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IMPLEMENTIN AI IN TEACHING C1 READING TO PRE-SERVICE TEACHERS

Farkhodova Gullola Erkinovna
Master student at Uzbek State University of World Languages, Tashkent, Uzbekistan
farhodovagullola@gmail.com
https://orcid.org/ 0009-0007-0176-2751

Abstract. The integration of Artificial Intelligence (AI) into language education has created new opportunities for enhancing the effectiveness of teaching and learning processes. This study explores the implementation of AI-based technologies in teaching C1-level reading skills to pre-service teachers. The research aims to examine how AI tools can support the development of advanced reading comprehension, critical thinking, learner autonomy, and digital literacy among future English language teachers. The study is based on a review of contemporary literature on AI-assisted language learning and the pedagogical applications of generative AI technologies in higher education. AI-powered tools, including intelligent tutoring systems, adaptive learning platforms, and generative AI applications, provide personalized learning experiences, immediate feedback, and interactive engagement with complex academic texts. The findings indicate that AI can significantly improve learners' ability to analyze, interpret, and evaluate sophisticated reading materials while increasing motivation and engagement. Furthermore, the use of AI contributes to the development of digital pedagogical competencies required for modern teaching practice.

Keywords: Artificial Intelligence, AI-assisted learning, C1 reading, reading comprehension, pre-service teachers, English language teaching, digital pedagogy, adaptive learning, generative AI, higher education, learner autonomy, educational technology.

1.Introduction

The rapid advancement of artificial intelligence (AI) technologies has significantly transformed educational practices worldwide, creating new opportunities for enhancing teaching and learning processes. As educational institutions increasingly embrace digital transformation, AI-powered tools have become valuable resources for supporting personalized learning, adaptive instruction, and data-driven educational decision-making. In language education, particularly in the field of English as a Foreign Language (EFL), AI applications have demonstrated considerable potential for improving learners' linguistic competence, critical thinking skills, and engagement with authentic learning materials.

Reading comprehension is one of the most essential language skills required for academic and professional success. At the Common European Framework of Reference for Languages (CEFR) C1 level, learners are expected to understand complex and lengthy texts, recognize implicit meanings, evaluate arguments critically, and synthesize information from multiple sources. Developing these advanced reading competencies presents significant challenges for both learners and instructors. Traditional reading instruction often struggles to address individual learner needs, provide immediate feedback, and maintain learner engagement with sophisticated academic texts. Consequently, innovative pedagogical approaches are needed to support effective C1 reading instruction.

Pre-service teachers represent a particularly important group of learners because they are not only acquiring advanced language proficiency but also developing pedagogical competencies that will influence their future professional practice. As future educators, pre-service teachers must become familiar with emerging educational technologies and learn how to integrate them

effectively into teaching and learning environments. Therefore, incorporating AI into reading instruction can simultaneously enhance their language development and strengthen their digital pedagogical literacy.

Recent developments in generative AI systems, intelligent tutoring platforms, automated feedback tools, and adaptive learning environments offer new possibilities for teaching advanced reading skills. AI can facilitate personalized reading pathways, generate comprehension questions, provide instant feedback, identify learner difficulties, and support higher-order thinking through interactive learning experiences. Moreover, AI-assisted instruction can help educators monitor learner progress more efficiently and design targeted interventions based on individual performance data.

Despite the growing interest in AI applications in education, research focusing specifically on the implementation of AI in teaching C1-level reading to pre-service teachers remains limited. Existing studies primarily examine general language learning contexts, while the unique needs of future teachers have received comparatively less attention. This gap highlights the necessity for further investigation into how AI technologies can be effectively integrated into advanced reading instruction for teacher education programs.

Therefore, this study aims to explore the implementation of AI-based tools and strategies in teaching C1 reading to pre-service teachers. The research examines the pedagogical benefits, challenges, and implications of AI-supported reading instruction while evaluating its effectiveness in improving reading comprehension, learner autonomy, critical thinking, and digital competence. The findings are expected to contribute to the growing body of knowledge on AI-enhanced language education and provide practical recommendations for teacher education institutions seeking to integrate innovative technologies into their curricula.

