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ORIGINAL

Scientific analysis of the productivity of using AI in mastering languages and interpretation

Análisis científico de la productividad del uso de la IA en el dominio de idiomas y la interpretación

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ABSTRACT

Modern education has been influenced by digitalization, including artificial intelligence. The impact of AI on foreign language learning and its role in translation is controversial, in particular due to its slow implementation in the educational process. Therefore, the purpose of our study was to determine the level of implementation of artificial intelligence in the educational process in university and to identify the factors that influence its effectiveness in acquiring language competence. To achieve this goal, the following methods were used: bibliographic and analytical, survey, induction, deduction, testing, comparative and statistical with the determination of Student's t-test. The results of the study showed that fourth year students were highly aware of the capabilities of artificial intelligence for automatic translation and automatic text creation. At the same time, the use of artificial intelligence had a negative impact on students' motivation to learn. Another negative aspect was the low level of popularization of the use of programs with artificial intelligence algorithms in universities. After analyzing the test results of students who have completed an English language course using an AI program, it was found that the effectiveness of artificial intelligence increases with the presence of a mentor lecturer. Thus, artificial intelligence systems should be implemented in the educational process of learning foreign languages in cooperation with a mentor lecturer, which will increase their effectiveness and offset the negative impact of artificial intelligence on students' motivation to learn.

Keywords: Automatic Translation; Business English; University English; Business English For Students; Foreign Language; Professional English; The Latest Teaching Method.

RESUMEN

La educación moderna se ha visto influida por la digitalización, incluida la inteligencia artificial. El impacto de la IA en el aprendizaje de lenguas extranjeras y su papel en la traducción es controvertido, en particular debido a su lenta implantación en el proceso educativo. Por lo tanto, el propósito de nuestro estudio era determinar el nivel de implantación de la inteligencia artificial en el proceso educativo en la universidad e identificar los factores que influyen en su eficacia en la adquisición de la competencia lingüística. Para lograr este objetivo, se utilizaron los siguientes métodos: bibliográfico y analítico, encuesta, inducción, deducción,

prueba, comparativo y estadístico con la determinación de la prueba t de Student. Los resultados del estudio mostraron que los estudiantes de cuarto curso eran muy conscientes de las capacidades de la inteligencia artificial para la traducción automática y la creación automática de textos. Al mismo tiempo, el uso de la inteligencia artificial repercutía negativamente en la motivación de los estudiantes para aprender. Otro aspecto negativo fue el bajo nivel de popularización del uso de programas con algoritmos de inteligencia artificial en las universidades. Tras analizar los resultados de las pruebas de los alumnos que habían realizado un curso de inglés con un programa de IA, se descubrió que la eficacia de la inteligencia artificial aumenta con la presencia de un profesor mentor. Así pues, los sistemas de inteligencia artificial deberían implantarse en el proceso educativo de aprendizaje de lenguas extranjeras en cooperación con un profesor mentor, lo que aumentaría su eficacia y compensaría el impacto negativo de la inteligencia artificial en la motivación de los estudiantes para aprender.

Palabras clave: Traducción Automática; Inglés Comercial; Inglés Universitario; Inglés Comercial Para Estudiantes; Lengua Extranjera; Ingles Profesionales; Método De Enseñanza Recientes.

INTRODUCTION

The modern education system has undergone changes due to the influence of digital technologies. In particular, online learning has become widespread, allowing to overcome distance barriers in the learning process. Distance learning has become popular for learning foreign languages, as it has opened up the possibility of learning with the help of native-speaking lecturers. Another aspect of learning foreign languages with the help of information technology is the development of applications for learning grammar and memorizing words that allows improving the skills.[1]

Artificial intelligence has become a revolutionary achievement of digitalization and has been widely implemented in various industries, including education. AI is used for learning, teaching, assessment, and management. AI-assisted learning includes the selection of learning materials according to individual student needs and skills, human-machine communication, feedback based on the analysis of completed tasks, and the acquisition of competencies in working with digital technologies. AI-assisted teaching increases efficiency by using adaptive programs based on student requests, assisting in teaching by delegating automatic tasks to AI, and supporting the continuous professional development of lecturers. AI-assisted assessment includes automatic verification of test results and prediction of student achievement. AI-assisted management allows for scheduling classes, managing staff workload, and other administrative tasks.[2]

