



The Impact of Artificial Intelligence on Learning Language and Literature

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Abstract

This study examined the impact of artificial intelligence (AI) technologies on learning and teaching language and literature. It aimed to assess the potential of AI in improving learning processes and to provide solutions for integrating and combining this technology with traditional teaching methods. The background of the work includes recent advances in the fields of natural language processing, machine learning, and deep neural networks that have enabled more accurate analysis of literary texts and personalization of the learning experience. The study employed a mixed-methods approach, which incorporated both qualitative and quantitative research methods. The qualitative phase involved conducting semi-structured interviews with 20 professors and students of Persian literature. The collected data were then analyzed using qualitative content analysis. In the quantitative part, a questionnaire with a five-point Likert scale was given to 150 students, and the collected data were analyzed using SPSS software version 25. The findings illuminated that the use of AI can significantly improve the process of learning Persian language and literature. For example, the use of AI-based recommender systems increased students' motivation to learn Persian language and study literary texts. Moreover, natural language processing algorithms helped identify different styles of authors and provide a deeper understanding of literary texts. The results of the study showed that artificial intelligence had significant potential to improve the process of learning Persian language and literature and improve the quality of education. However, there are also technical, cultural, and ethical challenges that need to be addressed.

Keywords: *Artificial Intelligence; Persian Language and Literature; Technology; Processing; Neural Networks; Algorithm*

Introduction

Definition of Artificial Intelligence and Its Applications in Education

Artificial Intelligence (AI), as a branch of computer science, deals with the design and development of systems that perform tasks which usually require human intelligence. These tasks include learning, reasoning, problem solving, natural language understanding, and even pattern recognition. In recent decades, significant advances have been made in the field of AI, leading to the development of more complex and efficient algorithms. These advances, especially in the field of education, have significant potential to improve learning processes, personalize instruction, and provide immediate feedback to learners. It helps to manage “students’ educational pathways, acting as a valuable tool for both professors and scholars” (Aguado-García, 2025, p. 21582440251).

In addition, AI has found wide applications in other areas such as healthcare, industry, and financial services. In healthcare, AI can help diagnose diseases, predict disease progression, and suggest appropriate treatments. It offers different merits. For example, through integrating advanced technologies, “it enhances medical practices for patient care and transforms the outlook for health success.” (Moradi et al., 2024, p. 5). In industry, the use of intelligent robots and automated systems can lead to increased productivity and reduced costs. In financial services, AI algorithms can help analyze big data and predict market trends, and ultimately, all these wide applications demonstrate the importance and high potential of AI in improving the quality of life and increasing the efficiency and speed of work in various fields.

Persian language and literature, as one of the most prolific and ancient languages in the world, plays an important role in the national and cultural identity of Iranians. Outstanding works such as Ferdowsi’s the Shahnameh, Divan of Hafez, works of Saadi and spiritual Masnavi of Rumi, are of overriding importance not only from a literary point of view but also from a historical, cultural and social point of view. However, teaching Persian language and literature faces multiple challenges. The complexity of this ancient language, the diversity of literary styles and the need for a deep understanding of cultural and historical concepts are among these challenges. These challenges require new and efficient methods of teaching and learning that can overcome these obstacles. Accordingly, the use of new technologies such as artificial intelligence and machine learning can help improve the education process. Moreover, they can “significantly improve the quality of learning and teaching and enhance the effectiveness of language and literature education” (Sadehvandi Harsini, 2024, p. 3419).

Likewise, the practical applications of AI in analyzing the content of Persian literary texts are noteworthy. According to Hojjat Ansari (2025), the aforementioned applications encompass the extraction of literary themes, the classification of poetic genres, the identification of the style of authors, the analysis of key words, and the study of the course of linguistic evolution in classical and contemporary texts. The use of advanced linguistic models in the creation of poetry and fiction, the rewriting of literary texts, and even the simulation of the writing style of famous Persian writers constitute another part of these capabilities. In addition to analysis and production, artificial intelligence can be used as a tool in teaching Persian language and literature in a way that by designing intelligent interactive systems, customized and adaptive learning is provided for language learners.” (Hojjat Ansari, 2025, p. 1). Additionally, these technologies are able to identify learners’ learning patterns by analyzing big data and provide personalized educational programs. The use of multimedia and interactive resources can also increase the attractiveness and efficiency of language and literature teaching. Holding specialized workshops and training courses for teachers and professors can lead to improving the quality of education, all of which can help preserve and develop the Persian language and literature among future generations.

