KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 02 August 2025
Revised 10 October 2025
Accepted 18 October 2025
Initial Published 21 October 2025
Final Publication 10 December 2025

Journal of Adolescent and Youth Psychological Studies

Volume 6, Issue 12, pp 1-12

E-ISSN: 2981-2526

Identifying and Ranking Psychological Determinants of Teacher Readiness for AI Integration

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A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Aghaziarati, A., & Parsakia, K. (2025). Identifying and Ranking Psychological Determinants of Teacher Readiness for AI Integration. *Journal of Adolescent and Youth Psychological Studies, 6*(12), 1-12.
http://dx.doi.org/10.61838/kman.jayps.4602

A B S T R A C T

Objective: This study aimed to identify and rank the key psychological determinants influencing teachers' readiness for integrating artificial intelligence (AI) into educational practices.

Methods and Materials: The research followed a sequential exploratory mixed-method design. In the first phase, a qualitative content analysis was conducted through a systematic literature review of peer-reviewed studies published between 2022 and 2025. Data were analyzed using NVivo 14, following open, axial, and selective coding until theoretical saturation was reached. Seven major psychological determinants emerged. In the second phase, a quantitative ranking analysis was performed using SPSS 26. A structured questionnaire, based on the qualitative findings, was distributed to 200 teachers in Tehran. The relative significance of each determinant was analyzed using Friedman's test, with reliability and validity verified through Cronbach's alpha and exploratory factor analysis.

Findings: Results indicated a statistically significant difference among the seven determinants ($\chi^2 = 187.42$, df = 6, $p < 0.001$). Technological self-efficacy ranked highest, followed by growth mindset and learning orientation, and cognitive flexibility and adaptability. Motivation and engagement and attitude toward AI integration occupied mid-ranks, while emotional readiness and regulation and social and collaborative orientation ranked lowest. These findings reveal that teachers' internal cognitive and motivational capacities are stronger predictors of AI readiness than emotional or institutional factors.

Conclusion: Teacher readiness for AI integration is primarily shaped by self-efficacy, continuous learning orientation, and adaptability. Psychological empowerment and professional reflection precede emotional and social readiness, underscoring the need for professional development programs that foster confidence, growth mindset, and adaptive cognition.

Keywords: *Artificial intelligence integration; teacher readiness; technological self-efficacy; educational innovation.*

1. Introduction

The accelerating diffusion of artificial intelligence (AI) across education systems has reshaped traditional conceptions of teaching, learning, and assessment. AI technologies—ranging from adaptive learning algorithms and intelligent tutoring systems to automated assessment platforms—are increasingly embedded in classrooms, transforming pedagogical practices and redefining teacher roles (Tahir et al., 2025). While the technical capacity of AI is advancing rapidly, successful integration depends not only on institutional infrastructure but also on teachers' psychological readiness to engage with and adapt to these innovations (Fuentes & Chiappe, 2025). Psychological readiness involves a multidimensional set of beliefs, emotions, and attitudes that govern how teachers perceive, accept, and employ emerging technologies in their instructional routines. In this context, understanding and ranking the psychological determinants of readiness becomes a prerequisite for guiding professional development, policy, and implementation strategies in AI-enhanced education (Ofem et al., 2025).

Recent global efforts have recognized that technological transformation requires psychological adaptation. Teachers are expected to shift from traditional instructional delivery to facilitative, data-driven, and personalized pedagogies supported by AI tools (Ajlouni et al., 2025). However, this transition is not merely a technical process—it is fundamentally cognitive and affective. Teachers' perceptions of usefulness, ease of use, and their self-efficacy beliefs have been repeatedly linked to willingness to adopt AI-based applications (Farooq, 2025; Ofem et al., 2025). These psychological mechanisms mediate the relationship between technological opportunities and pedagogical application, determining whether AI integration will enhance or hinder learning outcomes (Eke, 2024).

A growing body of research underscores self-efficacy as the cornerstone of teachers' technological readiness. Self-efficacy represents an individual's belief in their ability to organize and execute actions necessary to achieve specific goals—in this case, effective AI utilization in teaching (Alshorman, 2024). Teachers with high technological self-efficacy exhibit greater persistence in experimenting with AI platforms, navigating errors, and exploring new digital pedagogies (Ajlouni et al., 2025). Studies on blended and AI-assisted learning contexts have confirmed that confidence in using technology directly predicts engagement and resilience in adapting to educational innovations (Alconis, 2023; Krause & Jenny, 2023). Conversely, teachers with low self-efficacy may perceive AI as complex, uncontrollable, or even threatening to their professional identity (Aloka et al., 2024).

