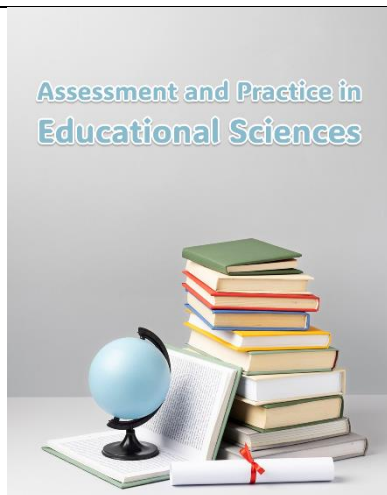




© 2027 the authors. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

1. Kezhal. Ghorbannezhad^{ORCID}: PhD student, Department of Educational Management, Ki.C., Islamic Azad University, Marand, Iran
2. Farhad. Shafiepour Motlagh^{ORCID}: Department of Educational Administration, Maha.C., Islamic Azad University, Mahallat, Iran (Email: F.shafiepour@iau.ac.ir)
3. Javad. Hatami^{ORCID}: Professor in Educational Technology, Department of Education, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran
4. Parivash. Mohammadi Gheshlagh^{ORCID}: Department of Educational Sciences, Mah.C., Islamic Azad University, Mahabad, Iran

Article type:
Original Research

Article history:
Received 14 April 2026
Revised 16 July 2026
Accepted 23 July 2026
Initial Publish 28 August 2026
Published online 01 January 2027

How to cite this article:

Ghorbannezhad, K., Shafiepour Motlagh, F., Hatami, J., & Mohammadi Gheshlagh, P. (2027). Investigating the Feasibility of Teachers' Use of ChatGPT in Teaching Students in North Khorasan Province and Proposing a Model. *Assessment and Practice in Educational Sciences*, 5(1), 1-17.
<https://doi.org/10.61838/japes.296>

Investigating the Feasibility of Teachers' Use of ChatGPT in Teaching Students in North Khorasan Province and Proposing a Model

ABSTRACT

The present study was conducted with the aim of examining the feasibility of teachers' use of ChatGPT in teaching students in North Khorasan Province and proposing a corresponding model. In terms of purpose, this study was applied research, and in terms of method, it was a qualitative study based on the systematic grounded theory approach. The research population consisted of professors and experts in the fields of educational management and artificial intelligence, from whom 25 participants were selected through purposive sampling until theoretical saturation was reached. Data were collected through unstructured in-depth interviews and analyzed using open, axial, and selective coding. To ensure the trustworthiness of the findings, Guba and Lincoln's criteria, including credibility, dependability, transferability, and confirmability, were employed. The results indicated that teachers' use of ChatGPT in teaching is influenced by a set of multilayered factors and conditions. In the category of causal conditions, 6 core components were identified: motivational teaching, efficient teaching, multidimensional teaching, sustainable teaching, aligned teaching, and technology-based teaching. In the category of strategies, 5 core components were extracted, namely widespread internet access, teaching capacity building, teacher training, teacher preparation, and continuous monitoring of ChatGPT productivity. In addition, the contextual conditions included educational support, managerial support, follow-up of teachers' problems, programmatic support, and infrastructural and informatics support. In contrast, the intervening conditions were characterized by three main barriers: the superficiality of teaching, teachers' lack of technological proficiency, and teaching inefficiency due to insufficient internet access. Finally, the consequences of using ChatGPT included facilitating students' learning, increasing teachers' instructional efficiency, providing learning opportunities, and enhancing flexibility in learning management. The findings suggest that the effective use of ChatGPT requires the integration of teachers' professional empowerment, managerial support, the development of technological infrastructure, and continuous educational supervision.

Keywords: ChatGPT, Feasibility, North Khorasan, Systematic Grounded Theory, Teacher Instruction

Introduction

The rapid development of artificial intelligence has created a profound transformation in contemporary education, changing the ways knowledge is produced, delivered, evaluated, and personalized. Educational systems across the world are increasingly moving beyond traditional teacher-centered and content-centered models toward intelligent, flexible, data-informed, and learner-responsive environments. In this transition, artificial intelligence is no longer limited to administrative automation or information management; rather, it has become a strategic educational technology capable of supporting curriculum planning, instructional design, classroom interaction, formative assessment, personalized learning, teacher decision-making, and institutional innovation. Early discussions on the academic and administrative role of artificial intelligence in education emphasized that AI could contribute simultaneously to learning processes and institutional efficiency by supporting teachers, students, managers, and policymakers in performing complex educational tasks more effectively (1). More recent literature has confirmed that AI is becoming one of the central forces reshaping the education sector, especially as schools and universities seek new solutions for improving instructional quality, responding to learners' diverse needs, and increasing the adaptability of educational services (2, 3).

Among the various branches of artificial intelligence, generative artificial intelligence has attracted particular attention because of its ability to generate human-like text, answer questions, summarize information, provide explanations, create examples, support dialogue, and assist in educational content production. ChatGPT, as one of the most visible and widely discussed generative AI tools, has quickly entered educational discourse and practice. Its emergence has shifted the discussion from whether artificial intelligence can be used in education to how it should be used, under what conditions, and with what pedagogical, ethical, and organizational safeguards. Scholars have described generative AI in education as both disruptive and transformative, because it challenges conventional assumptions about knowledge production, assessment, authorship, academic integrity, and the role of teachers while also creating new opportunities for more interactive and personalized learning (4). Empirical and review-based studies have also shown that ChatGPT can support instructional activities by helping teachers design lessons, generate examples, prepare educational materials, formulate questions, provide feedback, and create more engaging learning environments (5, 6).

The significance of ChatGPT in education is closely related to its potential to enhance the teaching–learning process. In classroom settings, teachers are required to respond to students with different levels of readiness, motivation, prior knowledge, learning styles, and cognitive needs. This diversity places considerable pressure on teachers, particularly in systems where class sizes are large, resources are limited, and instructional time is restricted. ChatGPT can support teachers by providing immediate explanations, alternative examples, differentiated activities, and supplementary materials that may help students understand concepts more effectively. In language education, for example, AI and ChatGPT have been discussed as tools for supporting EFL classrooms, improving interaction, assisting assessment, and transforming feedback practices (7). In science education, ChatGPT has been examined as a resource for lesson planning among pre-service teachers, showing that it can assist in designing instructional activities while still requiring professional judgment and pedagogical refinement (8). Studies on science education trends have similarly indicated that artificial intelligence has become an expanding field of research and innovation, especially in relation to intelligent tutoring, inquiry-based learning, and learner support (9).

Despite these opportunities, the integration of ChatGPT into teaching cannot be understood as a simple matter of access to technology. The educational value of AI depends on how teachers interpret, adapt, regulate, and embed it within pedagogical practice. Teachers remain central actors in transforming technological capacity into meaningful learning experiences. Without teachers' professional readiness, digital competence, pedagogical awareness, and critical evaluation skills, AI-generated

outputs may remain superficial, inaccurate, or misaligned with curriculum objectives. The literature repeatedly emphasizes that ChatGPT should not be viewed as a replacement for teachers but as a supportive tool that can assist, enrich, and extend teaching when used purposefully (10). This distinction is particularly important because teaching is not limited to information transfer; it also involves emotional support, moral guidance, classroom management, motivation, social interaction, assessment judgment, and contextual interpretation. Therefore, the feasibility of teachers' use of ChatGPT depends not only on the technical features of the tool but also on teachers' beliefs, skills, acceptance, concerns, and perceptions of its educational relevance.

