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# POSSIBILITIES OF USING ARTIFICIAL INTELLIGENCE TOOLS IN THE PROCESS OF PRIMARY EDUCATION

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**Abstract.** The article comprehensively examines the possibilities of using tools (elements) of artificial intelligence in the process of primary education. The study identifies the need to develop skills in working with elements of artificial intelligence among senior students of the educational program *"Pedagogy and Methods of Primary Education"* at a higher educational institution.

The introduction presents the relevance of the topic, the purpose, and the objectives of the research. In addition, the article discusses the advantages of using artificial intelligence tools. The presented study also provides a definition of the concept of "artificial intelligence". A review of the works of foreign and domestic scholars who have studied this issue is conducted, including their opinions on bots, ChatGPT, and other similar technologies. However, the literature review notes that the potential for using artificial intelligence tools in primary education has not been fully explored.

The next section provides information about the research methods, namely observation and survey. The final section presents detailed results of these methods. The research findings include diagrams illustrating data obtained through observation and surveys of 3rd- and 4th-year students of the *"Pedagogy and Methods of Primary Education"* program at Abai Kazakh National Pedagogical University. The study concludes that elements of artificial intelligence enhance interest in the learning process.

Furthermore, the study identifies the need for developing specialized courses that demonstrate the possibilities of applying artificial intelligence tools in primary education. The survey results are processed and presented using the SPSS software.

Based on the research findings, a recommendation is made to develop a specialized course aimed at training future primary education teachers to work with artificial intelligence tools.

**Keywords:** primary education process, future primary education teachers, artificial intelligence (AI), artificial intelligence tools, activity, enhancement, digital education, ChatGPT

## Introduction

The possibilities of using artificial intelligence in the development of the modern education system in Kazakhstan are high. Because President of the

country Kassym-Jomart Tokayev said at an expanded meeting of the government that "it is very important to continue digitalization and use artificial intelligence technologies on a large scale. To do this, first of all, we need qualified personnel who use artificial intelligence in their field," he said, noting the important tasks. This is one of the global changes in the field of education – the need to use the capabilities of artificial intelligence even by personnel of the primary education process-indicates the relevance of the topic [1].

Thus, after the relevance of the topic, the goal, objectives were determined. The purpose of the article: to describe the need for it by identifying the possibilities of using elements of artificial intelligence in the process of primary education. In this regard, the following tasks were set: to analyze the theoretical foundations of the use of artificial intelligence; to characterize the concept of artificial intelligence; to identify the possibilities of using artificial intelligence in the process of primary education, to describe the need and to give methodological recommendations on the results.

First, a description of the basic concept of our study was made. The concept of the basis of the study is artificial intelligence. Artificial intelligence (AI, Eng., Artificial intelligence) - science and technology for the development of intelligent computer programs and Machines [2]. Artificial intelligence (AI) is a computer program used in relation to human – specific actions such as thinking, using language, solving problems [3]. And in our conclusion, artificial intelligence is an artificial intelligence ability of copy systems (machines) that can read and perform tasks in imitation of human cognitive abilities. In this regard, in the field of education, artificial intelligence is an auxiliary tool used for the purpose of privatization, simplification and automation of the educational process and create new thoughts (ideas).

In the next step, the theoretical foundations of the study were established. To do this, a review of the works of several first-time foreign scientists AI was analyzed. It is noted that the study of the scope of the use of artificial intelligence in the field of education increased after Alan Turing's promising views on the "Thinking Machine" for the first time in 1950. They are the following works: Calancey et al., 1979; Kurzweil, 1985; Simmons and Chappell, 1988; Beck et al., 1996; Andrissen and Sandberg, 1999; Kurzweil and Kapor, 2002; Kurzweil, 2002; Zdenek, 2003; Legg and Hutter, 2007; Burleson and Lewis, 2016; Kaplan and Haenlein, 2019 [4]. Ke Zhang, Ayse Bugum Aslan indicate in their study that the first works on artificial intelligence in education were in the Natural Science direction.