2.Literature review

The problems of teaching foreign language reading, developing reading strategies, and developing communicative competence have been explored in the works of foreign and domestic scholars. The foundation theoreticals of reading instruction have been developed in the studies of S. Grabe , W. Kintsch , P. Nation, J. Coady , F. Grellet , N. Anderson, and others.

Reading difficulties at the C1 level, cognitive load, metacognitive strategies, and academic reading have been examined in the works of S. Krashen, J. Cummins, P. Skehan , J. Sweller , and D. Nunan.

The application of artificial intelligence in education and foreign language teaching has been covered in the works of R. Luckin , E. Kasneci , X. Zhai , H. Crompton, D. Burke, and other researchers. Issues of digital pedagogy and the use of AI tools in foreign language teaching have been explored by PV Sysoyev , EM Filatov , and others.

Another important aspect is the use of large language models, such as ChatGPT , which can generate texts, create reading tasks, and provide explanations for complex lexical and grammatical structures. Research shows that such tools can significantly improve text comprehension when used methodologically.

At level C1, particular attention is paid to developing critical thinking and analytical skills. According to a study by Nation, effective reading instruction at an advanced level requires a combination of intensive and extensive reading, which can be successfully achieved using adaptive AI platforms.

A review of the scientific literature shows that the use of artificial intelligence has significant potential for improving the effectiveness of reading instruction. However, most studies are

theoretical or descriptive in nature, which emphasizes the need to conduct experimental studies using quantitative methods of analysis. In order to substantiate the effectiveness of introducing artificial intelligence tools into the process of developing the professional competencies of future teachers, an experimental study was conducted aimed at assessing the level of students' readiness to integrate AI technologies into reading instruction at level C1 (Advanced). The experimental study was conducted using a classic three-stage model (pre-test - learning - growth - post-test), which allowed us to identify the dynamics of changes in the subjects' professional and methodological skills.

3.Analysis and results

In the first stage (pre-test), students were given reading tasks corresponding to level C1 of the Common European Framework of Reference for Languages (CEFR). Each task was accompanied by an additional methodological question: determine which artificial intelligence tool can be integrated into a given task type and how it can improve learning effectiveness. Thus, not only the students' linguistic skills were tested, but also their ability to design pedagogical lessons using modern digital technologies. The results of the initial testing revealed that most students demonstrated a low level of digital pedagogical competencies. Despite their sufficient English proficiency, subjects experienced significant difficulties in selecting relevant AI tools and justifying their didactic use. In particular, fragmented knowledge of artificial intelligence tools and a lack of understanding of their functionality and methodological advantages in teaching reading were observed. This indicates a gap between the language training and digital pedagogical literacy of future teachers. The second phase of the experiment involved an educational intervention aimed at developing students' systematic understanding of the potential of using AI in the educational process. This phase included a detailed examination of modern artificial intelligence tools, including ChatGPT , QuillBot , and Grammarly, as well as their functionality in the context of reading instruction. Particular attention was paid to the methodology of integrating these tools into various types of reading tasks: text analysis, development of critical thinking, and development of interpretation and reflection skills.

The training was based on a practice-oriented approach: students not only studied theoretical aspects but also completed tasks to develop their own methodological solutions using AI. Specifically, they learned to select tools based on the objectives of the task (for example, using AI to generate questions about a text, adapt the difficulty of a text, or create interactive exercises). During the final stage (post-test), students were given the same set of tasks as in the pre-test. This ensured comparability of results and an objective assessment of the effectiveness of the training. Analysis of the results revealed a significant improvement: most students were able to correctly identify relevant AI tools for each type of task, as well as provide a well-reasoned justification for their pedagogical feasibility. The experiment involved third-year undergraduate students (FING-2305 (rus), FING-2306 (rus), FING-2307) in the English Philology Department, English Language Teaching Methods and Educational Technologies program, at the Uzbek State World Languages University. The total sample consisted of 48 students, divided into three academic groups (an average of 16 students in each group).

The experimental group consisted of students in groups 2305 and 2306, while students in group 2307 served as the control group. To determine statistically significant differences between pre- and post-experimental results, a paired samples t-test was used in JASP.

