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Teachers' Readiness to Integrate Artificial Intelligence into Inclusive Classrooms

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Abstract
Artificial intelligence (AI) can be used to do things that improve accessibility, differentiated instruction, and the involvement of learners in inclusive classrooms. But for its successful implementation, teachers' knowledge, skills, confidence, attitude and institutional support are essential. This study aimed to explore the preparedness of teachers to implement AI in inclusive classrooms in Punjab, Pakistan. A quantitative and descriptive Cross Sectional Survey Design was used which included 278 valid responses from the teachers in Gujranwala, Sialkot and Narowal districts. A structured online questionnaire which responded with a five-point likert scale was used; data were analysed with frequencies, percentages, means, and standard deviations. Results indicated moderate level of awareness of teachers (M = 3.14, SD = 1.12) about AI and comparatively moderate to low readiness to use AI in inclusive classrooms (M = 2.87, SD = 1.16). Conversely, teachers showed very positive attitudes toward the use of AI (M = 4.13, SD = 0.85), and especially about using AI if enough training was given (M = 4.45). There were significant barriers to using AI (M = 4.15, SD = 0.87), with insufficient professional formal education (M = 4.38) and poor technology infrastructure (M = 4.25) being the most prevalent issues. The results also demonstrate that teachers' attitudes towards AI are positive, but not their actual preparedness to use it in inclusive education environments. The study suggests the implementation of structured professional development, enhanced technological infrastructure, policy clarity, and ethical protection to facilitate responsible integration of AI into society. These measures could support teachers' ability to leverage AI to meet the needs of a diverse group of learners.

Keywords: Artificial intelligence, teacher readiness, inclusive education, AI literacy, teacher professional development, differentiated instruction, accessibility,

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1: INTRODUCTION

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The goal of inclusive education is to allow all learners with different abilities, disabilities, preferred learning styles, languages and social backgrounds to engage in learning. It demands that teachers recognize obstacles, adjust teaching methods, make available suitable materials, and foster a supportive classroom environment. Studies have shown that factors such as teacher training, lack of resources, and institutional support limit the inclusion of children with disabilities in Punjab, Pakistan (Mehmood & Parveen, 2021, 2025). Therefore, teacher readiness in the implementation of educational technologies is important.

AI is becoming a more common feature in the field of education by utilizing adaptive learning platforms, automated feedback, speech recognition, text-to-speech capabilities, intelligent tutoring systems, and generative AI. The following applications might assist teachers with creating differentiated materials, with providing alternate means of access to information, and with communicating. Just because a tool is made available does not ensure it is appropriate, accurate and accessible for all learners. Zawacki-Richter et al. (2019) pointed out the necessity for educators to be part of the process in deciding how AI can be used in a relevant and useful way in teaching.

Given that the learners process information in unique ways, AI can be a helpful tool in promoting inclusion. With careful choice, speech recognition, captions, text-to-speech, language support, personalised practice and flexible content formats could minimise barriers. Zhang et al. (2026) conducted a review of AI in education for students with disabilities, emphasizing the need to assess the relevance of the AI to students' needs and outcomes. Aftab et al. (2024) discussed the use of AI speech recognition for inclusive education of hearing impaired students in Pakistan.

Teachers need to assess and decide if a tool meets the learning goals, provides trustworthy information, is easy to use and respects the dignity and privacy of students. AI-generated content may have errors, be biased, or not be appropriate for specific learners, languages, or curriculum. However, teachers should be equipped with ability to review outputs and make informed decisions using more than automated recommendations (Zawacki-Richter et al., 2019; Zhang et al., 2026).

Teacher readiness is related to knowledge, skills, confidence, ethical consciousness, experience, and support. Teachers might be interested in AI but have not received training on how to assess its results or modify tools for students with disabilities. They could also experience policies that are not clearly understood, unreliable internet, limited devices, or issues of fairness. Connectivity, affordability of devices, platforms and institutional capacity are some of the challenges identified in public schools in Pakistan through digital transformation research (Mehmood et al., 2025).

Local research outlines that school support is crucial to inclusive teaching. Mehmood and Parveen (2021) conducted interviews with 36 elementary teachers in 12 districts and found the needs of these teachers were infrastructure, assistive aids, parents' cooperation, support from headteacher, professional training, and collegial encouragement. In their later study, they created a support programme for teachers related to mainstream teachers' inclusion of children with disability in the mainstream elementary classrooms (Mehmood & Parveen 2025). While these studies were not specifically about AI readiness, they can offer a baseline understanding of the factors that could impact AI readiness.

The importance of research on the link between teachers' AI readiness and inclusive classroom practice should not be overlooked. The literature on AI in education tends to focus on technology adoption and the literature on disability in education on tools and outcomes for learners with

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specific needs. When analysed together these areas can be used to determine if teachers are confident in their selection, adaptation, evaluation and utilization of AI tools to support access and participation (Zawacki-Richter et al., 2019; Zhang et al., 2026; Voultsiou & Moussiades, 2025; Mehmood et al., 2026). This study aims at addressing the readiness of teachers for the integration of AI in inclusive classrooms.

1.2 Statement of the Problem

AI tools can be used to facilitate differentiated instruction and accessibility but the educational value is contingent on how teachers decide to choose and employ these tools. Challenges faced by teachers not prepared to incorporate AI tools responsibly include a lack of AI literacy, inclusive pedagogy skills, professional development, easy access to infrastructure, and clear institutional guidance. However, the use of AI without considering accessibility, privacy, bias, and individual needs of learners can amplify and/or perpetuate inequalities, not diminish them (Voultsiou & Moussiades, 2025; Zhang et al., 2026).

