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Human-AI collaboration in the analysis of literary narratives: a new pedagogical paradigm

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ABSTRACT

The digitization of education in Kazakhstan has demonstrated the importance of using AI in the teaching of literature. The purpose of this article is to evaluate the effectiveness of collaboration between humans and AI in improving students' analytical and interpretive skills when studying literary narratives in the context of higher education. The study applied a true experimental design with a randomized controlled trial (RCT) with a pre-test/post-test control group structure. A voluntary purposeful sample (40 participants in total) with elements of randomization was used (all participants were randomly divided into two groups). The results showed that the t-test results indicated the importance of using ChatGPT, as it showed a statistically significant improvement in literary analysis skills among students. There is also a high level of positive perception of learning using AI elements. This indicates the effective introduction of AI technologies as an important factor in increasing student motivation and engagement. The main challenges to the further integration of AI systems into literary education are technical unpreparedness, further integration of AI systems into literary education are technical unpreparedness, lack of experience and skills in interacting with special programs. The advantages of using AI include the formation of individual educational trajectories, increased access to information sources, interactivity and support. The conclusions emphasize the importance of scaling up the study to obtain new empirical data.

Keywords: Artificial Intelligence, ChatGPT, Digitalization, Higher education, Higher education, Kazakhstan, Literary pedagogy, Student engagement

1. Introduction

In today's world, artificial intelligence (AI) has become an extremely important mechanism for transforming educational environments, contributing to the formation of personalized, adaptive, and technologically supported learning formats. Considering the experience of the early stages of education digitization, AI was considered a tool for automating individual routine tasks or tests. However, it is now increasingly being used as an active participant in cognitive processes, ranging from knowledge modeling to collaborative work on interpreting the content of complex literary texts. The formation of new qualities of interaction between students and AI systems is particularly relevant in the humanities, where intellectual interpretation, emotional sensitivity, and contextual flexibility have traditionally been considered the essence of human work. In the scientific field of literary studies, this meant not only the use of technologies for operational work with texts, but also cross-subject perception of meanings, in which human and machine understanding can complement each other. However, literature education in most educational systems, especially in the former Soviet Union, was still based on the use of traditional methods of analyzing literary works. This approach rarely provided for the use of the latest digital intellectual tools. Teachers usually did not have the practical and methodological means to integrate AI systems into the educational process. Under these circumstances, AI was perceived not as a real partner in the acquisition of knowledge, but as a rather "threatening" mechanism capable of reducing the depth of humanistic knowledge, leaving only isolated details of superficial statistics, template algorithms, and theses.

1.1. Literature review

As a result of the evolution of digital tools, researchers define the elements of interaction between humans and artificial intelligence through the prism of synergy rather than strict opposition. Jiali determined that the effective combination of pedagogical approaches and innovative AI capabilities has created conditions for the use of new models of education [1]. Hutson proposed a multidimensional model of authorship in which AI can be not just a technological tool, but also a kind of "cognitive partner" for creating new texts [2]. Serbanescu's work notes that when considering narratives as bridges between human empathy and machine analysis, it is worth defining paradigms of coexistence in digital educational environments [3].

Individual studies have demonstrated the potential for human-AI collaboration in the fields of writing, literary creativity, and narrative thinking. For example, Pan et al. analyzed elements of writing, pointing out that collaboration between AI and higher education students enables the latter to significantly improve their writing, text structuring, style, and argumentation [4]. Emerson's study proved the effectiveness of AI in creating collaborative narratives using the example of English as a foreign language class, which simultaneously increases student motivation and creativity [5]. Radwan et al. described the innovative SARD platform, determining that it provides tools for collaborative learning and the creation of artistic texts [6]. Similarly, the relevance of the gamified approach, which was investigated by ref. [7], was also noted. This made it possible to identify new ways of immersing students in literary discourse through digital tools.

Wang, Cheung, and Chai, in a special thematic review, emphasized how AI in language learning makes it possible to model personalized educational learning trajectories [8]. Particular attention was paid to the dynamics of establishing feedback loops and the development of critical thinking among students. Liu's research pointed to the important role of ChatGPT in improving the professional competence of teachers [9]. When used competently, AI not only helped to generate teaching materials, but also acted as a mentor, enabling errors to be corrected and facilitating pedagogical reflection.

Against this backdrop, it is also worth noting that Kazakhstan is an active participant in global transformations in the field of digital education. This is indicated by the material by Omar Ahmad et al., in which the authors analyzed individual trends in digitalization and the "Digital Kazakhstan" program, while also pointing out existing challenges (uneven adaptation to AI in the educational sphere in different educational institutions) [10]. Research by ref. [11] revealed existing problems: a lack of digital infrastructure and difficulties in the necessary training of personnel. Reference [12] demonstrated the potential of AI in improving the writing skills of philology students using the example of local digital platforms. In the context of using the latest digital technologies, legal issues have also attracted research attention. Apakhayev et al. outlined the need for permanent updating of the regulatory framework for further distance learning and support for the development of AI systems [13]. Reference [14] drew attention to the existing specifics of Kazakh-English bilingualism, which has formed unique contexts for the application of AI in language and literary education.

