The Effect of Artificial Intelligence on the Academic Development of Iranian EFL Students

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Abstract

The incorporation of Artificial Intelligence (AI) with teaching and education has changed academic learning and created new opportunities and challenges for students' academic development. The current research examines the effect of AI on EFL students' academic performance and learning processes, focusing on their opportunities and challenges related to AI. The participants of the study consisted of ninety-five EFL students of Tehran University who used AI to learn courses better in the academic year of 2024-2025. These students were chosen using purposive sampling to ensure relevance. This research used a mixed methods design, including both quantitative and qualitative data collection techniques. A self-structured questionnaire consisted of eleven items: seven closed-ended questions measuring the perception, usage, and effectiveness of AI tools, and four open-ended questions that examined experiences, expectations, and concerns. Using SPSS version 24 software, quantitative data were analyzed by considering frequency and percentage, while qualitative answers underwent thematic analysis. The results show that 96.6 percent of participants apply AI in their academic tasks; 89.2 percent of virtual assistants are the most widely employed AI applications, supporting real-time feedback, task management, and information retrieval. Moreover, 43.4 percent of participants apply AI-powered learning platforms, indicating a shift towards interactive and personalized learning. This research also emphasizes the necessity of a structured framework for integrating AI with support from ethical guidelines. Consequently, while AI has enormous potential to improve academic performance and increase learning efficiency, its successful implementation is contingent on addressing concerns about accuracy, cognitive disengagement, and ethical implications.

Keywords: Academic Development; Artificial Intelligence; Critical Thinking; Education Technology

1. Introduction

In recent years, the role of Artificial Intelligence (AI) in education has become increasingly relevant in both research and practice (Schiff, 2021).

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As Jafari and Keykha (2024) stated, the uninterrupted development of AI within higher education has made predicting its path with certainty increasingly difficult, and decision-makers should remain attentive in monitoring emerging opportunities and challenges. AI is the methods and technologies that enable computers to simulate human intelligence and be able to learn, think, reason, and solve problems like humans. As stated by Jia (2024), today, the application areas of AI are very broad, from transportation (smart logistics, autonomous driving), finance (credit assessment, risk), healthcare (medical robots, assisted disease diagnosis), agriculture, entertainment, to smart homes, bringing convenience and innovation to people's lives and work. Furthermore, AI is changing many fields, particularly teaching and education. AI makes it easier to achieve personalized learning by tailoring the educational experience to meet the requirements of individual students. In accordance with Liang and Xu (2013), learning systems employ AI to understand students' strengths and weaknesses and offer appropriate resources and guidance. Moreover, as these technologies continue to develop, the scope of AI's impact on other dimensions of teaching and education has become progressively obvious. This leads us to explore how AI is not only a tool for advanced learning but also a powerful asset for improving the efficiency of education management.

Education facilitators face changes arising from technology. Its utilizations change the world in which they teach, along with the students under their care. Ultimately, students change based on what teachers teach about – content, context, and skills. According to Roll and Wylie (2016), AI can perform some tasks better than humans. But even a child can beat the most advanced AI technology in many ways. Despite the many advances that AI has made in the present time, it still has a long way to go before it can surpass humans in rich cognitive, social, and cultural activities such as learning and education. But it can certainly assist by adding to what the student is able to do. Where AI can assist in education, educational experts emphasize that the student must always be in the loop and monitor what they are doing. Efficient AI solutions in the classroom are those that enable the student. When a student understands what the teacher is teaching, the gains are considerable (Serholt et al., 2014). In the evolving landscape of education, AI has also emerged as an important assistant for teachers around the world. If we look at the digital revolution, the challenge facing every student is how to effectively use AI in learning.

The fast development of AI has changed different fields of science, and education is no exception. According to Magazine (2020), AI plays an important role in academic development and has a direct effect on

students' academic growth by providing a combination of opportunities and challenges. From personalized learning experiences to intelligent learning systems that offer appropriate guidance, support, and feedback relied on individual learning patterns (Hwang et al., 2020), AI has the potential to change the field of education and meet the diverse needs of learners (Holmes et al., 2019). Even so, positive educational outcomes are not guaranteed by adopting advanced AI technologies alone (Castaneda & Selwyn, 2018; Du Boulay, 2000; Selwyn, 2016). The use of AI in academic settings raises important questions regarding access, equity, and the evolving role of traditional teaching methods. The effect of AI on teaching and education is multifaceted and transformative.