Another critical psychological determinant involves attitudes and beliefs toward AI. Attitude shapes motivational direction—positive attitudes facilitate exploration and innovation, whereas negative or ambivalent attitudes generate resistance (Gatlin, 2023). Teachers' attitudes are closely linked with perceived usefulness and perceived ease of use, aligning with the Technology Acceptance Model framework (Ofem et al., 2025). When educators perceive AI as a tool that enhances instructional quality, reduces workload, or promotes individualized learning, they are more likely to integrate it into their pedagogical practice (Tahir et al., 2025). Yet, ethical and emotional concerns—such as data privacy, human replacement, and loss of pedagogical autonomy—often temper enthusiasm (Alshorman, 2024; Fuentes & Chiappe, 2025). Thus, readiness entails balancing optimism for innovation with critical awareness of potential challenges.

Emotional readiness forms another layer of psychological preparedness. The shift toward AI-driven instruction often elicits mixed emotional responses, including curiosity, anxiety, or fear of inadequacy (Farooq, 2025). Teachers' ability to regulate such emotions and maintain adaptive optimism determines their capacity to cope with technological uncertainty (Levkovich & Stregolev, 2024). Emotionally resilient educators demonstrate openness to experimentation, tolerance for ambiguity, and willingness to learn from mistakes (Saidi et al., 2024). In contrast, emotional rigidity can lead to avoidance behaviors or defensive attitudes toward AI, which impede professional growth.

Motivational factors—both intrinsic and extrinsic—are equally influential. Teachers motivated by curiosity, professional fulfillment, and a sense of purpose exhibit sustained engagement in learning how to use AI tools effectively (Natividad et al., 2024). External incentives, such as administrative recognition or institutional rewards, also play a role in reinforcing readiness (Ofem et al., 2025). However, intrinsic motivation, rooted in the desire to improve teaching quality and student outcomes, appears to have more durable effects (Aboushi & Obied, 2025). Motivation is intertwined with growth mindset—the belief that abilities can be developed through effort and learning—

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encouraging teachers to embrace new technologies as opportunities rather than threats (Thapliyal, 2024).

Cognitive flexibility complements these motivational orientations by enabling teachers to adapt their instructional strategies dynamically. Teachers who can reframe problems, integrate new knowledge rapidly, and design innovative solutions demonstrate a higher level of readiness (Yılmaz & Saraç, 2023). Cognitive flexibility underpins creative lesson design, collaborative problem-solving, and reflective practice—all essential for adapting AI applications to diverse classroom contexts (Carvalho et al., 2024). Such flexibility also supports the transfer of knowledge across technological platforms, reducing the cognitive overload associated with continuous innovation (Korkmaz & Keçik, 2024).

Beyond individual dispositions, social and collaborative orientation also influences readiness. Teachers' willingness to engage in AI integration is often shaped by collegial support, professional learning communities, and the broader institutional culture (Eke, 2024). Organizational environments that promote collaboration, mentorship, and shared experimentation foster a sense of collective efficacy and reduce resistance to change (Martín et al., 2024). Research has shown that leadership encouragement and peer learning opportunities enhance teachers' confidence and enthusiasm for using AI tools (Ajlouni et al., 2025; Ofem et al., 2025). Conversely, lack of institutional support or unclear policy frameworks can amplify psychological barriers, even among technologically competent educators (Carvalho et al., 2024).

Social cognition also shapes readiness through perceived norms and expectations. When AI use is embedded in a supportive culture that values innovation, teachers are more likely to align with those expectations (Szász et al., 2024). Conversely, environments characterized by skepticism or minimal digital infrastructure may undermine motivation and confidence (Eke, 2024). Social trust in AI systems—trust that AI decisions are fair, transparent, and reliable—plays a crucial role in mediating acceptance (Fuentes & Chiappe, 2025; Ofem et al., 2025). Thus, readiness must be examined as a socially situated construct, influenced by both interpersonal relationships and organizational structures.

Teacher readiness for AI integration is also interlinked with inclusive education and cross-cultural dimensions. Studies across diverse educational settings reveal that attitudes, empathy, and perceived efficacy in addressing learner diversity influence openness to AI tools designed for personalization and inclusion (Jiang et al., 2025; Martín et al., 2024). For example, inclusive practices require teachers to use AI not merely as a technological extension but as an assistive resource for equitable learning opportunities (Carvalho et al., 2024). The ability to empathize with students' diverse needs enhances teachers' appreciation of AI's role in supporting accessibility and differentiation (Thapliyal, 2024). Similarly, exposure to global and multicultural teaching environments fosters adaptive attitudes that facilitate AI readiness (Aloka et al., 2024; Szász et al., 2024).

Comparative studies further highlight national and contextual variations in readiness levels. For instance, teachers in technologically advanced systems demonstrate higher AI confidence but may still grapple with ethical and pedagogical dilemmas (Woo, 2023). Conversely, educators in developing contexts often exhibit enthusiasm but face infrastructural and training constraints (Eke, 2024; Korkmaz & Keçik, 2024). In both settings, however, the psychological variables—self-efficacy, attitude, motivation, emotional regulation, and social support—remain consistent predictors of readiness (Farooq, 2025; Ofem et al., 2025). The convergence of findings underscores that readiness is less a function of geography and more a function of psychological adaptability and institutional facilitation.