In foreign language learning, artificial intelligence is used for assessment, delegation of simple tasks in the learning process, human-machine communication, quick feedback, and automatic translation. Although artificial intelligence is continuously evolving, its application in education and foreign language learning is still not sufficiently explored, as there are limitations from students, lecturers, ethical and confidentiality issues.[3] Thus, it is important to understand the effectiveness of new AI capabilities against the background of the above shortcomings and limitations.

Literature review

Artificial intelligence in education includes programs that target students, lecturers, and institutions. Among the programs targeted at students are Intelligent Tutoring Systems, apps, simulations, virtual reality, chatbots, an AI-generated learning and writing assistant, and others. For the needs of lecturers, programs have been developed to detect plagiarism, monitor student performance, provide automatic grading, and create a lecturer's assistant, among others. For the institution, artificial intelligence develops study schedules and course programs, selects students into groups according to skills and educational program.[4]

Information technology has greatly facilitated many learning tasks, such as searching for information, which a few decades ago required long hours in libraries and now takes a few minutes with the help of the Internet. However, the question arises as to whether all AI programs are useful, and which ones, on the contrary, demotivate students and reduce their level of knowledge. One such example is automatic writing based on GPT, which is able to write a detailed answer to any question. Although at the beginning of GPT development, many answers were superficial and sometimes meaningless, today the programs have improved so much that it is impossible to distinguish between a paper written by artificial intelligence or a student without additional programs.[5] Moreover, the struggle between updated writing programs and programs that can detect them points to new challenges in student assessment.[6]

Artificial intelligence algorithms are used in linguistics through applications and online platforms, and include automatic translation, such as Google Translator, Language Tutoring Systems, which consist of personalized lessons and feedback, and Language generation systems, which create original texts according to specified

parameters.[7] In general, artificial intelligence provides the following advantages: accessibility due to financial and technical mobility, personalized approach based on automatic control of results and the ability to rework on mistakes, speed of learning, the ability to explore the culture of another country, and the ability to learn multiple languages simultaneously. Sari[8] found that artificial intelligence can improve communication skills in language learning, including listening, reading, speaking, and writing, through a personalized and interactive approach to learning.

Belda-Medina and Calvo-Ferrer[9] studied the integration of chatbots into foreign language learning and the perception of students and lecturers of different forms of communication with chatbots. The results of the study showed that students perceive multimedia materials, non-verbal and game-based learning better, and lecturers prefer written communication to oral communication that sounds artificial. Another aspect was the high expectations of chatbots' adaptability, as students expected a full conversation and answers to various questions that often went beyond the topic, especially in business or other professional languages.[10] This mismatch has led to a moderate interest in implementing artificial intelligence algorithms in practice.

Although the use of artificial intelligence in language learning is currently limited, in part due to the moderate interest of lecturers in its implementation in the classroom, in the future, the cooperation of artificial intelligence with lecturers will become crucial. After all, the capabilities of artificial intelligence can optimize the work of lecturers, redistribute the workload, and increase the efficiency of the educational process.[11] Lecturers are skeptical about the possibilities of automatic text writing, although it should be borne in mind that modern knowledge requires, among other things, the skills of working with digital technologies. That is why the use of automatic text writing has not only a linguistic justification, but also develops skills of analysis, critical thinking, and working with new technologies.[12] For example business language requires high skills in translation that can be achieved during studying university language.