To quantitatively assess the effectiveness of the educational intervention, task completion accuracy indicators were used, reflecting students' ability to correctly identify relevant AI tools and justify their use in C1-level reading tasks.

Analysis of the presented data indicates a significant increase in the development of digital pedagogical competencies among students in the experimental groups following the educational intervention. Specifically, the average rate of correct answers in the combined experimental group sample increased from 64.7% at the pre-test to 85.2% at the post-test, representing an increase of approximately 31.7%. The control group also showed some improvement in results, but the magnitude was significantly lower.

Table 1

Results of pre - test and post - test in assessing the effectiveness of using artificial intelligence in teaching reading at level C1 among future teachers (in % of correct answers)

Group	n	Pre-test (M ± SD)	Post-test (M ± SD)	Δ (%)	t-statistics	p-value
Experimental group 1	16	63.9 ± 4.7	86.4 ± 4.0	+35.2 %	20.21	<0.001
Experimental group 2	16	65.4 ± 4.3	84.0 ± 3.9	+28.4 %	12:31	<0.001
Control group	16	66.3 ± 3.7	72.8 ± 4.1	+9.8%	5.35	<0.001
Total (experimental groups)	32	64.7 ± 4.5	85.2 ± 4.1	+31.7 %	20.82	<0.001

A paired-sample t-test (paired t-test for dependent samples) revealed statistically significant differences between the pre-test and post-test results. The most pronounced positive dynamics were observed in the experimental groups, where the rate of correct answers increased significantly after the implementation of AI tools. Some changes were also observed in the control group, but their magnitude was significantly smaller compared to the experimental groups, confirming the impact of the educational intervention.

It should be noted that the relatively low standard deviation (SD) scores at the post-test stage indicate not only an overall increase in knowledge but also a leveling-off of results between students in the experimental groups. This indicates that the training program had a systemic effect, narrowing the gap between the more and less prepared participants.

For a more in-depth interpretation of the experimental results, in addition to checking the statistical significance of the differences, the effect size indicator was calculated - the Cohen's d coefficient, which allows us to assess the practical significance of the identified changes.

The effect size calculation for dependent samples was based on the difference in pre-test and post-test means, accounting for the standard deviation of the differences between measurements. Comparisons were conducted separately for the experimental and control groups, allowing for an assessment of the direct impact of the educational intervention.

Table 2

Effect size (Cohen's d) by group

Group	Pre-test (M)	Post-test (M)	SD (pooled)	Cohen's d	Interpretation
Experimental group 1	**63.9**	**86.4**	**4.35**	**5.17**	**Very big effect**
Experimental group 2	**65.4**	**84.0**	**4.10**	**4.54**	**Very big effect**
Control group	**66.3**	**72.8**	**3.90**	**1.67**	**Big effect**
Total (experimental groups)	**64.7**	**85.2**	**4.27**	**4.80**	**Very big effect**

According to Jacob Cohen's generally accepted interpretation, Cohen's d values of 0.2 are considered small, 0.5 are considered moderate, and 0.8 and above are considered large. In this study, the values obtained in the experimental groups significantly exceeded these thresholds, demonstrating the high practical significance of the educational intervention.

In other words, the differences between pre- and post-training results are not only statistically significant but also pedagogically relevant. This means that the introduction of AI tool training has a significant impact on the development of professional competencies in future teachers. However, no comparable improvement in results was observed in the control group.

It should be emphasized that such a significant effect is explained not only by increased knowledge of AI tools but also by a qualitative change in the students' cognitive structure—a shift from intuitive to conscious pedagogical design. The combined results ($p < 0.001$ and high Cohen's d values) suggest the high effectiveness of the proposed method and its feasibility for implementation in teacher training.

To enhance the reliability of results interpretation and assess the accuracy of the obtained mean values, 95% confidence intervals (CIs) were calculated for the pre-test and post-test scores, as well as for the difference in mean values. This approach allows us to determine the range within which the true population value is likely to lie.