Teachers' perceptions of ChatGPT have become a major research focus because they strongly influence adoption, resistance, and actual classroom use. Studies have shown that teachers often recognize the potential of ChatGPT to support lesson preparation, student engagement, personalized feedback, and instructional efficiency, while simultaneously expressing concerns about accuracy, overdependence, ethical misuse, plagiarism, weakening of critical thinking, and the reliability of AI-generated content. Research on teachers' perceptions of ChatGPT as a supporting tool in the digital era has indicated that educators may accept this technology when it is aligned with pedagogical goals and supported by appropriate training, but they remain cautious about its uncontrolled or uncritical use (11). Mathematics teachers' perspectives also reveal that AI adoption is shaped by perceived usefulness, practical challenges, professional readiness, access to infrastructure, and uncertainty about how to integrate AI into subject-specific teaching (12). In the Iranian context, studies of teachers' views on ChatGPT in science education have similarly shown that teachers may consider it useful for improving classroom interaction and supporting learning, while also worrying about students' excessive reliance on AI and the need for curriculum revision (13).

The use of ChatGPT in schools also raises important questions about instructional quality and learning depth. While ChatGPT can provide quick answers and generate educational content, these same capacities may encourage passive learning if students use the tool as a substitute for thinking, problem-solving, reading, and discussion. The risk of superficial learning is particularly relevant when AI-generated responses are accepted without verification or when teachers lack the skills to evaluate content accuracy. Studies comparing ChatGPT-generated and teacher-generated content have suggested that AI can be useful in certain instructional contexts, but teacher-designed and teacher-mediated learning remains essential for ensuring conceptual accuracy, relevance, and meaningful engagement (14). Similarly, research on personalized feedback has shown that ChatGPT may provide rapid and individualized responses, yet its effectiveness depends on the complexity of the task, the quality of prompts, and the presence of teacher supervision (15). These findings indicate that educational feasibility must include not only the possibility of using ChatGPT but also the conditions required for its responsible and pedagogically sound use.

The broader literature on artificial intelligence in education presents a balanced picture of opportunities and challenges. Systematic reviews have identified several advantages of AI, including personalization, learning analytics, intelligent tutoring, administrative efficiency, adaptive assessment, and enhanced access to educational resources. However, they have also highlighted ethical, pedagogical, technical, and organizational concerns, including bias, privacy, transparency, teacher preparedness, inequality of access, and limited context-specific research (16). Studies on undergraduate students' and teachers' perspectives further show that users often combine enthusiasm with uncertainty: they recognize the speed, convenience, and productivity of AI tools, but they also seek guidance on proper use, academic integrity, and the boundaries of acceptable reliance (17). These findings suggest that the educational adoption of ChatGPT should be studied through a multidimensional lens that considers technological infrastructure, teacher competence, institutional policies, learner behavior, curriculum compatibility, and cultural context.

From an organizational perspective, the implementation of artificial intelligence in education is closely connected to institutional readiness and strategic management. AI adoption requires more than individual teacher initiative; it depends on

school leadership, policy frameworks, professional development, technical support, infrastructure, evaluation mechanisms, and organizational culture. The management of artificial intelligence has been conceptualized through the dimensions of feasibility, desirability, and viability, indicating that organizations must assess whether AI can be technically implemented, whether it is educationally and ethically desirable, and whether it can be sustained over time within institutional systems (18). In organizational behavior research, AI is understood as a multilevel phenomenon that influences individuals, teams, leadership, decision-making, work design, and institutional structures (19). Although such literature often focuses on organizations broadly, its implications are highly relevant to schools, because teachers' use of ChatGPT requires coordination among human capacities, managerial decisions, technological resources, and institutional norms.

The relevance of organizational and human-resource perspectives becomes more evident when considering the changing role of teachers in AI-supported education. Artificial intelligence can transform professional tasks by automating routine activities, supporting decision-making, and reshaping job expectations. Studies on AI in human resource management show that intelligent technologies can influence recruitment, evaluation, training, performance management, and role design (20). Research on AI and job elimination further highlights that intelligent systems may alter occupational structures and create concerns about displacement, task redefinition, and professional identity (21). In education, these concerns do not necessarily imply that teachers will be replaced; rather, they suggest that teachers' roles may shift from sole providers of information toward designers of learning experiences, evaluators of AI outputs, facilitators of inquiry, ethical guides, and managers of technology-mediated learning. Therefore, studying the feasibility of teachers' use of ChatGPT requires attention to professional empowerment and role adaptation.

Another important dimension of ChatGPT integration concerns sustainability and equitable educational development. Artificial intelligence may support broader educational goals by expanding access to resources, improving learning opportunities, and helping institutions address complex sustainability challenges. Studies on the use of AI for implementing the UN Sustainable Development Goals in higher education institutions indicate that artificial intelligence can support institutional planning, innovation, inclusion, and sustainability-oriented educational practices when integrated strategically (22). In school education, this perspective suggests that ChatGPT may contribute to more flexible and inclusive learning environments by providing support beyond classroom time and offering additional learning resources to students. However, sustainability also requires attention to digital divides. If students and teachers do not have stable internet access, appropriate devices, digital literacy, and institutional support, AI may deepen inequality rather than reduce it. Accordingly, infrastructure and access must be treated as core components of feasibility, not secondary technical issues.

Technological innovation in education also requires contextualization. The successful implementation of one technology in one educational setting does not guarantee similar results in another. Regional differences in infrastructure, teacher training, socioeconomic conditions, school resources, internet quality, institutional culture, and policy support can significantly shape adoption outcomes. Studies on artificial intelligence adoption in public organizations show that implementation processes vary across institutional contexts and are influenced by governance structures, organizational capacity, professional norms, and stakeholder readiness (23). In education, these factors become even more important because schools operate within complex social and administrative systems. Research on the organization of educational processes using artificial intelligence technologies also confirms that AI implementation requires attention to planning, pedagogical design, teacher preparation, and institutional capacity (24). Therefore, local feasibility studies are essential for identifying the conditions under which teachers can realistically use ChatGPT in their own educational environments.

In Iran, the growing interest in ChatGPT and educational artificial intelligence has created a need for empirical and context-sensitive research. Domestic studies have begun to examine the application of AI in education, curriculum planning, classroom

teaching, and educational technology development. Research on artificial intelligence in education and curriculum planning suggests that AI can support more interactive, adaptive, and efficient learning environments when curriculum structures are designed to accommodate technological change (25). Studies on the impact of AI and ChatGPT on school educational outcomes also indicate that these technologies may have both positive and negative consequences, requiring careful policy design and evidence-based implementation (26). In addition, research on elementary teachers' perceptions of integrating ChatGPT has shown that teachers identify both opportunities and challenges, including improved teaching support, content generation, concerns about misuse, and the need for professional development (27). These findings confirm that Iranian educational contexts require models that go beyond general descriptions and identify specific components of readiness, support, barriers, and consequences.