As stated by Hennekeuser et al. (2024), AI makes personalized learning easier by adapting educational content to students' needs. Some studies have shown that students in personalized learning environments demonstrate more positive attitudes and better self-efficacy upon their learning (Johnson & Smith, 2019). Accordingly, Baker (2021) declared that these experiences are progressively reachable by AI-based tools that analyze large amounts of data to identify learning problems and provide tailored solutions. For example, AI-based platforms, such as adaptive learning systems, have been shown to increase student performance and engagement by offering real-time feedback and customized learning paths (Luckin et al., 2016; Zawacki-Richter et al., 2019).

Wazir et al. (2025) examined how collaborative learning, study habits, and time management affect students' academic performance. Their AI-based models not only identified at-risk students early but also facilitated interventions that reduced dropout rates by 25 percent. Concurrently, these investigations underscore the growing importance of advanced AI assessment systems in fostering more adaptive, data-driven, and student-centered learning environments. In another study, Jayawardena et al. (2025) compared the quality of feedback provided by ChatGPT-4 and a teacher on dental student assignments. Whereas students rated both sources similarly on most dimensions, they stated feeling more comfortable with human feedback. However, expert evaluations showed that feedback generated by AI was clearer and more constructive, emphasizing the potential of AI tools to complement teachers in educational settings.

Traditional education encourages students to take a more active role in the learning process by strengthening their exploration, analysis, and problem-solving skills. Students must have critical thinking skills to shape their overall learning experiences. According to Facione (2011), teachers sometimes emphasize questioning techniques, collaborative activities,

and assignments to develop students' abilities to evaluate information and develop independent perspectives. Nevertheless, the rapid information processing and perspicacious answers offered by AI challenge traditional learning techniques, raising questions about the differentiations between machine-based learning and human learning. For instance, although AI can process and analyze data, it may lack the precise understanding and creativity inherent in human cognition (Luckin et al., 2016). As Wu (2023) stated, this highlights the need for an unbiased technique to integrate AI, ensuring that it complements rather than replaces human interaction and the development of critical thinking skills.

Using AI in education is not without challenges. Effective incorporation of AI and education needs a comprehensive understanding of the learning process and technology. This complexity is compounded by ethical concerns surrounding the increasing use of generative AI. For example, Qadir (2023) points out, the risk of students misusing AI tools in unauthorized or dishonest ways, such as using AI-generated content to complete academic assignments. Furthermore, Williamson (2017) indicated that concerns about the use of AI in control, monitoring, and evaluation methods could undermine independence and trust in the educational environment. Accordingly, Holmes and Tuomi (2022) stated, universities need to clearly define the role of AI and the extent to which it will be used in student learning to automatically address these challenges.

As data processing and computing technologies have changed, AI is increasingly being used in the field of learning, often referred to as AI in learning. Applications such as intelligent learning systems, learning analytics dashboards, human-computer interactions, educational robots, and adaptive learning platforms have shown considerable potential to enhance learning and teaching (Chen et al., 2020; Zawacki-Richter et al., 2019). As an example, Luckin et al. (2016) stated, intelligent learning systems provide personalized feedback and support learning outcomes and improve student engagement. Likewise, Holmes et al. (2019) pointed out that adaptive learning platforms use AI to match learners' individual needs with educational content, promoting more efficient and effective learning experiences.

Although advances in new technologies have occurred, the integration of AI with education raises many questions about its alignment with learning theories. Whereas investigations have studied the challenges (Hwang et al., 2020), obstacles (Baker et al., 2019), and future perspectives (Pinkwart, 2016), few explicitly analyze AI's s various roles and their association with educational frameworks. As an example, how do AI tools correspond to sociocultural or constructivist theories that

emphasize critical thinking, context, and collaboration? (Luckin et al., 2016) Furthermore, the long-term impact of AI on learning, teaching, and educational equity is still unknown. (Selwyn, 2019).