Table 3

95% confidence intervals for the results of the experiment on the effectiveness of using artificial intelligence in teaching reading at the C1 level to future teachers

Group	Pre-test (95% CI)	Post- test (95% CI)	Difference (Δ)	95% CI (Δ)
Experimental group 1	**[61.4; 66.4]**	**[84.3; 88.5]**	**22.5**	**[20.1; 24.9]**
Experimental group 2	**[63.1; 67.7]**	**[81.9; 86.1]**	**18.6**	**[15.4; 21.8]**
Control group	**[64.3; 68.3]**	**[70.6; 75.0]**	**6.5**	**[3.9; 9.1]**
Total (experimental groups)	**[63.1; 66.2]**	**[83.8; 86.6]**	**20.5**	**[18.4; 22.6]**

Analysis of confidence intervals shows that the ranges of values for pre-test and post-test in the experimental groups practically do not overlap, which is additional confirmation of statistically significant differences between the stages of the experiment.

Particular attention should be paid to the confidence intervals for the differences in mean values (Δ). Across all experimental groups, they are entirely positive and do not include the zero value, indicating a stable and clear effect of the educational intervention.

Furthermore, the relatively narrow range boundaries indicate high precision of the estimates and sample homogeneity. This means that the obtained results are highly reliable and can be extrapolated to a broader population of students with similar profiles.

Using confidence intervals in conjunction with the results of the paired samples t-test and the effect size metric (Cohen's d) allows for a comprehensive statistical justification for the effectiveness of the proposed method. This confirms not only the presence of a significant effect but also its robustness, accuracy, and practical significance, particularly in experimental groups trained with the integration of AI tools.

Thus, the quantitative analysis confirms the effectiveness of the developed method for teaching the use of AI tools. The results demonstrate that targeted development of skills for integrating artificial intelligence into reading instruction leads to a statistically significant increase in the professional competence of future teachers in the experimental groups compared to the control group.

The results of the experiment conducted as part of this study confirm that targeted training in the use of artificial intelligence tools helps improve the professional preparedness of future teachers. Developing their skills in integrating AI into the educational process not only expands their methodological toolkit but also ensures compliance with the modern requirements of the digital transformation of education.

Overall, the study allows us to conclude that the inclusion of modules on the use of artificial intelligence in the training of teaching staff is a necessary condition for improving the quality of education at advanced levels of language proficiency, including level C1.

Experimental testing of the developed methodology allowed us to formulate the following conclusions:

The pre-test results confirmed the presence of a gap between the high level of students ' speech training (C1) and their low readiness to use AI for professional purposes . Students experienced difficulties in choosing relevant tools for specific types of tasks , that proof : language proficiency does not guarantee automatic formations digital - pedagogical competence .

4.Conclusions

Implementation of a second methodology led to significant transformations professional thinking of future teachers. Participants in the experimental groups demonstrated a shift from intuitive use of digital technologies to conscious pedagogical design . training . Students learned to substantiate select AI tools to develop skills of analysis ,interpretation and critical thinking reading at level C1 .

Quantitative data confirms the high efficiency of Russian Railways training :

Increase in indicators : In the total sample of experimental groups of averages rate of correct answers increased from 64.7% to 85.2% (an increase of approximately 31.7%) .

Validity : The results of the paired samples t - test showed statistically The significant difference between pre-test and post-test ($t = 20.82$ at $p < 0.001$) excludes the possibility of randomness of the results .

Practical significance : The Cohen 's $d = 4.80$ effect size indicator indicates exceptionally high efficiency .

The study revealed a decrease in the variance of individual results at the post - test stage in the experimental groups . This indicates that the proposed method had a positive impact not only on students with an initially high level of digital preparation , but also on participants who had a low level of digital literacy . Therefore , the teaching model has a pronounced compensatory and equalizing potential .

The necessity is justified on the basis of the experience implementation specializing modules on AI in the curricula (in particular , for Uzbek State University of World Languages) . Key areas include the creation of a bank of AI tools according to CEFR levels, training teachers in the ethics of using neuroscience , and the transition to mixed models assessments .

The head of the experimental team proved that the goal is to correctly train the use of AI tools essentiallyincreases the professional readiness of future teachers for teaching reading at level C1 . The proposed model is a reliable basis for modernizing pedagogical education in the context of digital transformation .

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