Theoretically, teacher readiness for AI integration can be situated at the intersection of technology acceptance theories, social cognitive theory, and self-determination theory. The Technology Acceptance Model explains readiness through perceived usefulness and ease of use, while social cognitive theory highlights self-efficacy and observational learning (Ajlouni et al., 2025; Ofem et al., 2025). Self-determination theory adds the motivational dimensions of autonomy, competence, and relatedness (Natividad et al., 2024). Integrating these frameworks provides a holistic understanding of how beliefs, motivation, and environment converge to shape teacher behavior.

Practically, examining psychological determinants informs the design of targeted professional development programs. Training that enhances technological self-efficacy, cultivates growth mindset, and develops emotional regulation skills can significantly strengthen teachers' readiness for AI integration (Alshorman, 2024; Farooq, 2025). Moreover, institutional policies should encourage collaborative learning ecosystems that promote experimentation and reflection (Carvalho et al., 2024; Martín et al., 2024). Administrators can leverage insights from readiness assessments to align teacher training with the psychological factors most predictive of adoption success.

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Despite growing scholarly attention, systematic identification and prioritization of psychological determinants of teacher readiness for AI integration remain limited (Fuentes & Chiappe, 2025). Most prior studies have explored isolated constructs—such as self-efficacy, attitude, or motivation—without integrating them into a comprehensive framework or ranking their relative importance (Farooq, 2025; Ofem et al., 2025). This study addresses that gap by adopting a mixed-method sequential design that first identifies the psychological determinants through qualitative synthesis and then quantitatively ranks them based on teachers' perceptions in Tehran. By doing so, the research contributes to a more nuanced understanding of how psychological factors interact to influence readiness for AI adoption in education.

The overarching aim of this study is therefore to identify and rank the key psychological determinants of teacher readiness for AI integration

2. Methods and Materials

2.1. Study Design and Participants

This study employed a sequential exploratory mixed-method design consisting of two distinct but complementary phases. The first phase involved a qualitative exploration aimed at identifying the psychological determinants influencing teacher readiness for AI integration in educational settings. The second phase employed a quantitative ranking analysis to prioritize these determinants based on empirical data.

The study population comprised teachers from public and private schools in Tehran, representing diverse educational levels and disciplines. A total of 200 teachers were selected through stratified random sampling to ensure representation across gender, teaching experience, and educational background. Inclusion criteria were at least three years of teaching experience and prior exposure to digital technologies in instructional practice.

2.2. Measures

In the qualitative phase, data collection was conducted exclusively through a systematic literature review to identify key psychological factors influencing teachers' readiness for AI integration. The review included peer-reviewed journal articles, conference proceedings, and doctoral dissertations published between 2022 and 2025. Databases such as Scopus, Web of Science, and Google Scholar were searched using keywords including teacher readiness, artificial intelligence integration, psychological determinants, and educational innovation adoption. The process continued until theoretical saturation was reached—when no new themes or categories emerged from the analysis.

All retrieved sources were imported into NVivo 14 software for coding, categorization, and theme development. Open, axial, and selective coding were performed following the grounded theory approach to extract the underlying psychological determinants (e.g., self-efficacy, openness to change, technological anxiety, growth mindset, and intrinsic motivation).

In the quantitative phase, the psychological factors identified from the qualitative stage were operationalized into measurable variables. A structured questionnaire was developed and distributed to the 200 teacher participants. The instrument used a five-point Likert scale (ranging from "strongly disagree" to "strongly agree") to assess the perceived importance and influence of each determinant on readiness for AI integration.

2.3. Data Analysis

The qualitative data obtained from the literature review were analyzed using NVivo version 14. Through iterative coding and constant comparison, categories were refined until a comprehensive conceptual model of psychological determinants was established. The credibility of the qualitative findings was enhanced through triangulation of multiple sources and peer debriefing.

For the quantitative analysis, data collected via questionnaires were analyzed using SPSS version 26. Descriptive statistics (means, standard deviations, and frequencies) were computed to summarize participants' responses. Inferential analyses were performed to rank the identified psychological determinants using Friedman's test and mean rank comparison to determine their relative significance in influencing teachers' readiness for AI integration.

Reliability of the questionnaire was confirmed through Cronbach's alpha ($\alpha > 0.7$), and construct validity was established using exploratory factor analysis. The combined results from both phases provided a holistic understanding of the psychological factors that underpin and shape teacher readiness for AI adoption in educational contexts.

