Identifying the Factors of AI Acceptance in Education: A Systematic Review

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Abstract

Artificial Intelligence (AI) applications have significantly transformed the education sector in recent years, and with the rapid advancements in technology, AI is expected to continue reshaping the educational landscape. Since the introduction of ChatGPT in November 2022, it has become a catalyst in the popularity of AI. Students have been observed using generative AI tools very frequently and are becoming dependent on them. This can be attributed to the high accuracy, personalization, and human-like responses generated by generative AI such as ChatGPT and its public availability. These technologies have begun to play an important role in education. In the coming years, it is likely to become transformative and reshape the education paradigm. Although there has been extensive research on AI, gaps remain in understanding the factors influencing learners' acceptance of these technologies. This paper presents a systematic review of AI acceptance in educational settings to address these gaps. For the review, we systematically selected relevant papers from journals and conferences published between 2011 and 2024 using the Google Scholar search engine. A total of 680 papers were identified in the search. A thorough screening was conducted using acceptance and rejection criteria, leading to the selection of 54 papers for the final review. We analyze existing models of technology acceptance found in the literature and propose our model for AI acceptance in education, offering new insights and directions for future research. In the future, we plan to evaluate our model using structural equation modeling (SEM) techniques.

1 Introduction

The field of education is evolving rapidly, shifting from traditional methods that focus primarily on static learning to more dynamic, personalized, and technology-driven approaches. At the forefront of this transformation are Artificial Intelligence (AI) applications, which are reshaping how we interact with educational content by offering adaptive, scalable solutions. Initially, AI and intelligent systems were integrated into education through basic tools like automated grading systems and personalized learning platforms. However, its true potential is now being realized in more advanced applications, including intelligent tutoring systems, predictive analytics for student performance, and AI-powered chatbots that deliver personalized content. Tools like ChatGPT, Google Bard, Claude AI, and other generative AI tools are expected to play an important role in the ongoing transformation of the education sector. A large number of investigations around the use of AI in education are being conducted with the introduction and accessibility of generative AI tools. AI use is seen in learning programming languages [1, 2], for assisting in large classrooms [3]. LLMs are also used by instructors for repetitive administrative tasks, and to analyze students' work [1]. With the growing popularity and increasing investigations into applications in the education domain, there is a need to understand the factors that influence the acceptance of these AI-based tools.

As AI's influence grows, researchers have increasingly focused on understanding how these technologies are being adopted by both educators and students. Several studies have already examined the acceptance of AI applications in education, and much of this research has used adapted versions of widely-recognized models such as the extended Technology Acceptance Model (TAM) [4] and the Unified Theory of Acceptance and Use of Technology (UTAUT) [5]. These frameworks have been tailored to the educational context, emphasizing factors like Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Self-Efficacy (SE) [5]. By focusing on these factors, researchers have gained valuable insights into how AI technologies are perceived and utilized within learning environments.

Despite these contributions, a noticeable gap remains in the research, as current studies have not yet provided a comprehensive overview of all the major frameworks and factors that influence the acceptance of AI applications, specifically within the education field. Addressing this gap will allow us to better understand the commonalities and distinctions in current research, enabling a more accurate evaluation of AI-based applications in the educational context. The importance of this research is further underscored by AI's transformative potential. As these technologies become more embedded in classrooms and learning environments, understanding their impact and identifying best practices for their use is crucial. A systematic review of existing literature and research will not only highlight gaps in current knowledge but also provide insights into how AI can be effectively integrated into education.

To achieve this goal, our study conducts a comprehensive literature review focused on the acceptance of AI applications in educational settings. Using specific keywords and search terms, we filtered and refined our literature search to target research work exploring both AI acceptance and educational contexts. We gathered an initial pool of 680 papers. We screened these papers for relevance and, after a rigorous review process using acceptance and rejection criteria, selected 54 papers. Based on a review and analysis of the papers, we propose a model for the acceptance of AI in education.

2 Background

The conception of artificial intelligence (AI) began in 1950 when Alan Turing raised the question, "Can machines think?" This question marked a pivotal moment, establishing the foundation for discussions surrounding AI. To clarify, a machine is defined as any mechanical or electronic device that executes tasks based on programmed instructions. In contrast, thinking encompasses cognitive functions such as reasoning, problem-solving, and decision-making traits typically associated with human intelligence [6]. Contemporary advancements in generative AI have yielded tools capable of producing human-like, contextually relevant, and accurate responses. AI has gained widespread traction, with its integration evident across diverse domains including medicine, agriculture, and education. As AI establishes a foothold in educational contexts, it is imperative to critically examine the factors that influence learners' acceptance of AI [7]. The global AI-in-education market is experiencing sustained growth, reflecting increasing adoption. As educational institutions adopt AI solutions such as intelligent tutoring systems and predictive analytics, AI is becoming integral to enhancing teaching methods and enriching student learning experiences [8]. For many users, AI has become an intuitive resource—supporting a range of educational activities such as topic ex-

ploration, question answering, information summarization, writing assistance, and programming support. For instance, ChatGPT gets 193.33 million visits per day in 2025 [**?**].