And the research of Lijia Chen, Pingping Chen and Zhijian Lin is designed to evaluate the effect of artificial intelligence on education. The research paper, based on the descriptive part and evaluation structure, is limited to the effect of using artificial intelligence in administration, teaching and education [5]. Management provides evidence of the effect of AI in providing review, assessment and feedback of administrative tasks, assignments and student work. This effect

was based on the work of Sharma and several scholars who argued that it eases the workload of instructors [6]. And in teaching, the effect of AI has been described based on additional tools and platforms. This effect was based on the work of Timms [7]. That is, it was discussed that AI tools, such as virtual reality, have a positive impact on students' practical or hands-on learning experience. The next impact of AI on learning is that it makes learning interesting and enjoyable [8]. It is reasoned that learning perception and memory are improved in this way. Pokrivcakova's research is also cited, who writes about chatbots that best influence students' academic achievements and needs [9]. In general, all these works evaluated the impact of artificial intelligence on education.

Olaf Zawacki-Richter, together with several authors, made a systematic review of the use of artificial intelligence in higher education in his article [10]. This work highlights the increasing number of articles on artificial intelligence (AI) in the field of education each year and provides an in-depth analysis of these articles. This indicates that the number of AI-related studies is growing and demonstrates their relevance.

Kazakh researchers Mambetalieva A. K. and Turalbaeva A. T. describe the importance of future teachers of primary education in the age of increasing new technological capabilities to be familiar with the achievements of science at the request of the time and to be able to apply elements of artificial intelligence in practice. It also classifies the positive and negative aspects of the use of artificial intelligence in the classroom [11]. This reveals the importance of using the element of artificial intelligence in primary education.

Also, A. A. Utepbaeva, together with several researchers, in her article considered artificial intelligence as a diagnostic technology for identifying children with special needs. The content of the article concludes that only one smartphone with an artificial intelligence tool will be able to find out the problem that worries parents and consider ways to solve it, without causing stress to the schoolchild, without getting tired on a long road [12]. So it conveys the idea that it can be an indispensable aid for parents and teachers.

A. S. Dzhanegizova, together with several authors, in her works showed by percentage indicators that the data obtained by artificial intelligence is not always correct. That is, she described the consequences of misinterpretation of information in the request when using artificial intelligence [13]. As a result, it is also noted that the constant use of AI leads to addiction.

In her article, M.Zh. Tusupbekova, together with several coauthors, conducted a study highlighting that digital technologies such as ChatGPT significantly enhance students interest and motivation in the process of learning English. Furthermore, the authors provided practical materials for conducting lessons using digital tools.[14].

In the course of a comprehensive review of the ChatGPT bot, R. K. Izmagambetova considered the impact, advantages and possible problems of general educational practice. The article also presents ethical considerations

regarding the use of ChatGPT in educational institutions [15]. This means that it is necessary to take into account the negative ethical consequences of using ChatGPT in educational practice. It is these studies that show that in modern conditions there are opportunities for the use of artificial intelligence in the process of primary education. However, after analyzing the literature review, it was analyzed that the possibility (effectiveness) and need to use elements of artificial intelligence in primary education were not fully considered, and systematic research work on the increase in the number of AI tools is just beginning. In this regard, based on the above theoretical analysis, a research design was established.

**Materials and methods**

The study involved 122 third and fourth year students of the educational program B003 – "Pedagogy and Methodology of Primary Education". The research initially employed the observation method, which was conducted over a period of three months during seminar lessons. The observation took place specifically in the seminar sessions of the courses "Development of innovative Educational Products" and "The experience of creative thinking in business". The observation was evaluated based on three criteria: high (students are knowledgeable about AI and able to use AI tools), medium (students have general knowledge about AI tools but do not fully know how to use them), and low (students have only heard about AI). Based on the results of the observation, it became clear that additional methods were needed to identify further indicators. Therefore, the next research method selected was a survey.

As the second research method, an author-developed survey was chosen. This method was selected due to its ability to collect data from a large number of respondents relatively efficiently. The standardized structure of the questions ensured consistency in the responses. Additionally, the survey allowed for the collection of information without disclosing respondents' identities, increasing the likelihood of obtaining honest answers. Most importantly, the data collected through the survey were in a quantitative format, offering the advantage of easy processing using statistical software (SPSS). The purpose of the survey is to identify and clarify the necessity of using AI during lessons.

Based on the aforementioned studies, a brief author-developed survey was designed to determine the necessity of incorporating artificial intelligence (AI) elements (tools) into the primary education process. To further clarify this need, a specific question, "Does the use of artificial intelligence tools increase interest in education?" was included in the survey.