3. Findings and Results

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The qualitative phase of this study aimed to explore and conceptualize the underlying psychological determinants of teacher readiness for AI integration. To achieve this goal, a systematic literature review was conducted, drawing from peer-reviewed studies published between 2022 and 2025 in databases such as Scopus, Web of Science, and Google Scholar. The review focused on identifying recurring psychological constructs influencing teachers' acceptance, adaptation, and sustained use of artificial intelligence in educational environments. The process of data extraction and coding was carried out using NVivo 14 software, following the principles of grounded theory. Through iterative rounds of open, axial, and selective coding, seven main themes emerged, each representing a distinct dimension of teachers' psychological readiness for AI integration. These themes reflect both internal and external psychological dispositions that facilitate or hinder engagement with AI-enhanced pedagogy.

Table 1

Main Themes, Subthemes, and Open Codes (Concepts)

Main Categories (Themes)	Subcategories	Concepts (Open Codes)
1. Technological Self-Efficacy	Confidence in AI use	mastering AI tools; problem-solving ability; self-directed learning; experimenting with AI platforms
	Perceived competence	familiarity with algorithms; understanding AI-based feedback systems; managing AI errors
	Overcoming fear of failure	trying new technologies; viewing mistakes as learning; gradual confidence building
2. Growth Mindset and Learning Orientation	Openness to new experiences	curiosity about AI innovations; enthusiasm for change; exploring AI-based pedagogy
	Continuous learning	participation in AI training; reflecting on AI use; self-evaluation and feedback seeking
3. Attitude Toward AI Integration	Perceived usefulness	belief in efficiency gains; improved student engagement; enhanced teaching performance
	Perceived ease of use	user-friendliness; intuitive interface experience; minimal cognitive load
	Ethical and pedagogical concerns	fear of job replacement; data privacy; teacher–student relationship disruption; authenticity of learning
4. Emotional Readiness and Regulation	Anxiety management	reducing technological stress; maintaining calm in AI-based classes; self-soothing strategies
	Positive emotional framing	viewing AI as supportive; associating AI with innovation; emotional resilience to uncertainty
	Tolerance for ambiguity	coping with rapid change; dealing with unpredictable AI outputs; adaptive flexibility
5. Motivation and Engagement	Intrinsic motivation	interest in technology; internal satisfaction; personal growth through AI use
	Extrinsic motivation	institutional incentives; recognition from administration; student feedback as reward
	Sense of purpose	contributing to modernization; aligning with national education goals; shaping future learning
6. Cognitive Flexibility and Adaptability	Mental agility	rapid shifting between methods; integrating AI with existing pedagogy; multitasking under change
	Creative problem-solving	designing AI-assisted activities; innovating lesson plans; adapting AI tools to diverse learners
	Reflective thinking	evaluating AI outcomes; analyzing classroom responses; adjusting strategies dynamically
7. Social and Collaborative Orientation	Collegial support	peer mentoring; sharing best practices; forming AI learning communities
	Organizational culture	institutional encouragement; leadership support; professional development programs
	Social trust and norms	trust in AI decisions; openness to collective experimentation; aligning with group norms

Theme 1: Technological Self-Efficacy

The first theme, *technological self-efficacy*, represents teachers' perceived confidence and capability in effectively engaging with AI-based tools and systems. This dimension reflects the internal belief that one possesses the skills necessary to operate, adapt, and troubleshoot AI applications in educational contexts. Teachers with higher self-efficacy tend to experiment more readily with emerging technologies and demonstrate resilience when facing technical challenges. Confidence in AI use enables educators to transition from apprehension to competence, while a sense of mastery over AI tools reinforces a self-directed approach

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to professional growth. The ability to overcome fear of failure further contributes to persistence in learning and refining AI integration practices.

Theme 2: Growth Mindset and Learning Orientation

The second theme, *growth mindset and learning orientation*, captures teachers' openness to continuous learning and adaptation in response to technological change. Educators exhibiting a growth mindset perceive AI integration not as a threat, but as an opportunity for personal and pedagogical development. This mindset fosters curiosity, innovation, and persistence when encountering novel AI applications. Teachers who embrace lifelong learning actively seek training, engage in reflective practice, and continuously update their digital competencies. Such orientation towards learning sustains their motivation to explore AI-driven instructional designs and ensures long-term adaptability in evolving digital education ecosystems.

Theme 3: Attitude Toward AI Integration

The third theme, *attitude toward AI integration*, reflects teachers' evaluative judgments and emotional orientations toward incorporating AI in their teaching. Positive attitudes are closely tied to perceived usefulness—teachers who recognize AI's potential to enhance efficiency, personalize learning, and enrich student engagement tend to show greater readiness. Conversely, skepticism arises when teachers perceive AI as complex or fear ethical issues such as privacy violations, job displacement, or dehumanization of learning. Thus, attitude functions as both a facilitator and barrier, determining the willingness to invest effort and trust in AI-based educational innovation.