Teacher training needs, school resources and administrative support are other issues identified in the Pakistani context in the research area of inclusive education (Mehmood & Parveen, 2021, 2025). Research on the digital transformation in public schools also highlights the challenges related to infrastructure and access to technology, which can limit the use of technology (Mehmood et al., 2025). These results, however, do not provide insight into teachers' preparedness to incorporate AI into inclusive classrooms. Moreover, the problem that this study aims to solve is identifying teachers' opportunities and barriers related to using AI for inclusive teaching, assessing the teachers' knowledge, confidence, attitudes, perceived competence, and access to support they have in relation to AI.

1.3 Research Questions

1. What is the level of teachers' readiness to integrate artificial intelligence into inclusive classrooms?
2. What knowledge, skills, confidence, and attitudes do teachers report regarding the use of AI to support learners with diverse educational needs?
3. What benefits do teachers perceive AI may offer for accessibility, differentiated instruction, and learner participation?
4. What technological, pedagogical, ethical, and institutional barriers affect teachers' readiness to use AI in inclusive classrooms?
5. What forms of training and institutional support do teachers consider necessary for responsible AI integration in inclusive education?

1.4 Research Objectives

1. To assess teachers' readiness to integrate AI into inclusive classrooms.
2 To examine teachers' AI-related knowledge, confidence, attitudes, and perceived competence in supporting learners with diverse needs.
3 To identify the perceived opportunities of AI for accessibility, differentiated learning, and classroom participation.
4 To identify technological, pedagogical, ethical, and institutional barriers that may affect AI integration.
5 To recommend relevant professional development and institutional support for responsible AI use in inclusive education.

1.5 Significance of the Study

The study is significant for several reasons.The study is significant in many ways.

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The study can be useful for research as it can provide a single analytical lens for teacher readiness, the use of AI, and inclusive education. It may aid in distinguishing between general enthusiasm for technology and the ability to choose accessible technology, assess the outputs of AI, and employ AI in a way that promotes inclusive teaching. This focus aligns with broader studies that have highlighted the importance of educators' engagement and thoughtful consideration of how AI can be implemented, especially for those whose learning needs require it (Zawacki-Richter et al., 2019; Zhang et al., 2026).

The findings can also help practitioners (teachers, leaders, teacher education institutions, and education policy makers). The research could serve as a basis for professional learning activities related to AI readiness competencies and inclusive pedagogy, accessibility, ethical insights, and classroom implementation. In terms of inclusive education and digital transformation in the context of Punjab and Pakistan, the attached studies on inclusive education and digital transformation indicate that training is most useful with resources, leadership support, collaboration and workable infrastructure (Mehmood & Parveen, 2021; Mehmood et al., 2025).

1.6 Scope and Delimitations

The research is directed at the teacher readiness for using AI in inclusive classroom practices. It takes into account readiness from the perspective of AI knowledge and skills, confidence, attitudes, perceived usefulness, ethical awareness, access to technology, professional training and institutional support. The use of AI is seen as a potential aid to teaching and accessibility, not a substitute for teachers or any specialist services. The exact study population, geographic area, sample size, and data collection method should be detailed in the final research design based on the approved setting by the researcher.

1.7 Operational Definitions

Artificial intelligence (AI): In this study, digital systems that perform tasks such as generating content, recognising speech, adapting learning materials, supporting feedback, or providing other forms of educational assistance.

Inclusive classrooms: Learning environments in which students with diverse abilities and educational needs are supported to access learning, participate, and make progress alongside their peers.

Teacher readiness: Teachers' reported preparedness to use AI for educational purposes, including their knowledge, confidence, attitudes, perceived competence, ethical awareness, and access to relevant support.

AI integration: The purposeful selection and use of AI tools as part of teaching, learning, assessment, or accessibility practices, guided by educational goals and teacher judgement.

2: LITERATURE REVIEW

2.1 Inclusive Education and Teacher Readiness

The vision of inclusive education is to ensure that all children and young people have the opportunity to meaningfully engage in learning regardless of their ability, disability, language, background and learning needs. It is not just about putting students in the same classroom; curriculum, instruction, assessment, materials, and school environments need to be flexible to address learner variability. Accessibility, participation, and non-discrimination are at the heart of inclusion as recommended by international guidance (United Nations, 2006; UNESCO, 2020).

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Multiple means of engagement, representation, and action/expression are also a goal of Universal Design for Learning (UDL) that minimizes barriers to learning (CAST, 2024).

According to the research done in the provided article collection, Teacher preparation and institutional support are important conditions for inclusion in Pakistan. Mehmood and Parveen (2021) found that the needs were related to professional training, assistive aids, accessible infrastructure, leadership, colleague support and cooperation with families. They then designed an inclusive classroom teacher support programme which is locally situated (Mehmood & Parveen, 2025; Mehmood, Parveen & Rubab, 2026). While these studies did not explicitly assess AI readiness, they have thus demonstrated the need to take into account teacher preparedness along with school conditions.

Adopting AI into inclusive classrooms is thus a multi-faceted process. A teacher can be enthusiastic about being positive but may be lacking in confidence, appropriate devices, Internet connections, time, technical support or knowledge of accessibility. On the other hand, possessing a tool does not mean that it will be used inclusively. Readiness should not be measured by the number of times the product is used, but by knowledge, confidence, pedagogical judgement, ethical awareness and institutional conditions.

2.2 Artificial Intelligence in Education

In the context of education, artificial intelligence (AIED) encompasses intelligent tutoring systems, adaptive learning, automatic feedback, learning analytics, speech and language technologies, and generative AI. Previously, reviews were conducted to chart the use of AI in education (Zawacki-Richter et al., 2019; Chiu et al., 2023) and to emphasize the importance of teacher participation in research and implementation. AI applications in teaching and teacher development, in lesson preparation, in providing feedback, in designing lessons, in assessing learning, and in professional learning are discussed in recent reviews (Tan et al., 2025; Qian, 2025).