The development of educational technologies in Iran also demonstrates that successful innovation requires strategic planning and support mechanisms. Studies on augmented reality technology in higher education have emphasized that the development of emerging technologies depends on clear strategies, implementation requirements, capacity-building processes, and institutional support (28). Although augmented reality and ChatGPT are technologically different, both represent advanced educational innovations that require teacher training, infrastructure, alignment with curriculum objectives, and continuous evaluation. Similarly, studies on ChatGPT use in the classroom suggest that teachers can employ this tool to improve content preparation, interaction, and learning support, but only when they receive adequate guidance and when its use is integrated into instructional design rather than treated as an uncontrolled external resource (6). Therefore, a feasibility model for teachers' use of ChatGPT should identify not only perceived benefits but also causal conditions, strategies, contextual supports, intervening barriers, and educational consequences.

The existing literature thus indicates that ChatGPT can potentially enrich teaching, personalize learning, support assessment, improve instructional efficiency, and increase flexibility in learning management. At the same time, the literature warns that the uncontrolled use of ChatGPT may generate inaccurate content, promote dependence on ready-made answers, weaken critical thinking, create ethical risks, and intensify inequalities in access. Studies on perceptions and usage of ChatGPT in education show that adoption is influenced by user awareness, prior experience, institutional environment, and perceived usefulness (29). Research on ChatGPT in the educational instruction sector also indicates that its benefits are maximized when teachers understand how to formulate prompts, evaluate responses, adapt generated content, and connect AI-supported activities to learning objectives (5). Therefore, the key issue is not whether ChatGPT has educational capacity, but whether teachers, schools, and educational authorities possess the readiness and support systems necessary to use it effectively.

Nevertheless, several gaps remain in the current body of research. First, many studies on ChatGPT in education are conceptual, review-based, or focused on higher education, while fewer studies investigate the feasibility of using ChatGPT among school teachers in specific local contexts. Second, although many studies discuss teachers' perceptions, fewer provide comprehensive models that connect causal conditions, implementation strategies, contextual supports, intervening barriers, and outcomes. Third, in regional educational systems such as North Khorasan Province, there is limited evidence on how infrastructural constraints, teacher readiness, managerial support, and local educational culture affect the practical use of ChatGPT in teaching. These gaps are important because educational technology policies cannot be effective when they are based only on general assumptions or global trends. Local evidence is needed to design realistic, equitable, and sustainable implementation models. Accordingly, examining the feasibility of teachers' use of ChatGPT in North Khorasan Province can contribute both to the scientific literature on artificial intelligence in education and to practical policymaking for teacher empowerment, digital infrastructure development, and responsible AI-supported teaching.

The aim of the present study was to investigate the feasibility of teachers' use of ChatGPT in teaching students in North Khorasan Province and to propose a model for enhancing and developing this use.

Methods and Materials

The present study was applied in terms of purpose and qualitative in terms of the nature of the data, and it was conducted using the systematic grounded theory approach. This approach was considered appropriate because it provided the possibility of identifying the various dimensions, influencing conditions, strategies, and consequences associated with teachers' use of ChatGPT in teaching within a coherent conceptual framework. The research population consisted of all university professors in the fields of educational management and artificial intelligence across the country during the 1404–1405 academic year. Purposive sampling was used to select the participants, and this process continued until theoretical saturation was achieved. Ultimately, 25 relevant professors were selected as participants in the study. Theoretical saturation was considered reached when new data no longer contributed any new concepts or categories to the findings and when the conceptual model of the study had attained relative stability.

The data collection tool was unstructured in-depth interviews. Due to the exploratory nature of the study, this type of interview made it possible to obtain participants' deep, analytical, and multidimensional perspectives regarding the feasibility of teachers' use of ChatGPT in teaching. The interviews began with open-ended questions, and subsequently, follow-up and probing questions were raised in accordance with the participants' responses in order to clarify different dimensions of the subject. After obtaining informed consent from the participants, the interviews were conducted, audio-recorded, and then fully transcribed. Data were analyzed using open coding, axial coding, and selective coding. In the open coding stage, the initial concepts were extracted from the interview transcripts and categorized. Then, in the axial coding stage, the relationships among concepts and categories were identified and organized. Finally, in the selective coding stage, the core category was determined and the final model of the study was developed based on the relationships among the categories. This analytical process enabled the researcher to explain the conceptual structure of the feasibility of teachers' use of ChatGPT in teaching on the basis of real data.

To establish the trustworthiness of the findings, the four criteria proposed by Guba and Lincoln (1985), namely credibility, dependability, transferability, and confirmability, were employed. To ensure dependability, efforts were made to record and document in detail the procedures of data collection, data sources, and stages of analysis. To establish credibility, the coherence and consistency of the collected data were examined, and it was found that the data were free from meaningful contradiction and dispersion and that the relationships among them were logical and grounded in scientific rationality. To assess transferability, the applicability and conceptual generalizability of the findings to similar contexts were examined. In addition, to ensure confirmability, the validity of the data was assessed on the basis of naturalistic reporting and direct reference to the interview data so that it could be assured that the findings were genuinely grounded in the actual data. Alongside the field data, valid domestic and international sources were also used to strengthen the theoretical foundation and complete the analytical process. In this regard, the required information was collected by referring to authoritative Iranian databases and websites, including IranDoc, SID, Magiran, and Noormags, as well as international sources such as Emerald, Elsevier, Springer, Sage Publications, and ScienceDirect. Throughout all stages of the study, ethical considerations were observed, and the participants took part in the research with full awareness of its objectives and with assurance of the confidentiality of their information.

Findings and Results

The present study aimed to examine the feasibility of teachers' use of ChatGPT in teaching students in North Khorasan Province and to propose an appropriate model. To identify the dimensions and components of this model, the data obtained from the interviews were analyzed through a three-stage coding process, including open, axial, and selective coding. In the first step, in response to the question of what dimensions and components constitute the model for enhancing the development of teachers' use of Artificial Intelligence-ChatGPT in teaching students, the findings were classified into five categories: causal conditions, strategic conditions, contextual conditions, intervening conditions, and consequential conditions. The details of these categories are presented below.

Causal conditions include categories that directly affect the central phenomenon and explain the necessity and underlying reasons for the emergence of the behavior or phenomenon under study. To organize the extracted codes in this section, the open codes were presented in Table 1 according to their corresponding axial and selective codes.

Table 1. Coding of the Causal Conditions of Teachers' Use of ChatGPT in Teaching Students

Selective Code	Axial Code	Open Codes
Causal Conditions	Motivational Teaching	Making teaching more attractive (Code 10), making teaching interactive (Code 10), personalizing teaching (Code 10), awareness of the capabilities of AI tools for teaching (Code 10), positive functions of AI in learning (Code 10), facilitating individual learning (Code 10), teachers' motivation and acceptance of technology (Code 6), training in the effective use of the tool (Code 24), model design and technology management (Code 24), a practical model for integration with activities (Code 24), creating an active and engaging learning environment through content (Code 24)
	Efficient Teaching	Effective use of ChatGPT in teaching (Code 7), sufficient digital skills (Code 7), ability to evaluate content generated by AI (Code 7), the necessity of designing empowerment programs (Code 7), providing technical conditions for AI-based teaching (Code 7), providing social conditions for AI-based teaching (Code 7), providing organizational conditions for AI-based teaching (Code 7), providing cultural conditions for AI-based teaching (Code 7), providing individual conditions for AI-based teaching (Code 7)
	Multidimensional Teaching	Providing an appropriate learning environment (Code 6), removing temporal boundaries from teaching (Code 6), removing geographical boundaries from teaching (Code 6), removing managerial boundaries from teaching (Code 6), making teaching multidimensional (Code 6), making teaching multimedia-based (Code 6), managing the use of technology (Code 24), inspiration (Code 24), teacher guidance and framing (Code 23), continuous teacher monitoring (Code 23)
	Sustainable Teaching	Equal improvement in teaching quality (Code 9), precise planning for advancing AI-based teaching (Code 9), development of sustainable teaching through AI (Code 9), removing infrastructural barriers to AI-based teaching (Code 9), removing program-related barriers to AI-based teaching (Code 9), removing managerial barriers to AI-based teaching (Code 9), teachers' stable access to the internet (Code 8)
	Aligned Teaching	Providing technical infrastructure for teaching (Code 10), providing administrative infrastructure for teaching (Code 10), providing educational infrastructure for teaching (Code 10), providing informatics infrastructure for teaching (Code 10), familiarity with digital literacy (Code 8), smart classroom management skills (Code 8)
	Technology-Based Teaching	Use of platform-based teaching (Code 21), use of technological educational tools (Code 21), use of intelligent learning systems (Code 19), development of interactive learning (Code 15), use of synchronous teaching (Code 23), use of asynchronous teaching (Code 23), expansion of communication between the two sides of the teaching-learning process (Code 23), removing environmental boundaries from learning (Code 20)