In total, the study analyzed responses from 122 participants.The survey asked the following questions:

1. Year of study (3/4)
2. Do you have experience using AI?
3. Does the type of technology you use in digital education matter?
4. Do you use digital technologies?

5. Which types of digital technology do you use?

6. Do you use artificial intelligence tools?

7. Do you know how to work with artificial intelligence tools?

8. Do you want to learn how to work with artificial intelligence?

9. Does the use of artificial intelligence tools activate school students' learning activities?

10. What do you think is necessary to learn to use artificial intelligence in education?

For the research, mathematical statistics were applied to the responses of questions №1, 6, and 9 in the survey, as these answers are crucial for determining the research hypothesis. The results of these questions are presented in the following section with various indicators.

The reliability of the method used in this study is supported by several factors, including frequency, the effects of independent selections, relationships between responses, probability ratios, and linear relationships. Additionally, the sample was selected in accordance with Pearson's chi-square criteria.

**Results**

As a result of the first research method, observation, it was found that students have limited opportunities to use AI tools during seminar lessons. Specifically, 20% of the student demonstrated a high level, 24,2% a medium level, and 55,8% a low level of AI tool usage. This indicates that the majority of the students involved in the study lacked the skills to use AI effectively.

The second research method, the survey, consisted of 10 questions.

1. Regarding the question about the respondents' academic year (3rd or 4th year), 62.30% were 4th year, and while 37.80% were 3rd year students.

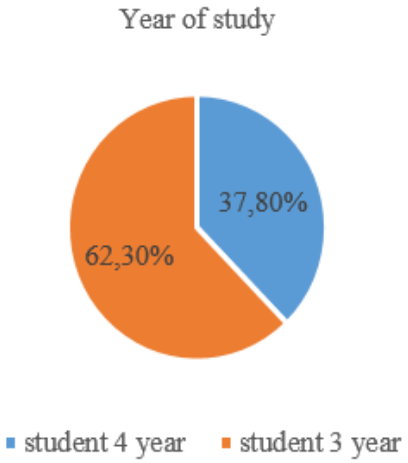


Figure 1 - Result of the first question

2. Regarding the question about experience in using AI, 33.70% of respondents had no experience, 6.20% had 1 year of experience, 17.40% had 2

years of experience, and 42.80% had more than 3 years of experience.

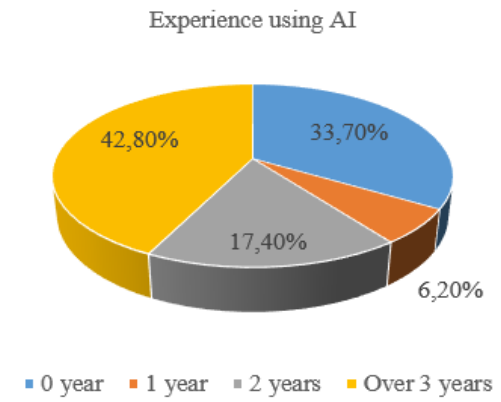


Figure 2 - Result of the second question

3. Regarding the question "Does the type of technology you use in digital education matter?", 92.8% responded "yes," 0% responded "no," 7.1% responded "partially," and 0% responded "I can't say anything."

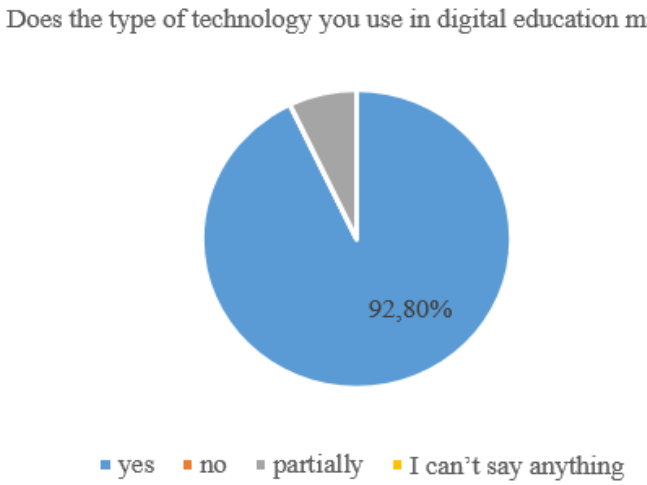


Figure 3- Result of the third question

4. Regarding the question "Do you use digital technology types?", 78.5% responded "yes," 2% responded "no," 19.3% responded "partially," and 0% responded "I can't say anything."