AI can assist teachers in creating explanations, designing practice exercises, adjusting reading difficulty, offering examples, translating, and offering initial feedback. Generative systems can, however, make incorrect statements, make up citations, provide culturally inappropriate examples or content that does not align with learning objectives. Kasneci et al. (2023) and Ifenthaler et al. (2024) thus advocate for critical and context-dependent use. Teachers will continue to monitor accuracy, content coverage, accessibility, appropriateness, and fairness.

In research on adoption, the distinction is made between general tool use and pedagogically relevant integration. Kong et al. (2024) examined teachers' intent to utilize generative AI in teaching and Al-Abdullatif (2024) explored the dimensions of AI literacy, intelligent TPACK, and trust in acceptance. These studies indicate that perceived ease of use and perceived usefulness are key, but pedagogical knowledge and the ability to relate a tool to a learning goal are also important. The important thing is not only that teachers have experimented with AI, but that they can choose, modify, assess, and restrict its use.

2.3 AI & Inclusive or Special Education

AI can be used to help inclusive education by providing more access to information, communication, practice, and feedback. This could be speech recognition, caption, text-to-speech, translation, adaptive practice or communication supports. In a companion article, Aftab et al. (2024b) explored strategies to engage students with disabilities in mainstream classrooms, and in the current article, Aftab et al. (2024a) analyzed the use of AI in speech recognition for hearing-impaired students in Pakistan. The contributions are relevant because they bring technology to the wider context of teaching practice and school support.

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The applications of this are reported to be promising with some limitations in international reviews. Voultsiou and Moussiades (2025) conducted a review on AI, virtual reality and LLM in special education. The medium effect on learning outcomes found by Zhang et al. (2026) in studies about AI based interventions for students with disabilities indicated that more robust studies and focus on learner participation are needed. Other empirical research on the use of AI in inclusive education was also examined by Li et al. (2025). These findings suggest that these tools are not necessarily effective for every learner or disability profile; a tool that works for one learner may not work in the same manner for a different one.

To achieve inclusive implementation, teachers must reflect on the accessibility of a system to AT, the language(s) of relevance, the protection of personal information, the clarity of outputs, and the relevance of the active role of the learner. The participation patterns can be observed through learning analytics, but this is not sufficient if the effects of disability, language and access to technology or family circumstances are not taken into account (Khalil et al., 2024). It is, therefore, imperative that teachers have technical knowledge and pedagogical judgement for inclusiveness.

2.4 Teachers' AI Literacy and professional competence

The applications of teacher AI literacy are much wider than simply using software. It covers aspects of knowing what AI can and cannot do, choosing AI tools for education, analyzing the results of AI, safeguarding information, understanding and detecting bias, and measuring the effects on learning. UNESCO's AI Competency Framework for Teachers categorizes the relevant competencies under the following heads: Human-centred mindset, AI ethics, AI foundations and applications, AI pedagogy, and AI for professional learning (Miao & Cukurova, 2024). The following framework is relevant to inclusive classrooms as it can have an impact on agency, equity, privacy, accessibility and participation of learners.

Teacher competence and attitudes research shows the significance of confidence, pedagogical knowledge, and professional learning. Du et al. (2024) investigated teachers' intention to learn about AI, Yue et al. (2024) investigated teachers' TPACK readiness and attitudes, and Delcker et al. (2025) created the instrument for teachers' self-perceived AI competence, while Yim and Wegerif (2024) examined teachers' acceptance of AI learning tools for young students. These studies suggest that readiness means attitudes, knowledge, confidence, and evaluating tools for suitability with learners and curriculum.

Professional development is more effective when it provides conceptual learning with guided practice, reflection and implementation in the classroom. Tan et al. (2025) did a comprehensive review of AI in teaching and teacher professional development, and Li et al. (2025a) did a review of AI integrated teacher professional development programmes. The structured professional development can help teachers gain self-efficacy in technology-integrated teaching, as reported by Yang et al. (2024). Yue et al. (2024) also highlighted curriculum alignment, teaching methods, and classroom practices. These studies are supportive of long-term development instead of one-time demonstrations.

These three articles, all newly supplied, add to this discussion. Mehmood et al. (2026a) explored the use of AI-driven curriculum strategies in inclusive, quality higher education, finding disparities between institutions in capability and technical confidence. Mehmood et al. (2026b) conducted a study on artificial intelligence manipulated misinformation among Pakistani university students and emphasized the importance of digital literacy, critical media literacy and cognitive reflection in the assessment of misinformation. Mehmood et al. (2026c) contended that AI transforms teachers' roles from merely providing information to facilitating learning, designing activities, providing guidance,

and monitoring progress. These articles agree that ‘readiness' necessitates technical and pedagogical judgement.

2.5 Potential Benefits for Inclusive Teaching

AI can assist teachers in creating resources of varying reading levels, create alternate explanations, create extra practice material, facilitate translation, and provide alternative communication formats. AI in science education literature presents diverse applications in learning while posing challenges and uncertainties regarding implementation and impact (Almasri, 2024). The principles of AI literacy, prompt design and critical thinking are also highlighted, instead of focusing solely on the technical skills of using AI (Walter 2024).

The article provided by Mehmood et al. (2026c) suggests that AI can help teachers manage simple tasks like drafting and providing formative feedback, but the teacher is still responsible for relationship building, task design and accuracy. This is consistent with broader studies examining the impact of AI on teachers' professions (Ifenthaler et al., 2024; Tan et al., 2025). The goal of inclusive classrooms should be less of a response and more of support for learning.

Assumptions about benefits are not appropriate; benefits must be evaluated. It is important that teachers think about whether AI can enhance access, participation, understanding, independence, or feedback for learning(s) involved. They should also determine if outputs are accurate and culturally relevant, accessible, and consistent with personal learning objectives.