A positive aspect of the use of artificial intelligence in education has been the development of programs to support students with disabilities, such as the creation of robots that helped students with autism, including learning foreign languages.[13] A study by Barua et al.[14] found a positive impact of AI-based programs for socialization and supportive learning for students with various neuropsychiatric conditions. However, despite the great capabilities of artificial intelligence, these programs have a negative impact on motivation to learn, especially among students. For example, apps with automatic translation question the need to learn university foreign languages. That is why the Chinese Ministry of Education has banned AI-based programs that help students with their homework.[15]

In terms of translationartificial intelligence has significantly expanded the capabilities and improved the quality of translation in recent years through automatic speech recognition, machine translation, and advanced search for topic-specific terminology.[16] Neural machine translation has played an important role in the transformation of translation, as it is able to identify subtleties and idioms based on context analysis. A revolutionary step in translation studies was the development of multimodal translation with voice and image recognition, which makes translation more inclusive and integrated into communication.[17] Although machine translation, neural and hybrid machine translation, rule-based automatic translation are widely used in translation studies, there are problems related to cultural nuances, as well as data confidentiality.[18] Another controversial aspect is the quality of specialized translation when using artificial intelligence. In particular, the analysis of medical documentation translation by artificial intelligence cannot fully compete with professional human translation, since a mistake can lead to negative consequences for life or health.[19] Also business language needs professional translation, for example professional English knowledge, because mistakes can lead to financial losses or destroy a partnership.

Although artificial intelligence has become an integral part of education, research on its impact on learning and teaching effectiveness is limited due to the lack of implementation in practice.[20] Thus, it is relevant to determine the level of implementation of artificial intelligence in the educational process in foreign language universities, as well as to identify factors that contribute to the effective use of artificial intelligence for learning.

Aim to determine the level of implementation of artificial intelligence in the educational process in universities and to identify factors that affect its effectiveness in acquiring language competence.

METHOD

To achieve this goal, we conducted original descriptive research with the following objectives: to determine the state of awareness of students about the use of artificial intelligence algorithms for learning foreign languages and translation; to determine the effectiveness of artificial intelligence-based programs for learning English; to determine the main motivations for learning using artificial intelligence tools for learning foreign languages and translation. To determine the students' awareness of artificial intelligence, an online survey of 1060 students was conducted, which included the following questions: "Do you use artificial intelligence to learn English?", if yes, please specify which programs or applications you use; "Does learning with artificial

intelligence motivate you to learn English?", please justify your answer, for example, how it motivates or vice versa; "Does your university promote artificial intelligence for learning foreign languages?". The survey was conducted using a Google form after respondents signed consent to conduct the survey and to publish the summarized results. Confidential information and personal data were not disclosed. To determine the effectiveness of artificial intelligence tools for learning a foreign language, it was developed an English language course for first year students of Taras Shevchenko National University of Kyiv. The course was developed on the basis of the general university curriculum, but included additional artificial intelligence tools, namely the Duolingo program, and was designed for the period from September 1 to October 30. The terms of the study were approved by the university administration. A total of 607 first year students took part in the study. They were divided into 2 groups. In the first group (n = 303 students), students downloaded the Duolingo program and completed tasks independently without lecturer supervision. In the second group (n = 304 students), lecturers assigned homework using the Duolingo program and performed some tasks in class using the Duolingo program. The groups were compared using a Student's t-test for homogeneous populations using Microsoft Excel. The results were considered homogeneous at $p<0,05$. After completing the course, an online survey of students who participated in the study was conducted using a Google form. The survey questions were as follows: "How often have you used Duolingo outside of class?", "Do you find the program useful for learning foreign languages?", please justify your answer, "Do you find the Duolingo program interesting?", why? The bibliographic-analytical method was used to analyze the literature, and the survey results were presented graphically as a percentage of positive responses. Open-ended responses were analyzed using the methods of induction and deduction.

RESULTS

To determine the state of artificial intelligence use in foreign language learning and students' awareness, there was conducted a survey of 1060 students of Taras Shevchenko National University of Kyiv. The survey results were divided into 3 groups depending on the grade: Group 1 – first year students; Group 2 – second- and third-year students; and Group 3 – fourth year students. The survey results are presented in figure 1.