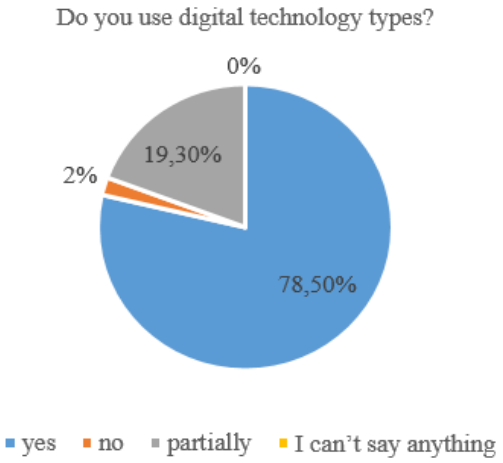


Figure 4- Result of the fourth question

5. Regarding the open-ended question "Which types of digital technology do you use?", the responses included: "There are many types, I use all of them"; Wordwall, quizzes, Kahoot; Bamboozle, lumio.kz; learning app; D-ID; Bandicam, Coreapp, and others.

6. Regarding the question "Do you use artificial intelligence tools?", 30.6% responded "yes," 36.8% responded "no," 28.5% responded "partially," and 4.1% responded "I can't say anything.

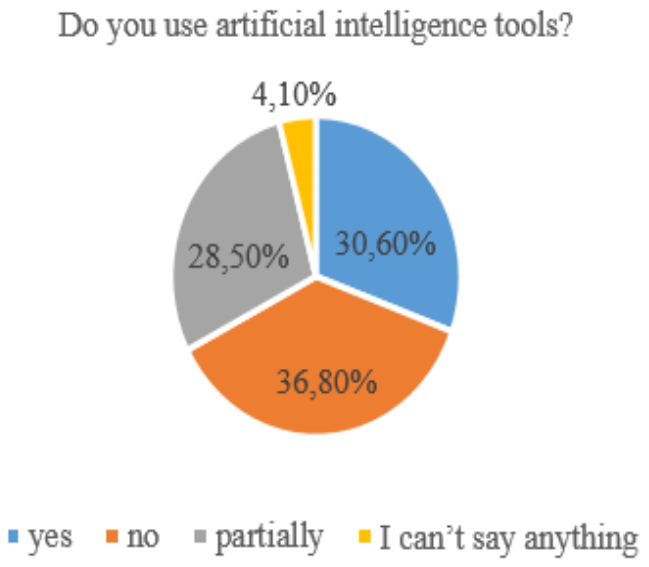


Figure 5 - Result of the sixth question

7. The question “Do you know how to work with artificial intelligence tools?” received the following responses: “Yes” – 38.8%, “No” – 23.5%, “Partially” – 30.6%, and “I can’t say anything” – 7.2%.

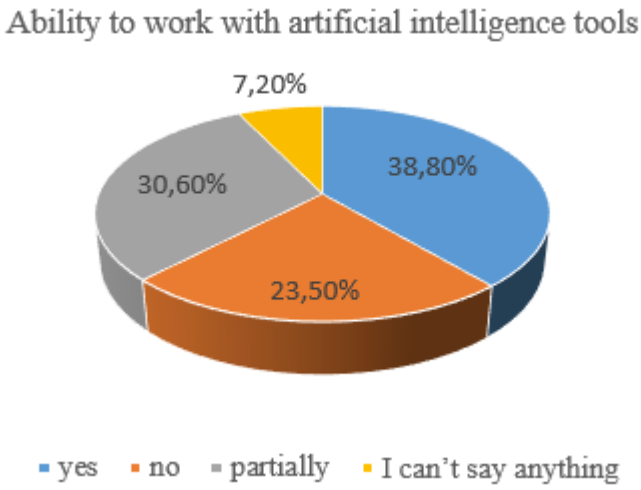


Figure 6 – Result of the seventh question

8. The question “Do you want to learn how to work with artificial intelligence?” received the following responses: “Yes” – 83.7%, “No” – 5.1%, “Partially” – 8.1%, and “I cannot say anything” – 3%.