2.6 Barriers, Ethics, and Institutional Support

Lack of training, unreliable internet, inadequate devices, subscription costs, lack of technical support, limited time and unclear policies are all barriers. Mehmood et al., (2025a) in their study mentioned above, discussed the infrastructure and digital-pedagogy constraints in the context of equitable education in public schools in Pakistan. Differences in institutional capability and technical confidence were also obtained in the supplied AI-curriculum study (Mehmood et al., 2026a). Willingness of individuals is not an adequate substitute for school resources.

Ethical issues are privacy, data security, bias, inaccurate outputs, transparency, IP, over-reliance, unequal access. UNESCO (2023) suggests a human-centred approach to generative AI in education. Kasneci et al. (2023) and Ifenthaler et al. (2024) also highlight the need for critical evaluation of outputs from and implications of AI. Errors in inclusive settings can be particularly significant if learners rely on generated communication or accessibility. The teacher should have procedures to check outputs and to restrict sensitive data, report problems, and provide alternatives.

The article provided on psychological processes in English-language learning relates cognitive load, anxiety, motivation, self-efficacy, and social support to participation and educational equity in the field (Mehmood, Jamal, Dara, & Goraya, 2025). While it doesn't directly address AI readiness, it still applies to inclusive implementation; technology should not add cognitive load, language anxiety, or fear of error. Activities that are mediated by AI need to be comprehensible, culturally responsive, emotionally safe and teacher-encouraging.

2.7 Theoretical Perspectives

The Technology Acceptance Model is used to explain the acceptance of the technology in terms of perceived usefulness and perceived ease of use (Davis, 1989). The Unified Theory of Acceptance and Use of Technology includes performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003). These models help to explain intention to use AI, however intention doesn't necessarily mean inclusive or effective practice.

Technological Pedagogical Content Knowledge (TPACK) is a construct that highlights the interplay between technology, pedagogy and subject matter (Mishra & Koehler, 2006). The UNESCO

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competency framework for AI includes specific emphasis on human-centred practice, ethics and pedagogy of AI (Miao & Cukurova, 2024). In the context of UDL and inclusive-education principles, access, participation and learner variability are the core concepts (CAST, 2024; UNESCO, 2020). These views collectively contribute to a conceptualization of readiness that encompasses the following: Pedagogical skills, confidence, ethical decision-making, AI knowledge, inclusive teaching, and institutional support.

2.8 Research Gap

AI applications, teacher AI literacy, professional development, inclusive pedagogy, and AI-based support for learners with disabilities are featured in the literature. But, not all these strands will consider the same population or outcome. AI study has been primarily conducted in general classrooms or higher education, and inclusive-education research has been conducted to examine disability issues and needs without explicitly measuring teachers' AI readiness. Training, ethics, infrastructure and context are all areas of potential benefit and on-going concerns as identified by international reviews (Li et al., 2025b; Voultsiou & Moussiades, 2025; Zhang et al., 2026).

The contextual evidence of teacher support, digital transformation, accessibility, institutional capability and psychological barriers is provided by the studies conducted within Pakistan (Aftab et al., 2024a, 2024b; Mehmood & Parveen, 2021, 2025; Mehmood et al., 2025a; Mehmood et al., 2026a). There is a need for more empirical research to link these conditions directly to teachers' preparedness to incorporate AI into inclusive classrooms. This study aims to fill this gap, by focusing on teachers' knowledge, confidence, attitudes, perceived competence, perceived benefits, barriers, and support needs. It doesn't take it for granted that AI will automatically enhance inclusion, but rather explores the readiness needed for responsible integration.

