ACCESS Journal:
Access to Science, Business, Innovation in Digital Economy
2027, 8(1), 88-104, https://doi.org/10.46656/access.2027.8.1(5)

ISSN 2683-1007 (Online)
https://journal.access-bg.org/

ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: STUDENTS' AI COMPETENCE, ATTITUDES, USE, AND RESOURCE EFFICIENCY

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Received: August 7, 2026 *Accepted: October 13, 2026* *Online Published: November 1, 2026*

ABSTRACT

The integration of artificial intelligence (AI) into the educational system is one of the most important opportunities and challenges of the modern world. The presented study aims to determine the impact of students' use of artificial intelligence on their academic activities and attitude towards AI. In addition, it was considered important to determine its impact on the effective use of time resources and on reducing additional financial costs associated with non-formal education. 1,020 students of the Faculty of Economics and Business of Ivane Javakhishvili Tbilisi State University participated in the study. The results were processed using the SPSS statistical software package. During the research process, hypotheses were developed and tested using various statistical procedures. Thefollowing objectives were developed during the research process: 1. Assessing students' competence in using artificial intelligence; 2. Determining whether high competence in using AI determines the perception of artificial intelligence as a necessary tool for future education; 3. Assessing the impact of technological resources (computer, Internet, etc.) on the use of artificial intelligence; 4. Determining the relationship between competence in using AI and time efficiency and reduction of financial costs associated with non-formal education, etc. Research findings indicate that artificial intelligence is gradually assuming a significant role in higher education. Its proper and effective application positively impacts both the quality of the educational process and the optimization of time and financial resources. It should be noted that the data obtained in this study are based solely on the opinions and experiences of students from the Faculty of Economics and Business at Ivane Javakhishvili Tbilisi State University. Consequently, these results do not reflect the attitudes of students across higher education institutions in Georgia as a whole. To gain a broader and more comprehensive perspective, it would be advisable to survey students from various public and private universities in the future. A study of this scale would make it possible to compare data, identify differing trends, and gain a more complete understanding of student attitudes toward the use of artificial intelligence.

Keywords: Generative Technologies, University, Digital Transformation, Financial Efficiency, Academic Integrity
JEL classification: *I21, I23, O33*
Paper type: Research article
Citation: Kharadze, N., Pirtskhalaishvili, D., Giorgobiani, M., Gagnidze, I. (2027). Artificial intelligence in higher education: students' AI competence, attitudes, use, and resource efficiency. *Access to science, business, innovation in the digital economy*, ACCESS Press 8(1), 88-104, https://doi.org/10.46656/access.2027.8.1(5)

INTRODUCTION

According to the OECD "an artificial intelligence (AI) system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments" (OECD, 2024). While early forms of AI, such as expert systems and early machine learning algorithms, have been used in education for over 60 years, recent advancements in AI capabilities are disrupting the education sector. Models such as

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ISSN 2683-1007 (Online)
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ChatGPT, Synthesia, DALL-E 2, and Bard can write essays, create images, explain complex topics and provide step-by-step guidance for solving math problems, among many other functionalities (World Economic Forum, 2024). Based on Miao and Holmes (2023), generative AI (GenAI) is an AI technology that automatically generates content in response to prompts written in natural-language conversational interfaces. Rather than simply curating existing webpages by drawing on existing content, GenAI actually produces new content, but it cannot generate new ideas or solutions to real-world challenges, as it does not understand real-world objects or social relations that underpin language. By synthesizing recent research and case studies, Brandao investigates the dual nature of AI as both a catalyst for innovation and a source of potential disruption. Findings highlight the necessity for proactive governance and ethical frameworks to mitigate risks associated with AI deployment while maximizing its benefits (Brandao, 2025). Sîrghi et al. argue that the intention to adopt applications using AI among Romanian students directly depends on constructs such as perceived usefulness, attitude towards these technologies, perceived hedonic value, expected performance, or degree of compatibility, while the interactivity of the applications also has an important but indirect influence (Sîrghi et al., 2023).

Yim argues that constructivist/constructionist and human cognitive approaches alone may not fully enable students of AI literacy education to understand critical issues such as data injustice and the ethical and societal impact of AI (Yim, 2024). Praveen and Vineethan highlight a growing trend toward student-centric learning and evolving instructional methods. However, successful AI implementation depends heavily on institutional readiness and robust infrastructure (Praveen & Vineethan, 2025; Mikhno, et al., 2026; Polevoy, Gelmanova, & Georgiev, 2026; Georgiev, 2022; Khussainova et al., 2024; Petrova, et al., 2018). Trung argues that AI enhances personalization, engagement, and academic performance. However, critical evaluation skills and ethical frameworks remain underdeveloped among students (Trung, 2025). Turingan indicates that students generally perceive AI tools as effective in improving writing efficiency and organization (Turingan, 2025). However, concerns about over-reliance, ethical challenges, and institutional inconsistencies in AI policies emerged as critical issues. In Indonesia students commonly use AI to support academic tasks but recognize ethical risks, particularly when used without critical reflection. Concerns include over-reliance on AI and reduced critical thinking. The findings aim to inform the development of ethical guidelines and educational strategies that foster integrity and promote thoughtful engagement with AI in higher education (Handayani, 2025).

Gagnidze (2025) "highlights one potential issue among others. If students become accustomed to exclusively using AI-generated content, they may face significant challenges when required to produce original work, such as a PhD thesis or articles for publication in highly ranked academic journals. Many esteemed publishing houses have implemented software capable of detecting AI-generated texts, which would likely lead to the rejection of such submissions" (Gagnidze, 2025).