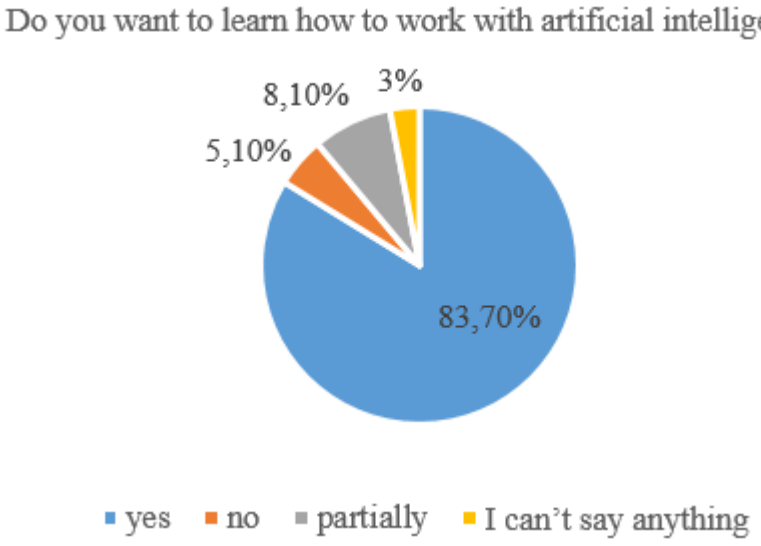


Figure 7: Result of the eighth question

9. The question “Does the use of artificial intelligence tools activate school students’ learning activities?” received the following responses: “Yes” – 80.6%, “No” – 1%, “Partially” – 7.1%, and “I cannot say anything” – 11.2%.

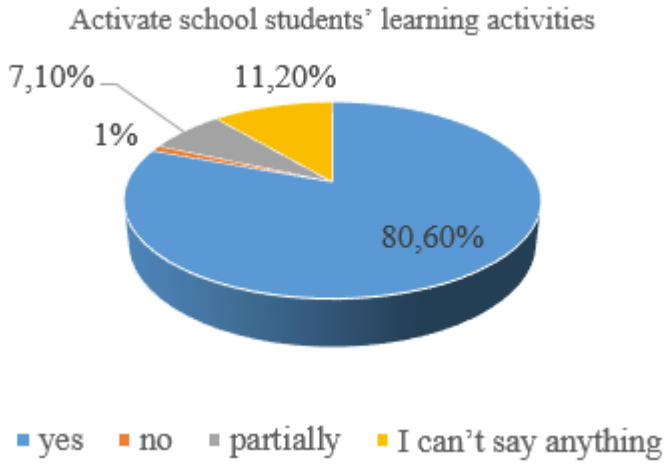


Figure 8: Result of the ninth question

10. To the question, “What do you think is needed to learn how to use artificial intelligence in education?” the responses included: digital literacy; knowledge, skills, and seminars; teaching artificial intelligence as a separate subject; understanding the correct methods; access to reliable internet; proficiency in digital technologies; enhancing knowledge about artificial intelligence; interest and time; and specialized education.

Following the survey results, mathematical processing was conducted for questions 6, and 9. The data was analyzed using SPSS software, and mathematical statistical results were obtained. To assess the extent to which AI tools are utilized, a frequency analysis was performed, as presented in Table 1.

Table – 1 *Frequency of AI use*

| Application of AI | | | | | |
|---|---|---|---|---|---|
| Response | | Frequency | Percentage | Valid percentage | Accumulated percentage |
| Valid | yes | 37 | 26,4 | 30,9 | 30,6 |
| | no | 45 | 32,1 | 36,8 | 67,4 |
| | partially | 35 | 25,0 | 28,5 | 95,9 |
| | I can't say anything | 5 | 3,6 | 4,1 | 100,0 |
| | Total | 122 | 87,9 | 100,0 | |
| Missed | Systematic | 17 | 12,1 | | |

Table 2 shows the estimation of the effects of independent choices on the use of AI. The data were analyzed by three indicators: Cohen’s d, Hedges’ correction and Glass’s delta. Cohen’s d was -0.871.