2.9 Chapter Summary

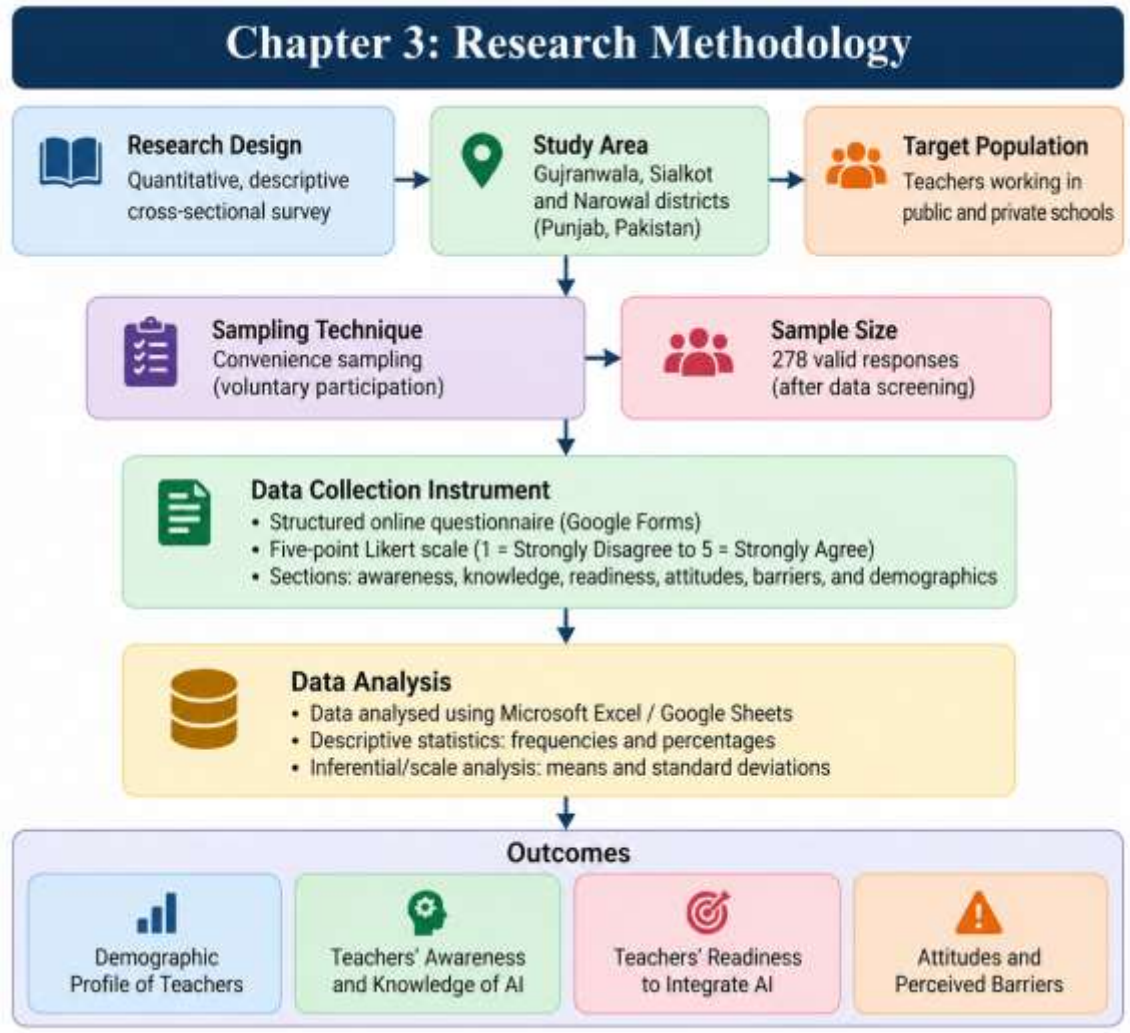
While the literature indicates that AI can assist with accessibility, differentiated instruction, learning design, and feedback, it is limited in its impact if teachers lack proficiency, inclusive pedagogy, is affected by infrastructure, goes unchecked by ethics, and does not consider learners' needs. Studies on AI literacy highlight continuous professional development and critical thinking, whereas studies on the use of AI for people with disabilities demonstrate the need for context and tool specificity. The provided articles are in Pakistan context and reiterate the significance of teacher support, access to digital resources, institutional capacity, and psychological safety. Thus, the Readiness construct in this study is defined as an integration of AI Literacy, Inclusive Pedagogical Competence, Pedagogical Confidence, Ethical Awareness and Enabling Institutional Conditions.

3: RESEARCH METHODOLOGY

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3.1 Introduction

The methodology employed in the research work, titled "Teachers' Readiness to Integrate Artificial Intelligence into Inclusive Classrooms," is described in this chapter. It presents a research design, study area, population, sampling technique, sample size, research instrument, data collection procedure, data analysis and ethical considerations. The methodology was centered around the teachers' preparedness, knowledge, attitude, confidence, and perceptions on the use of AI in inclusive classrooms.

3.2 Research Design

The study design used was quantitative descriptive survey design, which was of cross sectional type. The decision to use this method was made to gather structured responses and investigate teachers' perceptions quantitatively. The cross-sectional design enabled data to be collected at a particular point in time. The study looked at the pre-existing readiness of teachers to integrate AI, not as an intervention or in relation to measurable academic outcomes.

3.3 Study Area

The study was carried out in three districts of Punjab, Pakistan that were Gujranwala, Sialkot and Narowal. These districts were taken as the geographical area of the study. This research explores

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teachers' attitudes and perspectives on the use of AI in inclusive classrooms, especially to assist students with diverse learning needs.

3.4 Population and Sample Size

Teachers in educational settings in the three selected districts made up the target population. The final analysis included 278 valid questionnaire answers. The answers given were used to analyze the preparation, attitudes, confidence and perceptions of teachers toward the opportunities and obstacles of using AI in inclusive education.

3.5 Sampling Technique

The study used non-probability convenience sampling method in which the respondents were voluntarily participated in the study. Teacher access networks and groups were used to provide participant with the questionnaire. The teachers who answered the questionnaire gave it their all-voluntary response through Google Forms.

This method enabled collection of data in districts that were selected. The conclusions drawn, however, were mainly limited to the participating teachers as they were not a random sample, so results did not necessarily apply to the entire group of teachers in the three districts.

3.6 Research Instrument

The main research instrument was a structured questionnaire using a Google Forms. Participants were asked to respond to the questionnaire using a 5-point Likert scale that ranged from Strongly Disagree to Strongly Agree.

The questionnaire focused on teachers' knowledge and awareness, confidence and perceived competence, attitudes towards AI, perceptions of accessibility and inclusive education, ethical awareness, and perceptions of institutional support and barriers. These areas were used as a guideline in exploring the dimensions of teacher readiness in relation to the goals of the research. Items were interpreted based on the actual items in the questionnaire.

3.7 Data Collection Procedure

Google Forms was used to collect data. The questionnaire was sent via the easily accessible teachers contacts and groups in Gujranwala, Sialkot and Narowal. Teachers completed and submitted their responses online. After the data was collected, 278 valid responses were kept for analysis. The responses gathered formed the key data set to examine teachers' preparedness for the use of AI in inclusive classrooms.

3.8 Data Analysis

Data collected were sorted and analysed in Microsoft Excel or spreadsheet Google Sheets. To summarise participants' responses, descriptive statistical techniques were used.

The distribution of responses for each of the questionnaire categories was described using frequencies and percentages. Average scores were calculated for appropriate items on the questionnaire and standard deviations used to provide a description of the variation in the responses. These statistics were then used to systematically present and interpret teachers' perceptions regarding their readiness for AI, their confidence, attitudes towards AI, and other dimensions addressed in the questionnaire.

Results were analyzed with regard to the research purposes. The analysis was descriptive in nature – no causal relationships were assumed or reported statistics from non-confirmatory research.