The analysis of the findings presented in Table 1 shows that the causal conditions of teachers' use of ChatGPT in teaching include six axial codes: motivational teaching, efficient teaching, multidimensional teaching, sustainable teaching, aligned teaching, and technology-based teaching. These findings indicate that the need to increase the attractiveness, dynamism, and personalization of teaching, alongside the necessity of improving teachers' digital skills and removing geographical and temporal boundaries from the teaching-learning process, are among the main causal drivers of the tendency to use ChatGPT in schools in North Khorasan Province. Strategic conditions include purposeful plans, actions, and behaviors adopted to manage, control, and respond to the central phenomenon. The extracted codes for this section are presented in Table 2.

Table 2. Coding of the Strategic Conditions of Teachers' Use of ChatGPT in Teaching Students

Selective Code	Axial Code	Open Codes
Strategic Conditions	Widespread Internet Access	Universal student access to the internet (Code 17), access to digital devices (Code 17), availability of technology-equipped classroom space (Code 17), access to technology-based educational resources aligned with the curriculum (Code 17), stable internet access (Code 16), access to smart devices (Code 16), the necessity of preparing contextual conditions before integrating technology (Code 16), appropriate internet access (Code 11), accessibility of AI tools for teaching (Code 11), development of digital literacy (Code 11), receiving immediate responses and independent interaction (Code 23), correction and guidance of interaction (Code 23), ability for critical thinking (Code 23), active learning and student participation (Code 24), increased creativity and variety in teaching (Code 24), defining learning objectives (Code 23), precise activity design (Code 23), diverse ideas and examples (Code 24), interactive and dynamic classroom (Code 24), technology as a facilitator of learning (Code 23), use of ideas, examples, and samples provided by ChatGPT (Code 24)
	Capacity Building for Teaching	Educational capacity building for the use of ChatGPT in teaching (Code 1), managerial capacity building for the use of ChatGPT in teaching (Code 1), technical capacity building for the use of ChatGPT in teaching (Code 1), individual capacity building for the use of ChatGPT in teaching (Code 1), simulated learning environment (Code 24), diversity of learning styles (Code 24), expansion of the temporal scope of learning (Code 24), expansion of the scope of learning (Code 24), motivational learning (Code 24), attractive learning content (Code 24), authentic learning (Code 24), diverse learning activities (Code 24)
	Teacher Training	Supplementary training for teachers (Code 18), skill workshops (Code 18), continuous guidance by educational experts (Code 18), purposeful use aligned with the curriculum (Code 18), developing teachers' mastery for AI-based teaching (Code 2), teachers' awareness in AI-based teaching (Code 2), prevention of mistakes and misuse (Code 18), continuity of training and support before and during use for effectiveness (Code 18), practical exercises and enhancement of teachers' abilities in using the tool (Code 18), design of teacher empowerment programs (Code 15), development of clear guidelines for classroom use (Code 15), ensuring that the use of the tool is aligned with the goals and curriculum of the school (Code 15), teacher training in digital literacy (Code 14), determining the framework for the use of the tool in the curriculum (Code 14), professional support and continuous guidance for teachers (Code 14), purposeful and coherent use of ChatGPT (Code 14), enhancement of the quality of student learning and interaction (Code 14)
	Teacher Preparation	Teachers' cognitive readiness for AI-based teaching (Code 11), teachers' emotional readiness for AI-based teaching (Code 11), teachers' psychomotor readiness for AI-based teaching (Code 11)
	Continuous Monitoring of ChatGPT Productivity	Continuous monitoring of the effects of technology on learning (Code 15), ensuring the correct and effective use of ChatGPT in the teaching-learning process (Code 15), enhancement of the quality of teaching and student learning (Code 15), purposeful, safe, and effective use of technology (Code 15), ability to evaluate responses generated by AI (Code 2), equal student access to digital tools (Code 6)

The findings presented in Table 2 indicate that the strategic conditions of teachers' use of ChatGPT in teaching include five axial codes: widespread internet access, capacity building for teaching, teacher training, teacher preparation, and continuous monitoring of ChatGPT productivity. These strategies show that the successful implementation of this model requires comprehensive actions, ranging from providing technical and internet access to developing formal training and cognitive-emotional empowerment for teachers, and ultimately to the continuous evaluation and monitoring of how AI is used.

Contextual conditions refer to the specific characteristics of the setting or environment in which the central phenomenon occurs and that influence the strategies. The information related to the coding of contextual conditions is presented in Table 3.

Table 3. Coding of the Contextual Conditions of Teachers' Use of ChatGPT in Teaching Students

Selective Code	Axial Code	Open Codes
Contextual Conditions	Educational Support	Existence of clear strategic frameworks (Code 13), development of executive guidelines (Code 13), digital empowerment programs (Code 12), preparation of training packages for ChatGPT tools (Code 12), preparation of AI training syllabi for teachers (Code 2), precise educational planning (Code 7), teacher guidance and proper management of students' interaction with technology (Code 3), provision of facilities for presenting content creatively (Code 2), effective educational context for teachers' use of ChatGPT (Code 1)
	Managerial Support	Managerial support (Code 13), teacher support policies (Code 12), development of strategic plans (Code 12), supportive policies for teachers (Code 12), access support for using ChatGPT in education (Code 7), availability of technical support by the school (Code 6)
	Follow-Up on Teachers' Problems	Follow-up on teachers' technical problems for teaching with ChatGPT (Code 3), follow-up on teachers' social problems for teaching with ChatGPT (Code 3), follow-up on teachers' technological problems for teaching with ChatGPT (Code 3)

Selective Code	Axial Code	Open Codes
	Programmatic Support	Strategic planning for teacher training (Code 12), specific school management strategies for advancing AI-based teaching (Code 10), development of integrated AI training programs (Code 15), development of continuous training programs (Code 12), development of a learning management system (Code 12), effective technical context for teachers' use of ChatGPT (Code 1), effective organizational context for teachers' use of ChatGPT (Code 1), effective cultural context for teachers' use of ChatGPT (Code 1)
	Infrastructural and Informatic Support	Necessary measures for AI-based teaching (Code 4), widespread integration of technology into the education system for AI-based teaching (Code 4), resolving teachers' educational challenges in teaching with ChatGPT (Code 4), resolving teachers' technical challenges in teaching with ChatGPT (Code 4), resolving teachers' internet-related challenges in teaching with ChatGPT (Code 4)

As reflected in Table 3, the contextual conditions of teachers' use of ChatGPT in teaching include five axial codes: educational support, programmatic support, follow-up on teachers' problems, managerial support, and infrastructural and informatic support. These findings suggest that the institutional, organizational, and infrastructural context of schools and the Department of Education in North Khorasan Province, such as the development of strategies, the continuous removal of technical barriers, and supportive measures, provides the necessary foundation for the implementation of strategies and the facilitation of teachers' activities. Intervening conditions include mediating and external variables that may facilitate the effects of strategies in leading to consequences or, conversely, weaken them and create challenges. The categories identified in this area are reflected in Table 4.

