

TEACHERS' READINESS FOR AI-INTEGRATED CLASSROOMS: EXPLORING KNOWLEDGE, ATTITUDES, SKILLS, AND INSTITUTIONAL SUPPORT IN INTERNATIONAL EDUCATIONAL CONTEXTS

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Abstract

AI is revolutionizing education by enabling personalized learning, automated feedback, intelligent tutoring, adaptive assessment, content creation, and data-driven decision-making. While access to technology is a significant factor, success in introducing AI into the classroom will ultimately rely on teachers' understanding of how to effectively evaluate and utilize AI tools in their classrooms. Teachers will continue to play a pivotal role in education transformation, creating meaningful learning experiences, providing ethical guidance on the use of technology, making sense of AI output and maintaining the human touch in the learning process. Recent international frameworks also highlight the importance of teacher competencies in ethics, pedagogy, teacher learning, and human-centered decision making in relation to AI (UNESCO, 2024).

The paper examines teachers' preparedness to incorporate AI into their classrooms in international educational settings. It emphasizes teachers' awareness and attitudes towards AI, digital competence, AI self-efficacy, ethical awareness, PD, and institutional support. The research design is proposed to be a mixed methods research design, where a questionnaire for teachers and semi-structured interviews will be used to look at teacher readiness in statistical and experiential studies. The study should help uncover the most important individual and institutional barriers to teachers' responsible and effective use of AI. It also helps drive global conversations about the education of teachers and the responsible use of AI in the classroom and in the educational system.

Keywords: *Artificial intelligence, Teacher readiness, AI integrated classrooms, AI literacy, Digital competence, professional development, educational technology*

1. Introduction

AI has emerged as one of the most powerful technological innovations in modern-day education. AI is being integrated into international educational systems in various ways, such as assisting with lesson planning, personalizing learning, automated assessment, providing student feedback, language support, learning analytics and administrative decision-making. This shift is further facilitated by the advent of generative AI tools, which can create text, explanations, summaries, quizzes, lesson plans, and feedback in seconds, empowering teachers and students to generate

more content more quickly. This has made AI not just a technology of the future, but a reality in the educational world today (UNESCO, 2023).

AI-powered classrooms can be considered learning spaces where AI technologies are utilized to aid teaching and learning, assessment, communication, and classroom management. They can feature intelligent tutoring systems, adaptive learning platforms, AI writing assistants, automated grading systems, educational chatbots, and generative AI solutions. These can support teachers to create differentiated instruction, detect students' learning gaps, decrease redundant administration tasks, and offer timely assistance to learners (Holmes et al., 2019).

Teachers will still play a key role in the effective implementation of AI in schools. Teachers remain accountable for making professional decisions on appropriateness, ethics and pedagogical value, even in the context of AI systems advising them, creating content, or analyzing student learning. While AI can help teachers, it can't replace the relational, emotional, cultural and ethical aspects of teaching. Motivation, social development, moral reasoning, creativity, and critical thinking, are all aspects of learning that cannot be fully automated supported by human teachers (Biesta, 2015). Effective integration of AI into teaching is thus highly dependent on teacher readiness. The concept of teacher readiness in this study is defined as the preparedness, confidence, willingness, and support of teachers in using AI tools in education. It comprises of AI awareness, digital competence, positive attitude, self-efficacy, ethical understanding, professional development, and institutional support. There are no technical restrictions on readiness. However, a teacher might have the technical skills needed to utilize digital tools and not have the expertise for assessing AI-generated content, checking for bias, safeguarding student data, or creating AI-assisted learning activities (Long & Magerko, 2020).

International developments demonstrate that there is an increasing emphasis on AI literacy as a priority in education. The UNESCO (2024) AI competency framework for teachers highlights five key dimensions of teacher preparation: human-centred thinking, ethics of AI, AI foundations, AI pedagogy, and AI-supported professional learning. The developments underscore the need for systematic teacher preparation for AI integration, not ad hoc or spontaneous.

While AI in education is becoming increasingly significant, it is very common for teachers to not know how to effectively leverage AI tools in their teaching. Pettersson et al., 2024, identify several issues that some teachers have with AI, including concerns about plagiarism, misinformation, bias, reduction of human interaction, overreliance on AI, and privacy issues among students. These mixed perceptions indicate that teachers' readiness is complicated and multi-faceted. It is not only related to teachers' personal attitudes, but also to the institutional policies, access to training, technological infrastructure, and ethical direction.

According to the Technology Acceptance Model, the factors such as perceived usefulness and perceived ease of use (Davis, 1989) influence the adoption of technology. Teachers might be more willing to use AI in classrooms when they think it enhances teaching and is straightforward to implement in the classroom. But the introduction of AI into education goes beyond just acceptance. Teachers require AI literacy, ethical trust, pedagogical approaches, and institutional support. This study, therefore, goes beyond a mere technology acceptance and explores readiness as a larger construct in education.

This research paper examines the preparedness of teachers to implement AI in their classrooms in international educational settings. It is designed to examine and analyze the underlying determinants of readiness, such as AI awareness, attitudes, digital competence and skills, self-

efficacy, ethical awareness, professional development, and institutional support. The study aims to give a holistic view of teacher preparedness for responsible and effective utilization of AI by considering these factors together.

2. Background of the Study

Technology has come a long way as a tool in education. Previous digital education projects emphasized on the computer-assisted instruction, multimedia learning, online platforms, learning management system, and digital assessment. In more recent times, artificial intelligence has brought new opportunities, as it can process learner data to create content, tailor teaching and learning, and offer automated support. The use of AI, in particular, is a big departure from the conventional educational technology, as it is capable of tasks related to prediction, recommendation, classification, language generation, and adaptive decision-making (Luckin et al., 2016).