3.9 Ethical Considerations

Participation in the online survey was voluntary. The research process took into account the right to privacy and appropriate treatment of the responses to the questionnaires. Information that identified

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a participant, if collected, was to be used accordingly and findings were presented in a way that would protect participants' identity.

The study also explored the critical role of responsible use of AI, such as privacy, accuracy, fairness, accessibility and human judgement in inclusive education. Ethical approval and consent procedures were not elaborated upon as it was not confirmed that these procedures were in place.

3.10 Chapter Summary

In this chapter, the methodology employed for the analysis of teachers' preparedness to integrate AI in inclusive classrooms was presented. The study was designed in quantitative approach with descriptive cross sectional survey design and was conducted in Gujranwala, Sialkot and Narowal of Punjab, Pakistan. A questionnaire was used on Google Forms, scoring on a 5-point likert scale, which gathered data from 278 valid responses. Convenience sampling was used and they were volunteers. Results were analysed using frequencies, percentages, means and standard deviations in Excel and Google Sheets. Teacher readiness and perceptions towards using AI in inclusive education were described based on these procedures.

4: DATA ANALYSIS AND RESULTS

4.1 Introduction This chapter presents the framework and findings for the data collected for the study titled "Teachers' Readiness to Integrate Artificial Intelligence into Inclusive Classrooms." The study was conducted across the districts of Gujranwala, Sialkot, and Narowal in Punjab, Pakistan. Data were collected using a structured Google Forms questionnaire, resulting in 278 valid responses that were included in the final analysis.

The data were analyzed using descriptive statistical techniques. Frequencies, percentages, means, and standard deviations were calculated to summarize the teachers' responses. The analysis evaluates teachers' demographic profiles, their knowledge of artificial intelligence (AI), their readiness to integrate AI into inclusive classrooms, their attitudes towards AI, and the perceived barriers to its adoption.

4.2 Profile of the Respondents A total of 278 valid responses were recorded. Participants were recruited through convenience sampling with voluntary participation. Table 4.1 details the demographic distribution of the participating teachers.

Table 4.1: Demographic Profile of Respondents (N = 278)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	116	41.7%
	Female	162	58.3%
District	Gujranwala	114	41.0%
	Sialkot	89	32.0%
	Narowal	75	27.0%
Teaching Experience	1 – 5 years	94	33.8%
	6 – 10 years	108	38.8%
	More than 10 years	76	27.4%
Highest Qualification	Bachelor's Degree	102	36.7%
	Master's Degree / M.Phil	176	63.3%

Interpretation: The sample is well-distributed, with a higher representation of female teachers (58.3%) and a majority holding a Master's Degree or M.Phil (63.3%). A significant portion of

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respondents (38.8%) have 6 to 10 years of teaching experience, ensuring that the perspectives gathered come from established educators familiar with inclusive classroom dynamics.

4.3 Teachers' Awareness and Knowledge of AI This section evaluates teachers' self-reported awareness of AI and its educational applications. The responses were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Table 4.2: Teachers' Awareness and Knowledge of AI

Questionnaire Item	Mean (M)	Std. Dev. (SD)	Interpretation
1. I am familiar with basic AI tools (e.g., text-to-speech, generative AI).	3.42	1.05	Moderate
2. I understand how AI can be applied in educational settings.	3.15	1.12	Moderate
3. I am aware of how AI tools function to assist learners with diverse needs.	2.85	1.20	Low to Moderate
Overall Dimension Mean	**3.14**	**1.12**	**Moderate**

Interpretation: The findings indicate that while teachers possess a moderate familiarity with basic AI tools (M = 3.42), their understanding of how to specifically apply these tools for learners with diverse needs remains lower (M = 2.85). This suggests that general AI awareness has not yet fully translated into specialized knowledge for inclusive educational practices.

4.4 Teachers' Readiness to Integrate AI into Inclusive Classrooms Teachers' readiness is the central focus of this research, measuring their preparedness and confidence to incorporate AI to support learners with diverse educational needs.

Table 4.3: Teachers' Readiness to Integrate AI

Questionnaire Item	Mean (M)	Std. Dev. (SD)	Interpretation
1. I feel confident using AI to adapt learning materials.	2.95	1.18	Moderate
2. I possess the necessary technical skills to integrate AI in my teaching.	2.78	1.24	Low to Moderate
3. I am prepared to evaluate AI outputs for accuracy and bias.	2.65	1.15	Low to Moderate
4. I proactively seek out AI applications to support inclusive teaching.	3.10	1.10	Moderate
Overall Dimension Mean	**2.87**	**1.16**	**Low to Moderate**

Interpretation: The overall mean for teacher readiness is 2.87, indicating a low-to-moderate level of preparedness. Teachers report a lack of confidence in evaluating AI outputs for accuracy (M = 2.65) and report insufficient technical skills (M = 2.78). This aligns with the literature highlighting that educators require focused professional development beyond basic digital literacy to purposefully integrate AI.

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4.5 Teachers' Attitudes Towards AI in Inclusive Education This section examines the perceptions and attitudes of teachers regarding the usefulness of AI for differentiated instruction and accessibility.

Table 4.4: Attitudes Towards AI in Inclusive Education

Questionnaire Item	Mean (M)	Std. Dev. (SD)	Interpretation
1. AI has the potential to improve accessibility for students with disabilities.	4.12	0.85	High (Positive)
2. AI can assist me in creating differentiated learning resources.	4.05	0.88	High (Positive)
3. Using AI will positively impact student participation in my classroom.	3.90	0.95	High (Positive)
4. I am willing to adopt AI if provided with adequate training.	4.45	0.72	Very High (Positive)
Overall Dimension Mean	**4.13**	**0.85**	**High (Positive)**

Interpretation: In contrast to their current readiness levels, teachers exhibit highly positive attitudes towards AI's potential (Overall M = 4.13). They strongly agree that AI can improve accessibility (M = 4.12) and are highly willing to adopt it if given adequate training (M = 4.45). This demonstrates that the primary challenge is not resistance to technology, but rather a gap in capacity and support.