Currently, there is a lack of a comprehensive understanding of the factors influencing the acceptance of AI applications in the education sector. As educational institutions increasingly adopt AI technologies, it becomes essential to identify and analyze the underlying factors that affect their acceptance among educators and students. This gap in research is significant because understanding these factors can lead to more effective integration of AI tools in educational settings, ultimately enhancing learning experiences. The issue of AI acceptance in education is particularly intriguing due to the transformative potential of AI technologies. As AI continues to evolve and become more integrated into educational practices, addressing the challenges and barriers to acceptance becomes crucial for maximizing the benefits these technologies can offer.

3 Related Work

The rapid expansion of AI applications has led to a surge in research exploring their integration and acceptance. Several studies have examined different aspects of AI acceptance, revealing various perspectives and insights. For instance, Kim et al. investigated students' perceptions of AI teaching assistants in online education [9]. Their study examines the importance of the perceived usefulness of AI assistants and ease of communication, suggesting that these factors are crucial for the adoption of AI applications in educational settings. Raffaghelli et al. applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to study students' acceptance of Early Warning Systems(EWS) in higher education [10]. Their findings revealed that the expectations and acceptance of such technologies evolve over time, offering valuable insights into how AI systems should be integrated into virtual classrooms.

While these studies provide valuable insights into the acceptance of AI applications in the education field, they often focus on specific contexts or applications without offering a comprehensive view of AI acceptance across various educational settings. Additionally, while some reviews exist, they do not focus on AI applications in education with the depth required to understand the full range of influencing factors. For instance, the study done by Kelly et el. [11] provides an extensive overview of AI acceptance across various industries and models. However, it does not explore the educational context.

Recent studies have introduced a proposed model that centers on learners' acceptance and trust in pedagogical conversational AI (C-AI), highlighting important factors such as perceived usefulness and privacy concerns. While this model offers valuable insights into specific aspects of learners' perceptions and trust, it does not provide a comprehensive view of AI acceptance, as it primarily draws on limited research and lacks a broader literature review to address the diverse educational contexts in which AI is applied [12].

Our study addresses these gaps by providing a systematic review of AI acceptance within the educational sector. Unlike broader reviews or studies limited to specific models or contexts, our research offers a comprehensive framework that integrates major AI applications, theoretical models, and their associated factors in education. By synthesizing findings across various research works, we aim to deliver a nuanced understanding of AI acceptance that is directly relevant to

educational settings, ultimately providing actionable insights to guide the effective integration of AI technologies in education.

4 Paper Selection Process

To conduct the literature review, we utilized the Google Scholar search engine, focusing on scholarly articles published between 2011 and 2024, with particular emphasis on recent years following the surge of AI applications. During the review, two foundational theoretical frameworks were frequently referenced: the Technology Acceptance Model (TAM, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT, 2003), both of which have played a significant role in examining the acceptance of technology.

The search strategy involved specific combinations of keywords and terminologies, such as "Acceptance scale for AI in education," "AI acceptance scale," "Factors for AI in learning," "Intelligent system acceptance in education," and "Large language models acceptance scale in education." Additionally, we incorporated broader educational and AI-related terms, including "pedagogical," "teaching," "education," "learning technologies," "adaptive learning," "digital pedagogy," "educational technology adoption," and "edtech integration".

The search results for each combination of terms were carefully reviewed until the items in the Google Scholar results became irrelevant or redundant, typically 10-12 pages per set of keywords. Through this approach, a total of 680 papers were identified. Of the 680 papers initially identified, only 64 were selected for in-depth analysis. Papers were excluded if they did not address both AI applications and education or if they focused solely on one of these areas without examining their interrelation. Additionally, 10 papers were excluded due to their nature as project papers, dissertations, or positional papers, which did not meet the criteria for empirical research. As a result, the systematic review is being conducted using the remaining 54 papers.

5 Analysis

The analysis process utilized a systematic method for organizing and evaluating the selected papers. Details from each paper were carefully recorded in an Excel spreadsheet to ensure thorough analysis. The key elements documented and assessed included:

•Basic Information: Recorded the title of the paper, the authors, the publication year, and a concise summary of the content provided in the abstract.

•Technology Explored: Focused on identifying the specific AI technologies examined, such as AI text generators, e-learning systems, or intelligent tutoring systems.

•Application: Detailed the precise AI application referenced in the study.