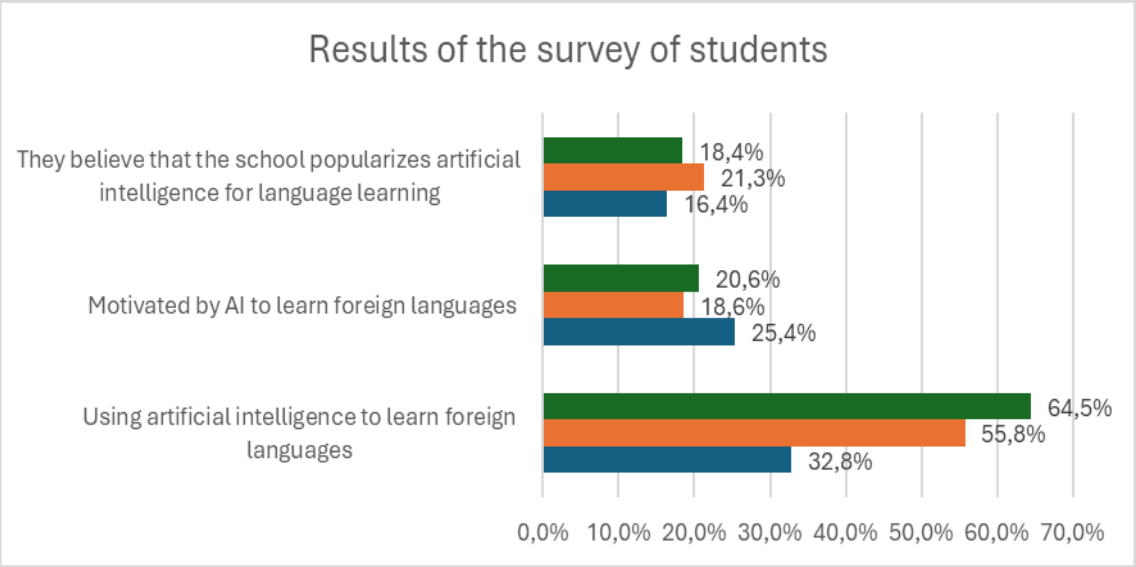

Figure 1. Results of the survey of students (blue – 1st year students, orange – 2nd and 3rd year students, green – 4th year students)

According to the survey, AI programs are most often used by seniors – 64,5 % of fourth year students and 55,8 % of second and third test students. Only a third of first test students use AI programs to learn foreign languages. Among the programs used by students, automatic translation using Google and Reverso platforms and automatic text writing using ChatGPT prevailed. Less than 10 % of students used apps to learn English in a game form, which was more typical for first years students.

As for the popularization of the use of artificial intelligence for language learning less than 22 % of students believe that artificial intelligence is popularized in their educational institutions. Instead, more than 75 % of students denied that artificial intelligence is popularized in universities. Moreover, students noted lecturers' dissatisfaction with students' use of automatic translators or ChatGTP when doing homework.

As for motivation by AI programs, less than a quarter of students felt a desire to learn foreign languages, as they believed that AI programs would help them replace their own knowledge of a foreign language by automatically writing texts and translating them. At the same time, they considered learning a foreign language

useful for detecting translation inaccuracies of the text created by artificial intelligence, as well as for live communication while traveling. The most motivated were first year students who used foreign language learning apps in the form of a game.

To determine the effectiveness of artificial intelligence in the practical learning of English among first year students of Taras Shevchenko National University of Kyiv. It was conducted a study that included learning an English course using the Duolingo AI-based program. The students were divided into 2 groups. In the first group, students used the Duolingo program independently and at their own request; in the second group, lecturers monitored the completion of tasks in the Duolingo app and some tasks were completed using the app. At the end of the course, a comprehensive test consisting of 40 questions was conducted. The results of the first and second groups were compared using Student's t-test for homogeneous populations. The results are presented in table 1.