Thus, scientific literature, which stipulates the importance of introducing AI into humanities education, has demonstrated the existence of several gaps. First, as can be seen, the studies are dominated by conceptual and descriptive approaches that indicate the significant potential of AI, but without adequate empirical evidence or determination of the impact of these tools on learning outcomes. Second, there is a tendency to define technical aspects without adequate integration with the functional capabilities of pedagogical scenarios. Such scenarios are under-researched, not developed in detail, and appear to be significantly generalized. Third, cultural specificity has not been sufficiently researched, i.e., the extent to which modern AI can be used in specific national educational contexts, understanding the language, cultural codes, and values of the educational process in specific countries.

1.2. Research problem, aim and questions

In the context of active digitalization, Kazakhstan is gradually implementing the Digital Kazakhstan program. This allows creating unique environments for researching the implementation of innovations in pedagogy. On the other hand, digital modernization of infrastructure and materials for learning, moderate integration of AI and humanities disciplines (including literary education) is little studied. Such limitations have created a rather contradictory situation, when the presence of digital policy, individual practices of its use and technical means do not allow fully guarantee their effective application, especially in the context of humanities education. This is also due to the dominance of traditional ideas about the nature of interpretations. Additionally, in the context of global changes in pedagogical education systems, which are caused by both technological and social factors, the joint work of a person and AI has emerged not so much as a temporary trend, but as an updated form of

academic interaction. Accordingly, such a form of education will require rethinking the roles of the teacher and the student, shifting the emphasis from monological explanations to dialogical construction of knowledge. Research Goal is to assess the effectiveness of human-AI collaboration in enhancing students' analytical and interpretive skills when studying literary narratives in a higher education context.

Research Questions:

RQ1. Does the integration of AI tools improve students' ability to analyze and interpret literary texts compared to traditional methods?

RQ2. How does AI-assisted narrative analysis affect student engagement and motivation?

RQ3. What challenges and opportunities arise in implementing AI-based methods in literary pedagogy in Kazakhstan?

2. Research method

The proposed study used a true experimental design involving control and experimental groups of students. This approach made it possible to assess the impact of using AI tools on the development of students' literary analysis skills. This approach is most appropriate in the context of educational research, during which there is a need to establish cause-and-effect relationships between educational interventions and learning outcomes. As researchers have noted [15], [16], experimental design usually made it possible to compare results between different groups and clearly measure the presence of change. Other scientists have determined that studying the effectiveness of new educational technologies will primarily require controlled interventions [17]. Given the rapid evolution of AI and its integration into the humanities, the use of an experimental approach makes it possible to trace both quantitative and qualitative characteristics.

2.1 Participants

The study employed a purposive sampling technique to recruit participants. Forty second-year students from the Philology Department of Kazakh National Women's Teacher Training University volunteered to participate in the study. All participants were full-time students, had basic literary analysis skills, and provided written consent to participate in the experiments. The participants were assured of confidentiality; all materials are stored in the scientific archive of the authors of the proposed article and are used exclusively for scientific purposes.

The participants of the experiment were randomly divided into two groups by drawing lots:

1. In the control group (n=20), training took place using traditional methods, which included reading literary texts, group discussions, and completing written assignments.

2. In the experimental group (n=20), separate AI tools were used to analyze texts (primarily based on the GPT-4 system) using the prompt engineering technique for a deeper understanding of plots, motifs, and symbolism.

2.2. Instruments

The study used two main tools: pre-test and post-test, which made it possible to assess the level of students' literary analysis skills before and after the experimental intervention. Both tests were developed specifically for this study, taking into account the learning outcomes of the discipline "Literary Analysis" and the competencies that students should acquire in the second year of study.

The pre- and post-tests consisted of tasks identical in structure, which included: analysis of a short literary text (a passage of prose or poetry), identification of literary devices (metaphor, allegory, intertextuality, etc.), formulation of the interpretation of the text in written form.

The test tasks were developed jointly with three teachers of the Department of Philology who have experience in teaching literary studies courses. All tasks were pre-tested on a separate student group (n = 12), which did not participate in the main experiment.

2.2.1.Validity check

To ensure the content validity of the tests, an expert group of three specialists conducted an analysis of the correspondence of the test tasks to the learning objectives of the course. All experts confirmed that the tests cover the main components of the target skills of literary text analysis.

2.2.2. Reliability check

The reliability of the instrument was checked using the internal consistency method (Cronbach's coefficient). According to the results of the testing, the α coefficient was: for the pre-test: 0.82, for the post-test: 0.87. These values indicate a high level of reliability of both instruments.

In addition, a criterion-referenced evaluation scale was developed to evaluate the students' written responses, which included three parameters: depth of interpretation, accuracy of terminological analysis, argumentation of conclusions (0–30 points). The total score of each test is 100 points. The assessment was carried out by two independent experts. To check the interrater reliability, the Kendall coefficient of agreement ($\tau = 0.91$) was used, which indicates a high agreement of the assessments.

2.3. Procedure

The research procedure took four weeks and consisted of several stages. First, a pre-test was conducted to determine the baseline level of literary analysis skills (same tasks for both groups, maximum score 100 points – see Table 1).