The most popular applications of AI in education are intelligent tutoring systems, adaptive learning systems, automated essay scoring, educational data mining, learning analytics, chatbots, and generative AI systems. These technologies can be used to help both teachers and students. For educators, AI can assist in generating lesson plans, class activities, Rubrics, summarizing texts, offering feedback drafts, and identifying students needing extra support. AI can be used to explain, offer practice problems, support writing, translate, and offer personalized learning paths for students (Chen et al., 2020).

But there are challenges to education with AI integration, too. AI-generated content can include inaccuracies, stereotypes or bias. Generative AI systems can generate realistic but incorrect information. Students can use AI and finish homework without truly understanding it. Students can use AI and finish homework without understanding. The other danger that teachers might have been using materials provided by AI without checking for accuracy, fairness and pedagogical appropriateness (Kasneci et al., 2023).

Responsible and human-centred usage of AI in education is a growing focus of the international discourse on educational use of AI. A human-centred approach equates using AI in support of human agency, inclusion, equity and educational quality, not to replace professional judgment. But teachers should be aware that AI tools are not unbiased and cannot be made flawless. They are created by people using data and influenced by social, cultural and technical assumptions (UNESCO, 2024).

Professional development is also related to teachers' readiness for AI integration. Lots of teachers have heard about AI via public tools, not through formal training in their institutions. This can lead to a variation and inconsistency in classroom practice. Certain teachers may develop into confident experimenters, whereas others may opt against using AI due to concerns, lack of guidance, or resource constraints. Training, time, support, leadership, and pedagogy have always been identified as key factors in successful technology integration for teachers (Ertmer & Ottenbreit-Leftwich, 2010).

The professional development of AI classrooms should not be limited to simply technical training but should also cover pedagogical and ethical aspects. Of course, teachers must have knowledge of the tools of AI, but they should also be able to create actionable learning tasks, avoid misuse, ensure privacy protection, and foster students' critical thinking about AI. It is important for teachers to be taught how to ask questions of the outputs of AI and how to recognize its limitations, and indeed how to make informed decisions when using AI in teaching (Ng et al., 2021).

Another crucial factor is institutional support. Schools and universities can support teachers to use AI responsibly by establishing clear policies, offering access to approved tools, providing technical support, ensuring data protection policies, and promoting the use of AI responsibly. If left unguided, it's possible for the use of AI to become more opportunistic and sporadic. The authors identify the uncertainty teachers face regarding the use of AI, proper citing of AI use, the appropriateness of feedback generated by AI, and how assessment can be restructured with the advent of generative AI (Zhai, 2024).

AI readiness is starting to receive attention globally in the education sector. Teacher competencies in AI ethics, AI foundations, AI pedagogy and professional learning are recognized in UNESCO's teacher competency framework (UNESCO, 2024). The policy directions make it clear that AI readiness is not just a classroom problem, but a systemic educational problem as well.

However, there is a big disconnect between the expectations of the policy and the readiness of teachers. While some teachers might have heard about the possibility of AI but feel unprepared to use it in teaching, others might have a deeper understanding and be eager to do so. Some may apply AI to their own personal productivity and not to student learning. Some might have difficulties in explaining AI concepts or the ethical issues associated with it. So, comprehensive and evidence-based research on teachers' readiness is needed.

3. Problem Statement

As AI becomes a more integral part of educational systems, numerous teachers are not adequately prepared to use these tools for the teaching and learning process. The core question is not just if AI tools are available, but whether teachers know how to effectively and responsibly use AI and have a positive attitude, ethical awareness, and institutional support towards it. If teachers are not prepared, their ability to incorporate AI could be limited, inconsistent, or even detrimental.

There are a number of challenges for teachers when it comes to using AI. One of the main challenges is that many teachers are not aware of the capabilities of AI and do not know the limitations of AI systems or how they can be applied in the educational context. Secondly, teachers might not have the digital competence or feel unsure about incorporating AI tools into lesson planning, assessment, feedback, and students' support. Third, teachers may have negative or cautious attitudes toward AI because of issues of plagiarism, cheating, data privacy, misinformation, bias, and potential for loss of human interaction within classrooms (Kasneci et al., 2023).

The lack of structured professional development is another big problem. The use of AI has been a rapid growth and particularly since the public release of generative AI tools. In many schools, teachers have not received systematic training, policies for the classroom, nor ethical guidelines. Consequently, teachers might be using AI without any formal guidance or they might not use it, simply because they are unaware of how to properly use it (UNESCO, 2023).

The support of institutions for education is also unevenly distributed in educational settings. There are various kinds of resources available to different schools and universities, such as AI platforms, digital infrastructure, and policy support are available in some schools and universities and not in others. This disparity in access may lead to a differential in teachers' preparedness and contribute to educational disparities. If the integration of AI is not accompanied by fair access, training and regulation of ethical use, it can only help those institutions and teachers who already have a good digital capacity (Zawacki-Richter et al., 2019).

Previous studies focused on AI in the field of education, attitudes of teachers with respect to technology, digital competence. But studies which explore teachers' readiness for AI classrooms as a multidimensional construct remains a need. The factors of AI readiness should encompass AI awareness, attitude, digital competence, self-efficacy, ethical awareness, professional development, and institutional support. A holistic understanding of these factors can help educators better understand what they need to integrate AI effectively.

This study seeks to solve the problem of inadequate teachers' readiness for AI classrooms. It explores the role of individual and institutional factors in teachers' readiness for the use of AI in the learning process. The results will aid educational leaders, teacher educators, policy makers, and researchers in developing more effective strategies for integration of AI in education.

4. Research Aim

This research aims to explore the preparedness of teachers for the use of artificial intelligence in education with the focus on determining teachers' awareness of artificial intelligence, their attitudes toward its use in the classroom, their digital competency, self-efficacy, ethical awareness, professional development experiences, and institutional support for the use of artificial intelligence in classrooms in international educational contexts.