Table 4. Coding of the Intervening Conditions of Teachers' Use of ChatGPT in Teaching Students

Selective Code	Axial Code	Open Codes
Intervening Conditions	Superficialization of Teaching	The possibility of ChatGPT providing incorrect answers (Code 19), superficial student learning (Code 19), the impossibility of replacing humans with technology (Code 19), reliance solely on ChatGPT responses (Code 11), lack of active engagement in learning (Code 11), teachers' indifference toward designing active lessons (Code 19), lack of continuous study by teachers before entering the classroom (Code 19), lack of effort to build sufficient knowledge before teaching (Code 19), lack of effort to develop instructional techniques during teaching (Code 19), excessive dependence on ready-made answers (Code 23), reduction in critical thinking and problem-solving skills (Code 23)
	Teachers' Lack of Technological Mastery	The need for systematic planning for the purposeful use of technology (Code 22), educational inequality among students (Code 21), some teachers' lack of technological mastery (Code 21), the possibility of the tool providing incorrect or superficial information (Code 20), the necessity of teacher training (Code 20)
	Inefficiency of Teaching Due to Lack of Adequate Internet	Infrastructural limitations such as unstable internet (Code 19), limited access to digital devices (Code 19), limited effectiveness in the absence of infrastructure (Code 16), internet disconnections during teaching (Code 16), internet bandwidth limitations (Code 19), lack of access to strategic educational networks for solving internet problems (Code 19)

Based on the descriptive findings in Table 4, the intervening conditions of teachers' use of ChatGPT in teaching students consist of three axial codes: superficialization of teaching, teachers' lack of technological mastery, and inefficiency of teaching due to lack of adequate internet. The interpretation of these findings shows that factors such as internet instability and limitations in North Khorasan Province, along with possible negative behaviors such as students' excessive dependence on ready-made answers and teachers' neglect of active instructional design, operate as intervening barriers in the successful implementation of the model. Consequential conditions indicate the outputs and results arising from the adoption of specific strategies under the influence of contextual and intervening conditions. The categories and open codes related to consequences are organized in Table 5.

Table 5. Coding of the Consequential Conditions of Teachers' Use of ChatGPT in Teaching Students

Selective Code	Axial Code	Open Codes
Consequential Conditions	Facilitation of Student Learning	Facilitation of students' individual learning (Code 23), strengthening the personalization of learning (Code 21), making learning more attractive (Code 12), receiving immediate responses (Code 22), access to diverse educational content (Code 16), diversity in the resources and information provided to students (Code 22), enrichment of educational content (Code 24), increasing students' motivation (Code 5), increasing students' participation (Code 22), encouraging active interaction with content and classroom activities (Code 5), a more interactive classroom (Code 21), strengthening self-motivation in learning (Code 11)
	Enhancement of Teachers' Teaching Efficiency	Increased variety in lesson presentation (Code 24), increased creativity in teaching (Code 24), improving the efficiency of the content preparation process (Code 20), reducing teachers' inefficiency (Code 23), strengthening teachers' self-efficacy (Code 23), integration of technology with traditional education (Code 23)
	Provision of Learning Opportunities for Students	Opportunity for problem solving (Code 23), opportunity for critical thinking (Code 21), opportunity for personalized learning (Code 18), opportunity for problem identification (Code 21), opportunity for self-determined learning (Code 23), opportunity for the development of creativity in learning (Code 23), opportunity for the development of self-organization in learning (Code 23), opportunity for the development of self-regulation in learning (Code 23), opportunity for the development of self-planning in learning (Code 23)
	Flexibility in the Management of Student Learning	Flexibility in monitoring the learning process (Code 22), the possibility of monitoring learning activities (Code 24), the possibility of monitoring learning tools (Code 21), monitoring learning resources (Code 23), flexibility in learning conditions (Code 20), flexibility in monitoring learning progress (Code 22), flexibility in monitoring learning time (Code 22)

As evidenced by the results presented in Table 5, the consequential conditions of teachers' use of ChatGPT in teaching include four axial codes: facilitation of student learning, enhancement of teachers' teaching efficiency, provision of learning opportunities for students, and flexibility in the management of student learning. The interpretation of these outcomes indicates that the principled integration of ChatGPT into teaching not only contributes to improving students' academic achievement and strengthening their metacognitive skills, but also increases teachers' teaching self-efficacy by making the content preparation process more creative and by integrating traditional and modern forms of learning. To address the question of what the model for enhancing the development of teachers' use of Artificial Intelligence-ChatGPT in teaching students looks like, the structural relationships among the identified dimensions were formulated based on grounded theory. The dynamic interaction among the five dimensions of the model is illustrated in Figure 1.

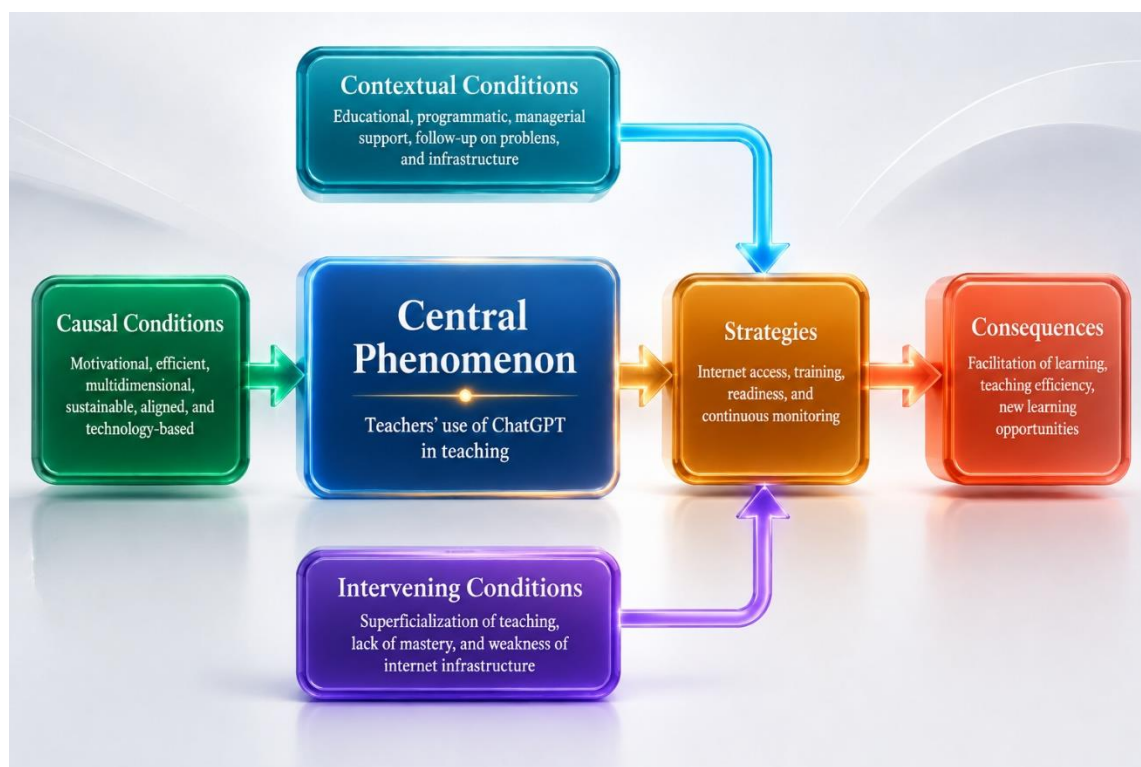


Figure 1. Model for Enhancing the Development of Teachers' Use of Artificial Intelligence-ChatGPT in Teaching Students in North Khorasan Province