An essential challenge is to ensure that AI complements human interaction rather than replaces it. Holmes and Tuomi (2022) pointed out that AI performs tasks automatically and provides data-driven insights, but it lacks the creativity, empathy, and accurate understanding of humans. In the same way, Facione (2011) stated, excessive use of AI for evaluation and feedback may reduce opportunities for meaningful dialogue and reflection, which are crucial for higher-order thinking. Ethical concerns, such as algorithmic bias, data privacy, and the digital divide, must also be addressed to ensure inclusive and equitable learning environments (O'Neil, 2017). AI has enormous capability to change education through personalized learning and adaptive systems. Even so, its incorporation needs caution. A deeper comprehension of the relationship of AI to educational theories is needed, along with addressing essential educational and ethical challenges. A human-centered and balanced approach that prioritizes equitable access can ensure the power of AI, rather than eliminate it.

The present research studies the effect of AI technologies on the academic performance and learning processes of English as a foreign language (EFL) students of Tehran University who used AI to learn courses better in the academic year of 2024-2025. In particular, this study attempts to investigate the types of AI technologies used, the frequency of their use, and students' perceptions of their effectiveness in improving academic performance. Furthermore, this research explores the concerns and challenges related to integrating AI into education. For the purpose of achieving the above-mentioned research objectives, the following research question was raised:

1. What is the effect of artificial intelligence on the academic development of Iranian EFL students?

2. Materials and Methods
2.1. Design and Participants

This research used a mixed methods design, including both quantitative and qualitative data collection techniques. The participants of the study included ninety-five EFL students of Tehran University (45 males and 50 females) who used AI to learn courses better in the academic year of 2024-2025. Their ages ranged from 20 to 40 years, and most of the students were between 20 and 25 years old. A purposive, non-probability sampling method was used to ensure the selection of participants with

direct experience in learning environments using AI to enhance the relevance of the findings. These EFL students were selected for their knowledge and exposure to advanced technologies related to AI. The demographic characteristics of the students are represented in Table 1.

Table 1. *Demographic Characteristics of the Participants of the Study*

Variables		Frequency	Percent	Valid Percent
Gender	Male	45	42.75	42.75
	Female	50	47.25	47.25
Age Group (Year)	20-25	42	39.9	39.9
	26-30	28	26.6	26.6
	31-35	19	18.05	18.05
	36-40	6	5.7	5.7
Total		95	100.0	100.0

According to Table 1, 47.25 percent of the participants were female students, and 42.75 percent of the participants were male students. Most of the participants were aged between 20 and 25 years (39.9 %), representing that the majority of the students were young, while only 5.7 of the students were between 35 and 40 years.

This approach allowed for a focused survey of individuals who were directly involved with the core technologies of the study. Given the small sample size and its focus on particular academic programs, the research findings were examined preliminarily and exploratory. They cannot be generalized to all students in these programs or to students in other disciplines. Further study with a larger and more diverse sample is required to offer stronger perceptions.

2.2. Data Collection Procedure

Data were collected employing a self-structured questionnaire distributed via Google Forms. This platform was selected due to its user-friendly interface and integrated analytical tools that help with effective data management and interpretation. As stated above, this research used a mixed methods design, including both quantitative and qualitative data collection techniques. The questionnaire includes eleven questions, classified into two kinds of questions as follows: seven closed-ended questions to quantify students' answers and identify patterns, and four open-ended questions intended to collect detailed qualitative insights into participants' experiences, perceptions, and expectations regarding the impact of AI on their learning. The open-ended questions were divided as follows: yes/no questions (Items 1, 4, and 6), multiple-choice questions

(Items 2 and 7), and Likert-scale questions (Items 3 and 5), allowing for classified and ordinal data analysis.

2.3. Data Analysis Procedure

All data were analyzed employing the Statistical Package for Social Sciences (SPSS version 24). Quantitative data were analyzed using descriptive statistical methods, which consist of frequency and percentage calculations, to provide a clear overview of students' perceptions, usage patterns, and the perceived effectiveness of AI tools. For qualitative data, answers to open-ended questions were analyzed by applying thematic analysis, a rigorous and well-established method for interpreting qualitative data. Thematic analysis followed the framework introduced by Braun and Clarke (2006), ensuring a clear and systematic approach to identifying, analyzing, and reporting patterns (themes) in the data.