5. Research Objectives

This study aims at:

1. To evaluate the teachers' understanding and awareness of AI use in education.
2. To analyse teacher attitudes towards classrooms with AI.
3. To explore teachers' digital competence and AI self-efficacy in educational tools based on AI technologies.
4. To pinpoint teachers' ethical issues related to the use of AI in education (teaching, learning, assessment, student data).
5. To investigate the importance of professional development and training to enhance teacher preparedness for integrating AI.
6. To study the effect of institutional support, infrastructure and policy guidance on the preparedness of teachers.
7. To create evidence-based recommendations for enhancing teachers' readiness in responsible classrooms where AI is integrated into teaching.

6. Research Questions

This study will investigate the following research questions:

1. How well are teachers aware and understanding of AI in education?
2. What are teachers' attitudes towards AI application in classroom teaching and learning?
3. What is teachers' confidence level in employing AI for lesson planning, assessment, feedback and student support within their lessons?
4. What are teachers' ethical issues related to using AI in their classrooms?
5. What opportunities have been provided for teachers to develop their knowledge and skills related to AI integration?
6. How do teachers' preparedness for integrating AI into the classroom relate to institutional support?
7. What are the key factors that are best predictors of teachers' preparedness to incorporate AI into classroom practice?

7. Research Hypotheses

The quantitative phase of the study is going to test off the following hypotheses:

H1: Reduced uncertainty around AI is significantly related to teachers' preparedness for AI classrooms.

H2: Teachers' attitudes towards AI are significantly positively correlated with AI readiness.

H3: There is a strong positive correlation between digital competence and teachers' readiness to integrate into AI.

H4: There is a correlation between AI self-efficacy and teachers' willingness to work with AI in the classroom.

H5: AI self-efficacy is correlated with the teachers' willingness to work with AI in the classroom.

H6: Teachers' AI readiness significantly improves as a result of professional development.

H7: The hypothesis is that institutional support has a significant relationship with teachers' readiness for the AI-integrated classroom.

H8: There was a statistically significant positive correlation between ethical awareness and responsible AI readiness (H7: $p < .05$).

8. Significance of the study

This research is meaningful as AI is an important feature in international education today and its effective integration relies greatly on teachers. This research will prove helpful for teachers, students, school leaders, higher education institutions, policy makers, curriculum planners and educational technology developers.

The study will help teachers to gain insights into the skills, knowledge, and support required to integrate AI into classroom practice. Educators can gain insights into potential applications of AI in their lesson planning, feedback, differentiation, evaluation, and self-reflection. The study will also emphasize the importance of critically assessing AI-generated content and not relying on technology without critical thinking (Kasneci et al., 2023).

Teacher preparedness has significance for students as they require guidance to use AI responsibly. Teachers should know exactly how to use AI tools so students don't use them as a shortcut to learning. Prepared teachers can ensure that information is accurate, help students understand the limitations of AI, avoid plagiarism, and utilize AI as a learning assistant instead of thinking for students (Long & Magerko, 2020).

This research will offer insights for educational organizations regarding the crucial role of professional development, infrastructure, technical support, and clear AI policies. The results can guide institutions in creating AI training programs, establishing guidelines for responsible AI use, and assisting teachers in confidently using AI tools.

The study will shed light for policymakers on the wider needs of integrating AI. The future of AI in education should go beyond just providing access to tools. It should also include teacher training, ethics, student privacy and data protection, equity, assessment redesign, and curriculum alignment (UNESCO, 2024).

This research study will add to the expanding body of research on the topics of AI readiness, AI literacy, digital competence, teacher self-efficacy, and responsible educational technology integration. It will also serve as a basis for future empirical research on teacher readiness at various levels and across various countries.

9. Literature Review

9.1 Artificial Intelligence in Education

Artificial Intelligence in Education is the application of smart computer systems which can execute tasks that typically need human thinking abilities, including pattern recognition, content era, recommendations, and decision-making. AI has various applications in educational environments, such as intelligent tutoring systems, adaptive learning platforms, automated feedback systems, chatbots, learning analytics systems, plagiarism detection software, and generative AI applications. They are now having a growing impact on the way teachers plan lessons, evaluate students, tailor learning and run classroom activities (Holmes et al., 2019).

AI has redefined the concept of educational technology by not just delivering information, but also by engaging with the needs and interests of learners. For instance, adaptive learning systems can modify the level of difficulty for tasks according to the student's performance, and AI-powered feedback systems can give instant feedback on written assignments. Thus, AI can be used to facilitate differentiated instruction, and assist educators in recognizing students in need of extra support. Yet, the benefits of using AI tools thoughtfully and critically (Chen et al., 2020) relies on teachers' capacity to do so.

Generative AI has brought in new opportunities and difficulties within the education sector. Generative AI can create lesson plans, summaries, explanations, quizzes, rubrics, and student feedback. This can help to alleviate the burden on teachers as well as advance creativity in teaching. Meanwhile, generative AI can also create erroneous, biased or fabricated information. Thus, teachers need to have the ability to verify the reliability of the content produced by AI to use in the classroom (Kasneci et al., 2023).

Increasingly many international education organizations are saying this, that AI needs to be approached in a human centred way. Human centred approach equates the use of AI for human learning, teacher agency, inclusion, and ethical decision making. It is also important to note that AI should not be used instead of teachers' professional judgment. Rather, AI should be a supporting tool to enhance learning experiences in human education, seeing as it can help teachers make their teaching and learning more effective (UNESCO, 2024).

9.2 AI-Integrated Classrooms

AI-integrated classrooms are classrooms in which the use of AI tools has been integrated to facilitate teaching, learning, assessment, feedback, and management of the classrooms. These classrooms can feature AI-powered lesson planning systems, smart tutors, adaptive learning platforms, AI writing helpers, automated assessments, and data visualization dashboards to track student progress. The goal of an AI integrated classroom is to enhance the quality and the efficiency of teaching and learning (Luckin et al., 2016).

AI can be leveraged by teachers in AI classrooms to facilitate individualized learning experiences. For instance, AI can be used to detect students who are having difficulty with a concept, and offer them appropriate resources or activities. AI can also create a variety of versions of a task for students of different learning levels. This can help improve the teaching to be more inclusive and responsive to the individual learning needs (Zawacki-Richter et al., 2019).