4.6 Perceived Barriers to AI Integration This section addresses the technological, institutional, and ethical barriers restricting AI adoption, utilizing the same five-point Likert scale to assess the severity of these challenges.

Table 4.5: Perceived Barriers to AI Integration

Questionnaire Item	Mean (M)	Std. Dev. (SD)	Interpretation
1. Lack of formal professional training on AI pedagogy.	4.38	0.78	Major Barrier
2. Inadequate infrastructure (e.g., unreliable internet, lack of devices).	4.25	0.82	Major Barrier
3. Absence of clear institutional policies or support for AI use.	4.15	0.86	Major Barrier
4. Concerns regarding student privacy and data security.	3.85	1.05	Moderate Barrier
Overall Dimension Mean	**4.15**	**0.87**	**Major Barrier**

Interpretation: Teachers strongly identified systemic issues as major barriers. The lack of formal professional training (M = 4.38) and inadequate infrastructure (M = 4.25) were rated as the most critical obstacles. These findings strongly reflect the challenges previously identified regarding digital transformation and resource constraints in Pakistan's educational landscape.

4.7 Summary of the Chapter This chapter presented the quantitative findings from 278 teachers across Gujranwala, Sialkot, and Narowal. The analysis revealed a compelling contrast: while teachers hold highly positive attitudes regarding the potential of AI to support inclusive education (M = 4.13), their actual readiness and technical skills remain low to moderate (M = 2.87).

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The data highlights that teachers' willingness to integrate AI is severely constrained by structural barriers, primarily a lack of formal training (M = 4.38) and inadequate technological infrastructure (M = 4.25). Consequently, while the theoretical acceptance of AI as an accessibility tool is strong, practical, school-level interventions and policy support are urgently required to bridge the gap between positive attitudes and actual classroom integration.

5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study “Teachers' Readiness to Integrate Artificial Intelligence into Inclusive Classrooms” is discussed in this chapter. The study focused on the awareness, readiness, attitudes and perceived barriers of teachers towards AI. A total of 278 teachers were selected in Gujranwala, Sialkot and Narowal of Punjab, Pakistan for data collection. The findings are discussed in the context of the review of literature presented in Chapter 2 followed by recommendations, limitation, and conclusions.

5.2 Discussion of the Findings

5.2.1 Teachers’ Awareness and Knowledge of AI

The results showed that the AI awareness level in the group was moderate, with an average score of 3.14 (SD = 1.12). The mean scores of familiarity with basic AI tools and understanding about AI applications in education were 3.42 and 3.15, respectively. The mean for understanding the potential of AI in helping students with varying learning preferences was, however, lower at 2.85.

The results imply that teachers had better knowledge about the general applications of GAIs in education than its applications in inclusive classrooms. This is significant because inclusive teaching demands that teachers choose the tools based on the individual learning needs. The results align with those of Zawacki-Richter et al. (2019), who pointed to educators' role in the integration of AI, and with those of Miao and Cukurova (2024) who identified the competency framework established by UNESCO which focuses on AI knowledge, ethics, pedagogy, and professional learning.

5.2.2 Teachers’ Readiness to Integrate AI

Overall, preparedness was rated at 2.87 (SD = 1.16), suggesting limited preparedness. The mean of teachers' confidence level in adaptation of learning materials and technical skills were 2.95 and 2.78 respectively. The lowest scoring area was the ability to judge outputs from AI for bias and accuracy, with a score of 2.65.

These findings indicate that the general awareness was not yet reflected in competence. Teachers must assess AI-generated content, identify potential inaccuracies and adjust content based on student needs. Kasneci et al. (2023) have introduced the concept of the opportunities and threats of large language models in education. Likewise, Miao and Cukurova (2024) highlighted the responsible and human-centered use of AI. Therefore, professional development should include hands-on activities related to content assessment, planning for inclusion, and ethics.

5.2.3 Teachers’ Attitudes Towards AI

The overall mean score of teachers' attitudes towards AI was 4.13 (SD = 0.85) and positive. AI's potential to improve accessibility and support differentiated learning materials received means of 4.12 and 4.05, respectively.The perceived potential of AI to improve accessibility and support differentiated learning materials was given ratings of 4.12 and 4.05 respectively. The mean for willingness to adopt with sufficient training was at the highest of 4.45.

The results suggest a general openness among respondents to the adoption of AI, but also showed that respondents were somewhat less ready than their counterparts. Aftab et al. (2024) explored the

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role of AI speech recognition in facilitating education for students with hearing disabilities in Pakistan, and Zhang et al. (2026) analyzed AI-based educational interventions for students with disabilities. This research offers context to teachers' positive experiences of the potential for access to AI. But the current study did only measure teachers' perceptions, not real improvements in student outcomes.

5.2.4 Barriers to AI Integration

The overall barrier mean was 4.15 (SD = 0.87). The highest mean was for lack of formal AI training (4.38), followed by inadequate infrastructure (4.25) and insufficient institutional policies or support (4.15). The mean for the privacy and data security category was 3.85. The results showed that the challenges of professional and institutional were found to influence teacher readiness. Mehmood and Parveen (2021, 2025) pointed out that teacher training, infrastructure and institutional support were important in inclusive education in Punjab. The technological and institutional hurdles towards the digital transformation of Pakistani schools have also been discussed by Mehmood et al. (2025). The current study indicates that implementing AI effectively does not just depend on teacher readiness, but also on their training, the resources available, and institutional support.

5.2.5 Overall Discussion

This difference between the attitude mean of 4.13 and readiness mean of 2.87 is among the main findings of the study. Teachers tended to feel more confident and competent in the benefits of AI but less in terms of its practical uses. The high mean of 4.15 for the high barrier reinforces the need for training, infrastructure and institutional support.