Table 1. Pre-test results

№	Group	Number of students	Average results (100 max)
1	Control	20	71
2	Experimental	20	72

The results of the pre-test showed that the control and experimental groups demonstrated approximately equal average knowledge results. The second stage involved an educational intervention, according to which the work of the control group was carried out according to traditional approaches, while the experimental group additionally had the opportunity to use the capabilities of ChatGPT to analyze literary texts. The observation and comparison method made it possible to identify the features of the work of education seekers using AI and during traditional learning. At the third stage, a post-test was conducted, which determined the effectiveness of the intervention. A questionnaire was also conducted to assess motivation, involvement and general impressions of learning with elements of the use of AI (for both groups). The questionnaire was carried out using a Likert scale, where students were asked to determine their attitude from 1 point (very bad) to 5 points (very good).

Finally, education seekers (experimental group) were given the opportunity to identify problems in the further use of AI for collaboration in literary studies. Semi-structured interviews were used to doing this. This approach allowed us to identify the potential for improving the current situation with the use of AI and to outline the difficulties that will need to be addressed.

2.3.1. Intervention plan

The aim of the experimental intervention was to study the impact of using artificial intelligence tools (based on GPT-4) on the development of literary analysis skills in students. The intervention lasted four weeks (8 lessons of 90 minutes each) and was conducted in parallel in the control and experimental groups.

As the main AI tool, ChatGPT (a version based on GPT-4) was used, which made it possible to process the naturalness of speech, generate answers, interpret text tasks, and perform a thorough analysis of artistic structures. Students interacted with the AI system by performing prompts that were dedicated to the study of literary themes, individual characters, genre features, and authorial techniques for working with texts. Such opportunities were edited in accordance with the use of AI and the discussion of the results in groups.

The basic work for testing was “Kuraq korpe” by E. Tursunov, a film prose based on which a film was shot. The work is the main educational material for the analysis of students. The choice of this work of art is justified by its narrative complexity, intercultural symbolism, and the richness of autobiographical and cross-cultural allusions. Such diversity has formed a favorable ground for using the capabilities of AI for the processes of literary interpretation.

The text of the above-mentioned story has made it possible to form the following analytical directions: the symbolism of “friend-stranger” in artistic spaces, the image of the “patchwork” as a metaphor for memory, identities and spiritualities, female images of adherence to traditions, zoosemiotic and technosemiotic images, the interaction of different cultures (Kazakh, Russian, European and Chinese). For this reason, “Kuraq korpe” is an ideal text for testing the ability of AI to detect hidden meanings, intertextual connections and national-

cultural contexts in cooperation with educational seekers. Participants in the experimental group worked with ChatGPT (GPT-4) to construct prompts that were related to the analysis of the imagery of the "patchwork quilt" as a metaphor, the structure of polarity ("one's own" – "alien"), semiotics, and the plot's relationships with national archetypes.

2.4. Data analysis methods

Quantitative analysis was used to analyze the data. In particular, the results of the pre- and post-tests of the control and experimental groups were compared to using the t-test for independent samples. The results obtained as a result were also confirmed using qualitative analysis. Thus, interviews and open-ended responses in the questionnaires were processed using thematic analysis, which made it possible to identify key themes related to the experience of using AI in the educational process. In the discussion, the results obtained were compared with the conclusions of other researchers, for which content analysis of their scientific publications was used.

3. Results and discussion

3.1. Results

The use of ChatGPT when working with contemporary Kazakh literature enabled the experimental group to obtain an expanded interpretative framework using machine modeling of meanings. Since ChatGPT's answers had a logical structure (e.g., thesis – antithesis – example – explanation), in most cases, students followed this logic in constructing their own answers [9]. As a result, the experimental group's written work had a clear composition, clear argumentation, and internal coherence. Students actively used ChatGPT to form and verify their own interpretations and assumptions. For example, if a student assumed that the image of Kulzhamal was a symbol of the maternal archetype, this idea was immediately compared with the options offered by AI. As a result, this interaction contributed to improved self-reflection, which conveyed the author's theses much more accurately. In addition, the speed of responses allowed students to evaluate the quality of their own assumptions and arguments, which is extremely necessary when working with symbolic images. This accelerated the learning process. Reducing the time spent on doubts allowed for improved analytical judgment.

The interactivity offered by AI contributed to the transformation of habitual passive reading into active research [18]. Higher education students not only did not limit themselves to their initial understanding of the text but also returned to it repeatedly to confirm or refute the AI's theses. First, this approach concerned symbols, metaphors, and ideas in the narrative related to national values and polarization. Sometimes, answers to complex questions required cultural specificity, to which ChatGPT did not always respond deeply. Therefore, educational intervention with ChatGPT had its advantages over traditional learning (see Table 2).

Table 2. Learning effects in the control and experimental groups

№	Depth of educational outcomes	Control group of students	Experimental group of students
1	Depth of text interpretation	Average level of interpretation	Higher level
2	Argumentation based on text	Use of superficial argumentation	(more details and connections)
3	Independence of analytical judgments	Average independence	Balanced argument with specific examples and quotes
4	Ability to detect subtexts, metaphors, symbols	Uneven	Providing own thoughts and examples
5	Involvement in the learning process	Average	Systematized (based on AI examples)
6	Motivation for further analysis	Often external	Above average

As a result of the AI intervention, students in the experimental group began to work more actively with subtexts, analyzing individual symbols (such as the image of a golden eagle, a patchwork quilt, the existence of "us" and "them") not only literally, but also taking cultural codes into account. However, the intervention also revealed some important elements that will require more detailed consideration. First, the success of the intervention depended on the development of critical thinking among students. The effectiveness of the AI intervention was reflected in the post-test results, which identified the existing difference in learning outcomes for both the

experimental and control groups. Based on the written assignments, the overall assessments of the students were summarized (see Table 3).