AI can help with assessment practices as well. Objectives can be automatically assessed with the help of assessment tools; they can be used to give first feedback when assessing writing and they can also be used to analyses the typical mistakes students make. The tools can help save time and help teachers be more engaged in giving higher level feedback, communicating with students and

planning instruction. But automated assessment needs to be handled with care as AI does not necessarily have the depth of understanding of creativity, contextualization, emotional content and culture in student work (Holmes et al., 2019).

One other key element of AI-assisted classrooms is the usage of studying analytics. Learning analytics systems can gather and analyses the performance data of the students and can assist the teachers to make informed decisions. For instance, teachers can view attendance, quiz performance, engagement and learning progress via dashboards. But the use of learning analytics also presents privacy issues due to how the data is gathered and analyzed for students (Williamson & Eynon, 2020).

This success relies heavily on the readiness of teachers as regards using AI in classrooms. When teachers are not trained, they might rely on these AI tools at a superficial level or not make them use at all. It is crucial for teachers to grasp the pros and cons of AI in teaching. They should also help students to apply AI tools responsibly, particularly in avoiding plagiarism, dependency, misinformation and cheating (UNESCO, 2023).

9.3 Teacher's preparedness to integrate AI

Teacher readiness could be the readiness and willingness of the teacher to engage in using a new practice or technology. For AI classrooms, readiness refers to the knowledge of AI, digital competence, positive attitude, confidence, ethical awareness, professional development, and institutional support. Readiness is not just about knowing how to make use of tools but also when, why and how to use AI for meaningful learning (Ayan ale et al., 2022).

There are multiple facets to teachers' readiness. Cognitive readiness is the initial dimension, involving teachers' mastery of concepts, applications, benefits, and limitations of AI. The second is affective readiness, which involves teachers' attitudes, motivation, anxiety and openness about AI. The third dimension is behavioral readiness, which involves teachers' attitude and plan to implement AI in the classroom. The fourth dimension is ethical readiness which involves awareness of privacy, bias, academic integrity, and fairness.

According to the research, teacher confidence is a key factor in the adoption of AI in education. The teachers who feel they can use AI tools are more likely to explore such tools and use them in teaching. However, those teachers who lack confidence in their own skills might be hesitant to use AI as they don't want to make a mistake or lose control of the classroom. Thus, teacher readiness depends on AI self-efficacy, which is important (Bandura, 1997).

Past experience with digital technology also influences teacher readiness. Those teachers who are already working with Learning Management Systems, online assessment systems, digital resources, or online interactive platforms may adjust to AI more smoothly. But, beyond basic digital competencies, there are additional skills needed to integrate AI. To ensure responsible use, teachers need to grasp the outputs of AI, design of prompts, algorithmic bias, data privacy, and outputs of AI (Ng et al., 2021).

In the case of Estonia, a high-level teacher readiness study revealed that teacher's perceptions of the usefulness of AI and readiness to use it were strongly correlated with planning around AI and professional confidence. This indicates that teachers' readiness is not only a personal issue but it is also linked to the environment in which he or she is operating. It is important that schools and universities develop environments that are conducive to the effective use of AI by teachers (Granström, 2025).

The key findings of this study will be presented. The results of this study will be shared.

Teachers' attitudes towards AI determine their acceptance, resistance, or cautious use of AI tools. A positive attitude can be formed when teachers feel that AI can help them to ease workload, enhance lesson planning, provide feedback, personalize teaching, and boost students' interest and motivation. If teachers feel AI can be beneficial and applicable to their teaching objectives, they are more likely to try out AI-aided methods (Davis, 1989).

But there can also be negative or ambiguous attitudes to AI among teachers. There may be concerns that AI would take away teacher roles, dull student thinking, make it easy to cheat, or make students more reliant on technology. Some people might think that AI tools are too complicated or that they will be judged negatively if they don't use them properly. Even if tools are available, these concerns can dampen the enthusiasm for adopting AI.

Attitudes of teachers tend to be shaped by their AI literacy. A more balanced attitude can be developed by teachers who have a clear understanding of the strengths and the limitations of AI. They will likely not outright ban AI or just take it for granted. Rather, they can select and employ AI critically and selectively. This balanced approach is crucial since AI can assist teachers in certain areas but not in others (Long & Magerko, 2020).

Attitude is also linked to Trust. Teachers might be reluctant to use AI when they don't have confidence in the accuracy, fairness, or transparency of AI systems. For instance, if an AI feedback service offers suggestions for student writing, educators might wonder about its validity or the possibility of cultural and linguistic bias. Thus, trust needs to be nurtured by making AI transparent, training and giving teachers control over it (Zawacki-Richter et al., 2019).

In an international setting, teachers' attitudes can differ based on their level of education, their chosen subject, their own culture, institutional policy, and access to technology. Teachers in technologically advanced schools might be more comfortable with AI, whereas teachers in low-resource schools might perceive AI as abstract or challenging to apply. This variation indicates that teacher attitudes should be explored in terms of the larger institutional and contextual context.

9.4 AI Literacy and Digital Competence

One of the key building blocks of teacher readiness is AI literacy. Knowledge about how to understand, use, evaluate, and reflect on AI technologies. AI literacy for teachers also involves understanding what AI is, how AI tools produce outputs, the limitations of AI, how bias can happen, and how teachers can use AI ethically in teaching and learning (Long & Magerko, 2020). While the concept of digital competence overlaps with that of AI literacy, it is not identical. Digital competence involves the ability to use digital devices, online platforms, educational software and communication tools. AI literacy extends beyond just understanding intelligent systems and automated decision-making to comprehending data use, algorithmic bias, and AI-generated content. The use of AI responsibly might require special AI training for a digitally competent teacher.