•Technology Readiness: Categorized the technology readiness by classifying the application as an existing technology, a newly developed solution, or a simulated (Wizard of Oz) application.

•AI Application Used by Participants: Assessed whether participants were using that particular AI application for the first time.

•Educational Setting and Number of Participants: Recorded the context of the study, including the diversity of participants, their age range, and the method of survey administration, such as online, offline, or interviews, and noted the total number of participants involved.

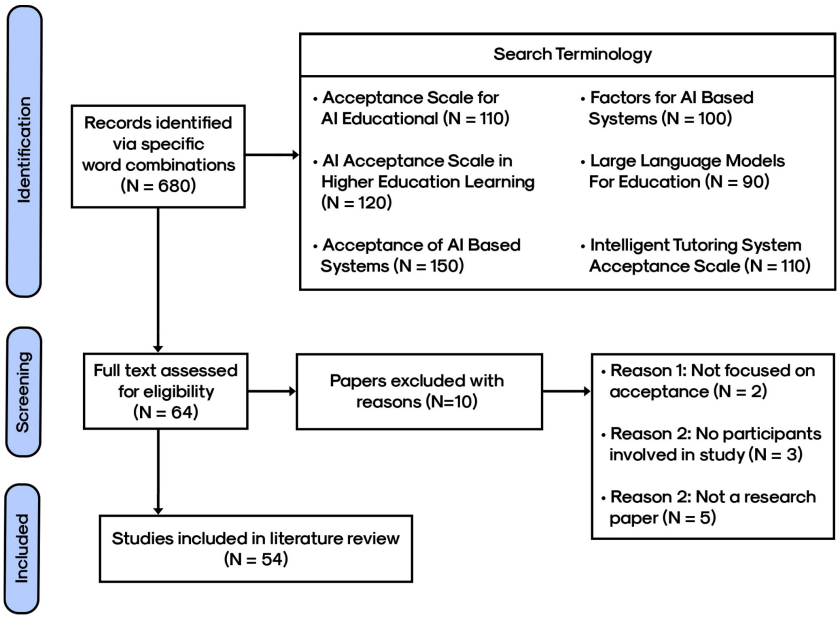

Figure 1: Flow diagram of paper identification and selection process.

•Model Included: Noted the theoretical framework applied in the study, such as the extended Technology Acceptance Model (TAM) [4], the Unified Theory of Acceptance and Use of Technology (UTAUT) [5], or Attitudes Towards Artificial Intelligence (ATAI).

•Model Validation: Indicated whether the proposed or developed model was validated or not.

•Factors Involved: Outlined the specific factors examined in relation to AI acceptance, which are key dimensions influencing user perceptions and acceptance of AI technologies.

•Variables Investigated: Detailed the various factors explored in the studies, which are essential for understanding the mechanisms that impact the acceptance and usage of AI technologies in educational settings.

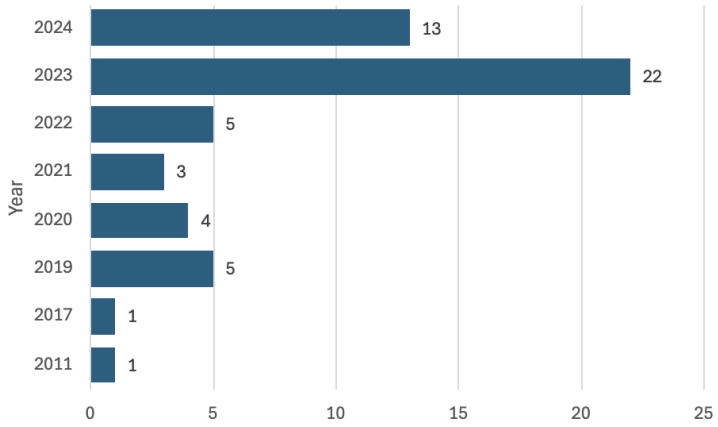

Figure 2: The number of selected papers published by year

The Excel sheet of information was analyzed to identify frequently used models and individual factors in the final set of papers. This systematic approach ensured a thorough and organized evaluation of the selected studies, capturing all critical elements relevant to AI acceptance in education. By recording key details such as the AI technologies explored, their applications, and the theoretical models used, the analysis highlighted emerging trends and recurring themes in the literature. Frequently used factors are picked to determine the proposed model.