This study aimed to investigate the potential of artificial intelligence in improving the process of learning Persian language and literature and to provide solutions for integrating and combining AI technologies with traditional teaching methods. Despite the significant advances in AI in various educational fields, its application in teaching Persian language and literature has not yet been fully investigated. This research attempts to investigate innovative applications of AI in fields such as language teaching, literary text analysis, literary style identification, personalization of the learning experience, using qualitative and quantitative research methods. It also discusses the technical, cultural, and ethical challenges facing this field and outlines a vision for the future.

Research Background

The use of technology and artificial intelligence in teaching Persian language and literature is a relatively new topic that has attracted much attention in recent decades. In this area, limited studies have been conducted on the application of new technologies. These studies have shown that AI can significantly improve the learning process. For example, in a study conducted by Nasirian and Abbasi Zirvani (2014), they underlined the positive role of educational technologies in the development of Persian language teaching in secondary schools in Behshahr city. Sadehvandi Harsini (2014) also pointed to useful strategies for improving the quality of Persian language and literature teaching and students' learning success using modern educational technologies. Moreover, Khafi et al. (2014) maintained in another study that the greater use of virtual education technology reduces the costs of traditional education and increases the quality of educational services. Lai and Bavar (2020) also examined how to evaluate the use of technology in education in an extensive systematic review. They found that AI could play an important role in assessing student progress and providing personalized feedback. The researchers specifically point to AI's potential to analyze student learning patterns and provide instructional suggestions tailored to individual needs. In the context of language teaching, this means systems that can identify student weaknesses in specific language skills (such as pronunciation, grammar, or vocabulary) and provide targeted practice. Göksel and Bozkurt (2019) also examined current insights and future prospects for AI in education in their study. They pointed to AI's potential to create intelligent educational systems that could recognize individual learning styles and tailor educational content to each student's needs. The researchers also emphasized the possibility of using AI to create "virtual learning companions" which could act as personal coaches and help students practice language skills.

Popenisi and Kerr (2017) examined the impact of AI on teaching and learning in higher education. They found that AI could be effective in providing immediate feedback, facilitating collaborative learning, and creating personalized learning environments. The researchers specifically noted the potential of AI to analyze student writing and provided suggestions for improving writing style and text structure. In the context of language and literature education, this could mean systems that are able to analyze and evaluate students' literary essays and provide accurate and constructive feedback. Zhou et al. (2016) also presented a research framework for intelligent education, in which AI is identified as a key element in creating adaptive and personalized learning environments. They introduced the concept of "intelligent education," in which AI technologies are integrated with curriculum and teaching methods to create a more dynamic and interactive learning experience. In the field of literature education, this could include systems that are able to analyze literary styles, identify narrative elements, and even generate initial interpretations of literary texts.

In their article, Roll and Wiley (2016) discussed the evolution and revolution of AI in education. They emphasized the importance of developing AI systems that not only transmitted knowledge, but also helped students develop critical thinking and problem-solving skills. The researchers argued that AI could help students move from being passive learners to active knowledge producers. In the field of literature education, this could include systems that encouraged students to provide their own interpretations of

literary texts and then used AI analyses to compare these interpretations with different literary perspectives.

Overall, these studies showed that AI has significant potential to transform language and literature teaching. From providing personalized feedback and creating adaptive learning environments to facilitating complex literary analyses and providing innovative practice opportunities, AI can play an important role in improving educational processes. However, researchers highlight the need for careful and ongoing evaluation of the impact of AI on learning, consideration of the ethical aspects of using this technology, and maintaining a balance between the use of AI and human interactions in the educational process. Despite these studies, a comprehensive study on the impact of artificial intelligence on Persian language and literature learning has not yet been conducted. This study attempts to fill the aforementioned gap.

Research Methodology

Research Design

This study used a mixed methods approach that included qualitative and quantitative research methods. The approach allowed us to benefit from the advantages of both methods and obtain more comprehensive results. In the qualitative part, in-depth interviews on language learning and text content analysis were used, while in the quantitative part, we used statistical analysis of data collected from questionnaires and performance tests.

Sampling and Data Collection

In the qualitative part, purposive sampling was used. 20 professors and students of Persian literature from different universities in Iran were selected as samples. Semi-structured interviews were conducted with these individuals to collect their views and experiences on the use of artificial intelligence in teaching Persian language and literature. In the quantitative part, a standard questionnaire was used and administered to 150 students at different universities. This questionnaire encompassed questions about the experience of using AI tools in learning Persian language and literature and its impact on their motivation and performance.