The analysis of the final paradigm model illustrated in Figure 1 demonstrates a structured and dynamic flow among the five dimensions of grounded theory. At the core of this model lies the central phenomenon, which is teachers' use of ChatGPT in teaching, serving as the focal point of the entire process. The emergence and development of this central phenomenon are directly driven by causal conditions, which encompass motivational, efficient, multidimensional, sustainable, aligned, and technology-based teaching. These conditions act as the primary drivers and initial necessities that justify and stimulate the integration of artificial intelligence tools in schools across North Khorasan Province. To manage, control, and respond to the central phenomenon, five key strategies must be adopted, including widespread internet access, capacity building for teaching, teacher training, teacher preparation, and continuous monitoring of ChatGPT productivity. As depicted in Figure 1, the implementation and effectiveness of these strategies are simultaneously influenced by two external forces. On one hand, contextual conditions, which exert influence on the strategies from above, provide the necessary organizational, managerial, programmatic, and infrastructural support to facilitate executive actions. On the other hand, intervening conditions, represented by the risk of superficialization of teaching, teachers' lack of technological mastery, and the inefficiency of teaching due to lack of adequate internet, direct their impact from below as mediating barriers that can challenge or hinder the successful application of the strategies. Ultimately, the interactive output of this systemic flow leads to the four consequential conditions, which manifest as the facilitation of student learning, enhancement of teachers' teaching efficiency, provision of learning opportunities for students, and flexibility in the management of student learning.

Discussion and Conclusion

The findings of the present study showed that the feasibility of teachers' use of ChatGPT in teaching students in North Khorasan Province is a multidimensional, conditional, and context-dependent phenomenon. The grounded theory analysis identified causal conditions, strategies, contextual conditions, intervening conditions, and consequences as the main dimensions

of the proposed model. In the causal conditions, six components were extracted: motivational teaching, efficient teaching, multidimensional teaching, sustainable teaching, aligned teaching, and technology-based teaching. These findings indicate that teachers' tendency to use ChatGPT is not rooted merely in technological curiosity, but in perceived instructional needs such as making teaching more attractive, interactive, personalized, flexible, and efficient. This result is consistent with studies emphasizing that artificial intelligence can support both academic and administrative functions in education and can improve the quality of teaching–learning processes when it is connected to real pedagogical needs (1-3). The finding also aligns with the view that ChatGPT can function as a disruptive yet productive educational tool, because it changes the traditional structure of instruction by enabling teachers to access immediate explanations, examples, prompts, learning activities, and adaptive content (4, 5). Therefore, the causal conditions identified in this study show that ChatGPT becomes meaningful for teachers when it is perceived as a means for improving teaching quality rather than as an external technological addition.

The emergence of motivational teaching as one of the main causal conditions suggests that teachers and experts consider ChatGPT feasible when it increases students' interest, engagement, and participation in the learning process. This finding is supported by previous research indicating that ChatGPT can enhance classroom interaction, provide alternative explanations, and support more engaging instructional experiences (6, 13). The emphasis on personalization is also consistent with research in language education and science education, where ChatGPT has been found to support individualized learning, assignment design, lesson planning, and feedback-oriented instruction (7, 8). In this regard, the present findings suggest that teachers' motivation to use ChatGPT is closely linked to the tool's capacity to reduce the rigidity of traditional instruction and to support differentiated learning. However, this motivational potential depends on teachers' ability to transform AI-generated materials into pedagogically meaningful activities. This interpretation is compatible with studies showing that ChatGPT can support teaching, but its effectiveness depends on instructional design, teacher mediation, and the quality of prompts and educational tasks (14, 15).

The findings also showed that efficient teaching, multidimensional teaching, sustainable teaching, aligned teaching, and technology-based teaching are major drivers of ChatGPT integration. These components indicate that participants viewed ChatGPT as feasible when it contributes to the efficiency, scope, continuity, and technological enrichment of instruction. This result is in line with studies demonstrating that artificial intelligence can support curriculum planning, content production, learner analysis, educational resource development, and technology-enhanced learning environments (24, 25). The identification of multidimensional and technology-based teaching also supports the findings of studies on AI in science education, which show that artificial intelligence has expanded the boundaries of learning by enabling more interactive, adaptive, and resource-rich educational experiences (9). Similarly, the emphasis on sustainable and aligned teaching is consistent with research arguing that AI use in education should not be fragmented or incidental, but should be embedded within broader institutional, curricular, and sustainability-oriented frameworks (22, 30). Thus, the present study confirms that ChatGPT can support sustainable educational development only when it is aligned with curriculum goals, school policies, teacher competencies, and students' learning needs.

At the level of strategies, the findings identified widespread internet access, teaching capacity building, teacher training, teacher preparation, and continuous monitoring of ChatGPT productivity as the central actions required for effective implementation. This part of the model is particularly important because it shows that feasibility is not achieved automatically through the availability of ChatGPT. Rather, successful use requires a structured implementation process. The emphasis on internet access and digital devices is consistent with previous studies showing that infrastructure is a prerequisite for educational AI adoption and that unequal access can limit the benefits of technology-based education (12, 16). The findings also support studies on AI adoption in public and organizational contexts, which show that technological implementation is shaped by

institutional capacity, management support, organizational readiness, and operational resources (19, 23). In North Khorasan Province, where infrastructure and access may vary across schools and regions, internet stability and access to digital tools should therefore be considered fundamental components of feasibility, not merely technical details.

Teacher training and teacher preparation were also among the most important strategies identified in the model. This finding indicates that the most decisive factor in the use of ChatGPT is not the tool itself, but the teacher's ability to use it critically, ethically, and pedagogically. This result is aligned with studies showing that teachers' perceptions, digital literacy, and professional readiness play a key role in the adoption of ChatGPT and artificial intelligence tools (11, 17, 29). It is also consistent with studies emphasizing that teachers need practical guidance, training, and institutional support to use AI effectively in classroom instruction (26, 27). The findings suggest that teacher preparation should include cognitive readiness, emotional readiness, psychomotor readiness, prompt-writing skills, content evaluation skills, ethical awareness, and the ability to align ChatGPT outputs with curriculum objectives. This conclusion supports the broader literature on AI management, which argues that the adoption of intelligent technologies must be assessed through feasibility, desirability, and viability and must be accompanied by human capacity development (18).