Table 3. Post-test results

№	Group	Number of students	Average Obtained Scores (100 max)
1	Control	20	74
2	Experimental	20	81

Therefore, the results obtained demonstrated an increase in the average score in both the control and experimental groups. On the one hand, this indicates the interest of students in educational material and works of Kazakh literary fiction. At the same time, the increase in the average score for the completed task in the experimental group is much higher - 81 against the initial 72 points, while in the control group 74 against 71. Thus, the assessment of the effectiveness of educational intervention using AI systems is evidenced by the results of pre- and post-tests in control and experimental groups. Table 4 shows the descriptive statistics of the increase in scores in each group (see Table 4).

Table 4. Comparison of scores between experimental and control group in post-test

Group	Average gain	Standard deviation (SD)	Number (n)
Experimental	8.9 points	4.7	20
Control	3.2 points	5.0	20

Checking the statistical significance of differences in score increases between groups using the t-test for independent samples showed that: $t = 2.37$, and $p = 0.0229$ (see Table 5).

Table 5. Comparison of scores between experimental and control group in post-test

Group	Average gain	Standard deviation (SD)	Number (n)	t	p-value
Experimental	8.9	4.7	20		
Control	3.2	5.0	20	t = 2.37	p = 0.0229

Given that the p-value is less than 0.05, it can be confirmed that the use of ChatGPT in the learning process led to a statistically significant improvement in literary analysis skills among students in the experimental group (compared to the control group). First, students who actively used AI demonstrated greater growth in deep understanding of the text, more accurate argumentation, and the ability to identify hidden subtexts in Y. Tursunov's work “Kuraq korpe.”In Table 6 Pre-Test and Post-Test scores within each group (Control and Experimental) using Paired Sample t-test results are shown (See Table 6).

Table 6. Comparison of pre-test and post-test scores in the control and experimental group

Group	Test	Average obtained scores	Standard deviation (SD)	t-value	p-value
Control	pre-test	71.4	6.1		
	post-test	74.6	5.9	2.01	0.058
Experimental	pre-test	70.9	5.7		
	post-test	79.8	6.2	4.26	0.0004

Note. Paired Samples t-test, n = 20

Therefore, in the experimental group, the increase in scores after the intervention is statistically significant ($p < 0.001$). In the control group, the increase in scores does not reach statistical significance ($p = 0.058$).

Respondents (60 higher education students) completed a questionnaire to assess their motivation, engagement, and overall impressions of learning with AI (ChatGPT). According to the commonly used five-point Likert scale, 1 point meant “very poor,” while 5 meant “very good.” The results are presented in Table 7.

Table 7. The impact of AI use on student engagement and motivation

Indicator	Mean values (M ± SD)	Mediana	Mode	Min	Max
Motivation	4,2 ± 0,6	4	5	3	5
Engagement	4,0 ± 0,7	4	4	2	5
Overall Impressions	4,3 ± 0,5	4	5	3	5

The analysis of the survey results showed a high level of positive perception of learning using AI elements among higher education students in Kazakhstan. In particular, the average values for motivation (4.2), engagement (4.0), and overall impressions (4.3) on the Likert scale indicated a predominantly "good" and "very good" understanding of the innovativeness of digital educational formats. The standard deviations found were no greater than 0.7, which demonstrated uniform responses from respondents and a low level of dispersion of opinions in determining the experience of obtaining an education using AI. The medians and modes confirm the existence of a stable trend toward positive assessment. Therefore, the results obtained indicate the effective introduction of AI technologies as an important factor in increasing student motivation and engagement.

Accordingly, an important step was to identify the difficulties and prospects for the further use of AI in literary education. As a result of semi-structured interviews with respondents, some key challenges and opportunities related to the introduction of AI-based methods into the educational process in literature were identified (see Table 8).

Table 8. Challenges in applying AI

№	Challenge	Description	Characteristics of respondents
1	Technical readiness	Respondents noted that not everyone has the same level of access to the necessary technical resources or stable Internet. This makes it difficult to work with AI tools.	Respondent 5: "Stable internet is not always available, sometimes the technology fails, so it is difficult to process large amounts of data with AI"
2	Lack of experience and skills	Some students indicated that they do not have a sufficient level of competence to work with new technologies. The preparation process may take some time and additional training.	Respondent 8: "It is not always clear how to use these tools correctly. AI requires very clear questions, so it takes time to learn"
3	Resistance to digital change	Some students reported that the replacement of traditional teaching methods in favor of AI will reduce the role of teachers and may lead to uncertainty	Respondent 2: "I do not want AI to replace live communication"
4	Quality of generated content and its adaptability	Concerns were expressed about the accuracy and relevance of the materials of the information prepared by AI. A lack of understanding by digital systems of all elements of Kazakh culture was noted.	Respondent 11: "I am afraid that AI does not take into account the peculiarities of our culture, so it may misinterpret texts"

At the same time, the use of AI contains not only challenges. Respondents also identified the prospects that exist as a result of the applied application of AI for training future specialists (See Table 9).