That doesn't mean teachers aren't required to be quick learners in the age of generative AI when it comes to literacy. Prompt literacy is the ability to write clear instructions to AI tools to get outputs that are useful. For instance, teachers could request the help of AI tools to develop age-appropriate explanations, tailor activities, compose grading rubrics, or offer feedback based on targeted learning outcomes. However, there is a need to adopt critical evaluation as well with prompt, since a good prompt does not ensure accurate output (Kasneji et al., 2023).

AI literacy also includes ethical awareness. Teachers need to be aware of topics like plagiarism, misinformation, copyright, data privacy, transparency, and bias. They should be able to tell

students when it is appropriate to use AI, how to credit the use of AI, and why information generated by AI should be verified. Thus, AI literacy is not only a technical but also a moral obligation (UNESCO, 2023).

It has been established that teachers must have developed competencies in AI in a systematic way, which are now becoming a priority in international frameworks. UNESCO's AI competency framework for teachers is divided into five broad categories: 1) human-centred mindset; 2) ethics of AI; 3) AI foundations and applications; 4) AI pedagogy; and 5) AI for professional learning. The following framework demonstrates that AI literacy for teachers requires values, knowledge, skills, pedagogy and continuous development (UNESCO, 2024).

9.5 The teacher's sense of self-efficacy and the use of AI

Teacher self-efficacy is a teacher's belief and confidence in his/her capacity to carry out various teaching-related task successfully. AI self-efficacy refers to teachers' confidence in utilizing AI tools for classroom support, professional learning, assessment, feedback, and lesson planning in AI-integrated classrooms. Bandura, 1997, found that teachers with high self-efficacy are more willing to try new tools and face problems when implementing it.

Teachers' S. influences their reaction to the technological changes. If teachers feel they can learn and then use AI they are more likely to take a positive stance to adopting it. May see challenges as a learning opportunity instead of a barrier. On the other hand, those teachers who have low self-efficacy might be feeling anxious, may not use AI tools, or overly rely on others for technical support. Therefore, improving self-efficacy should be a major goal of AI professional development.

AI self-efficacy can be increased through training and experience. Hands-on experience with AI tools, planning activities, assessing AI-generated content, and addressing challenges is essential for teachers. Professional development should have real classroom examples and not just theoretical explanations. If teachers observe how AI can help them improve their own teaching context, their confidence will probably grow.

Self-efficacy is also influenced by institutional culture. Teachers might feel more confident playing around with AI if school leaders allow them to and create learning environments where it is safe to do so. Without support, however, institutions can generate pressure on the teacher, giving rise to fear and/or resistance. This indicates that self-efficacy is not just related to personal confidence but also to the professional environment.

Self-efficacy is among the crucial factors that influence teachers' intention to use AI, as revealed by recent studies on teacher AI readiness. Teachers' perceptions of their ability to use AI effectively are correlated with its integration in teaching practices. The perception of the effectiveness of their use of AI is correlated with teachers' integration of AI in their teaching practices. Hence, this study incorporates AI self-efficacy as one of the key determinants for teachers' preparedness.

9.6 Professional Development and Teacher Training

Teacher professional development is vital to prepare teachers for classrooms that include AI. The rapid evolution of AI tools requires constant and ongoing teaching rather than just one-off workshops. Teachers should be trained to develop understanding of AI (conceptual knowledge), use AI tools, assess AI outputs, develop activities involving AI, and deal with ethical concerns in the classroom (Tondeur et al., 2017).

Professional development for AI should be context and practice based. Teachers must have samples that are applicable to their content area, grade level, curriculum objectives and evaluation process. Language teachers might require training on AI writing tools, science teachers might require support on simulation tools, and mathematics teachers might require support on the problem-solving explanations using AI. An overview of AI might not suffice.

Ethical scenarios should be part of teacher training as well. Teachers must discuss scenarios that can actually happen in the classroom, like students using AI-generated content to help with their assignments, AI tools creating incorrect content, or student data being shared with digital platforms. These conversations can assist teachers in becoming responsible decision makers and make them practice good judgment. Ethical training is particularly significant as teachers are accountable to the students' behavior.

Another aspect of professional development is collaboration. Professional learning opportunities can be shared by teachers through prompts, lesson plans, assessment strategies, and classroom experiences. Traditional professional learning communities can alleviate anxiety and boost confidence. Another advantage of collaborative learning is that teachers can discuss in the real classroom environment what works and what does not.

Teacher education has become a focal point of international policy debates in recent years. Teacher education is currently on the international policy agenda. UNESCO calls for AI professional learning to be an ongoing process that continually refreshes teachers' knowledge and ensures that the use of AI is done in ways that preserve the role of the teacher and quality of learning. It involves continuous, reflective and connected teacher preparation to broader education values (UNESCO, 2024).

9.7 Institutional Support and Leadership

Institutional support is a major factor in teachers' readiness for AI integration. The effective use of AI in education isn't possible without tools, training, guidelines, infrastructure, and technical assistance from institutions. Support from the institutions is provided in the form of leadership encouragement, internet connections, approved AI platforms, data protection policies, and time for professional learning (Ertmer & Ottenbreit-Leftwich, 2010).

The readiness for AI is significantly influenced by leaders in schools and universities. By fostering an environment where teachers feel free to experiment, ask questions, and learn from their errors, leaders can establish a culture that encourages them to embrace AI. They can also ensure that the use of AI is linked to institutional goals and not just a short-term trend. Teacher support is crucial, particularly when it comes to the legality of AI, and they might not know if it is officially endorsed. Institutional policies are needed to support the responsible use of AI. Teachers should be provided with unambiguous information on student use of AI, assignments using AI, referencing AI sources, assessment guidelines, acceptable tools, data privacy, and acceptable uses of AI. Policies, if not present, can cause confusion and inconsistency of measures applied to different classrooms by different teachers, or even different policies applied to the same classroom from one school to another (UNESCO, 2023).