Theme 4: Emotional Readiness and Regulation

The fourth theme, *emotional readiness and regulation*, involves teachers' capacity to manage anxiety, uncertainty, and emotional responses associated with AI adoption. Emotional readiness plays a crucial role in moderating the stress and ambiguity that accompany rapid technological transformation. Teachers who can regulate their emotions maintain a positive outlook toward AI, seeing it as an aid rather than an obstacle. Emotional resilience enables them to approach AI experimentation with composure, transform anxiety into curiosity, and maintain confidence amid unpredictable technological outcomes. This emotional balance ultimately supports sustained engagement with AI-enhanced instruction.

Theme 5: Motivation and Engagement

The fifth theme, *motivation and engagement*, highlights the internal and external drivers that inspire teachers to adopt AI technologies. Intrinsic motivation stems from personal interest in innovation, a sense of purpose in improving education, and the satisfaction derived from mastering new tools. Extrinsic motivation, meanwhile, arises from organizational support, administrative recognition, or student feedback. Teachers with a strong motivational foundation are more likely to commit to learning AI systems and integrating them into their pedagogy. Motivation not only propels the initial adoption process but also sustains engagement during the challenges of implementation and adaptation.

Theme 6: Cognitive Flexibility and Adaptability

The sixth theme, *cognitive flexibility and adaptability*, reflects teachers' mental agility in navigating the complexities of AI integration. This includes the ability to shift perspectives, redesign instructional approaches, and creatively apply AI tools across diverse teaching contexts. Flexible educators can adjust to continuous technological updates, reinterpret AI outcomes, and respond to unexpected challenges in real time. Their reflective thinking allows for critical evaluation of AI's pedagogical impact and the fine-tuning of classroom strategies. Such adaptability is essential for integrating AI meaningfully into educational practices rather than superficially adopting it as a trend.

Theme 7: Social and Collaborative Orientation

The seventh theme, *social and collaborative orientation*, emphasizes the collective and relational aspects of teacher readiness. Effective AI integration flourishes within supportive professional networks that encourage knowledge sharing, mentorship, and collaborative problem-solving. Teachers who engage in collegial dialogue and belong to learning communities benefit from mutual encouragement and collective expertise. Furthermore, institutional culture—characterized by leadership support and shared trust—reinforces psychological readiness. Social trust in AI and a culture of experimentation help reduce fear, normalize AI adoption, and align individual readiness with organizational innovation goals.

Following the qualitative phase, the second stage of the study aimed to quantitatively rank the identified psychological determinants to determine their relative importance in predicting teacher readiness for AI integration. The seven determinants extracted from the literature-based qualitative analysis were operationalized into measurable constructs. A structured questionnaire with a five-point Likert scale (1 = very low importance to 5 = very high importance) was distributed among 200 teachers in Tehran. Data were analyzed using SPSS version 26. Descriptive statistics (mean, standard deviation, and mean

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rank) and Friedman's test were used to rank the determinants based on perceived significance. The non-parametric Friedman test was chosen due to its suitability for comparing related samples across multiple categories, making it ideal for ranking psychological constructs.

Table 2

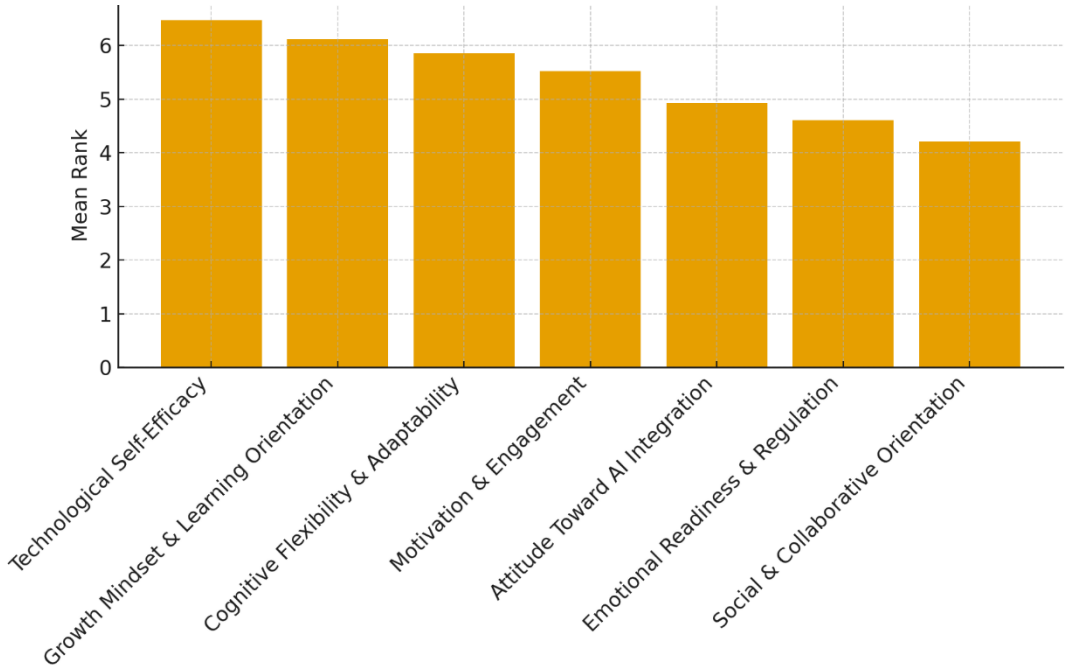
Ranking of Psychological Determinants of Teacher Readiness for AI Integration (n = 200)