Data Collection Tools

Semi-structured interviews were used to collect qualitative data. These interviews were conducted in person and online, and each interview lasted an average of 45 minutes. The data collected from the interviews were analyzed using qualitative content analysis. A five-point Likert scale questionnaire was used to collect quantitative data. The questionnaire included questions about the experience of using AI, satisfaction with these tools, and their impact on learning.

Data Analysis

Qualitative data were analyzed using qualitative content analysis. This method involved coding data, identifying patterns and themes, and interpreting results. Quantitative data were also analyzed using SPSS software. Statistical analyses included descriptive tests (mean, standard deviation) and inferential tests (independent t-test, analysis of variance). These analyses helped us to examine the impact of using AI on students' motivation and performance.

Validity and Reliability

Several methods were used to ensure the validity and reliability of the collected data. In the qualitative section, the triangulation method was used, which involved comparing data collected from interviews with data available in the research literature. In the quantitative section, the Cronbach's alpha test was used to examine the reliability of the questionnaire. The Cronbach's alpha value for the questionnaire used was 0.87, indicating high reliability of the instrument.

Research Limitations

This study faced several limitations. One of the limitations was the limited number of samples in the qualitative section, which might not fully generalize the results. Furthermore, time and financial constraints also affected the data collection process. However, an attempt was made to increase the validity and reliability of the results by using different methods of data collection and analysis.

Results and Discussion

The Impact of AI on Improving the Learning Process

The results of the study illuminated that the use of artificial intelligence could significantly improve the learning process of Persian language and literature. By analyzing data related to students' interests and performance, these systems suggested appropriate texts to them, which led to increased student engagement and motivation. In addition, natural language processing (NLP) algorithms helped identify different styles of authors and provide a deeper understanding of literary texts. In addition, artificial intelligence could also play an important role in Persian language teaching. For example, automatic correction and machine translation systems could lead students to learn grammatical rules and vocabulary. By analyzing texts and providing immediate feedback, these systems helped students identify and correct their mistakes. Likewise, using smart chatbots to practice conversation and strengthen language skills could serve to improve students' improve speaking skills in an interactive and stress-free environment. Finally, combining artificial intelligence with traditional teaching methods could lead to the creation of a dynamic and efficient learning environment in which students benefited from educational resources in the best possible way and strengthen their language and literary skills. This combination can greatly help improve the quality of teaching and learning Persian language and literature.

Challenges and Solutions

Technical, Cultural, and Ethical Challenges

Despite the great potential of AI in teaching Persian language and literature, there are also multiple challenges, notably the need for big and high-quality data to train AI models is among the technical challenges. It should be emphasized that data quality plays an important role in the performance of the model. AI has its own merits. Cultural and ethical challenges must also be considered. For example, preserving the authenticity of literary texts and preventing their distortion is one of the important issues that must be considered in the use of AI in teaching Persian literature. In addition, another important challenge is the issue of privacy and data security. Given that AI requires access to a large amount of personal and educational data, maintaining the security and privacy of this data is of great importance. In this regard, advanced encryption and data management methods should be used to prevent unauthorized access to information. In addition, in the field of Persian language teaching, one of the main

challenges is adapting AI algorithms to the linguistic and cultural complexities of this language, which “requires methods that can transform these complexities into a modern and understandable language.” (Karimzadeh, 1400: 45). For example, machine translation and automatic correction systems must be able to analyze and correct the grammatical and semantic rules of the Persian language with high accuracy. The use of intelligent chatbots for practicing conversation and strengthening language skills also requires a precise design that is adapted to the needs of learners. Another cultural challenge is the acceptance of and trust in new technologies among professors and students. Many people may resist the use of AI in education or be unsure of its effectiveness. To overcome this challenge, it is necessary to organize training programs and workshops on AI technologies so that professors and students can become familiar with the benefits and applications of these technologies and be able to use them more effectively. Ultimately, the development and implementation of AI in Persian language and literature teaching requires cooperation and coordination between technology specialists, professors, and educational policymakers. Only through interdisciplinary collaboration and the development of appropriate policies can we fulfil the potential of AI in this area and manage the existing challenges.

To address these challenges, a multi-faceted approach is essential. It tackles not only technical solutions but also cultural and ethical issues. They are explicated in detail below.