Table 9. Opportunities in the application of AI

№	Opportunity	Description	Characteristics of respondents
1	Forming an individual educational trajectory	The use of AI allows you to adapt educational materials for use in the environment of individual needs of	Respondent 1: "I like that the program can adjust to my

		higher education students. This allows you to increase the efficiency of learning literary material.	level and explain the material more easily"
2	Increasing access to information sources	AI technologies can facilitate rapid search and analysis of large volumes of data. This allows you to process complex literary works.	Respondent 18: "With AI, you can quickly find additional information along with links to it"
3	Interactivity and increased motivation	Tools using AI can make learning much more interactive and stimulate interest.	Respondent 10: "Using new tools stimulates interest in learning"
4	Support from teachers	AI is a reliable assistant for teachers, which can automate routine processes.	Respondent 9: "AI helped teachers create tasks and check them"

Thus, the integration of AI into literature teaching has significant potential to further modernize the educational process. To do so, there is a further need to overcome both technical and organizational challenges.

3.2. Discussion

In the context of the active digitalization of the educational process, Kazakhstan is gradually adapting to the new conditions for the provision of educational services. This process has not only made it possible to create unique environments for researching innovations in pedagogy but has also opened up opportunities for more active use of AI systems. The aim of the study is to evaluate the effectiveness of human-AI collaboration in improving students' analytical and interpretive skills when studying literary narratives in the context of higher education. The implementation of this goal involved finding answers to research questions related to the possibilities of improving the integration of AI tools and their impact on students' ability to analyze and interpret literary texts better than traditional methods; analyzing narratives using AI, which has an impact on student engagement and motivation; and identifying challenges and opportunities in the use of AI in literary education.

When analyzing whether the integration of AI tools improves students' ability to analyze and interpret literary texts compared to traditional methods, a positive impact was noted. First of all, the use of AI demonstrated a deeper interpretation of the text, improved argumentation based on the material studied, independence in analytical judgments, the ability to identify subtexts and metaphors, better engagement in the learning process, and motivation for further analysis. The proposed results indicate that the average score in both the control and experimental groups increased. The results of pre- and post-tests in the control and experimental groups testify to the effectiveness of the educational intervention using AI systems. Given the results of the t-test and p-values less than 0.05, it can be confirmed that the use of ChatGPT in the learning process led to a statistically significant improvement in literary analysis skills among students in the experimental group (compared to the control group). The proposed result confirms the conclusions of other researchers who suggested that the use of AI can improve the level of education [19], [20]. Although no similar studies have been conducted on the example of literary education in Kazakhstan, the results obtained correspond to the hypotheses of scientists about the importance of the correct use of digital tools to achieve maximum efficiency [21]. In fact, certain elements of AI use can be harmful (e.g., lack of critical perception of AI responses [22]), while learning to work with such systems requires time and skill [23], [24]. These aspects need to be addressed in the future, especially through the prism of empirical measurements. When considering the second question regarding the analysis of how storytelling using AI affects student engagement and motivation, positive results were obtained. The proposed results demonstrated that there is a high level of positive perception of learning using AI elements among students in higher education in Kazakhstan. In particular, the average values for motivation (4.2), engagement (4.0), and overall impressions (4.3) on the Likert scale indicated a predominantly "good" and "very good" understanding of the innovativeness of digital educational formats. Therefore, the results obtained indicate the effective introduction of AI technologies as an important factor in increasing student motivation and engagement. The proposed results confirm the conclusions of other researchers who have indicated that there are generally positive trends in the assessment of digital technologies among students [26], [26]. In particular, the researchers added that motivation, engagement, and high overall impressions are associated with the development of AI systems [26], which offer new mechanisms of interaction [27], [28]. The development of technology points to the importance of conducting further research, as noted by scientists [29], [30]. Since these mechanisms are developing extremely rapidly, it is possible that students' interest in their use will continue to

grow. In particular, it is important to consider the possibilities of human administrative influence on AI [31]. The information base used by AI systems to generate responses can be corrected by humans [32], which can affect the results obtained [31]. In such circumstances, there is a risk of distorting the cultural context [33]. Although AI tools have proven to be effective, the "human factor" still plays a significant role in their operation.

The proposed results also note that the main challenges to the further integration of AI systems into literary education are technical unpreparedness, lack of experience and skills in interacting with special programs, resistance to existing digital changes, and concerns about the quality of AI-generated content. The results obtained coincide with the conclusions of other researchers [34], who particularly emphasize the quality of content obtained as a result of working with AI [35]. Researchers have demonstrated that AI often generalizes answers and does not understand the cultural context of individual countries [36]. This should be taken into account when working with text and context generation in the field of literature [37]. At the same time, the proposed results identified the formation of an individual educational trajectory, increased access to information sources, interactivity, and teacher support as important aspects. The results obtained confirm the conclusions of other researchers [38], [39]. At the same time, researchers also pointed out the importance of combining the use of AI with other teaching methods [40], [41]. This is because, at the present stage, the use of AI is not yet capable of completely replacing traditional forms of learning [42]. This aspect will need to be taken into account during the next stages of the digitalization of education in Kazakhstan [43], [44]. The proposed study has certain limitations that need to be considered when interpreting the results. In particular, the sample of respondents is small, as the study aimed to trace the general trend of AI use in literary education. Further scaling of the measurements will allow for a deeper understanding of the results. Another limitation is the subjectivity of the assessments provided during the survey. Since views on certain events are based on personal experience, this experience also influenced the assessments. Scaling up the experiment will make it possible to reduce subjective views in the future.