Table 1. Results of comparing the first and second groups using Student's t-test

Group	No.	Mean	SD	Mean difference	T	P
1	303	23,1	5,2	8,8	-6,6	<0,001
2	304	31,9	8,3			

As can be seen from the test results, students in the first group performed worse on average than students in the second group: 23,1 + 5,2 correct tasks compared to 31,9 + 8,3 correct answers. Thus, the groups differed in terms of their effectiveness in learning English. Higher efficiency was observed in the second group, where students used a program with an artificial intelligence algorithm under the lecturer's supervision. These results suggest that it is the cooperation between the lecturer and artificial intelligence that ensures its positive impact on learning.

To determine students' perceptions of artificial intelligence, it was conducted a survey of first year students after completing an English course on the use of artificial intelligence algorithms. The survey included questions about assessing the capabilities of artificial intelligence, the usefulness and interest of the application, the assessment of students' motivation, and the negative aspects of the application. The results are shown in figure 2. There were compared the positive responses of students in the first and second groups and analyzed the reasons for these results.

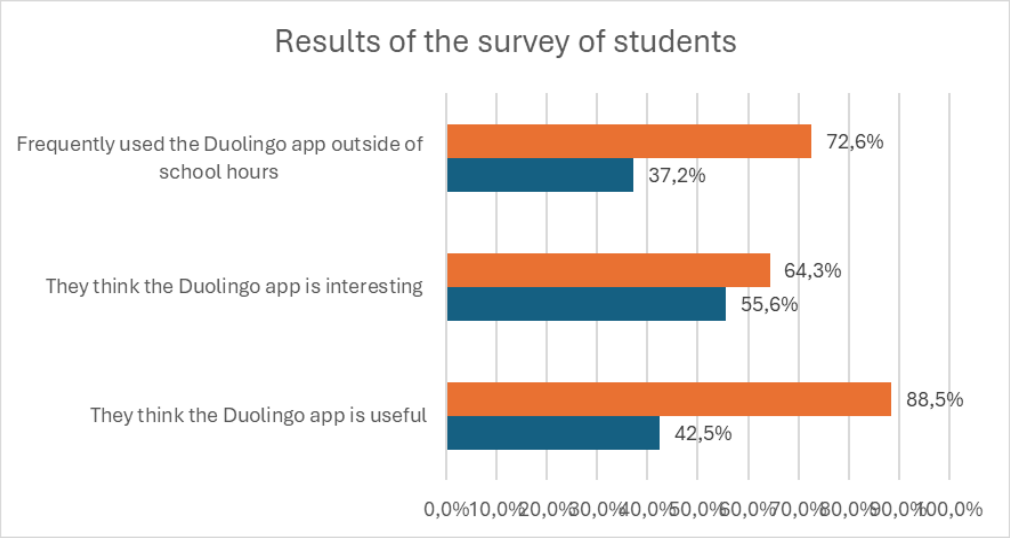

Figure 2. The results of a survey of first year students on the use of the Duolingo app in their English language course (blue – I group, orange – II group)

The survey results show that students in the first group used the app less often than students in the second group. Moreover, students in the second group were more motivated to engage in extracurricular activities, as they discussed extracurricular activities in the app with their lecturer and completed homework according to the curriculum. In the second group, students rated the app's interest and usefulness higher. Students in the first group noted that at the beginning of the course they used the app according to the recommendations, but over time, the repetition of the material caused a decrease in interest in the app. Another demotivating aspect was the expenditure of personal time working in the app with no visible result for students.

The conclusions of this study pointed to a higher efficiency of learning a foreign language through the use

of programs with artificial intelligence algorithms under the control of a lecturer. The lecturer gives feedback, explains, and evaluates the results of AI lessons, which motivates the student to use the program outside of class. Although the program's capabilities were the same for all students, it is the presence of systematic training with lecturer support that yields better results and changes students' perceptions of the program. For example, students in the second group, thanks to the lecturer's support, found the artificial intelligence-based application useful. At the same time, half of the students in both the first and second groups found the app interesting, but in the first group, only 42,5 % of students considered it useful. Without lecturer support, only one-third of students in the first group often used the AI tool, and one-third of students in the first group (37,2 %) often used the app for extracurricular activities. Thus, the presence of artificial intelligence does not give better results in foreign language learning in a group of first year students, but requires lecturer support that changes students' perception of the usefulness of artificial intelligence, as the the latest teaching method, and motivates them to use its capabilities.