Table – 2 *Indicators of evaluation of the effects of independent choices on the use of AI*

| The size of the effects of independent samples | | | | |
|---|---|---|---|---|
| | | Point assessment | 95% confidence interval | |
| | | | Lower | Upper |
| AI use | Cohen's d | -,196 | -,606 | ,215 |
| | Hedges' correction | -,194 | -,601 | ,213 |
| | Glass's delta | -,231 | -,642 | ,182 |

Now the main question in the questionnaire is "Does the use of artificial intelligence tools activate school students' learning activities?". In order to determine the result of our question, an analysis was carried out on the relationship between the answers. Its results are presented in the following tables. For example, in Table 3, " Does the use of artificial intelligence tools activate school students' learning activities?", the relationship between the answer and the status of respondents is given. Those who answered "yes" in the table: 4th year students-47, 3rd year students-75, in total-122 respondents.

Table – 3 *Correlation between the answers of the respondents to the question "*Does the use of artificial intelligence tools activate school students' learning activities*?"*

| Question, answer | | Year of study | | Total |
|---|---|---|---|---|
| | | 4th year | 3rd year | |
| | yes | 29,6 | 51 | 98 |
| | no | 0 | 1 | 1 |
| | partially | 3,55 | 3,55 | 9 |
| | I can't say anything | 5 | 6,2 | 14 |
| Total | | 47 | 75 | 122 |

Based on the updated date, the results of the Pearson's Chi-square test are as follows: Chi-square value-1.308, Degrees of freedom-3, Asymptotic significance (p-value)-0.727. Since the p-value (0.727) is greater than 0.05, the null hypothesis is accepted. This means that there is no statistically significant relationship between the responses and the year of study.

Table – 4 *Indicators according to Pearson's Chi-square test*

| Chi-square criteria | | | |
|---|---|---|---|
| | Value | Degree of freedom | Asymptotic value (2-sided) |
| Pearson Chi-Square | 1.308 | 3 | 0.727 |
| Probability relationships | | 3 | - |
| Linear connection | | 1 | - |
| Number of observations allowed | 122 | | |

According to the new indicators ($x^2$= 1.308, p=0.727), the Pearson Chi-square test showed that there is no statistically significant relationship between the responses and the respondents (3rd and 4th year students). The p-value of 0.727 is much higher than the 0.05 threshold. Therefore, we can conclude that there is no significant difference between the year of study and the answers to the question of whether AI increases interest. This result suggests that it is not necessary to associate interest in AI solely with the students' academic year. In future research, we will not select participants based on their year of study, but rather based on the results of their previous answers.

**Discussion**

According to the results of the first method – observation it was revealed that most respondents lack the ability to use AI tools. This outcome aligns with the conclusions of the article by A.K. Mambetalieva and A.T. Turalbayeva, cited in the theoretical review, which emphasized the importance of equipping primary education teachers with the practical skills needed to integrate AI elements in their work as required by modern educational demands.

The second analysis was conducted using survey results to clarify the potential reasons identified during the observations. According to the first question, the majority of respondents (62.3%) were 3rd-year students. The second question revealed that 33.7% of participants had no experience using AI tools, 6.2% had about 1 year of experience, 17.4% had around 2 years, and 42.8% had more than 3 years of experience. This indicates that there is a considerable number of respondents with no experience in using such tools.

For the third question, the vast majority (92.8%) highlighted the importance of the type of technology used in digital education. Similarly, for the fourth question, 78.5% stated that they actively use various digital technologies. For the fifth, an open-ended question, many participants specifically mentioned technologies that incorporate AI. In line with this, the sixth question revealed that 30.6% of respondents already use AI tools.

The seventh question showed that 38.8% of respondents claimed to possess the skills necessary to work with AI, while the eighth question indicated a significant interest (83.7%) in learning to work with AI tools. Supporting this finding, the ninth question revealed that 80.6% of participants believed that AI tools enhance engagement in education.

In the final question, respondents suggested that mastering AI in education requires specialized knowledge, training courses, seminars, or even dedicated subjects.

The third mathematical analysis began with determining the extent to which AI tools are used. Frequency analysis showed that only 37 respondents, or 30.6%, answered "yes," confirming that the majority do not fully utilize AI. This supports the hypothesis that a lack of practical skills is a significant barrier. These findings highlight the need for targeted interventions to address skill gaps

and support effective integration of AI in education.