6 Findings

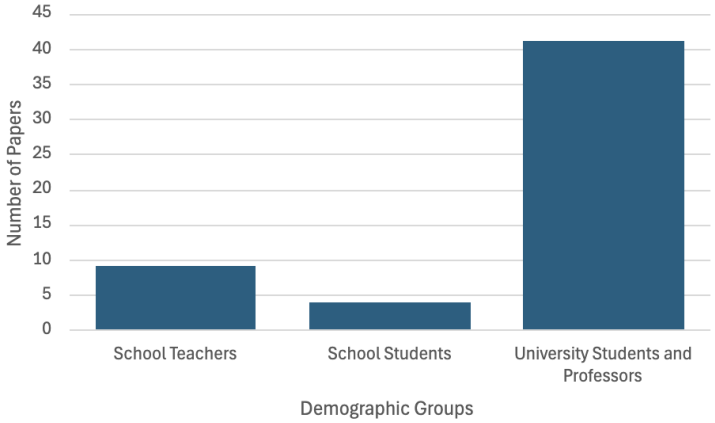

Figure 3: Demographic Breakdown of Research Papers

In this research, a total of 54 papers were reviewed to analyze various factors influencing the acceptance and use of AI in education. The majority of the relevant papers included in this review were published in recent years, specifically from 2011 to 2024, with only 2 papers originating from the period between 2011 and 2017. This trend highlights the accelerated growth and increasing interest in AI technologies within the educational sector, as only 11 instances were recorded where participants had not used the specific AI applications referenced in the studies. Among the 54 papers, 52 utilized existing applications, while 1 paper developed a new application, and another employed the Wizard of Oz method. The educational context of the research involved a diverse group of participants, which included school teachers, professors, and students. The demographic breakdown indicated that 10 papers focused on school teachers, 4 on school students, and the majority, 41 papers, on university students and professors [3]. This varied demographic allows for a comprehensive understanding of AI acceptance across different educational levels.

Among these papers, only 3 presented validated models, while 6 did not mention validation or were literature reviews with limited scope. The remaining 45 papers did not propose validated models. A significant portion of the studies, 29 in total, utilized the Technology Acceptance Model (TAM) [4] or its extended versions (TAM v2), highlighting its foundational role in examining technology adoption within educational contexts. Additionally, the Unified Theory of Acceptance and Use of Technology (UTAUT) [5] was cited in 20 papers, underscoring its relevance for understanding user acceptance of AI tools [7, 13, 14, 15, 16]. The prevalent use and reference of these models underscore the importance of established theoretical frameworks in the acceptance of AI in education. Multiple studies investigating AI acceptance research use UTAUT factors such as perceived

usefulness, perceived ease of use, and social influence [12, 17, 18, 19]. Table 1 lists all the papers reviewed and the acceptance models used the paper.

Table 1: Table of all papers reviewed with the acceptance models they used.

Author	**Title**	**Year**	**Model**
Abdulla Al Darayseh [20]	Acceptance of artificial intelligence in teaching science: Science	2023	TAM
Debajyoti Pal et al. [17]	University Students' Acceptance and Usage of Generative AI (ChatGPT) from a Psycho-Technical Perspective	2023	TAM, UTAUT
JC Sánchez-Prieto et al. [18]	Assessed by machines: Development of a TAM-based tool to measure AI-based assessment acceptance among students	2020	TAM
Kang Li [21]	Determinants of college students' actual use of AI-based systems: An extension of the technology acceptance model	2023	TAM2
OA Gansser, CS Reich [13]	A new acceptance model for artificial intelligence with extensions to UTAUT2: An empirical study in three segments of application	2021	UTAUT2
K Sohn, O Kwon [14]	Technology acceptance theories and factors influencing artificial Intelligence-based intelligent products	2019	TAM, TPB, UTAUT
José Carlos Sánchez-Prieto et al. [22]	How to measure teachers' acceptance of AI-driven assessment in eLearning: A TAM-based proposal	2019	TAM
Gerhard Brandhofer, Karin Tengler [7]	Acceptance of artificial intelligence in education: opportunities, concerns and need for action	2024	UTAUT
Darmawan Napitupulu et al. [23]	Analysis of Technology Acceptance Model (TAM) on E-Learning System	2017	TAM
Said A. Salloum, Khaled Shaalan [15]	Factors Affecting Students' Acceptance of E-Learning System in Higher Education Using UTAUT and Structural Equation Modeling Approaches	2019	UTAUT