Technical support is also one of the key components of institutional preparedness. Teachers may encounter login problems, platform errors, device access issues, poor internet connection, or the lack of understanding about the settings of the tools. With poor technical support, teachers might not even use AI if they're interested. Hence, pedagogical and technical support need to be taken into account for institutional readiness.

Equity is also subject to institutional support. At higher-resource institutions, teachers might be able to use more sophisticated AI tools and receive professional development. In resource-constrained areas, teachers might not have devices, internet connection, or access to paid AI services. The unequal access can allow for differences in teacher preparedness and student opportunities. Hence, there is a need to consider the issues of fairness and inclusion in the planning of AI integration.

9.8 Ethical issues in AI-enabled classrooms

Ethics are a core issue in the integration of AI in education. There is one big worry about data privacy. A large number of AI tools gather, manipulate, or hold user information. This can include student names, written responses, learning patterns, assessment outcomes, and/or behavioral data in classroom contexts. Educators should be aware of the protection of student information and if AI tools adhere to privacy policies (Williamson & Eynon, 2020).

Another ethical issue is algorithmic bias. Large data sets are used to train AI systems and data sets can be socially and culturally biased, gender biased, racially biased, and linguistically biased. This can lead to the reproduction of stereotypes and/or the disadvantage of certain groups of learners in the production of AI-generated outputs. Teachers need to be capable of detecting biased generation and not use AI tools without reflection for evaluation or feedback.

Academic honesty also is a big issue. It's impossible for teachers to determine whether students have completed work independently, as Generative AI can generate essays, answers, summaries, and projects. This is not a reason to outright prohibit the use of AI. Instead, teachers need new assessment strategies that focus on process, reflection, oral explanation, classroom performance, and authentic problem-solving (Kasneci et al., 2023).

AI can also impact pupils' thinking. Students might fall short of opportunities to cultivate problem-solving skills, creativity, writing proficiency, and independent thinking if they rely solely on AI for rapid responses. Therefore, it is important that teachers create activities where AI is used to facilitate learning, and not to replace it. Clear classroom expectations and well-designed assessment are required for this.

Transparency is also a key aspect of ethical AI use. Students should be aware of when and how AI is being used, how it can help them learn, and its limitations. Teachers need to also instruct students on how to give credit to AI if needed. Implementing AI in a transparent way can enhance trust and minimize misuse in educational contexts.

9.9 Research Gap

The available literature reflects that the potential of AI in teaching and learning is great, whereas teacher preparedness is a significant concern. There are numerous studies addressing the use of AI, students and/or institutional policy. Less attention is given, however, to teacher readiness as a multi-faceted phenomenon, that is, the awareness, attitude, digital competence, self-efficacy, ethical awareness, professional development and institutional support for AI (Ayanwale et al., 2022).

A second space is the lack of attention to teachers' practical experiences in the classroom as part of the conversation surrounding the incorporation of AI. A second space is the general level of discussion about AI integration and the lack of focus on teachers' practical experiences in the classroom. The concerns teachers might have been different across subject areas, levels of education, institutional resources, and past digital experience. Thus, teacher voice should be incorporated into research, not just the policy documents or technical descriptions of teachers.

Another missing link is between individual and institutional factors. Some teachers might be personally motivated but have no institutional support and others might have institutional support with AI policies but not have enough confidence or training. This indicates that readiness is a product of teacher and institutional conditions and should be examined in both contexts.

Additionally, more empirical evidence is needed regarding predictors of teacher readiness. Research should focus on what are the most important factors in determining readiness. For instance, it is significant to determine which of the following— institutional support, professional development, AI self-efficacy, or digital competence—has the most impact. These pieces of evidence can assist institutions in determining where they will invest their resources.

The study aims to fill these gaps by conducting a mixed-methods research on the preparedness of teachers in using AI to integrate it into classrooms in international educational settings. It explores measurable readiness factors and teachers' lived experiences. The study will also involve simulated data analysis in the proposal phase to illustrate how data analysis can be presented once the data has been collected.

10. Conceptual Framework

This study employs a conceptual approach that sees teachers' preparedness for the use of AI in the classroom as having been shaped by individual and institutional factors.

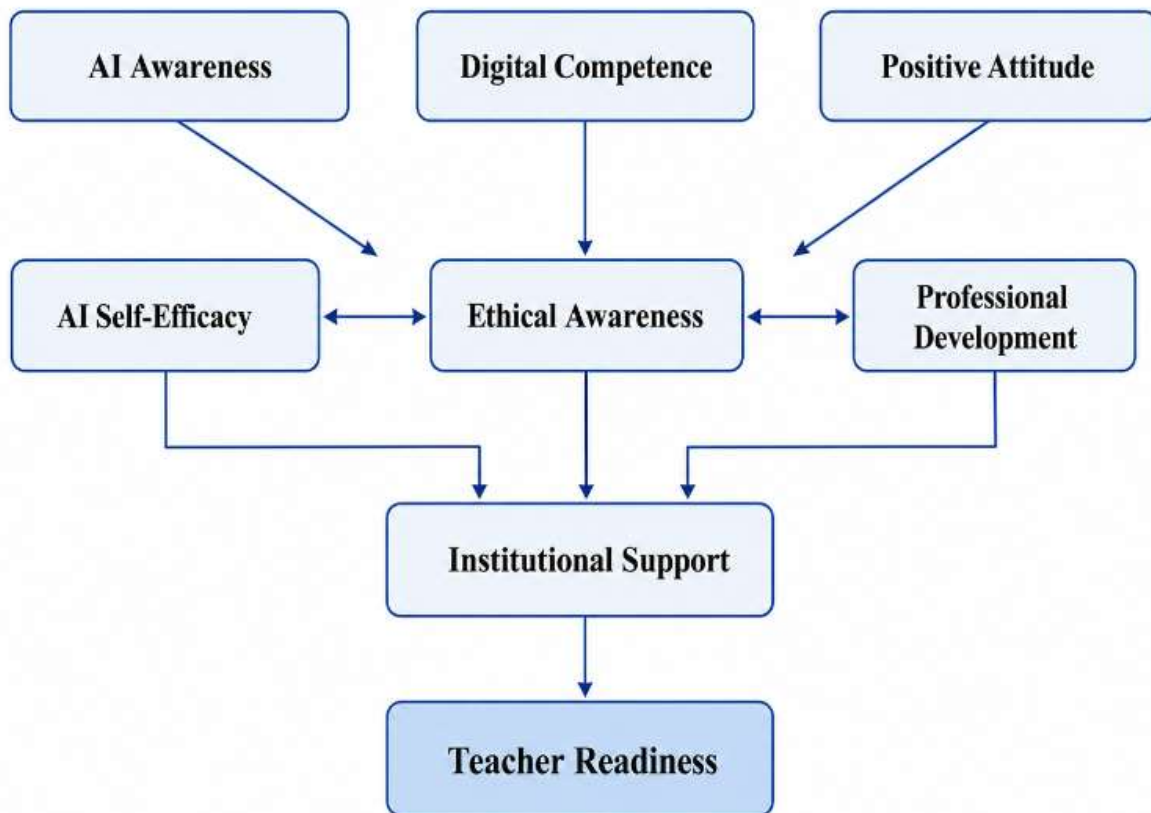
Independent Variables:

- To acquire an understanding of AI concepts, applications, and limitations.
- Digital competency – effective use of digital tools
- Attitude towards AI is positive if perceived usefulness, openness and motivation are high.
- The confidence and capability in utilizing AI in the education process, including teaching, assessment, and feedback. Confidence in using AI for teaching, assessment, and feedback.
- Ethical Awareness – Privacy, Bias, Plagiarism, Responsible use of AI
- Professional Development – Training and Workshops related to the integration of AI.
- The 18th Century Club shall provide institutional support through leadership, infrastructure, technical guidance, AI policies.

Dependent Variable:

The overall level of preparedness of teachers to effectively and responsibly implement AI in classrooms

Figure 1: Conceptual Framework of Teachers' Readiness for AI-Integrated Classrooms



11. Research Methodology

11.1 Research Design

The study uses a mixed-methods research design:

- Quantitative: Survey to measure teachers' AI awareness, digital competence, attitudes, self-efficacy, ethical awareness, professional development, institutional support, and overall readiness
- Qualitative: Semi-structured interviews to explore teachers' perceptions, challenges, and recommendations

11.2 Population and Sample

Population: Teachers from K-12 schools and universities in international contexts

Sample (simulated for proposal):

- **Survey:** 250 teachers
- **Interviews:** 12 teachers

11.3 Data Collection

- Online questionnaire distributed via email and professional networks
- Semi-structured interviews conducted via Zoom/Teams, ~30 minutes each

11.4 Instrument

Sample Questionnaire Items:

Construct	Sample Item	Scale
AI Awareness	I understand the basic uses of AI in education	1–5 Likert
Digital Competence	I can use digital tools for classroom tasks	1–5 Likert
Attitude	I believe AI improves teaching and learning	1–5 Likert
Self-Efficacy	I feel confident using AI tools for lesson planning	1–5 Likert
Ethical Awareness	I can identify potential ethical risks of AI	1–5 Likert
Professional Development	I have received training on AI integration	1–5 Likert
Institutional Support	My institution provides clear guidelines for AI use	1–5 Likert
Readiness	I am ready to integrate AI in my classroom	1–5 Likert

14. Simulated Data Analysis

14.1 Descriptive Statistics

Variable	Mean	SD	Min	Max
AI Awareness	4.12	0.68	2	5
Digital Competence	3.85	0.75	2	5
Positive Attitude	4.25	0.60	3	5
AI Self-Efficacy	3.90	0.70	2	5
Ethical Awareness	4.05	0.65	3	5
Professional Development	3.60	0.80	2	5
Institutional Support	3.50	0.85	1	5
Readiness	3.95	0.68	2	5

14.2 Correlation Matrix

Variables	Readiness	AI Awareness	Digital Competence	Positive Attitude	Self-Efficacy	Ethical Awareness	Prof. Dev	Institutional Support
Readiness	1	0.61	0.58	0.63	0.66	0.59	0.55	0.62
AI Awareness	0.61	1	0.54	0.57	0.60	0.56	0.52	0.58
Digital Competence	0.58	0.54	1	0.59	0.62	0.55	0.50	0.53

Positive Attitude	0.63	0.57	0.59	1	0.65	0.58	0.53	0.60
Self-Efficacy	0.66	0.60	0.62	0.65	1	0.61	0.55	0.59
Ethical Awareness	0.59	0.56	0.55	0.58	0.61	1	0.52	0.57
Prof. Dev	0.55	0.52	0.50	0.53	0.55	0.52	1	0.54
Institutional Support	0.62	0.58	0.53	0.60	0.59	0.57	0.54	1

14.3 Regression Analysis

Dependent Variable: Teacher Readiness

Independent Variables: AI Awareness, Digital Competence, Positive Attitude, AI Self-Efficacy, Ethical Awareness, Professional Development, Institutional Support