The strategy of continuous monitoring of ChatGPT productivity is another significant finding of the study. Participants emphasized that the use of ChatGPT should be monitored in terms of accuracy, educational value, alignment with learning objectives, and potential negative effects. This result supports previous studies warning that ChatGPT may generate inaccurate, superficial, or misleading responses and that teacher supervision remains essential (12, 15). It also aligns with research arguing that ChatGPT should not replace the teacher's role, but should operate as an assistant that supports professional judgment and instructional creativity (10). The need for continuous monitoring further confirms that AI-based teaching must include feedback loops, quality control, and clear guidelines for responsible use. Without monitoring, teachers and students may become dependent on ready-made answers, while the depth of learning, critical thinking, and problem-solving may weaken. Therefore, continuous evaluation is necessary to ensure that ChatGPT contributes to learning rather than reducing it to passive consumption of generated content.

The contextual conditions identified in the study included educational support, managerial support, follow-up on teachers' problems, programmatic support, and infrastructural and informatics support. These findings demonstrate that the feasibility of ChatGPT use is embedded in the broader educational environment. Even if teachers are motivated and trained, they may not be able to use ChatGPT effectively without supportive school management, technical assistance, implementation guidelines, and institutional planning. This result is consistent with research on technological innovation in higher education, which shows that the development of emerging technologies requires strategic planning, policy support, infrastructure, and capacity-building mechanisms (28). The finding also aligns with studies on organizational AI adoption, which emphasize that the successful use of AI depends on multilevel interactions among individual users, organizational systems, leadership, and policy structures (19, 23). In this study, the contextual conditions show that the Department of Education and school-level management should play active roles in guiding, supporting, and institutionalizing ChatGPT use.

The intervening conditions identified in the study were superficialization of teaching, teachers' lack of technological mastery, and inefficiency of teaching due to inadequate internet infrastructure. These findings are consistent with the critical strand of AI-in-education literature, which warns that artificial intelligence can produce negative consequences if it is used without sufficient digital literacy, ethical control, and pedagogical supervision (16, 26). The risk of superficialization is especially important because ChatGPT can provide fast and fluent responses that may appear credible even when they are inaccurate or incomplete. This finding supports previous research showing that overreliance on AI tools can reduce critical thinking, weaken independent learning, and blur the boundary between assistance and substitution (10, 12). Teachers' lack of

technological mastery also confirms the results of studies reporting that educators may be interested in ChatGPT but still need training, guidelines, and experience to use it properly (11, 27). In addition, inadequate internet access reflects the practical reality that technological innovation cannot be separated from infrastructure.

The consequences of teachers' use of ChatGPT included facilitation of student learning, enhancement of teachers' teaching efficiency, provision of learning opportunities for students, and flexibility in the management of student learning. These outcomes suggest that when ChatGPT is implemented under appropriate causal, strategic, and contextual conditions, it can improve both student learning and teacher performance. The facilitation of learning is consistent with studies showing that ChatGPT can provide immediate responses, personalized explanations, diverse examples, and interactive support (7, 14). The enhancement of teachers' teaching efficiency also aligns with research indicating that AI can reduce teachers' workload in content preparation, support lesson planning, and improve instructional creativity (6, 8). Furthermore, the provision of new learning opportunities, including problem-solving, creativity, self-regulation, and self-directed learning, corresponds with literature presenting AI as a tool for expanding the temporal, spatial, and cognitive boundaries of learning (9, 22). Therefore, the positive consequences identified in this study are consistent with previous findings, but the present model adds that these consequences are conditional rather than automatic.

From a broader professional perspective, the findings also show that ChatGPT may contribute to the redefinition of teachers' roles. Teachers are no longer only transmitters of information; they increasingly need to become designers of learning environments, evaluators of AI-generated content, facilitators of inquiry, ethical guides, and managers of technology-supported instruction. This interpretation is consistent with studies on artificial intelligence in human resource management, which show that AI changes professional roles, work processes, decision-making, and skill requirements (20). It also corresponds with research on AI and job transformation, which suggests that intelligent technologies may alter occupational structures and require workers to develop new competencies rather than simply replacing human roles (21). In the educational context, this means that ChatGPT should be understood as a tool for teacher empowerment, not teacher displacement. The results therefore support the argument that AI integration in schools should be guided by teacher-centered professional development and not by technology-centered implementation.

Overall, the findings of the present study contribute to the literature by presenting a comprehensive model for the feasibility of teachers' use of ChatGPT in teaching students in North Khorasan Province. The model shows that ChatGPT integration is shaped by the interaction of motivational, instructional, technological, organizational, infrastructural, and supervisory factors. It also demonstrates that positive outcomes such as enhanced learning, instructional efficiency, new learning opportunities, and flexible learning management depend on strategic interventions and the control of intervening barriers. This conclusion is consistent with previous studies that have described AI as a promising but complex educational technology requiring contextualized planning, teacher readiness, infrastructure, and ethical governance (1, 16, 18, 30). The present findings therefore suggest that the feasibility of teachers' use of ChatGPT is not a binary issue of possible or impossible, but a conditional process that becomes practical when professional empowerment, institutional support, technological infrastructure, and continuous supervision are simultaneously provided.

The present study had several limitations. First, the research was conducted qualitatively and relied on expert interviews; therefore, although the findings provide deep conceptual insight, they should not be interpreted as statistically generalizable to all teachers or all educational settings. Second, the study focused on North Khorasan Province, and the specific infrastructural, managerial, cultural, and educational conditions of this province may differ from those of other regions. Third, because the study examined feasibility through the perspectives of experts rather than direct classroom implementation, the findings reflect perceived conditions, strategies, barriers, and consequences rather than measured classroom outcomes. Fourth, the rapid

development of artificial intelligence tools may change teachers' needs, opportunities, and concerns over time, which means that the proposed model should be considered dynamic and open to future revision.

Future research should examine the proposed model through quantitative and mixed-method designs with larger samples of teachers, school principals, students, curriculum planners, and educational policymakers. Comparative studies across different provinces and school levels would also help determine whether the components identified in this study are stable across contexts or whether they vary according to regional infrastructure, socioeconomic conditions, subject area, or teacher experience. Future studies should also test the actual classroom effects of ChatGPT-supported teaching on students' achievement, motivation, critical thinking, creativity, self-regulation, and digital literacy. Longitudinal research is recommended to examine whether teacher training and institutional support lead to sustained and responsible use of ChatGPT over time. Experimental and design-based studies could further clarify which types of prompts, instructional strategies, supervision mechanisms, and assessment practices produce the strongest educational outcomes.

In practice, educational authorities should approach ChatGPT as a structured pedagogical innovation rather than as an informal digital tool. Teacher training programs should be designed to develop digital literacy, prompt engineering, ethical awareness, content evaluation skills, and the ability to integrate ChatGPT outputs with curriculum objectives. Schools should be equipped with stable internet access, appropriate digital devices, and technical support systems so that teachers can use AI tools without interruption or inequality. Clear implementation guidelines should be developed to define appropriate classroom uses, prevent misuse, protect academic integrity, and ensure that ChatGPT supports rather than replaces student thinking. School managers should also establish continuous monitoring and feedback mechanisms to evaluate the quality, accuracy, and educational effectiveness of ChatGPT use. In this way, ChatGPT can become a practical tool for strengthening teachers' instructional efficiency, enriching student learning, and increasing flexibility in learning management.