Psychological Determinants	Mean	Standard Deviation (SD)	Mean Rank	Rank
Technological Self-Efficacy	4.58	0.46	6.47	1
Growth Mindset and Learning Orientation	4.43	0.52	6.12	2
Cognitive Flexibility and Adaptability	4.37	0.50	5.85	3
Motivation and Engagement	4.28	0.57	5.52	4
Attitude Toward AI Integration	4.12	0.63	4.93	5
Emotional Readiness and Regulation	3.94	0.61	4.61	6
Social and Collaborative Orientation	3.86	0.65	4.21	7

Friedman Test: $\chi^2 = 187.42$, df = 6, $p < 0.001$

Figure 1

Ranking of Psychological Determinants of Teacher Readiness for AI Integration



The results of the Friedman ranking analysis revealed significant differences among the seven psychological determinants influencing teacher readiness for AI integration ($\chi^2 = 187.42$, $p < 0.001$). As shown in Table 2, technological self-efficacy received the highest mean rank (6.47), indicating that teachers consider their confidence and competence in using AI-based tools as the most critical psychological factor. Growth mindset and learning orientation ranked second (6.12), highlighting the importance of continuous learning and adaptability in dealing with emerging technologies. Cognitive flexibility and adaptability followed closely (5.85), suggesting that teachers' ability to think creatively and adjust their instructional methods plays a pivotal role in successful AI adoption.

Motivation and engagement ranked fourth (5.52), reflecting that both intrinsic and extrinsic motivational factors contribute meaningfully to teachers' readiness but are secondary to self-efficacy and learning orientation. Attitude toward AI integration placed fifth (4.93), implying that although teachers generally perceive AI positively, attitudes alone are insufficient without the underlying

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confidence and adaptability. Emotional readiness and regulation ranked sixth (4.61), indicating that managing stress and uncertainty, while important, exerts a comparatively moderate influence. Finally, social and collaborative orientation received the lowest rank (4.21), suggesting that although peer support and organizational culture facilitate readiness, individual psychological determinants exert a stronger predictive role in shaping teachers' AI adoption behavior.

4. Discussion and Conclusion

The present study sought to identify and rank the psychological determinants underlying teachers' readiness for artificial intelligence (AI) integration in educational contexts. The findings revealed that *technological self-efficacy*, *growth mindset and learning orientation*, and *cognitive flexibility and adaptability* were the three most influential determinants, followed by *motivation and engagement*, *attitude toward AI integration*, *emotional readiness and regulation*, and finally *social and collaborative orientation*. These results highlight that psychological factors connected to internal confidence, adaptive learning, and personal agency play a stronger role than environmental or social elements in determining the readiness of teachers to engage with AI.

The dominance of technological self-efficacy aligns with an extensive body of research showing that self-belief in technological competence is the single strongest predictor of technology adoption among educators. Teachers with higher self-efficacy are more willing to experiment with intelligent systems, persist in solving technical challenges, and creatively apply AI tools in teaching (Ajlouni et al., 2025; Alshorman, 2024). This finding is consistent with prior studies emphasizing that AI adoption depends more on psychological empowerment than on the mere availability of infrastructure (Eke, 2024; Farooq, 2025). In contexts where digital transformations are ongoing, teachers who perceive themselves as capable of mastering AI display greater pedagogical flexibility and instructional creativity. Similarly, (Aboushi & Obied, 2025) found that confidence in one's creative and problem-solving abilities predicted willingness to integrate STEM-based AI applications in schools, supporting the conclusion that self-efficacy serves as both a motivational and behavioral catalyst.

The second-ranked determinant, growth mindset and learning orientation, reinforces the importance of psychological openness and curiosity toward continuous technological learning. Teachers who believe that their abilities can develop through effort and reflection are more likely to embrace AI tools as opportunities for professional growth rather than as threats (Thapliyal, 2024). This echoes the findings of (Natividad et al., 2024), who observed that teachers with strong intrinsic motivation and self-directed learning attitudes exhibit higher adaptability to technological innovation. In the context of AI, a growth-oriented mindset enhances teachers' persistence in the face of technical uncertainty, facilitates error tolerance, and fosters experimentation. Furthermore, (Tahir et al., 2025) reported that teachers in higher education institutions in South Punjab who approached AI through continuous professional learning demonstrated more successful integration outcomes. Together, these findings indicate that fostering reflective learning orientations is essential to cultivating AI-ready educators.