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Author	Title	Year	Model
Mohamed A. Ragheb et al. [16]	Investigating the acceptance of applying chat-bot (Artificial intelligence) technology among higher education students in Egypt	2022	UTAUT
Chen, Jian-Liang [24]	The effects of education compatibility and technological expectancy on e-learning acceptance	2011	UTAUT
Alkhuwaylidee, Ahmed Rashid [25]	Extended unified theory acceptance and use technology (UTAUT) for e-learning	2019	UTAUT
Habibi, Akhmad et al. [26]	ChatGPT in higher education learning: Acceptance and use	2023	UTAUT2
Almahri, Fatima Amer Jid et al. [27]	Understanding student acceptance and use of chatbots in the United Kingdom universities: a structural equation modelling approach	2020	UTAUT2
Kim, Jin K et al. [28]	ChatGPT and large language model (LLM) chatbots: The current state of acceptability and a proposal for guidelines on utilization in academic medicine	2023	TAM
Xia, Xue et al. [29]	A Study on Educational Technology Acceptance of Special Education Teachers in Language Teaching Based on TAM Model	2023	TAM
Wu, Wentao et al. [30]	Exploring factors of the willingness to accept AI-assisted learning environments: an empirical investigation based on the UTAUT model and perceived risk theory	2022	UTAUT, PRT
Shal, Tarek et al. [31]	Leadership styles and AI acceptance in academic libraries in higher education	2024	TAM
Otto, D et al. [19]	Student Acceptance Of AI-Based Feedback Systems: An Analysis Based On The Technology Acceptance Model (TAM)	2024	TAM
Shin, Donghee [32]	The effects of explainability and causability on perception, trust, and acceptance: Implications for explainable AI	2021	FATE

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Author	Title	Year	Model
Kim, Jihyun et al. [9]	My teacher is a machine: Understanding students' perceptions of AI teaching assistants in online education	2020	TAM
Strzelecki, Artur [33]	To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology	2023	UTAUT2
Yilmaz et al. [34]	Generative artificial intelligence acceptance scale: A validity and reliability study	2023	UTAUT
Ghimire et al. [35]	Generative AI Adoption in Classroom in Context of Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT)	2024	TAM, IDT
Ma, Xiaoyue and Huo, Yudi [36]	Are users willing to embrace ChatGPT? Exploring the factors on the acceptance of chatbots from the perspective of AIDUA framework	2023	AIDUA, CAT
Montag et al. [37]	The propensity to trust in (automated) technology mediates the links between technology self-efficacy and fear and acceptance of artificial intelligence	2023	ATAI
Baroni et al. [38]	AI-TAM: a model to investigate user acceptance and collaborative intention in human-in-the-loop AI applications	2022	TAM
Park et al. [39]	Surveillance, security, and AI as technological acceptance	2023	TAM
Esiyok, Elif et al. [40]	Acceptance of Educational Use of AI Chatbots in the Context of Self-Directed Learning with Technology and ICT Self-Efficacy of Undergraduate Students	2024	TAM, ICT
Pitts, Griffin et al. [12]	A Proposed Model of Learners' Acceptance and Trust of Pedagogical Conversational AI	2024	TAM, UTAUT
Grassini, Simone [41]	Development and validation of the AI attitude scale (AIAS-4): a brief measure of general attitude toward artificial intelligence	2023	AIAS

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Author	Title	Year	Model
Rodway, Paul and Schepman, Astrid [42]	The impact of adopting AI educational technologies on projected course satisfaction in university students	2023	GAAIS
Grani, Andrina [43]	Technology acceptance and adoption in education	2023	TAM
Pan, Zelin et al. [44]	Exploring the Key Factors Influencing College Students' Willingness to Use AI Coding Assistant Tools: An Expanded Technology Acceptance Model	2024	TAM2
Billy, Iris and Anush, Hannah [45]	A study of the perception of students and instructors on the usage of Artificial Intelligence in education	2023	TAM
Author	**Title**	**Year**	**Model**
An, Xin et al. [46]	Modeling students' perceptions of artificial intelligence assisted language learning	2023	UTAUT
Guo, Shuchen et al. [47]	Validating an Instrument for Teachers' Acceptance of Artificial Intelligence in Education	2024	TAM
Wang, Youmei Liu, Chenchen and Tu, Yun-Fang [48]	Factors affecting the adoption of AI-based applications in higher education	2021	TAM
Rukhiran, Meennapa and Wong-In, Sethapong and Netinant, Paniti [49]	User acceptance factors related to biometric recognition technologies of examination attendance in higher education: TAM model	2023	TAM, TRA
Bilquise, Ghazala and Ibrahim, Samar and Salhieh, Sa'Ed M [50]	Investigating student acceptance of an academic advising chatbot in higher education institutions	2024	TAM, SDT
Kelly, Sage and Kaye, Sherrie-Anne and Oviedo-Trespalacios, Oscar [11]	What factors contribute to the acceptance of artificial intelligence? A systematic review	2023	TAM, UTAUT