Acknowledgments

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

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

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.

References

1. Ahmad SF, Alam MM, Rahmat MK, Mubarik MS, Hyder SI. Academic and Administrative Role of Artificial Intelligence in Education. *Sustainability*. 2022;14(3):1101. doi: 10.3390/su14031101.
2. Dhyani S, Ahmad I, Gupta A, Singh S, Pathak AK, Yamsani N, editors. Role of Artificial Intelligence in Education Sector. 2024 IEEE 1st Karachi Section Humanitarian Technology Conference (KHI-HTC); 2024: IEEE.
3. Alkan A. Use of Artificial Intelligence in Education. *Journal of Research in Human and Society Sciences*. 2024;13(1):483-97. doi: 10.15869/itobiad.1331201.
4. Alier M, Garcia-Penalvo F, Camba JD. Generative Artificial Intelligence in Education: From Deceptive to Disruptive. 2024. doi: 10.9781/ijimai.2024.02.011.
5. Tan AA, Huda M, Rohim MA, Hassan TRR, Ismail A, Siregar M. ChatGPT in Supporting Education Instruction Sector: An Empirical Literature Review. *International Congress on Information and Communication Technology*: Springer; 2024. p. 13-26.
6. Bakhtiarvand M. Using ChatGPT in the Classroom: Application of Artificial Intelligence in Improving Teaching and Learning. 2024.
7. Amin MYM. AI and ChatGPT in Language Teaching: Enhancing EFL Classroom Support and Transforming Assessment Techniques. *International Journal of Higher Education Pedagogies*. 2023;4(4):1-15. doi: 10.33422/ijhep.v4i4.554.
8. Lee GG, Zhai X. Using ChatGPT for Science Learning: A Study on Pre-Service Teachers' Lesson Planning. *IEEE Transactions on Learning Technologies*. 2024;17:1643-60. doi: 10.1109/TLT.2024.3401457.
9. Jia F, Sun D, Looi CK. Artificial Intelligence in Science Education (2013-2023): Research Trends in Ten Years. *Journal of Science Education and Technology*. 2024;33(1):94-117. doi: 10.1007/s10956-023-10077-6.
10. Ausat AMA, Massang B, Efendi M, Nofirman N, Riady Y. Can ChatGPT Replace the Role of the Teacher in the Classroom: A Fundamental Analysis. *Journal on Education*. 2023;5(4):16100-6.
11. ElSayary A. An Investigation of Teachers' Perceptions of Using ChatGPT as a Supporting Tool for Teaching and Learning in the Digital Era. *Journal of Computer Assisted Learning*. 2024;40(3):931-45. doi: 10.1111/jcal.12926.
12. Wardat Y, Tashtoush M, AlAli R, Saleh S. Artificial Intelligence in Education: Mathematics Teachers' Perspectives, Practices and Challenges. *Iraqi Journal for Computer Science and Mathematics*. 2024;5(1):60-77. doi: 10.52866/ijcsm.2024.05.01.004.
13. Ramazani A, Sharifi M. Examining Teachers' Views on the Use of ChatGPT in Science Education. *Iranian Journal of Distance Education*. 2025;7(1):89-102.
14. Namilae A, Leddo J. Comparing the Effectiveness of ChatGPT and Teacher-Generated Content for Teaching Students. *International Journal of Social Science and Economic Research*. 2024;9(7):2554-64. doi: 10.46609/IJSSER.2024.v09i07.031.
15. Naz I, Robertson R. Exploring the Feasibility and Efficacy of ChatGPT-3 for Personalized Feedback in Teaching. 2024. doi: 10.34190/ejel.22.2.3345.
16. Chiu TK, Xia Q, Zhou X, Chai CS, Cheng M. Systematic Literature Review on Opportunities, Challenges, and Future Research Recommendations of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*. 2023;4:100118. doi: 10.1016/j.caeai.2022.100118.
17. Khoso FJ, Ali N, Aslam N. Use of ChatGPT and AI Tools by Undergraduates: Students' and Teachers' Perspectives. *Spry Contemporary Educational Practices*. 2023;2(2). doi: 10.62681/sprypublishers.scep/2/2/14.
18. Brenner W, van Giffen B, Koehler J. Management of Artificial Intelligence: Feasibility, Desirability and Viability. *Engineering the Transformation of the Enterprise: A Design Science Research Perspective* 2022. p. 15-36.

19. Bankins S, Ocampo AC, Marrone M, Restubog SLD, Woo SE. A Multilevel Review of Artificial Intelligence in Organizations: Implications for Organizational Behavior Research and Practice. *Journal of Organizational Behavior*. 2024;45(2):159-82. doi: 10.1002/job.2735.
20. Javadi Fard F. The Role of Artificial Intelligence in Human Resource Management. 2023.
21. Kalatheh Aghamohammadi A, Sharifi SM. Examining the Position of Artificial Intelligence in Human Resources from the Perspective of the Role of Artificial Intelligence in Job Elimination: Case Study of News Anchoring. *Future Studies of Media*. 2022;3(3):36-64.
22. Leal Filho W, Ribeiro PCC, Mazutti J, Lange Salvia A, Bonato Marcolin C, Lima Silva Borsatto JM. Using Artificial Intelligence to Implement the UN Sustainable Development Goals at Higher Education Institutions. *International Journal of Sustainable Development & World Ecology*. 2024;1-20. doi: 10.1080/13504509.2024.2327584.
23. Neumann O, Guirguis K, Steiner R. Exploring Artificial Intelligence Adoption in Public Organizations: A Comparative Case Study. *Public Management Review*. 2024;26(1):114-41. doi: 10.1080/14719037.2022.2048685.
24. Prosviryakova L, Osipov K, Dmitriev A, editors. The Use of Artificial Intelligence Technologies in the Organization of the Educational Process. *AIP Conference Proceedings*; 2024: AIP Publishing.
25. Jashireh M, Mousazadeh S, Jabin M, Salehzehi F, Bazmani Z, editors. Application of Artificial Intelligence in Education and Curriculum Planning. *Proceedings of the First International Conference on Law, Management, Educational Sciences, Psychology, and Educational Planning Management*; 2023.
26. Pouriyeh A, Mohammadi H, Mostafalou T, editors. The Impact of the Emergence of Artificial Intelligence and ChatGPT on Educational Outcomes in Schools: A Systematic Review-Based Study. *Proceedings of the First National Conference on New Approaches to the National Curriculum in the New Ecosystem*; 2024.
27. Rostaminejad MA, Khajeh H. A Phenomenological Analysis of Teachers' Perceptions of Integrating ChatGPT in Elementary Education. *Quarterly Journal of Educational Planning Studies*. 2024;11(29):189-220.
28. Shafiipour Motlagh F, Moslehi N, editors. Presenting a Model for Developing the Use of Augmented Reality Technology in Higher Education: Strategies. *Proceedings of the 17th National Conference and the 11th International Conference on E-Learning Management and E-Teaching with an Emphasis on Technology-Enhanced Learning*; 2023: University of Isfahan.
29. Aleksic-Maslac K, Borovic F, Biocina Z, editors. Perception and Usage of ChatGPT in the Education System. *INTED2024 Proceedings*; 2024: IATED.
30. George B, Wooden O. Managing the Strategic Transformation of Higher Education through Artificial Intelligence. *Administrative Sciences*. 2023;13(9):196. doi: 10.3390/admsci13090196.