Analysis was conducted at two levels: vertical analysis, which concentrated on individual answers to identify unique insights, and horizontal analysis, which focused on patterns across the entire data set to ensure a comprehensive understanding of emerging themes. According to Ezzy (2013), to increase the validity and reliability of the findings, the analysis followed a structured and iterative process. This process contained: transcribing participants' answers, creating a coding scheme, developing an analysis grid, analyzing transcripts and thematic interpretation, and calculating statistical indicators. To further strengthen the validity of the findings, data triangulation was used. This mixed method approach, which integrates quantitative and qualitative analysis, provides a nuanced and rich understanding of students' perceptions of AI in education while ensuring the generalizability, depth, and reliability of the findings.

3. Results

The interpretation of collected data included addressing each research question both quantitatively, by calculating frequencies within specific thematic categories, and qualitatively, through the statistical analysis of the participants' answers. Based on the statistical data collected, 96.6% of participants use AI technologies in academic activities. This high percentage indicates a broad adoption of AI tools among students, reflecting the growing incorporation of advanced technologies into the educational perspective.

According to the major kinds of AI applied in academic fields, 89.2% of participants apply virtual assistants (e.g., ChatGPT, Siri, Google Assistant, etc.), 43.4% of participants apply AI-based educational

platforms (e.g., Coursera, Duolingo, etc.), 18.6% of participants apply automatic content generation tools, 9.2% of participants apply data processing tools (e.g., predictive analysis), while 4.5% of participants apply other kinds of AI. Frequency analysis and percentage calculations were used to analyze the data. These descriptive techniques enabled us to determine the distribution of answers within each class of AI application.

Percentages were measured by relating the number of answers for each class to the total number of participants, offering an obvious image of the frequency of each AI application option. The findings show that the use of AI in universities is now a well-established practice, with a definite preference for AI-based learning platforms and virtual assistants. This considers a worldwide tendency upon incorporating accessible and interactive technologies into the educational process. Virtual assistants are the most popular due to their ease of application and availability for a wide range of academic activities. Moreover, AI-assisted learning platforms offer a personalized learning experience that contributes to their usual application.

In addition, this research examined the frequency of use of AI tools in academic tasks. The findings represent considerable variation among students, with data suggesting a broad acceptance of these technologies. Most students (58.6 percent) apply them on a weekly basis, which indicates that these tools have become an integral part of the educational process, helping to complete projects, assignments and increase knowledge. A significant percentage, 19.8 percent, use AI on a daily basis, showing a greater reliance on these technologies, likely because they see them as crucial for learning – whether through learning platforms, virtual assistants, or other AI-based tools. Moreover, 12.8 percent of students apply AI monthly, which may indicate occasional application based on academic requirements, while a similar percentage (12.8 percent) apply it rarely, showing limited preference or adoption for traditional learning methods. Just 2.2 percent of students pointed out that they do not apply AI tools at all, confirming that AI has become an almost essential resource in education.

The research also aimed to explore students' perceptions of the impact of using AI in their learning process. The findings indicated a considerable majority of students think AI is helpful in their academic tasks. Therefore, 81 percent of students agree that the application of AI-based technologies improves their educational experience, whether by optimizing the time spent studying or by offering quick access to personalized educational resources that facilitate their understanding of complex material. Even so, 18.6 percent of students were skeptical about the impacts of AI on their

learning, which may indicate limited application or a lack of familiarity with the capabilities of these tools. This group may consist of students who have not studied in detail all the options offered by AI or those who are not yet convinced of the effectiveness of these technologies. On the other hand, just 3.4 percent of students saw AI as having no benefit to their educational process. These students may prefer traditional learning methods or may deal with difficulties in applying these technologies, which limits their perception of the capability of AI in facilitating their investigations.