Technical Solutions

Technical solutions begin with collecting and improving data quality, which involves creating comprehensive data banks that include a diverse and extensive range of texts from classical and contemporary Persian literature, scientific articles, and educational content. This effort is supported by using data preprocessing techniques, such as cleaning, normalization, and labeling, to improve the quality and accuracy of AI models.

Another critical area is the optimization of algorithms through the development of localized algorithms that are specifically designed for the Persian language and its unique features. This is further enhanced by using transfer learning techniques, where pre-trained models seen on big data are fine-tuned with Persian-specific data.

Finally, increasing computational resources is essential. This can be achieved through using cloud infrastructure to boost processing capacity and reduce operational costs. Additionally, collaboration with research centers and universities helps establish strategic partnerships to access advanced computing resources and apply existing expertise.

Cultural Solutions

Cultural solutions focus on education and awareness by holding workshops and training courses that provide specialized training for professors and students to familiarize them with AI technologies and their applications in teaching Persian language and literature. This is complemented by producing educational content that creates multimedia materials explaining the benefits and applications of AI in a simple and understandable way. Encouraging technology adoption is achieved through creating incentive programs that offer rewards for professors and students who use AI technologies in the learning and teaching process, as well as by promoting success stories that share examples of successful AI use in Persian language and literature education to increase trust, public acceptance, and reduce resistance to change (Moradi, 2025: 11).

Ethical Solutions

Ethical solutions emphasize maintaining the authenticity of literary texts through developing authenticity protection algorithms capable of analyzing and interpreting literary texts without changing their original meaning and concept, along with creating ethical standards that establish guidelines for the use of AI in analyzing and interpreting literary texts to ensure authenticity and prevent distortion. Maintaining privacy and data security involves using advanced encryption methods to protect personal and educational data, alongside the development of data management policies that establish detailed protocols for data access, security, and privacy. Promoting responsible use of AI is supported by ethics education, which provides training courses on ethical responsibilities related to AI use in education, and through continuous monitoring and evaluation that establishes systems to assess AI use and ensure compliance with ethical and cultural principles. These solutions can help improve and facilitate the use of artificial intelligence in Persian language and literature education and effectively manage existing challenges.

Long-term Effects of Using AI in Persian Language and Literature Education

The use of AI in Persian language and literature education can have long-term effects on the learning process. These effects encompass increasing students' motivation in learning Persian, improving their understanding of literary concepts, and increasing interaction between students and teachers. Furthermore, the use of AI can help personalize the learning experience and allow students to progress at their own pace and learning style. However, to fully exploit these potentials, more research is needed in the field of Persian language teaching and literary data collection and analysis.

Conclusion

This study illuminated that AI can significantly improve the process of learning and teaching Persian language and literature. The use of recommender systems and natural language processing algorithms (NLP) helped personalize the learning experience and increase student motivation. However, technical challenges such as the need for big and high-quality data, cultural challenges such as maintaining the authenticity of literary texts, and ethical challenges such as maintaining privacy and data security must be considered. To address these challenges, it is suggested that large-scale text data collection projects be carried out in collaboration with universities and research institutions, AI algorithms with the ability to preserve the authenticity of texts be developed, and security and privacy standards for data collection and use be formulated. Finally, the use of AI in Persian language and literature teaching can have long-term effects on the learning process which includes increasing students' motivation to learn Persian, improving their understanding of literary and linguistic concepts, and increasing interaction between students and professors.

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Appendix

Some Notes About Research Instruments

Questionnaire

The questionnaire used in this study included questions about the experience of using artificial intelligence tools in learning Persian language and literature and their impact on students' motivation and performance. This questionnaire includes the following sections: Demographic information (age, gender, level of education), Experience using AI tools, Satisfaction with AI tools, Impact of AI tools on motivation and performance.

Semi-Structured Interview Guide

The semi-structured interview guide included questions that were used to collect qualitative data from professors and students of Persian literature. These questions examined their views and experiences on the use of AI in teaching Persian language and literature. Some of the questions raised in the interviews were as follows:

What has been your experience using AI tools in teaching Persian language and literature?

In your opinion, how can AI help improve the learning process?

What are the challenges in using AI in teaching Persian?

What solutions do you suggest to address these challenges?

Sample Qualitative Content Analysis

The qualitative content analysis of data collected from interviews entailed coding the data, identifying patterns and themes, and interpreting the results. For example, one of the themes identified in the interviews was “increasing student motivation,” which was mentioned in many of the interviewees’ responses.

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