Cognitive flexibility and adaptability, which ranked third, reflect teachers' ability to modify instructional strategies and think creatively when using AI tools. This adaptability is crucial because AI systems often require teachers to interpret algorithmic recommendations and contextualize them for diverse learners. Previous studies support the finding that flexible educators show greater capacity for innovation, problem-solving, and dynamic decision-making in digital classrooms (Carvalho et al., 2024; Korkmaz & Keçik, 2024). Cognitive flexibility also enhances teachers' responsiveness to rapid changes in technological infrastructure. (Yılmaz & Saraç, 2023) demonstrated that self-efficacy and flexible thinking jointly predicted teachers' ability to manage supervision and performance feedback in technology-mediated environments. These studies converge on the idea that readiness is not a static trait but a dynamic capability underpinned by mental agility.

The finding that motivation and engagement ranked fourth underscores the interaction between intrinsic and extrinsic motivational factors in shaping readiness. Teachers motivated by curiosity, professional growth, and social recognition are more likely to invest time and effort in mastering AI technologies (Natividad et al., 2024; Ofem et al., 2025). (Aboushi & Obied, 2025) similarly reported that motivation mediates the link between creativity and technology confidence in predicting AI integration intentions. Furthermore, (Fuentes & Chiappe, 2025) highlighted that teachers' digital competencies improve when motivation aligns with institutional support and recognition systems. Hence, motivation operates as both an

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independent driver and a reinforcing mechanism of self-efficacy and mindset.

The mid-ranking position of attitude toward AI integration is noteworthy. Although attitude significantly affects behavioral intentions, its impact becomes limited when not accompanied by strong efficacy beliefs and adaptive learning orientations (Gatlin, 2023; Ofem et al., 2025). Teachers who perceive AI as useful but feel technically unprepared may still resist implementation, indicating that positive attitude alone is insufficient. This supports the results of (Ajlouni et al., 2025), who found that attitude contributed to intention only when mediated by technology self-efficacy. The finding also resonates with studies that revealed ethical and emotional ambivalence toward AI, including concerns about privacy, equity, and professional autonomy (Alshorman, 2024; Fuentes & Chiappe, 2025). Therefore, fostering informed and balanced attitudes is crucial for sustainable AI adoption.

Emotional readiness and regulation, ranked sixth, highlight that emotional stability and anxiety management, though important, may exert a secondary influence compared to cognitive and motivational factors. Teachers' emotional responses to AI often fluctuate between curiosity and apprehension, reflecting the novelty and complexity of intelligent technologies (Farooq, 2025). (Levkovich & Stregolev, 2024) illustrated that emotional self-regulation strongly predicts constructive teacher responses to challenging student behaviors, a finding translatable to the technological context—where emotional competence supports calm decision-making under uncertainty. Similarly, (Saidi et al., 2024) noted that teachers' personality traits, particularly emotional stability, correlated with positive student attitudes, implying that emotionally regulated teachers create adaptive environments conducive to innovation. The lower rank of emotional readiness in this study does not diminish its importance but rather indicates that teachers may manage emotions reactively once confidence and cognitive strategies are in place.

Finally, social and collaborative orientation received the lowest rank, suggesting that while collaboration and institutional culture matter, internal psychological determinants are stronger predictors of readiness. This outcome may reflect the individualistic nature of technological adoption, where personal competence and mindset precede collective engagement. Nonetheless, literature supports the enabling role of social factors. (Martín et al., 2024) and (Szász et al., 2024) reported that collaborative professional cultures enhance self-efficacy and positive attitudes toward inclusive and technology-assisted education. Similarly, (Eke, 2024) found that collegial encouragement significantly increased teacher educators' willingness to explore AI in Nigeria. However, the modest influence observed in the present study implies that, in Tehran's educational context, readiness is more individually driven than institutionally coordinated.

The ranking pattern observed in this study mirrors trends identified globally in the transition toward AI-based education. Across multiple settings, self-efficacy consistently emerges as the foundation of readiness (Ajlouni et al., 2025; Alconis, 2023). Teachers who perceive themselves as capable are not only more inclined to use AI but also more effective in leveraging it to enhance learning outcomes. (Woo, 2023) and (Krause & Jenny, 2023) both demonstrated that self-efficacy significantly predicted instructional innovation, even in domains such as gifted education and physical education. Moreover, (Ofem et al., 2025) confirmed through a large-scale structural model that self-efficacy, perceived ease of use, and pedagogical beliefs jointly predict preparedness for AI-based classroom assessment. These convergent findings underline that developing technological self-beliefs should precede complex training on AI pedagogy.