Considering the impact of applying AI on academic performance in exams, projects, and grades, many students think that AI has a positive role in the improvement of their results. Particularly, 83.4 percent of students believe that applying AI will help increase their academic performance. Even so, 16.3 percent of students think that using AI will not bring substantial changes in this area, and 4.5 percent feel that it will only limit knowledge acquisition. Furthermore, just 3.4 percent of students believe that the use of AI can lead to a decrease in academic performance, indicating that there are also key opinions about the long-term influences of this technology on the educational process.

The research also intended to study to what extent students think that the application of AI helps them be more efficient in the learning process, taking into account aspects such as quick access to relevant information or saving time. The findings of this study showed that the majority of students (84.5 percent) think that AI enhances the efficiency of learning by increasing quick access to educational resources, decreasing the time required to find information, and helping them better organize their academic tasks. In contrast, 11.6 percent of students did not believe that applying AI would increase their learning efficiency, which may indicate a different understanding of its application or a lack of familiarity with the capabilities of this emerging technology. Furthermore, 8.1 percent of students pointed out that they were unsure about the impact of AI on their learning efficiency, which could indicate lower usage or uncertainty about how these tools can help their learning. Most of the students identify the benefits of using AI in increasing the efficiency of learning. At the same time, there is still a segment of them who are not convinced by its impacts and highlight the need to better understand and use these technologies.

When discussing students' primary concerns about the application of AI in learning, the most critical topic is the chance of receiving incorrect answers, with 49.2 percent of students exhibiting this concern. This concern is accompanied by concerns about the negative impact on critical thinking (17.5 percent) and the risk of over-reliance on technology (17.5

percent). Other concerns, although less common, contain data privacy issues (10.4 percent), fears that findings produced by AI may not actually be related to the student (4.5 percent), and a class called "other" (6.9 percent). These concerns demonstrate a strong awareness among students of the benefits and disadvantages of AI in learning, specifically with regard to the precision of AI-produced content and its potential impacts on their cognitive potential.

For the question "What recommendations do you have to improve the application of AI to more successfully help the process of learning?", this research used thematic analysis to detect recurring patterns in the answers of student. This analysis continued a systematic process to ensure validity and reliability in capturing key themes.

Table 2. *Recommendations to Improve the Application of AI in Learning*

Thematic Classes	Frequency	Example Answers
Appropriate incorporation of AI into learning tasks	35	Teaching students in the use of AI; interactive courses with personalized assignments; algorithms that detect knowledge gaps and recommend exercises; personalized learning platforms; direct feedback programs
Controlled and limited application of AI	16	AI should only help with explanations, not problem solving. Information should be processed through personal critical thinking; encouraging critical engagement with AI-produced data.
Improved information accuracy	16	AI should offer organized and accurate information. Consistency in providing correct answers; recommendations to improve validation processes in AI tools
Others	28	Discounts on paid AI programs for students; recommendations for free, more effective AI tools; no recommendations made

According to Table 2, the following four thematic classes were detected, indicating students' diverse concerns and perspectives about the application of AI in learning: 1) Appropriate incorporation of AI into learning tasks (35 answers): Students highlighted the demand to appropriately incorporate AI tools into learning environments and teaching practices to ensure that they complement each other. Recommendations contained personalized learning platforms, instant feedback programs, and algorithms to identify knowledge gaps and suggest exercises. 2) Controlled and limited application of AI (16 answers): Students support a balanced approach, in which AI helps critical thinking or learning without replacing human interaction. Concerns about

overreliance on AI and the requirement for apparent application guidelines were emphasized. 3) Improved information accuracy (16 answers): Students emphasized the significance of trustworthy content produced by AI and called for accurate validation processes to confirm accuracy and prevent misinformation. 4) Others (28 answers): This class contained a variety of recommendations, such as user-friendly AI interfaces, transparency in AI decision-making, and demands for free or discounted AI tools.

To enhance the validity and reliability of the results, data triangulation was used by comparing responses across different academic programs. This enabled the research to identify program-specific concerns or trends and confirm the consistency of themes across different student populations. Triangulation helped strengthen the results by ensuring that the themes identified held true across different student groups. The results show that although students observe the capacity of AI to improve learning, they also have recommendations and concerns to develop its application in learning. In general, students support a responsible and thoughtful approach to integrating AI, stressing its capacity to improve the process of learning when used in a balanced and disciplined manner. Analyzing these themes emphasizes the significance of ensuring the value of adding AI tools to learning without challenging the accuracy of traditional learning methods.