4. Conclusions

This study showed that the introduction of AI in improves the analysis and interpretation of literary texts has a significantly greater positive effect than traditional methods. First and foremost, cooperation between humans and AI is effective in improving students' analytical and interpretive skills when studying literary narratives in the context of higher education. The study indicates that the integration of AI tools facilitates the analysis and interpretation of literary texts compared to traditional methods. Thus, the use of AI demonstrated a interpretation of the text, improved argumentation based on the material studied, independence in analytical judgments, the ability to identify subtexts and metaphors, better engagement in the learning process, and motivation for further analysis. Based on the results of the t-test, it was confirmed that the use of ChatGPT in the learning process led to a statistically significant improvement in literary analysis skills among students in the experimental group (compared to the control group). There is a high level of positive perception of learning using AI elements among students. In particular, the average values of motivation, engagement, and overall impressions indicated a predominantly "good" and "very good" understanding of the innovativeness of digital educational formats. Therefore, the results obtained indicate the effective introduction of AI technologies as an important factor in increasing student motivation and engagement. The main challenges to the further integration of AI systems into literary education are technical unpreparedness, lack of experience and skills in interacting with special programs, resistance to existing digital changes, and concerns about the quality of AI-generated content. The important advantages are also characterized as the formation of an individual educational trajectory, increased access to information sources, interactivity, and teacher support. Promising areas for further development of this issue are scaling up the experiment. This will reduce the influence of subjective assessments and add new empirical material to the existing picture.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

Author contribution

The contribution to the paper is as follows Roza Sabdaliyeva, Gibadat Orynkhanova: study conception and design; Karlygash Abildayeva: data collection; Lazzat Adilbekova, Kulmanat Auyelkhan: analysis and interpretation of results; Roza Sabdaliyeva: draft preparation. All authors approved the final version of the manuscript.

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References

[1] S. Jiali, "Human-AI Collaboration in Building Educational Content: Bridging Innovation and Pedagogy in the Classroom", *Pakistan Journal of Life and Social Sciences (PJLSS)*, vol. 22, no. 2, 2024. https://doi.org/10.57239/pjlss-2024-22.2.001344

[2] J. Hutson, "Human-AI Collaboration in Writing: A Multidimensional Framework for Creative and Intellectual Authorship", *International Journal of Changes in Education*, Feb. 2025. https://doi.org/10.47852/bonviewijce52024908

[3] A. Serbanescu, "Narrative-based human–artificial collaboration: A reflection on narratives as a framework for enhancing human–machine social relations," *Pivot 2021 Dismantling/Reassembling: Tools for Alternative Futures*, 2021, https://doi.org/10.21606/pluriversal.2021.0038

[4] H. Pan, E. Araujo Oliveira, and R. Ferreira Mello, "Exploring Human-AI Collaboration in Educational Contexts: Insights from Writing Analytics and Authorship Attribution," *LAK '25: The 15th International Learning Analytics and Knowledge Conference*, Dublin, Ireland, New York, NY, USA, 2025, pp. 903–909, https://doi.org/10.1145/3706468.3706536

[5] N. Emerson, "AI-enhanced collaborative story writing in the EFL classroom", *Technology in Language Teaching & Learning*, vol. 6, no. 4, p. 1764, Dec. 2024. https://doi.org/10.29140/tltl.v6n4.1764

[6] A. Y. Radwan, K. M. Alasmari, O. A. Abdulbagi, and E. A. Alghamdi, "SARD: A Human-AI Collaborative Story Generation", in *Lecture Notes in Computer Science*. Cham: Springer Nat. Switz., 2024, pp. 94–105. https://doi.org/10.1007/978-3-031-76806-4_7

[7] P. Halachev, "Gamification as an e-learning tool: A Literature Review", *E-Learning Innovations Journal*, vol. 2, no. 2, pp. 4–20, Sep. 2024. https://doi.org/10.57125/elij.2024.09.25.01

[8] D. Kobets, N. Terentieva, N. Shkvyria, N. Lysytsia, and I. Siemak, "Digitalization and its Impact on the Development of Contemporary Marketing Strategies," *Econ. Affairs*, vol. 69, no. 2, Jun. 2024. https://doi.org/10.46852/0424-2513.3.2024.26

[9] W. Liu, "AI for Language Teacher Professional Development: Advancing Through Human-ChatGPT Collaboration", *New Perspectives on Languages*, May 2025. https://doi.org/10.56395/41jkbr71

[10] A. S. Omar Ahmad, E. Abusham, K. A. Kuanyshbaikyzy, and S. Twaissi, "Kazakhstan in the Global Economy: Rank, Growth, and Digital Adaptation from AI and Data Science Lens", *Artificial Intelligence & Robotics Development Journal*, pp. 374–382, May 2025. https://doi.org/10.52098/airdj.20255347

[11] B. Bokayev, Z. Torebekova, and Z. Davletbayeva, "Implementation of information and communication technology in educational system of Kazakhstan: Challenges and opportunities", *Public Administration and Civil Service*, no. 4, pp. 32–43, Dec. 2020. https://doi.org/10.52123/1994-2370-2020-75-4-32-43