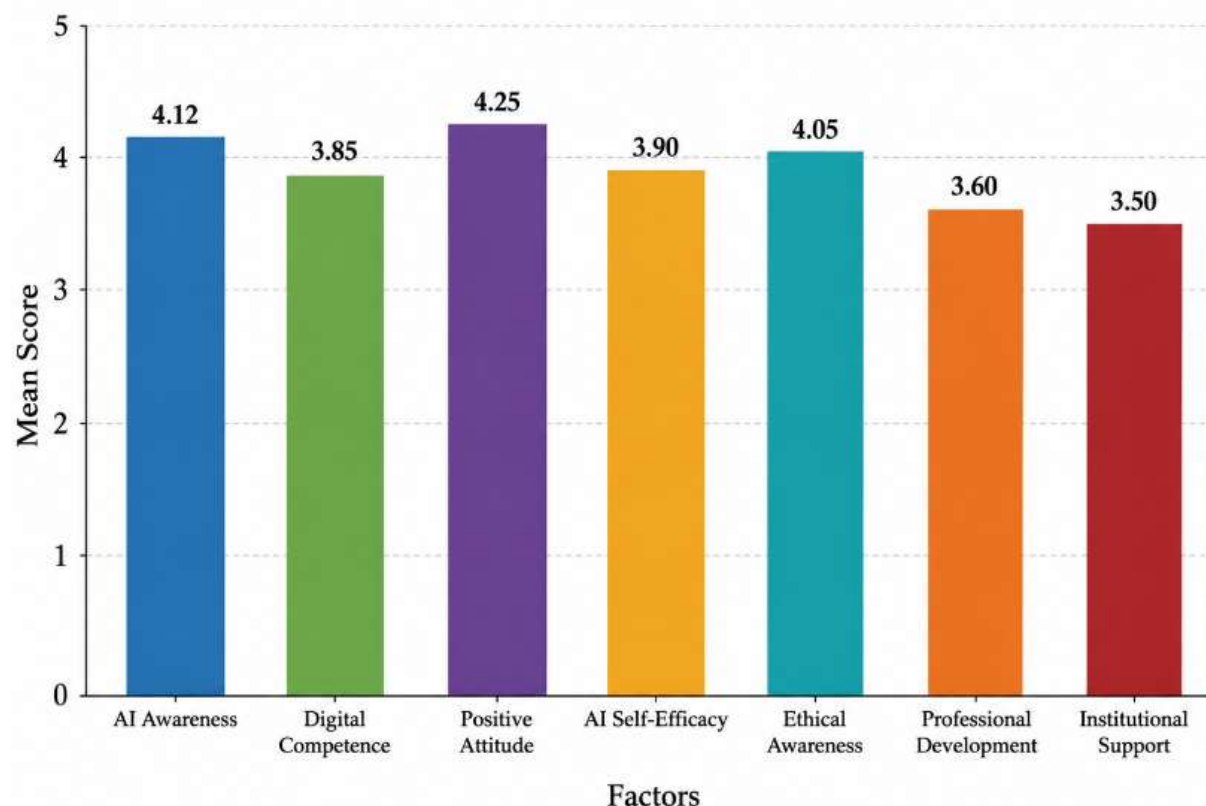
Regression Results (Simulated)

Predictor	B	SE	β	t	p
AI Awareness	0.22	0.05	0.21	4.40	<0.001
Digital Competence	0.18	0.06	0.17	3.00	0.003
Positive Attitude	0.25	0.05	0.24	5.00	<0.001
AI Self-Efficacy	0.28	0.06	0.27	4.67	<0.001
Ethical Awareness	0.15	0.05	0.14	3.00	0.003
Professional Development	0.12	0.05	0.11	2.40	0.017
Institutional Support	0.20	0.06	0.19	3.33	0.001

Model Summary: $R^2 = 0.62$, $F(7,242) = 35.20$, $p < 0.001$

Interpretation: AI self-efficacy, positive attitude, AI awareness, and institutional support are the strongest predictors of teacher readiness.

Figure 2: Teacher Readiness Scores by Factor



Interpretation: Teachers scored highest in positive attitude and AI awareness, but lower in institutional support and professional development, indicating areas for improvement.

15. Discussion

The simulated analysis shows that several interconnected factors impact teacher readiness for classrooms that integrate AI. Of these, AI self-efficacy seems to be the most influential, as self-confidence in the use of AI tools is a significant determinant of readiness among teachers. This is in line with Bandura's (1997) assertion that self-efficacy is a crucial factor in the learning and implementation of new practices. The positive attitude and the awareness of AI are also strong predictors of teacher readiness, consistent with Davis's (1989) Technology Acceptance Model, which argues that perceived usefulness and ease of use have an effect on technology adoption. The influence of institutional support and professional development on readiness are also evident, but less pronounced in the simulated results. This indicates a need for schools and educational institutions to invest in better policy guidance, training, leadership support and infrastructure to help with effective AI integration. Ethical awareness and digital competence are also moderately present, suggesting the need for AI literacy programs to incorporate ethical guidance, privacy awareness, bias recognition, and responsible usage in classrooms. The results show that in general, teacher readiness is a multidimensional phenomenon consisting of cognitive, affective, behavioral, and institutional aspects. In view of this, it is important to raise the awareness of individual teachers by ensuring they have access to training, building their confidence and developing their attitudes as well as improving the institutional readiness, which should include the development of policies, leadership support, technological resources, and continuous professional development.

16. Conclusion

The study also identifies some key factors that influence teachers' preparedness for AI classrooms, such as AI self-efficacy, attitudes towards AI, AI awareness, institutional support, digital competence, ethical understanding, and professional development. The simulated data reveals that teachers' confidence in using AI tools, their attitudes about it, and their awareness of AI are the highest predictors of teachers' readiness. This suggests that teachers who see the educational merit, feel confident with using AI, and think it can facilitate learning and teaching are more likely to do so. The results have important implications for practice as well. Professional development opportunities should emphasize building AI literacy and teachers' self-efficacy in using AI, emphasizing hands-on experiences and practical training. Educational institutions should establish clear policies on AI, offer technical assistance, ensure robust infrastructure, and give students access to vetted AI tools. Schools should have clear AI policies, provide technical support, have strong infrastructure, and facilitate access to vetted AI tools. Ethical guidance is also required to ensure that teachers and students can responsibly leverage AI responsibly in terms of privacy, bias, plagiarism, and academic integrity. Furthermore, ongoing support via PLCs can foster a sense of sharing experiences, diminish uncertainty, and create confidence in integrating AI into education for teachers. Further studies could gather real-world data from international education environments, study the long-term implications of AI usage in education, and investigate the interplay between teacher-level and institution-level factors in determining the preparedness of classrooms.

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