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Table 1 – continued from previous page			
Author	**Title**	**Year**	**Model**
Raffaghelli, Juliana E et al. [10]	Applying the UTAUT model to explain the students' acceptance of an early warning system in Higher Education	2022	UTAUT
Cabero-Almenara, Julio et al. [51]	Acceptance of educational artificial intelligence by teachers and its relationship with some variables and pedagogical beliefs	2024	UTAUT2
Saif, Naveed et al. [52]	Chat-GPT; validating Technology Acceptance Model (TAM) in education sector via ubiquitous learning mechanism	2024	TAM
Yao, Na and Abd Halim, Noor Dayana [53]	Analyzing Factors Influencing Primary School Teachers' Acceptance Willingness of Artificial Intelligence Technology	2023	UTAUT
Bernabei, Margherita et al. [54]	Students' use of large language models in engineering education: A case study on technology acceptance, perceptions, efficacy, and detection chances	2023	TAM
Tian, Weiqi et al. [55]	AI Chatbots in Chinese higher education: adoption, perception, and influence among graduate students—an integrated analysis utilizing UTAUT and ECM models	2024	UTAUT, ECM
Han, Jee-Hoon and Sa, Hye Ji [56]	Acceptance of and satisfaction with online educational classes through the technology acceptance model (TAM): The COVID-19 situation in Korea	2022	TAM
Strzelecki, Artur [57]	Students' acceptance of ChatGPT in higher education: An extended unified theory of acceptance and use of technology	2024	UTAUT
Kashive, Neerja and Powale, Leena and Kashive, Kshitij [58]	Understanding user perception toward artificial intelligence (AI) enabled e-learning	2020	TAM
Zhang, Chengming et al. [57]	Acceptance of artificial intelligence among preservice teachers: a multigroup analysis	2023	TAM
Chen, Siyu et al. [59]	An integrated model for predicting pupils' acceptance of artificially intelligent robots as teachers	2023	TAM
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Table 1 – continued from previous page			
Author	**Title**	**Year**	**Model**
Chavoshi, Amir and Hamidi, Hodjat [60]	Social, individual, technological and pedagogical factors influencing mobile learning acceptance in higher education: A case from Iran	2019	TAM, UTAUT

The findings from the use and reference of these models highlighted several key factors influencing the acceptance of AI in educational settings. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) [4] were frequently cited in AI acceptance investigations and proposed models [12, 18, 19] Performance Expectancy (PE) and Effort Expectancy (EE) [5] were frequently highlighted, underscoring the belief that AI technologies that can enhance performance while being manageable in terms of the effort required for their integration are accepted [16, 24]. Furthermore, Behavioral Intention (BI) revealed a strong willingness among participants to adopt AI technologies in their educational practices [13, 21].

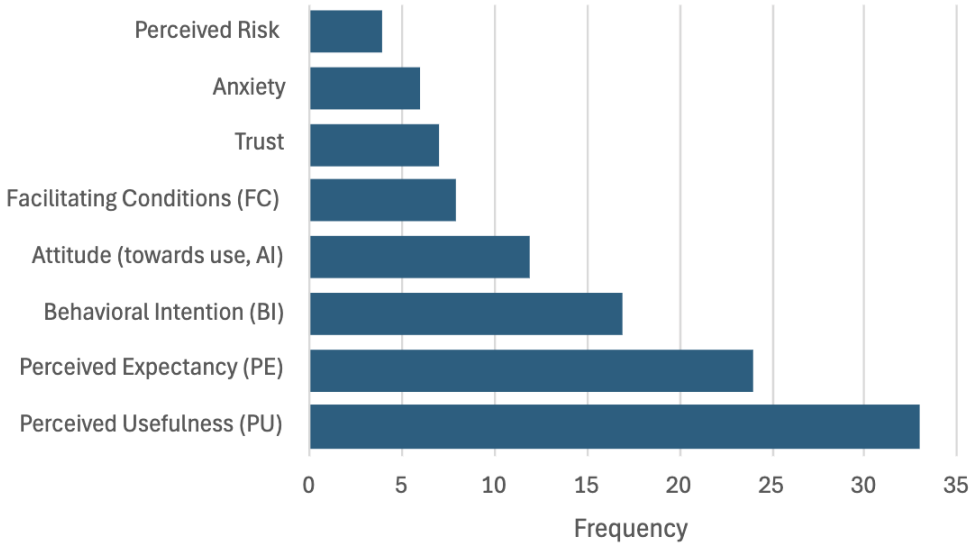

Figure 4: Most Frequently Investigated Variables in AI acceptance Models

Social Influence (SI) and Subjective Norms were identified as important factors, demonstrating that peer opinions and social networks significantly impact participants' attitudes toward AI integration [14, 15]. Similarly, a generally positive Attitude toward AI was expressed among the majority of respondents, reflecting openness to its incorporation into their educational methodologies. The findings also noted the presence of Facilitating Conditions (FC), pointing to supportive factors that exist, though barriers to AI adoption still persist [16]. Trust in AI applications was highlighted as a critical aspect needing reinforcement to enhance user acceptance [7]. Figure 4 illustrates the frequency of factors mentioned in the papers reviewed.