[12] A. Bodaubekov, S. Agaidarova, T. Zhussipbek, D. Gaipov, and N. Balta, "Leveraging AI to enhance writing skills of senior TFL students in Kazakhstan: A case study using "Write & Improve"", *Contemporary Educational Technology,* vol. 17, no. 1, Jan. 2025, Art. no. ep548. https://doi.org/10.30935/cedtech/15687

[13] N. Apakhayev, I. Mussabekova, D. Bugybay, K. Kuandykov, and K. Koishybaiuly, "Distance learning technologies and their legal regulation in the Republic of Kazakhstan", *E-Learning and Digital Media*, Feb. 2024. https://doi.org/10.1177/20427530241231842

[14] D. Tlepbergen, A. Akzhigitova, and A. Zabrodskaja, "Kazakh–English Bilingualism in Kazakhstan: Public Attitudes and Language Practices", *Languages*, vol. 10, no. 5, p. 102, May 2025. https://doi.org/10.3390/languages10050102

[15] A. Saliyeva, S. Kozhakhmetova, Y. Tokatligil, and A. Mambetalina, "A Comprehensive Study on the Effectiveness of Various Strategies of Educational Monitoring in Primary Schools in

Kazakhstan", *Leadership and Policy in Schools,* pp. 1–13, Mar. 2025. https://doi.org/10.1080/15700763.2025.2480614

[16] D. Siemon and T. Strohmann, "Human-AI Collaboration", in *Collaborative Convergence and Virtual Teamwork for Organizational Transformation*. IGI Glob., 2021, pp. 105–119. https://doi.org/10.4018/978-1-7998-4891-2.ch005

[17] R. Katsenou and I. Deliyannis, "Programming as play: A collaborative autoethnography on ai literacy in education", in *Collaborative Convergence and Virtual Teamwork for Organizational Transformation*, Valencia, Spain, Mar. 3–4, 2025. IATED, 2025, pp. 5661–5671. https://doi.org/10.21125/inted.2025.1448

[18] M. Ibrahim, "AI as a Collaborative Partner", in *AI Approaches to Literacy in Higher Education*. IGI Glob., 2024, pp. 117–149. https://doi.org/10.4018/979-8-3693-1054-0.ch006

[19] E. Creely and J. Blannin, "Creative partnerships with generative AI. Possibilities for education and beyond", *Thinking Skills and Creativity*, p. 101727, Dec. 2024. https://doi.org/10.1016/j.tsc.2024.101727

[20] O. Luchenko and O. Doronina, "Application of the positive Japanese experience for teacher induction in Slovakia," *Stud. Orient. Slovaca*, vol. 22, no. 1, pp. 21–48, 2023. https://fphil.uniba.sk/fileadmin/fif/katedry_pracoviska/kvas/SOS_22_1/SOS_22_1.pdf

[21] Y. Liu and L. Shen, "Consolidating Human-AI Collaboration Research in Organizations: A Literature Review", *Journal of Computer, Signal, and System Research*, vol. 2, no. 1, pp. 131–151, Mar. 2025. https://doi.org/10.71222/7dehvd30

[22] Z. Wang and C. Wang, "A posthumanist approach to AI literacy", *Computers and Composition*, vol. 76, p. 102933, Jun. 2025. https://doi.org/10.1016/j.compcom.2025.102933

[23] G. Z. Karimova, "The Dialogic Evolution of AI-Based Products: A Polyphonic Analysis of Temporal Transformations", *International Journal of Human-Computer Interaction*, pp. 1–14, Apr. 2024. https://doi.org/10.1080/10447318.2024.2338661

[24] M. Kayyali, "Future Possibilities and Challenges of AI in Education", in *Advances in Educational Technologies and Instructional Design*. IGI Glob., 2024, pp. 118–137. https://doi.org/10.4018/979-8-3693-1351-0.ch006

[25] A. Serbanescu, "Human-AI system co-creativity for building narrative worlds", in *IASDR 2023: Life-Changing Des.* Des. Res. Soc., 2023. https://doi.org/10.21606/iasdr.2023.293

[26] V. Echeverria, K. Yang, L. Lawrence, N. Rummel, and V. Aleven, "Designing Hybrid Human-AI Orchestration Tools for Individual and Collaborative Activities: A Technology Probe Study", *IEEE Transactions on Learning Technologies*, pp. 1–14, 2023. https://doi.org/10.1109/tlt.2023.3248155

[27] R. Li, "A "Dance of storytelling": Dissonances between substance and style in collaborative storytelling with AI", *Computers and Composition*, vol. 71, p. 102825, Mar. 2024. https://doi.org/10.1016/j.compcom.2024.102825

[28] N. Beguš, "Experimental narratives: A comparison of human crowdsourced storytelling and AI storytelling", *Humanities & Social Sciences Communications*, vol. 11, no. 1, Oct. 2024. https://doi.org/10.1057/s41599-024-03868-8

[29] T. Woelfle, J. Hirt, P. Janiaud, L. Kappos, J. P. A. Ioannidis, and L. G. Hemkens, "Benchmarking Human-AI Collaboration for Common Evidence Appraisal Tools", *Journal of Clinical Epidemiology,* p. 111533, Sep. 2024. https://doi.org/10.1016/j.jclinepi.2024.111533