DISCUSSION

Our study found high awareness of students' awareness of the possibilities of artificial intelligence for retaking and learning a foreign language. However, the popularization of artificial intelligence tools in universities curriculum was low, in part due to lecturers' negative attitudes toward artificial intelligence. It is necessary to change approaches to learning in the era of digitalization, which involves the development of reflective reasoning and critical thinking. In the language curriculum, it is important to pay attention to digital literacy with skills for the effective use of artificial intelligence, which is based on multimodality, integration and interaction.[21] Son et al.[22] emphasize that the educational environment will be in constant transformation due to the introduction of artificial intelligence, so lecturers should manage the introduction of artificial intelligence into the learning process to ensure its effective use. Although most AI programs are not suitable for studying professional English, as they do not provide a deep understanding of the differences in the typology of the Ukrainian and English languages, which underlie professional linguistics. Therefore, for the study of foreign languages at specialized linguistics departments, the selection of artificial intelligence tools must be carried out at a high level as the latest teaching method.

On the other hand, artificial intelligence has a negative impact on students' motivation to learn foreign languages. Moreover, some students doubted the prospects of the translation profession, although current research points to the importance of cooperation between AI developers, translation industry leaders, and developers of translation curricula. In this way, the authors emphasize the importance of the translator in a society that is subject to new learning requirements, namely critical thinking and the ability to work in an AI-driven environment.[23] That is, a modern translator must combine translation creativity and digital literacy in order to meet the requirements of modern translation studies and to be competitive in the labor market. Although there are concerns about the prospects of the translation profession due to the change in the profession's emphasis on mainly editing translation, such areas as business translation, translation in literature and art will not be able to exist without human intelligence. However, it is worth noting that the use of artificial intelligence for translation speeds up the duration of the process. Despite the constant development of artificial intelligence, it cannot replace humans in translation and teaching.[24,25]

The study found low student motivation when working only with AI-based applications without a lecturer-mentor. The role of the lecturer is indispensable in the learning process, even despite significant advances in artificial intelligence, because the lecturer is a mentor, and the lecturer-student relationship is based on ethical, social aspects, mutual respect, and support.[26] It is the connection between lecturer and student that motivates the acquisition of knowledge and ensures systematic learning when working with artificial intelligence. Although the study by Wang et al.[27] pointed to the negative impact of the lecturer's presence when students work with AI-based programs, this does not diminish the role of the lecturer, but rather indicates that AI is a lecturer's aid in pedagogical activities, and lecturer interaction with AI programs is effective if the lecturer supervises and assists in the selection of AI tools for learning. Moreover, our research has shown that the presence of a lecturer changes students' perception of the usefulness of artificial intelligence and encourages its more frequent use.

CONCLUSIONS

The survey results revealed a high level of awareness among senior students about the possibilities of artificial intelligence, in particular for automatic translation and text creation. However, university shows a low level of popularization of artificial intelligence for learning foreign languages. In particular, this is due to lecturers' negative attitudes toward artificial intelligence tools. Another negative aspect was the negative impact of AI-based programs on students' motivation to learn. However, when lecturers and artificial intelligence collaborate, the possibilities for effective learning expand and students' attitudes toward AI-based programs change, including increased motivation to learn, as proven by the results of testing and surveys of first year

students. This fact confirms the important role of a mentor lecturer for the success of AI-based learning as the latest teaching method.

As artificial intelligence is being introduced into all industries, including education, lecturers need to change the way they think about students using artificial intelligence to complete tasks. This will change the paradigm of foreign language learning with the development of students' analytical skills, critical thinking, and digital literacy. Such an approach to the introduction of artificial intelligence by lecturers will increase the effectiveness of students' language competence and increase their motivation to learn.

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