In addition, the study revealed insights into Usage Behavior, indicating that positive attitudes towards AI may not always lead to use. Self-efficacy was frequently discussed, showing that if users feel confident in their ability to effectively use AI tools, it is likely to impact their acceptance of the system. However, Anxiety emerged as a concern, suggesting that apprehensions related to AI technologies could hinder acceptance. Hedonic Motivation was acknowledged, but it was not the primary driver of adoption, as the enjoyment derived from using AI tools played a lesser role in the education context, though it had a positive influence in marketing [14]. The research also noted that Habit, Perceived Value, and Personal Innovativeness are relevant factors influencing acceptance of AI technologies [14]. Overall Satisfaction with AI tools varied among users, and concerns regarding Security and the need to cultivate greater Perceived Trust were also significant.

The research also investigated various applications of AI in educational contexts, highlighting their critical importance and effectiveness in enhancing the learning experience. For instance, in the area of Smart personalized teaching, AI tools such as ChatGPT, Polaris AI Tutor, and Youdao Speak are designed to simulate personalized teaching experiences. These tools provide customized learning activities tailored to the unique needs of each student, allowing for a more individualized approach to education. They also offer detailed feedback that helps learners identify their strengths and areas for improvement, thereby fostering a more engaging and supportive learning environment.

7 Proposed Model

After analyzing all the papers relevant to the fields listed above, we examined the major frameworks and models proposed, validated, or used in existing literature, along with their associated factors and variables. This comprehensive review enabled us to identify common themes and effective strategies across various studies. This proposed model illustrates the complex nature of AI acceptance in educational environments, highlighting the interactions among various factors and foundational properties that influence user perceptions and behaviors. This model is illustrated in Figure [5]. All the factors shown in the proposed model are broadly grouped into three categories impacting the acceptance of AI in Education. These three categories are inspired by three categories of trust in automation model developed by [61], namely learner properties, system properties, and environment properties.

Learner properties pertain to an individual's characteristics, such as age, prior experience with technology, and intrinsic motivation, all of which significantly influence how learners perceive and interact with AI. For instance, younger learners may be more open to exploring, using, and adapting to new technologies, while older learners may be more skeptical about new technology and have comparatively more difficulty and inhibition with new technology. Within learner properties, we include factors that were observed and defined in the literature review. We have also adapted some definitions to the educational context. The learner's demographic factors, such as age, may impact their acceptance of AI for learning tasks. Age has been identified as an important factor that impacts as identified in the UTAUT model [5]. Further, the learner's prior experience may define how comfortable they will be with the technology. It also sets the anchor for their expectations of the system and, hence, their acceptance of the system when it presents erroneous results. In our context, we define *prior experience* as the "Level of technological, especially AI exposure the learner has had in terms of AI variations tried and usage frequency." *Intrinsic motivation* is another

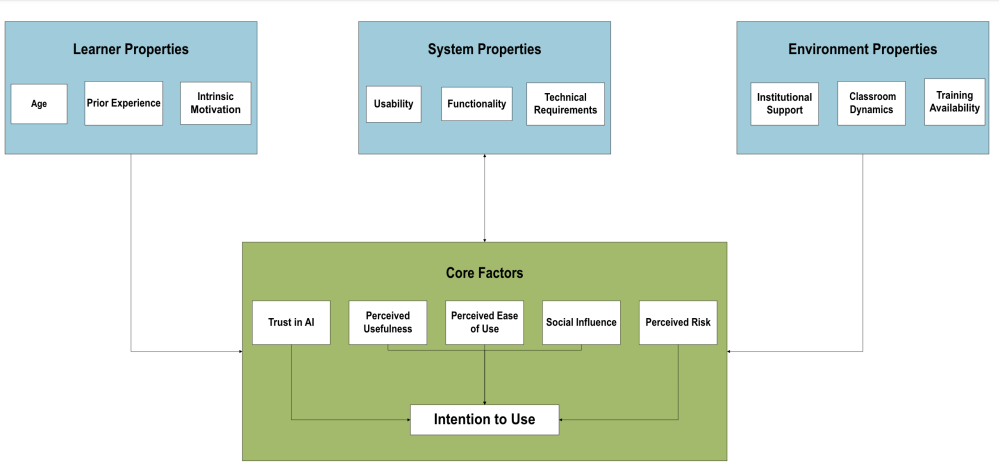

Figure 5: Proposed Model

factor within learner property. We define intrinsic and extrinsic motivation as ”using the AI application with the perception of positive outcomes and results that can assist in learning and learning related task” [62]. *Trust* is another factor that is learner property. Learner trust can be defined as a learner’s propensity to believe in AI’s good intention to help them and be able to provide accurate information [61] .