As shown in Table 3, regarding "What are the main ways that applying AI improves your learning process? (e.g., helping with understanding material, saving time, providing additional resources, etc.)". Three thematic classes were found as follows: 1) Time savings (40 answers): Participants extensively determined that AI tools decrease the time spent on activities such as research, information processing, and automating repetitive activities. AI's capacity to offer summaries, find relevant information, and perform complex calculations enables learners to concentrate on critical thinking and greater understanding. 2) Optimizing information understanding (21 answers): Students pointed out that AI tools, such as intelligent learning systems, to simplify complex concepts and present information in digestible formats. Relevant content, instant feedback, and adaptive learning increase comprehension, retention, and engagement. 3) Information Structure (13 answers): Participants highlighted the role of AI in effectively organizing and categorizing information. AI helps visualize data, create outlines and structure research, and helps learners navigate large volumes of information and concentrate on key aspects. 4) Others (21 answers): This class contained different recommendations, such as user-friendly AI interfaces,

transparency in AI decision-making, and demands for free or discounted AI tools.

Table 3. *Ways of Using AI that Enhance the Process of Learning*

Thematic Classes	Frequency	Example Answers
Time savings	40	AI saves time by quickly incorporating general items on demand. It curates answers, reducing study hours by 50 percent. AI offers clear explanations and synthesizes information efficiently.
Optimizing information understanding	21	AI assists to clarify complex concepts, makes content easier to understand, and finds relevant sources for documentation. It can give solutions step-by-step, create logical summaries and diagrams.
Information structure	13	AI structures and organizes information, summarizes content, provides additional resources, and clarifies complex topics. It helps learning by making information easily accessible and well-organized.
Others	21	Discounts on paid AI programs for students; recommendations for free, more effective AI tools; no recommendations provided.

To enhance the validity of the results, descriptive statistical methods were used to express the frequency of responses within each thematic class, which provided a quantitative analysis to support the qualitative analysis. These steps helped to provide an overall comprehension of the role of AI in improving the process of learning. These results emphasize the numerous ways in which AI is incorporated with learning, increasing both depth and efficiency of comprehension. The responses emphasize the impact of AI in enhancing understanding and helping organize information, all of which contribute to a more effective learning experience.

As shown in Table 4, regarding "What are the main challenges you face when applying AI for your studies? (e.g., misinformation, lack of personalization, over-reliance on technology, etc.)". The following four thematic classes were found: 1) Information accuracy (68 answers): The first concern among users is the reliability of the data offered by AI tools. Outdated or incorrect information can cause misunderstandings and may negatively impact the process of learning. 2) Over-reliance on technology (11 answers): Students emphasized the risk of over-reliance on AI, which may prevent critical thinking and independent problem-solving skills. 3) Various Errors (8 answers): This class consists of minor mistakes or errors

in AI systems that can disrupt the learning experience. 4) Other challenges (8 answers): This class covers other challenges that do not fall into the primary themes, reflecting the diverse constraints that users face in different contexts.

Table 4. *Main Challenges Faced when Applying AI*

Thematic Classes	Frequency	Example Answers
Information accuracy	68	Information is often inaccurate and needs to be verified. The answers provided are often not accurate and need to be checked with other sources. AI tools often use unverified or outdated databases, leading to unreliable results. Some AI answers contain irrelevant information, while others are incomplete or misleading.
Over-reliance on technology	11	Overreliance on AI decreases academic independence and critical thinking. I worry that students will become overly dependent on technology, leading to a lack of problem-solving abilities.
Various errors	8	Occasionally, AI doesn't fully comprehend the question, leading to irrelevant answers. There are frequent spelling errors and grammatical inaccuracies in AI-generated content. Some tasks are beyond AI's ability, such as more complex or nuanced problems.
Other challenges	8	AI cannot reflect emotional nuances in text, which affects its relevance in some contexts. Concerns about ethics and privacy arise, particularly regarding how personal data is applied by AI.