[30] J. Hitsuwari, Y. Ueda, W. Yun, and M. Nomura, "Does human–AI collaboration lead to more creative art? Aesthetic evaluation of human-made and AI-generated haiku poetry", *Computers in Human Behavior*, p. 107502, Oct. 2022. https://doi.org/10.1016/j.chb.2022.107502

[31] M. Orazbek, B. K. Issina, L. Bugenova, A. S. Tleulessova, M. Amangazykyzy, and G. A. Seidullayeva, "The Fantasy Genre and Mythopoetic Aspects in Children's Literature: Based on Foreign and Kazakh Literature," *Forum Linguistic Stud.*, Mar. 2025. https://doi.org/10.30564/fls.v7i3.8782

[32] A. Kabylov, G. Anes, N. Kamarova, A. Burkitbaeva, B. Zhailovov, and M. Shokhayev, "Cultural Identity of Public Consciousness in Kazakhstan Literature Education: Effects of a New Teaching Method", *Journal of Ethnic and Cultural Studies*, vol. 11, no. 1, pp. 119–141, Feb. 2024. https://doi.org/10.29333/ejecs/1954

[33] N. A. Toybazarova and G. Nazarova, "The modernization of education in Kazakhstan: Trends, perspective and problems", *Bulletin of the National Academy of Sciences of the Republic of Kazakhstan,* vol. 6, no. 376, pp. 104–114, Dec. 2018. https://doi.org/10.32014/2018.2518-1467.33

[34] Y. N. Pak, Z. S. Nuguzhinov, and D. Y. Pak, "Standardization and modernization of Kazakhstan Higher education", *Alma Mater*, no. 2, pp. 95–101, Feb. 2021. https://doi.org/10.20339/am.02-21.095

[35] L. N. Daurenbekova, Z. N. Zhumatayeva, A. M. Kartayeva, G. S. Bekenova, and A. N. Nurlanova, "The first educational directions and issues of literary translation in the Kazakh steppe", *Cadernos de Tradução*, vol. 44, no. 1, pp. 1–12, Apr. 2024. https://doi.org/10.5007/2175-7968.2024.e95583

[36] O. Bazyl, O. Abilova, O. Karpenko, H. Mierienkov, and A. Poliakova, "Assessing the impact of artificial intelligence integration on educational processes in higher education institutions of Ukraine and Kazakhstan", *Sustainable Engineering and Innovation*, vol. 7, no. 1, pp. 97–116, Mar. 2025. https://doi.org/10.37868/sei.v7i1.id418

[37] J. C. Auza-Santivañez *et al.*, "Artificial intelligence, education and digital inclusion," *EthAIca*, vol. 4, p. 110, Jun. 2025. https://doi.org/10.56294/ai2025110

[38] I. Kuznetsova, N. Shaimerdenova, and M. Buribaeva, "Kazakhstan modern culture and linguistics in the context of humanitarization of education", *Bulletin of Shokan Ualikhanov Kokshetau University Philological Series*, no. 3, pp. 255–266, Sep. 2024. https://doi.org/10.59102/kufil/2024/iss3pp255-266

[39] S. S. Murzaliyeva, "Kazakhstan`s modern mass culture in the context of musical revival trends", *Arts Education and Science*, vol. 1, no. 3, pp. 189–197, 2020. https://doi.org/10.36871/hon.202003023

[40] S. Gupta, P. Sharma, K. Vajrala, A. Fatima, and N. Sharma, "Integrating Artificial Intelligence in Education: Advancing Personalized Learning Within Ethical Frameworks: An Overview," *EthAIca*, 2025. https://ai.ageditor.ar/index.php/ai/article/view/418

[41] Z. Nurbekova and B. Nurbekov, "Digitalization of the Education System in Kazakhstan: Experience, Problems and Perspectives", *Strategies for Policy in Science and Education-Strategii Na Obrazovatelnata i Nauchnata Politika*, vol. 31, no. 4s, pp. 218–226, Jul. 2023. https://doi.org/10.53656/str2023-4s-19-dig

[42] A. S. Dzhanegizova, D. A. Amerzhanova, G. M. Mukhamedieva, L. G. Kirbasova, and A. E. Akbaeva, "Digitalization of higher education in Kazakhstan: Problems and development prospects," *Bulletin the National Academy of sciences of the Republic of Kazakhstan*, vol. 2, no. 408, pp. 386–400, 2024. https://doi.org/10.32014/2024.2518-1467.730

[43] O. Yuryk, L. Holomb, L. Konovalova, V. Vivsyannuk, and Y. Tsekhmister, "Assessment of the impact of artificial intelligence technologies on the development of Ukrainian medicine in war conditions," *Int. J. Chem. Biochem. Sci.*, vol. 24, no. 5, pp. 206–211, 2023. https://www.iscientific.org/wp-content/uploads/2023/11/26-ijcbs-23-24-5-26-done.pdf

[44] M. R. C. D. Bonon, "Transformation of performance management with artificial intelligence: Potentials and challenges", *International Seven Journal of Multidisciplinary*, vol. 3, no. 1, Mar. 2025. https://doi.org/10.56238/isevmjv3n1-028