System properties pertain to the inherent properties and features of the AI tool. This includes properties such as usability, functionality, accuracy, and technical requirements, which can either facilitate or impede acceptance. These factors are systems’ inherent properties related to their technical, design, and accuracy as visible to the learner using the application. The *usability* of an AI system is related to the design considerations made by the AI designers to make learner interaction with the AI application intuitive, coherent, and easier. Functionality refers to features provided by the AI application that make it useful for users’ tasks. *Technical requirements* refer to the design and build of the AI application, which decides what level of technical skill and knowledge a learner requires to be able to use it effectively. In our context,*Perceived usefulness* can be defined as a learner’s perception or belief that using AI for education will help them learn better and/or make the learning process more efficient and effective. *Perceived ease of use* refers to the learner’s perception of how easy it is to use the AI application for learning and related tasks. *Perceived Risk* refers to the learner’s evaluation of adverse outcomes associated with using AI for learning. This includes risks that may occur from using erroneous AI results or the risk of using AI unethically.

Finally, environment properties encompass contextual elements that emerge from the environment in which the learner uses the AI application [61]. It can include factors such as support, purpose of use, and social influence. *Support* refers to resources available in the environment of the learner to be able to use the AI tool effectively and efficiently; it can include support resources such as documentation of the AI application, tutorial or guide, training, and a support service that can be accessed when needed. *Social influence* refers to the influence that one’s social surroundings (people) have in terms of influence based on social norms, expectations, and image. This can be understood as a social influence or pressure one feels to use AI technologies, as many people around them are using it. It can also include people being influenced by the tech-savvy image that

using AI may carry, and, therefore, influencing learners' acceptance of AI. These factors emerge from social cognitive theory, which has long been considered a factor in the acceptance of technology [5]. *Purpose of use* refers to the learning need for which a learner is using an AI tool. This refers to the criticality of learning-related tasks for which the AI tool is used. If an AI tool is used for a graded project, it becomes critical for the student that the tool is accurate, whereas if the tool is used for users to learn about a topic simply out of interest, the learner would be less apprehensive about partial inaccuracy.

Collectively, these elements create a comprehensive framework for understanding AI acceptance in education field, emphasizing the necessity of integrating individual, technological, and contextual factors to enhance the effectiveness and sustainability of AI technologies in learning environments. The framework recognizes that the acceptance of AI in education is not merely a technological challenge but a complex interplay of user beliefs, system characteristics, and environmental influences. By synthesizing critical insights from various studies, this proposed framework seeks to advance the understanding of AI integration in education and provide guidance for future research and practice in this rapidly evolving field. This framework will serve as a foundation for educators, administrators, and researchers, enabling them to make informed decisions about implementing AI technologies. By doing so, we aim to foster an educational environment where AI is embraced as a valuable tool for enhancing learning outcomes and preparing students for a future in which AI plays an increasingly prominent role.

8 Conclusion and Future Work

In conclusion, this systematic review provides valuable insights into the acceptance of Artificial Intelligence (AI) technologies in educational settings. By examining the existing literature and synthesizing findings across multiple studies, we identified key factors influencing educators' and students' acceptance of AI applications. Central to our findings were established frameworks, particularly the extended Technology Acceptance Model (TAM) [4] and the Unified Theory of Acceptance and Use of Technology (UTAUT) [5], which have been adapted to better suit the educational context. However, we also highlighted significant gaps in the literature, particularly regarding a comprehensive understanding of the various models and factors that shape AI acceptance.

Our proposed model integrates critical aspects of AI acceptance, emphasizing the interplay between user perceptions, system properties, and environmental influences. By doing so, we aim to foster a more nuanced understanding of how AI can be effectively integrated into educational practices. This model serves as a foundation for future research and offers actionable insights for educators and policymakers looking to enhance the learning experience through the use of AI technologies. As AI continues to evolve and become an integral part of educational environments, our study underscores the importance of addressing challenges related to acceptance.

Moving forward, we intend to test our proposed model among university students to assess its applicability and effectiveness in real-world educational settings. We plan to evaluate our model using structural Equation modeling (SEM) techniques. This empirical investigation will provide valuable insights into how students perceive and interact with AI technologies, enabling us to refine the model based on their feedback and experiences. We aim to gather insights into the factors that facilitate or hinder AI acceptance, enabling us to identify best practices for integrating AI tools

across various educational contexts. Additionally, we will conduct longitudinal studies to track changes in student and educator attitudes toward AI over time. This research will provide insights into how acceptance evolves as familiarity with these technologies increases, helping us identify key turning points and factors that influence sustained adoption. Furthermore, our future research will focus on the implications of AI tools, such as ChatGPT, Google Bard, Moodle, Claude AI, Gradescope, EngageVR, and others, within the education sector. Given that new technologies can disrupt traditional practices, it is essential to critically evaluate the benefits and threats associated with their adoption.

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