To complete the qualitative analysis, descriptive statistical methods were applied to measure the frequency of responses within each class, which represented a quantitative basis for the recognized themes. This triangulation of data (i.e., combining quantitative frequency counts with qualitative thematic analysis) increases the validity of the results by offering a comprehensive overview of students' concerns about the application of AI in learning. The results highlight the requirement for continued efforts to address the challenges related to integrating AI into learning. The concerns emphasized in the responses highlight the significance of ensuring the accuracy and reliability of AI tools to reduce the risks of overreliance and system errors, finally creating an environment in which AI can augment traditional learning methods.

According to Table 5, for the topic "How would you explain the impact of applying AI on how you learn and collaborate with teachers or

classmates?", three thematic classes were found as follows: 1) Positive effect (61 answers): A considerable number of participants see AI as a precious tool for improving learning. AI was viewed as enabling access to resources, delivering personalized content, and enhancing communication with teachers and classmates. Tools such as intelligent learning systems and automated feedback mechanisms were considered to increase efficiency, engagement, and simplify interactions. 2) Negative effect (17 answers): Some of the students faced challenges such as over-reliance on AI that decreases critical thinking, lack of human interaction, and concerns about the accuracy or appropriateness of AI-produced content. For some people, AI-powered collaboration creates a sense of separation and reduces the depth of their learning experience. 3) Neutral effect (17 answers): Some of the students received no considerable shift in their learning because of AI. They understood AI tools valuable but not changing, recommending that AI supplements rather than essentially alter their academic interactions.

Table 5. *Effect of Applying AI on Learning and Collaboration with Teachers or Classmates*

Thematic Classes	Frequency	Example Answers
Positive effect	61	AI enhances students' relationship with classmates and improves the learning process. Learning is faster, better structured, and more accessible thanks to AI. AI offers more resources and makes the learning process more efficient. In collaborative learning, AI enables better communication through tools such as chatbots or automated translations.
Negative effect	17	AI decreases the willingness to ask questions because the student becomes overly reliant on it. Continuous use of AI can lead to dependency that kills independent thinking. There is a lack of human interaction and the boundary between the online and real world becomes blurred. AI can turn students into passive learners and decrease critical thinking.
Neutral effect	17	AI has not had an impact on how students collaborate with professors or colleagues. Students do not see any major impact of AI on their learning or relationships with others. AI does not appear to have a significant impact on how students collaborate with peers or professors. The use of AI has not really changed students' study habits or how they interact with others.

Descriptive statistical methods were applied to measure frequency distributions for each class, which provide a quantitative representation of

the perceived effect of AI. These results are consistent with the qualitative data, where most participants expressed the potential of AI to improve collaboration and learning. At the same time, neutral and negative classes point out fields to improve, such as ensuring accuracy, promoting critical thinking, and enhancing human interaction. To conclude, the thematic analysis indicates an overall positive outlook regarding the integration of AI into academic environments, with the majority of participants reporting improved learning experiences. Then, the results also emphasize the requirement for caution, as challenges such as overreliance and decreased human interaction need to be addressed to optimize the role of AI in learning.

4. Discussion

The current research analyzes the effect of AI technologies on EFL students' learning processes and academic performance, concentrating on their insights and the challenges related to AI integration in learning. The findings represent that 96.6 percent of participants apply AI in their academic tasks, highlighting the deep incorporation of this technology into modern learning. Virtual assistants are the most widely employed AI applications (89.2 percent), supporting real-time feedback, task management, and information retrieval. Moreover, 43.4 percent of participants apply AI-powered learning platforms, indicating a shift towards interactive and personalized learning. Virtual assistants assist students in quickly accessing relevant information, organizing tasks, and receiving immediate feedback, consequently increasing engagement and efficiency in the educational process.

Thematic analysis of open-ended responses shows that AI has had a dual impact. Furthermore, students support its incorporation to complement traditional teaching methods. And then, some of the members in the academic community are calling for balanced regulations and stronger accreditation protocols. Triangulating data from different university programs confirms the consistency of these concerns and strengthens the reliability of the conclusions. According to this research, it is concluded that AI provides significant benefits such as improved educational outcomes, increased student engagement, and personalized learning. Therefore, it also brings challenges such as reduced critical thinking, the risk of academic fraud, and overreliance on technology. The results are consistent with previous research representing that AI can optimize study time, increase academic performance, and adapt educational content to students' individual needs (Krause et al., 2025).