According to the following indicators, no statistically significant correlation was found between the respondents' status and their answers. The p-value (0.727) is considerably higher than the 0.05 threshold, indicating that whether a respondent is in the 3rd or 4th year does not significantly influence the type of response.

However, the majority of students in both groups-75 third-year students and 47 fourth-year students, totaling 122 respondents-answered "yes". These results suggest a shared belief that the use of AI tools enhances students' learning engagement. In other words, a positive evaluation of the role of artificial intelligence in the educational process is evident regardless of the respondents' year of study.

The following results were obtained from the Pearson's Chi-square test: the Chi-square value is 1.308, the degrees of freedom are 3, and the asymptotic significance (p-value) is 0.727. Since the p-value is significantly higher than the 0.05 threshold ($0.727 > 0.05$), the null hypothesis is accepted. This means that there is no statistically significant relationship between the respondents' year of study and their responses. Whether a student is in the 3rd or 4th year does not have a significant impact on their opinion about AI (e.g., "yes," "no," "partially," or "I can't say"). In other words, the attitude toward the use of AI is not dependent on the level of study. This indicates that students from both year levels have a shared need for theoretical knowledge and practical skills related to AI use.

This situation shows that students' assessment of AI is generally uniform and consistent. That is, both 3rd- and 4th-year students equally understand and support the importance of artificial intelligence in the educational process.

**Possible reasons:**

- limited dissemination of information about AI tools among students;
- a lack of sufficient professional understanding of AI among both 3rd- and 4th-year students.

Therefore, since no statistically significant relationship was found between the year of study and responses related to AI, the results of this question were not considered critical. However, based on the statistical results of **question 9** in the survey, a large number of respondents indicated that AI enhances students' learning engagement. Moreover, the majority of participants agreed in **question 10** that special course programs are needed to develop AI application skills.

## Conclusion

The purpose of this study was to determine the need for the use of AI in the process of primary education. First of all, an analysis of the basic concept of research was made for theoretical analysis. Based on this, the description was given that artificial intelligence is an auxiliary tool used to privatize, automate, speed up the educational process and create a new thought (idea). After the description of the concept of artificial intelligence, a review of the works of

foreign and Kazakhstani scientists who were the first to use this term in their research and are still devoted to their research was made.

The literary review was facilitated by the dissertation works and scientific articles of scientists. In the course of the review, it was found that the need to use artificial intelligence is important in all areas, although research has shown that the need to use it in the process of Primary Education has not been fully studied.

In order to identify this need, the research methodology was clarified, and survey questions were developed. The question "Does AI increase students' interest?" was used to determine the necessity of introducing training courses on AI application skills in future primary education.

Senior students were selected as respondents for the study. During the research, observation, surveys, and statistical analysis methods were used. As a result of the observation, the need to apply the survey method became evident. Additionally, mathematical analysis was conducted on several survey questions to refine the findings. The survey data were entered into a specialized computer program and processed using SPSS software. The data revealed a moderate level of statistical significance regarding the impact of AI use among the respondents.

As a conclusion, it was proposed to develop an elective course program for senior students majoring in "Primary Education Pedagogy and Methods." This course would include topics on the application of artificial intelligence, covering relevant knowledge and practical skills. The next stage of the research will focus on analyzing the outcomes of this elective course.

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# БАСТАУЫШ БІЛІМ БЕРУ ҮДЕРІСІНДЕ ЖАСАНДЫ ИНТЕЛЛЕКТ ҚҰРАЛДАРЫН ҚОЛДАНУ МҮМКІНДІКТЕРІ

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**Аңдатпа.** Мақалада жасанды интеллект құралдарын (элементтерін) бастауыш білім беру үдерісінде қолдану мүмкіндіктері жан-жақты қарастырылады. Зерттеу барысында жоғары оқу орнының «Бастауыш оқытудың педагогикасы мен әдістемесі» білім беру бағдарламасының жоғары курс студенттеріне жасанды интеллект элементтерімен жұмыс істеу дағдыларын дамыту қажеттілігі анықталады.