This indicates that having a positive attitude is not enough for achieving positive outcomes in the adoption of AI. It is the teacher's responsibility to have the knowledge and practical capabilities to make appropriate tools choices, assess products, secure the information of their students and support various learning patterns. The nature of the study (cross sectional survey and convenience sampling) does not create the capability of making causal inferences from the findings.

5.3 Recommendations

5.4 Based on the findings, the following recommendations are proposed.

5.5 **5.3.1 Provide Practical AI Training**

Educational institutions should provide structured professional development focusing on AI-assisted lesson planning, differentiated learning materials, accessible content, and the evaluation of AI-generated information. Training should emphasise practical classroom applications rather than basic tool demonstrations alone.

5.3.2 Strengthen Inclusive Teaching Competence

Teachers should receive guidance on selecting AI applications that meet diverse learning needs. Training should cover relevant accessibility tools, including captions, speech recognition, and text-to-speech, while emphasising that suitability must be assessed for individual learners.

5.3.3 Improve Technological Infrastructure

Schools and relevant authorities should address internet connectivity, device availability, and technical support. Where resources are limited, shared devices and accessible, low-bandwidth tools may help improve opportunities for responsible AI use.

5.3.4 Establish Clear AI Policies

Educational institutions should develop guidelines addressing appropriate AI use, accuracy checks, privacy, bias, and teachers' responsibilities. AI should support rather than replace teachers' professional judgement.

5.3.5 Promote Ethical and Collaborative Practice

Teachers should be trained to protect student information and identify inaccurate or biased AI outputs. Collaboration among teachers, special education professionals, school leaders, and parents may also help identify suitable tools and improve inclusive teaching practices.

5.4 Limitations and Future Research

A total of 278 teachers (who were conveniently sampled) participated in the study on a voluntary basis. Hence, the results might not be representative of all teachers of the selected districts or any other district in Pakistan. Self-reported answers also have the disadvantage that it is possible that the person may think they are prepared but turn out to be not prepared in the classroom.

Further studies are needed on larger, more representative samples, with comparisons of teachers who have received different levels of AI training, and examining whether or not professional development leads to the teacher becoming more competent in practice. Other research efforts could also measure the impact of individual use of AI for accessibility, participation, and learning.

5.5 Conclusion

Therefore, this study focused on teachers' preparedness for the integration of AI in inclusive classrooms in the districts of Gujranwala, Sialkot and Narowal. The results showed moderate AI awareness, relatively low levels of readiness, positive attitudes toward AI, and significant barriers.

When sufficient training was provided, teachers were more willing to implement AI. But as technical capabilities were not as advanced, challenges to assess AI-generated outputs, infrastructure issues, and institutional support were also critical concerns.

The study finds that responsible integration of AI in teaching needs to be facilitated by practical teacher training, adequate infrastructure, appropriate institutional policies, ethical protection, and ongoing human oversight. Improving these areas could facilitate the more effective and inclusive use of AI by teachers.

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Teachers' Readiness to Integrate Artificial Intelligence into Inclusive Classrooms

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1. ABSTRACT / BACKGROUND

Artificial intelligence (AI) can improve accessibility, differentiated instruction, and learner participation in inclusive classrooms. However, effective use depends on teachers' knowledge, skills, confidence, attitudes, and institutional support.

2. OBJECTIVES

1. Assess teachers' readiness to integrate AI into inclusive classrooms.
2. Examine teachers' AI-related knowledge, confidence, attitudes, and perceived competence.
3. Identify perceived opportunities of AI for accessibility, differentiated learning, and participation.
4. Identify technological, pedagogical, ethical, and institutional barriers.
5. Recommend professional development and institutional support.

3. METHODOLOGY

Research Design	Study Area	Sample	Sampling	Instrument	Analysis
Quantitative, descriptive cross-sectional survey	Gujranwala, Sialkot, and Narowal, Punjab, Pakistan	278 valid responses	Convenience sampling with voluntary participation	Google Forms questionnaire, 5-point Likert scale	Frequencies, percentages, means, and standard deviations using Excel / Google Sheets

4. KEY FINDINGS

Overall Constructs (Mean and Standard Deviation)

AI Awareness and Knowledge	Readiness to Integrate AI	Attitudes Towards AI	Perceived Barriers
M = 3.14 SD = 1.12 (Moderate)	M = 2.87 SD = 1.16 (Low to Moderate)	M = 4.13 SD = 0.85 (High Positive)	M = 4.15 SD = 0.87 (Major Barrier)



Key Item Findings (Mean Values)

Familiarity with basic AI tools	Understanding AI for diverse learners	Confidence using AI to adapt learning materials	Preparedness to evaluate AI outputs for accuracy and bias	Willingness to adopt AI if adequately trained	Lack of formal AI training	Inadequate infrastructure
M = 3.42	M = 2.85	M = 2.95	M = 2.65	M = 4.45	M = 4.38	M = 4.35

5. DISCUSSION / INTERPRETATION

Teachers showed positive attitudes toward AI, but practical readiness remained low to moderate. The main gap lies between enthusiasm for AI and actual preparedness to use it responsibly in inclusive classrooms.



6. RECOMMENDATIONS

1. Provide practical AI-focused teacher training.
2. Strengthen inclusive teaching competence.
3. Improve technological infrastructure.
4. Establish clear institutional AI policies.
5. Promote ethical and collaborative practice.

7. CONCLUSION

"Teachers are willing to adopt AI in inclusive education, but successful integration requires training, infrastructure, policy support, ethical safeguards, and continued human oversight."



8. KEYWORDS

Keywords: Artificial intelligence, teacher readiness, inclusive education, AI literacy, teacher professional development, differentiated instruction, accessibility, Pakistan.