



## **Chapter-III**

# **Methodology**

### 3.1 Introduction

This chapter outlines the methodology adopted to examine the awareness of Artificial Intelligence (AI) among pre-service teachers. Given the emerging role of AI in education and the need to assess the preparedness of future educators, the study adopts a quantitative approach based on survey research. This chapter details the research design, sample, tools used, data collection and analysis procedures, along with ethical considerations and delimitations of the study.

### 3.2 Research Design

The study employed a **descriptive survey design** using a structured questionnaire to quantitatively assess the level of awareness, attitudes, and perceived challenges related to AI among pre-service teachers. The survey design was chosen as it allows for the systematic collection of data from a large group to generalize findings regarding awareness levels and related factors.

### 3.3 Population and Sample

#### 3.3.1 Population

The population consisted of all pre-service teachers enrolled in teacher education programs at **IASE (Institute of Advanced Studies in Education), Bhopal**, during the academic session 2024–2025.

#### 3.3.2 Sample

The sample included **121 pre-service teachers** who responded to the online questionnaire. The entire sample was drawn from IASE, Bhopal, using a **convenience sampling technique**, given accessibility and the voluntary nature of participation through Google Forms.

### 3.4 Research Questions

This study aims to answer the following research questions:

1. What is the level of awareness among pre-service teachers about Artificial Intelligence (AI) and its applications in education?

2. What are the major sources of AI knowledge and exposure for pre-service teachers?
3. What are the attitudes of pre-service teachers toward the use of AI in education?
4. What level of preparedness do pre-service teachers perceive they have for integrating AI tools into their future teaching practices?
5. What challenges and concerns do pre-service teachers anticipate in using AI in educational contexts?

### **3.5 Research Tool**

A **Google Form-based structured questionnaire** was developed by the researcher. The instrument consisted of both closed-ended and multiple-choice questions divided into five sections:

- **Section A: General Awareness of AI**
  - Questions on prior knowledge of AI, sources of information, and perceived understanding.
- **Section B: AI in Education**
  - Awareness of AI applications in teaching, learning, assessment, and administration.
- **Section C: Attitudes Toward AI**
  - Perceived benefits, effectiveness, and concerns related to AI in educational settings.
- **Section D: Preparedness and Training**
  - Level of preparedness, previous training, interest in workshops, and perceived challenges.
- **Section E: Future Perspectives**
  - Views on integration of AI in teacher education and its impact on the teaching profession.

The tool was reviewed for **content validity** by experts in education and ICT. Reliability was established through a **pilot test**, and the internal consistency of the scale was deemed acceptable.

### 3.6 Procedure of Data Collection

Data collection was conducted through an **online Google Form**, which remained open for responses for a fixed duration in 23<sup>rd</sup> April 2025. The form was circulated among pre-service teachers of IASE, Bhopal, via email, WhatsApp groups, and classroom announcements.

Participants were informed about the purpose of the study, assured of confidentiality, and asked for informed consent before participation. A total of **121 valid responses** were recorded and used for analysis.

### 3.7 Data Analysis Techniques

Data collected through the Google Form were automatically compiled into Google Sheets and exported for statistical analysis.

- **Descriptive Statistics:**
  - Frequencies, percentages, and graphical representations were used to summarize data on awareness, usage, attitudes, and challenges.

Analysis was conducted using **Microsoft Excel and Google forms summary analysis**.

### 3.8 Ethical Considerations

- Participation in the survey was **voluntary**, and all participants provided **informed consent**.
- Anonymity of responses was maintained by not collecting personally identifiable data (except names, which were optional).
- The study was approved by the internal academic supervisor and adhered to the **research ethics guidelines of RIE, Bhopal**.

### 3.9 Delimitations of the Study

- The study is confined to a **single institution**: IASE, Bhopal.

- Only **pre-service teachers** enrolled during the academic session 2024–2025 were included.
- The research focuses exclusively on **awareness and perceptions** of AI, not on the technical proficiency or actual classroom implementation.
- Data were collected **online**, which may have excluded participants without digital access or familiarity.