Бұл жұмыстың кіріспе бөлімінде тақырыптың өзектілігі, мақсаты мен міндеттері ұсынылады. Сонымен қатар мақалада жасанды интеллект құралдарының артықшылықтары да қарастырылады. Ұсынылып отырған зерттеу жұмысында «жасанды интеллект» ұғымына анықтама беріледі. Бұл мәселені зерттеген шетелдік және отандық ғалымдардың бірнеше еңбектерін басшылыққа ала отырып шолу жасалады. Соның ішінде боттар, ChatGPT және т.б. туралы пікірлері қарастырылады. Алайда әдебиеттерге шолу жасау барысында, бастауыш білім беруде жасанды интеллект құралдарын қолдану мүмкіндігі толық қарастырылмағандығы сөз етіледі.

Келесі бөлімінде зерттеу әдістері, яғни бақылау және сауалнама туралы ақпараттар беріледі. Ал, соңғы бөлімінде сол әдістердің нәтижелері толықтай бейнеленеді. Зерттеу нәтижелерінде Абай атындағы Қазақ ұлттық педагогикалық университетінің «Бастауыш оқытудың педагогикасы мен әдістемесі» білім беру бағдарламасының 3 және 4 курс студенттерімен жүргізілген бақылау және сауалнама әдістерінің көрсеткіштері диаграммамен ұсынылады. Зерттеу қорытындысында жасанды интеллект элементтерінің оқу үрдісінде қызығушылықты арттыратыны анықталады.

Сонымен бірге бастауыш білім беру үдерісінде жасанды интеллект құралдарын қолдану мүмкіндіктерін көрсететін арнайы курстардың қажеттілігі белгіленеді. Сауалнама нәтижелері SPSS компьютерлік бағдарламасы арқылы өңделіп, ұсынылады.

Зерттеу қорытындысы бойынша болашақ бастауыш білім беру педагогтеріне жасанды интеллект құралдарын үйретуге бағытталған арнайы курсты әзірлеу жөнінде ұсыныс жасалады.

**Тірек сөздер:** бастауыш білім беру үдерісі, болашақ бастауыш білім педагогтері, жасанды интеллект (ЖИ), жасанды интеллект құралдары, белсенділік, арттыру, цифрлық білім, ChatGPT

# ВОЗМОЖНОСТИ ИСПОЛЬЗОВАНИЯ ИНСТРУМЕНТОВ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ПРОЦЕССЕ НАЧАЛЬНОГО ОБРАЗОВАНИЯ

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**Аннотация.** В статье всесторонне рассматриваются возможности использования инструментов (элементов) искусственного интеллекта в процессе начального образования. В ходе исследования определяется необходимость развития у студентов старших курсов образовательной программы «Педагогика и методика начального обучения» высшего учебного заведения навыков работы с элементами искусственного интеллекта.

Во введении данной работы представлена актуальность темы, цель и задачи исследования. Кроме того, в статье рассматриваются преимущества использования инструментов искусственного интеллекта. В представленном иследовании даётся определение понятию «искусственный интеллект». Проводится обзор трудов зарубежных и отечественных ученых, изучавших данную проблему, в том числе рассматриваются их мнения о ботах, ChatGPT и других подобных технологиях. Однако при прведении литературного обзора отмечается, что возможность применения инструментов искусственного интеллекта в начальном образовании изучена не в полной мере.

В следующем разделе представлена информация о методах исследования, а именно об использовании методов наблюдения и анкетирования. В заключительном разделе подробно отражены результаты применения указанных методов. Результаты исследования включают диаграммы, показывающие показатели, полученные в ходе наблюдения и анкетирования студентов 3 и 4 курсов программы «Педагогика и методика начального обучения» Казахского национального педагогического университета имени Абая. По итогам исследования установлено, что элементы искусственного интеллекта повышают интерес к учебному процессу.

Кроме того, выявлена необходимость разработки специальных курсов, демонстрирующих возможности применения инструментов искусственного интеллекта в процессе начального образования. Результаты анкетирования обработаны и представлены с использованием компьютерной программы SPSS.

По итогам исследования сделано предложение о разработке специального курса, направленного на обучение будущих педагогов начального образования работе с инструментами искусственного интеллекта.

**Ключевые слова:** процесс начального образования, будущие педагоги начального образования, искусственный интеллект (ИИ), инструменты

искусственного интеллекта, активность, повышение, цифровое образование, ChatGPT

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