The research also pointed out some remarkable considerations: Almost half of the participants (49.2%) commented on the accuracy of AI-produced content, whereas others pointed to the dangers of technological dependency that may weaken human interaction and critical thinking. These considerations were also represented in the literature. A research study by Ju (2023) has highlighted the negative impact of AI on human interaction and critical thinking, and has emphasized the need for validation mechanisms and ethical regulations for the use of the technology. Likewise, Saseanu et al. (2024) proposed control measures to decrease the negative influences of AI, and Lodzikowski et al. (2024) highlighted the need for ethical regulations in the application of AI in learning. Responsible application of AI in learning can have significant advantages and contribute to more efficient and consistent academic preparation. AI should not replace traditional methods, but rather complement them and provide an optimized and personalized learning experience.

5. Conclusions and Implications

The current study demonstrates that AI has become a vital component of the modern academic panorama, providing significant advantages such as personalized learning, increased engagement, and better access to educational resources. However, whereas most EFL students consider AI positively—citing its capacity to increase learning efficiency—there are significant challenges, especially concerning the accuracy of AI outputs, the potential erosion of critical thinking skills, and the risk of overreliance. To ensure the effective and practical integration of AI into learning, the study proposed the following: Comprehensive training: Universities should carry out practical programs for both teachers and students to develop a thorough understanding of AI tools and their proper application. Verification guidelines and protocols: Universities should create strong standards for AI placement that contain regular validation of information generated by AI and clear guidelines to avoid overreliance on the technology. Ethical and privacy considerations: Universities should develop and implement policies to protect student data and reduce potential biases in AI systems. Continuing research: Future research should adopt continuing programs with larger and more diverse participants to better understand the long-term impacts of AI on learning issues. Accordingly, universities can ensure that AI can complement, rather than replace, traditional learning methods, finally creating a more adaptive, efficient, and personalized learning environment that supports the development of essential skills for future success.

Looking to the future, AI is expected to play an important role in learning, not by replacing teachers, but by assisting them. AI can perform usual executive responsibilities, allowing students to concentrate more on the complex aspects of learning, such as providing emotional support and improving critical thinking. The future may include a hybrid learning model, where AI and teachers work together to offer a holistic learning experience. Furthermore, this hybrid method can help address educational inequalities and make learning opportunities more accessible to a wider range of students, especially in disadvantaged areas. AI also has the capacity to make learning more accessible, particularly in disadvantaged areas. By offering adaptable and measurable resources, AI can help bridge educational gaps and promote lifelong learning. Nevertheless, this needs careful programming and the establishment of strong ethical guidelines to ensure that the benefits of AI are shared equitably. As these future possibilities are considered, it is important that AI is carefully incorporated into the education system, balancing technological advancements with the human elements that are at the core of effective learning.

The impact of AI on learning is a complex and broad topic, presenting both opportunities and challenges. While AI can improve learning experiences and efficiency, it also raises important ethical questions. As AI continues to develop, it is critical to balance its application with human oversight and ethical considerations. Instead of replacing traditional teaching methods, AI should be considered as a tool that complements and improves the learning process.

This research had various limitations that should be considered when interpreting the findings. It is important to note at the outset that, given that the sample consisted of EFL students, it was impossible to generalize the findings to other educational fields. As a second limitation, the present study did not consider differences between cultures, religious beliefs, and their educational autonomy. It is recommended that students study the aforementioned aspects before drawing more accurate conclusions. Despite the limitations, the findings have provided new insights that deserve further study.

Further studies could aim to deeply investigate other factors in relation to AI and EFL student academic achievement. Future research could examine whether the fact that Iranian students study at a university or school could also affect the levels of use of AI technologies. Since this parameter was not studied in the present study, it is a good field for future research. Further study can be conducted to determine the relationships between AI and students' academic growth with other variables such as

reflective thinking, commitment, self-efficacy, participation, leadership, etc. Development and expansion of this study may include larger sample sizes, including different types of educational workplaces and demographic samples.

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