. This situation highlighted the critical need to reform teacher

education programs so that future educators are not only digitally literate but also AI-literate.

In light of this, the present study seeks to explore and evaluate the level of awareness among pre-service teachers regarding Artificial Intelligence in education. Understanding their current knowledge, perceptions, and readiness can serve as a foundational step in developing strategies for integrating AI content into teacher training programs. It also helps in identifying the barriers that prevent future teachers from adopting such emerging technologies.

1.2 Rationale of the Study

The rationale for this study stems from the increasing relevance of AI in educational reform and innovation. As AI-driven tools become more widespread and affordable, their adoption in school education is expected to rise. However, the successful implementation of these tools relies on the ability of teachers to understand and utilize them effectively. If pre-service teachers remain unaware or untrained in using AI, the potential benefits of these technologies will remain untapped.

Furthermore, India's National Education Policy (NEP) 2020 emphasizes the integration of digital technologies and 21st-century skills in school education and teacher training. In alignment with this vision, teacher education institutions must prepare future teachers to operate effectively in technology-enhanced learning environments. Despite this policy push, there exists limited research on the actual awareness and preparedness of Indian pre-service teachers regarding AI, particularly in regional or semi-urban contexts.

This study addresses this gap by investigating the awareness level of pre-service teachers studying in Bhopal city. The research findings will be instrumental in informing curriculum designers, policymakers, and teacher educators about the current state of AI awareness among future teachers, thereby providing a basis for curriculum reform and professional development programs.

1.3 Statement of the Problem

"A Study of the Awareness about Artificial Intelligence (AI) among Pre-service Teachers"

1.4 Objectives of the Study

This study aims to:

1. Assess the level of awareness of pre-service teachers regarding Artificial Intelligence (AI) and its educational applications.
2. Identify the key factors—such as previous exposure to AI, curriculum content, institutional support, and digital literacy—that influence pre-service teachers' awareness.
3. Provide suggestions and recommendations for improving AI-related content in teacher education programs to better prepare future educators for technology-integrated teaching.

1.5 Significance of the Study

This study is significant for several reasons:

- **For Pre-service Teachers:** It offers them a chance to reflect on their readiness to engage with future educational technologies and understand the expectations from 21st-century teaching roles.
- **For Teacher Educators and Institutions:** The findings will provide valuable data to enhance teacher education curricula by integrating AI-related modules, workshops, or projects.
- **For Policy Makers and Curriculum Developers:** The study can support data-driven decisions in shaping national-level teacher education reforms in line with NEP 2020 and international trends.
- **For Educational Researchers:** The study contributes to the academic discourse on digital pedagogy, emerging technologies, and teacher readiness for AI-based teaching practices.
- **For Developers of AI Tools:** The insights into user awareness can help developers create more intuitive, accessible, and educator-friendly AI solutions tailored to school environments.

1.6 Operational Definitions of Key Terms

- **Artificial Intelligence (AI):** Refers to computer systems or software that perform tasks typically requiring human intelligence, such as problem-solving,

pattern recognition, decision-making, and learning. In education, AI may include adaptive learning systems, intelligent tutoring systems, and automated grading.

- **Pre-service Teachers:** Individuals enrolled in a teacher education program who have not yet entered full-time teaching positions but are undergoing training to become professional educators.

- **Awareness:** In this study, awareness refers to the extent of knowledge, understanding, familiarity, and perceptions that pre-service teachers have about AI, its uses in education, potential benefits, challenges, and ethical considerations.