CHAPTER 3
RESEARCH METHODOLOGY

This chapter discusses the research methodology utilized in this study. It deals with the research design, population, sample, data collection, data analysis, and research schedule.

A. Research Design

A descriptive quantitative research design was used in this study, which was considered to be suitable for examining current conditions, practices, and perceptions within a specific population. As stated Cresswell (2015), survey research is a quantitative method that allows researchers use questionnaires or interviews to collect data from a sample or entire population in order to determine the attitudes, opinions, behaviors, or characteristics of the group. This design was chosen in order to get a thorough understanding of the different types of AI used, as well as their potentials and drawbacks, from the perspective of the TPACK framework. As suggested by (Cohen et al. 2002), descriptive research uses statistical tools to summarize a phenomenon's present situation without changing any variables.

Therefore, because this study did not seek to test hypotheses or investigate cause-and-effect relationships, the use of a descriptive quantitative design was appropriate. On an overview of students' experiences after teaching practice, this study aimed to define the present situation of AI integration in ELT. Descriptive statistics, such as mean and standard deviation, were used to analyze the data in order to provide a concise and organized summary of the results.

B. Population and Sample

The population studied in this research consisted of 2019, 2020, and 2021 classes of English Education Study Program students from several

universities in Tasikmalaya. The selection of the classes of 2019, 2020, and 2021 is based on the consideration that around that period, the use of AI technology began to increase and gain significant popularity from around that year. After the pandemic, the use of technology for language education increased significantly, and it has currently become an integral element of ELT (Moorhouse, 2023). Consequently, in the post-pandemic era, educational technology in ELT has become widely used, with many of these technologies relying on AI (Boonchom et al., 2024).

The population was approximately 400 university students who had participated in teaching practice organized by the university. To ensure that the findings are representative, a sample size of at least 30% of the population was selected to participate. Fraenkel et al. (2012) recommended that researchers target a sample size of at least 10% of the entire population for larger populations. However, for smaller populations (less than 100), they proposed at least 30 participants to ensure adequate representation and dependability in the study. Nevertheless, the actual sample size was determined by how many responders completed the questionnaire, as their participation was voluntary.

To accommodate practical considerations in conducting the research, the sample coverage was expanded to include students from other institutions around the research location who had also completed the teaching practice program. A total of 161 participants completed the survey. Most respondents were from Tasikmalaya (51 participants), followed by 14 participants from Bekasi and Bandung, and 13 participants from Bogor. Other regions, such as Purwakarta (9 participants), Depok (8 participants), Pangandaran and Cianjur (7 participants each), and Banjar and Cirebon (6 participants each), also contributed samples. Smaller numbers came from Ciamis (5), Karawang (4), and Garut, Kuningan, and Sumedang (3 participants each), while Subang, Sukabumi, Indramayu, and Majalengka had 2 participants each. In terms of class year, 65 participants came from

the class of 2021, 47 from the class of 2020, and 49 from the class of 2019, with the majority of respondents coming from the class of 2021.

This study used convenience sampling, which enabled researcher to obtain samples quickly and effectively while considering the accessibility and affordability of research subjects. Cresswell (2015) described that convenience sampling is a quantitative sampling technique that allows researcher to select participants who are available and willing to be examined. The inclusion of students from other nearby universities can enhance contextual variations in this study, which could deepen the analysis, particularly with regard to how students view the use of AI technology in ELT. In addition, this approach was expected to produce data that remains valid, representative, and reflects the perceptions of students from various institutions with geographical similarities, so that the results of this study can provide a comprehensive picture of the topic being studied.

C. Data Collection

Data was gathered using a survey questionnaire that included both open-ended and closed-ended questions. Respondents choose one or more options that most accurately represent their thoughts or experiences when answering closed-ended questions, which have few possible answers. In order to allow participants to discuss other forms of technology or artificial intelligence that they have utilized beyond those mentioned in the closed-ended questions, open-ended questions were formed. The Likert scale is a widely used survey method for determining the intensity of a person's feelings or opinions about specific statements.

The instrument of this research is a questionnaire.

1. Questionnaire

The types of questionnaires used in this research are closed-ended questions and open-ended questions. A questionnaire is a survey form that study participants fill out and give to the researcher (Cresswell, 2015). To develop the instrument adapted from Tan et al. (2019), three steps were

taken: (1) item creation, (2) expert review, and (3) validity and reliability testing. In the first step, the instruments to be used in this study were adapted from three main sources: Ayanwale et al. (2024), Celik (2023), and Teo (2011). Ayanwale et al. (2024) offer insights into AI literacy among educators, highlighting the need for pedagogical and content knowledge (TPACK) in the technology integration process. Celik's (2023) instrument is the basis for selecting an instrument that is relevant for student teachers' use of AI. Furthermore, Teo (2011) provides a viewpoint on the adoption of technology in a classroom, which is essential for evaluating how teachers react to the use of AI. To ensure their relevance in this study, the items are modified based on the research objectives, even though the basic instrument is derived from these sources. TPACK research experts Mishra and Koehler (2006) were instrumental in this adaptation process, as they evaluated the instrument to ensure that all essential components of the TPACK framework have been comprehensively addressed.