The importance of *growth mindset* and *learning orientation* further corroborates the argument that readiness is a developmental construct. (Thapliyal, 2024) found that teachers' self-efficacy and growth mindset jointly influenced their attitude toward mainstreaming students with disabilities, implying that adaptive learning dispositions transcend specific contexts. Likewise, (Tahir et al., 2025) emphasized that AI adoption is sustainable when embedded within professional learning ecosystems that reward exploration and critical reflection. This reinforces that teacher readiness for AI integration is both psychological and educational—a product of continuous self-renewal.

Findings regarding *cognitive flexibility* resonate with broader discussions on twenty-first-century teacher competencies. (Carvalho et al., 2024) observed that flexibility and positive sentiment predicted teachers' adaptation to inclusive classrooms, while (Korkmaz & Keçik, 2024) showed that flexibility before and after pandemic disruptions predicted resilience to instructional change. These results support the conclusion that flexibility operates as a bridge between knowledge and behavior—transforming awareness of AI potential into practical implementation strategies.

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Although *motivation* and *attitude* ranked moderately, they remain indispensable mediators between cognition and action. (Fuentes & Chiappe, 2025) identified motivation as the psychological engine that translates competence into behavioral engagement, whereas (Natividad et al., 2024) noted that sustained motivation differentiates short-term adoption from long-term integration. The present findings extend this reasoning by demonstrating that in contexts with emerging AI infrastructures, motivational reinforcement must complement self-efficacy development.

The relatively lower ranking of *emotional readiness* and *social orientation* aligns with prior cross-cultural research. In collectivist educational systems, teachers often emphasize individual mastery before collaborative engagement (Eke, 2024; Szász et al., 2024). Moreover, as (Farooq, 2025) explained, anxiety toward AI is often transitional—diminishing as competence increases. Thus, readiness appears to progress hierarchically: psychological empowerment and cognitive adaptation precede emotional equilibrium and social alignment.

Overall, the combined qualitative and quantitative results suggest a hierarchical model of psychological readiness:

1. Foundational self-efficacy enables competence and confidence;
2. Growth mindset and cognitive flexibility foster adaptive learning;
3. Motivation and attitude sustain engagement;
4. Emotional regulation and social collaboration reinforce long-term integration.

This hierarchy echoes theoretical models that blend social cognitive theory, self-determination theory, and the Technology Acceptance Model, supporting a multidimensional understanding of readiness (Natividad et al., 2024; Ofem et al., 2025). Collectively, the evidence affirms that psychological determinants are the invisible architecture supporting technological transformation in education.

5. Limitations & Suggestions

Despite its comprehensive design, the study has several limitations. First, the qualitative phase relied solely on literature review rather than direct interviews or focus groups, which may have limited the contextual richness of the emergent themes. Although theoretical saturation was achieved, the absence of field data could restrict the cultural specificity of findings. Second, the quantitative phase, while statistically robust, was geographically confined to teachers in Tehran; thus, generalizability to other regions or educational systems should be approached cautiously. Third, the reliance on self-reported measures introduces potential bias, as participants may overstate readiness due to social desirability. Additionally, the cross-sectional nature of data collection prevents causal inference—longitudinal research is needed to examine how psychological readiness evolves over time as teachers gain AI experience.

Future studies should employ mixed qualitative techniques such as semi-structured interviews, classroom observations, or focus groups to capture the lived experiences behind teachers' perceptions of AI readiness. Expanding samples to include rural and under-resourced schools could uncover contextual disparities in readiness determinants. Longitudinal studies tracking teachers across training and implementation stages would also clarify the causal pathways linking self-efficacy, mindset, and adoption behavior. Researchers might further explore the interaction between psychological factors and demographic variables such as age, gender, or subject specialization. Integrating psychometric modeling, such as structural equation modeling or partial least squares analysis, could provide deeper insight into the predictive weight of each determinant. Cross-cultural comparative studies would be valuable in identifying universal versus culture-specific psychological patterns shaping AI adoption in education.

Educational policymakers and administrators should prioritize professional development programs that strengthen teachers' technological self-efficacy through hands-on, scaffolded training. Workshops should encourage reflective learning, fostering growth mindset and adaptability. Institutions can cultivate motivation by recognizing AI-related achievements and embedding innovation in career progression systems. Psychological safety must be maintained through supportive leadership that normalizes experimentation and error. Finally, cultivating collaborative professional networks can gradually elevate social orientation, allowing teachers to exchange expertise and collectively shape the culture of AI-driven education.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

JAYPS Adolescent and Youth Psychological Studies E-ISSN: 2981-2526

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors equally contributed to this article.

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JAYPS
Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526