The instrument consists of seven factors and 28 items based on TPACK constructs: (a) using AI or not (1 item), (b) types of AI used in ELT (4 items); (c) TK related to AI tools (3 items); (d) PK related to AI integration (5 items); (e) CK related to AI effectiveness (4 items); (f) TPACK (4 items) (g) potentials of AI (4 items); and (h) drawbacks of AI (3 items).

The survey was conducted online using Google Forms and distributed to student teachers through their online platform (WhatsApp) for data collection. WhatsApp was chosen as the platform for distributing the questionnaires due to its wide use and accessibility among participants, ensuring efficient and timely data collection. As described by Mavhandu-Mudzusi et al. (2022), WhatsApp allowed the researchers to establish direct contact with a few participants. Similarly, Manji et al. (2021) noted that WhatsApp facilitates the management of surveys directly and interactively on the platform.

Each question had four options based on the Likert scale. The original Likert scale consists of a list of statements, or items, provided for the actual or fictitious scenario being studied. On a metric scale, participants are asked to indicate how much they agree or disagree with the provided statement (items) (Joshi et al., 2015). The goal of using a 4-point Likert scale is to make it easier for the researcher to process and analyze data and to make the analysis of study findings more clear (see Table 3.1). A 5-point Likert scale might bias results toward neutral responses (Eser et al., 2020).

Table 3. 1 The Rubric of Questionnaire

Statement	**Score**
Strongly Agree	4
Agree	3
Disagree	2
Strongly Disagree	1

2. Validity Test

The questionnaire undergoes a validity test to ensure it meets research objectives. Statistical analysis assessed the instrument's validity using the significance value (sig). A sig value below 0.05 indicated instrument validity, ensuring reliable results. Piloting was used to test the validity. Before the survey's main deployment, a small sample of 21 students participated in a pilot test to see if they understood the questions and to determine areas that needed improvement. Validity is the most important consideration when preparing to use or select an instrument (Fraenkel et al., 2012).

3. Reliability Test

Testing reliability is the next step after confirming the instrument's validity. Cronbach's Alpha coefficient is used to evaluate the questionnaire's reliability and make sure it is consistent and internally

consistent. One popular reliability metric is Cronbach's alpha (DeVellis, 2017). In order to make sense of the data gathered about AI in ELT using the TPACK framework and to give the research valuable insights, reliability testing is crucial if the Cronbach's alpha value is higher than 0.7, which indicates that this instrument has acceptable reliability.

D. Data Analysis

Using SPSS version 24, the data were first analyzed for descriptive statistics. The frequency distribution, mean, standard deviation, and percentage of participant responses were among the descriptive statistics used to characterize the response distribution. As described by Nunan and Bailey (2009), there are three main measures of central tendency in descriptive statistics: the mean, the median, and the mode. However, in this study, only the mean and standard deviation were used to analyze the survey data. The mean was used to determine the average level of agreement among respondents for each statement, while the standard deviation was used to assess the variability or spread of responses. These two measures were considered sufficient to capture the general trend and consistency of participants' perceptions regarding the integration of AI in ELT. The following table presents the interpretation of the average score based on the interval scale.

Table 3. 2 The Interpretation of Mean Score based on the Interval Scale

No	Interval Mean Score	Interpretation of Mean Score
1	1.00-1.74	Very Low
2	1.75-2.50	Low
3	2.51-3.25	High
4	3.26-4.00	Very High

Source: Educational Planning and Research Division (EPRD), Ministry of Education (MOE), 2006; Zakaria et al., 2017.

Data analysis used descriptive statistics to answer the research questions. For both research questions, the analysis included measures such as mean, median, mode, and standard deviation to summarize the participants' responses. These statistical measures provided a comprehensive picture of the patterns of AI use in ELT and perceptions of its potential and shortcomings through the TPACK framework.

The SPSS program was used to calculate the frequency of apps mentioned by respondents in order to analyze the data from the open-ended question about the types of apps used. Every app that was mentioned was categorized, and the respondents' frequency of use was determined. The information was categorized according to themes that surfaced for the benefit and drawback questions, such as "efficiency and ease of learning" or "limited access and technology infrastructure." Following that, these categories were examined to find any patterns or trends in the responses provided by the respondents. The analysis's conclusions about the perceived advantages and disadvantages of using the app are backed up by direct quotes from respondents.

E. Research Schedule

From August to October, the researcher began this study by writing a research proposal that outlined the goal, methodology, and importance of the study. In order to make sure that all of the feedback was successfully incorporated, the researcher presented the research proposal for review in November after writing it. The data was gathered in December by the researcher, who used a survey to learn more about student teachers' opinions and experiences with AI integration in ELT. In January 2024, the researcher carried out a comprehensive analysis of the data to determine the mean and standard deviation. These findings were compiled into a detailed report, which was developed in February 2024. The researcher presented the thesis results in a seminar in March 2024, followed by a final thesis examination

in April 2024. This structured schedule facilitated a systematic approach to the research process, ensuring comprehensive coverage of the topic.

Table 3. 3 Research Schedule

Description	Aug/ 2024	Sept/ 2024	Oct/ 2024	Nov/ 2024	Dec/ 2024	Jan/ 2025	Feb/ 2025	Mar/ 2025	Apr/ 2025	May/ 2025	June/ 2025
Research Proposal Writing											
Research Proposal Examination											
Data Collection											
Data Analysis											
Report											
Thesis Result Seminar											
Thesis Examination											