The scientific literature is filled with studies that point to the positive effects of using AI in the teaching of various subjects in higher education institutions (Georgieva-Tsaneva, et al., 2025; Beloeva, et al., 2026;

ISSN 2683-1007 (Online)
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Chornous, et al., 2026; Tairov, et al., 2024). Since English is studied as a foreign language by more students than any other subject, more attention will be paid to discussing the mentioned issue in the article. The use of AI in English as a Foreign Language (EFL) classrooms is changing the way of teaching and learning. This shift towards incorporating AI in education calls for the inclusion of AI-integration courses in preservice EFL teacher programs (Vera, 2023).

Pokrivcakova outlines that in Slovakia, EFL pre-service teachers were equally interested (38.67%) and uninterested (39.42%) in the ongoing discussion about AI in education. Overall, they self-reported having no (61.31%) or unsatisfactory (21.17%) understanding of the basic computational principles of AI. On the other hand, they were significantly more satisfied with their knowledge of AI-based applications for EFL teaching, which they considered adequate (35.04%) (Pokrivcakova, 2023).

Ali et al. investigate how ChatGPT impacts learning English. A quantitative research design was used to collect data from 80 teachers and students who had access to ChatGPT in its very beginning phase in early 2023. Findings showed that ChatGPT generally motivates learners to develop reading and writing skills. The respondents had neutral attitudes towards the effect of ChatGPT on developing listening and speaking skills (Ali et al., 2023).

Parraga et al. explore how AI platforms, through intelligent algorithms, can offer personalized learning experiences that optimize English language teaching, improving both comprehension and oral and written expression skills. The research emphasizes the importance of AI as an effective resource for English language teaching, but also highlights the need for equitable and adequate integration of these technologies in the educational environment (Parraga et al., 2025).

Alharbi and Khalil explore the benefits and challenges of incorporating AI in English as a Second Language vocabulary learning. Interestingly, 77 college students and 22 English language teachers at a local university in Pakistan participated in the study. Younger teachers demonstrate a more favorable to neutral view of AI, appreciating its contribution to efficiency and innovative teaching methods. Conversely, older teachers express resistance, voicing concerns about overshadowing traditional teaching methods and advocating for AI's complementary role in education (Alharbi & Khalil, 2023).

Parviz explores the perspectives of Iranian EFL instructors regarding AI integration in English language education. The findings revealed predominantly positive perceptions of AI technologies in English education, highlighting their potential to enhance teaching and learning processes. However, these positive views were accompanied by significant concerns regarding the capabilities and limitations of AI (Parviz, 2024).

In Georgia, Ivane Javakhishvili Tbilisi State University has adopted an AI University Strategy 2026–2029. Its development was preceded by two studies: a study of administrative and support staff, “Artificial Intelligence in Work Processes and Services,” and an employer study, “Artificial Intelligence Skills and Graduate Readiness”. The university aims to promote a sustainable process of integrating artificial intelligence into the university space, based on the development and implementation of standards for ethical and

ISSN 2683-1007 (Online)
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responsible use. It also supports the effective use of artificial intelligence technology in the educational and scientific/research fields (TSU, n.d.).

Many authors have written about the challenges of higher education in Georgia and internationally during the period of digital transformation, including Kharadze and Pirtskhalaishvili (2026), Singun (2025), Abuseridze (Abuseridze, et al., 2022). Based on all of the above, we can conclude that the effective use of AI in the educational process is important and contributes to the improvement of students' knowledge by minimizing time and financial costs. If students need additional private lessons outside of the university to deepen their knowledge, the use of AI will save their time (time spent in transportation to get to a private teacher, the need to make a prior agreement with a private teacher in case of missing a lesson or changing the time for any reason, and the cost of compensating for the missed lesson, while this is not necessary when using AI) and finances (transportation and preparation costs, since studying with a private teacher is more expensive than the fee for using AI).

Furthermore, the results obtained reflect only the attitudes of students of Ivane Javakhishvili Tbilisi State University, Faculty of Economics and Business. Accordingly, research findings cannot be generalized to students of other universities. It is desirable to conduct an in-depth study in the future, including students from other private and public universities, to get a complete picture and compare the results.

The article aims to determine the impact of students' use of artificial intelligence on their academic activities and attitude towards AI. In addition, we considered it important to determine its impact on the effective use of time resources and the reduction of additional financial costs associated with non-formal education. The following objectives were developed during the research process:

1. Assessing students' competence in using artificial intelligence;

2. Determining whether high competence in using AI determines the perception of artificial intelligence as a necessary tool for future education;

3. Assessing the impact of technological resources (computer, Internet, etc.) on the use of artificial intelligence;

4. Determining the relationship between competence in using AI and time efficiency and reduction of financial costs associated with non-formal education, etc.

1,020 students of the Faculty of Economics and Business of Ivane Javakhishvili Tbilisi State University participated in the study.

METHODOLOGY

Quantitative research was chosen as the research methodology, allowing us to generalize the obtained results and conduct various statistical procedures. The SPSS (Statistical Package for the Social Sciences) statistical software package was used for data processing. Among them, the following statistical procedures were applied: one-way ANOVA, Spearman's correlation analysis, Pearson's chi-square ($\chi 2$) test, and cross-tabulation. 1,020 respondents participated in the study. The sample size varied across the statistical analyses

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due to item non-response and the exclusion of responses that were not applicable to specific analyses. Therefore, the number of valid observations differed across tables and statistical tests. In analyses involving usage-related questions, respondents who indicated that they did not use the relevant technology were excluded where appropriate.

RESULTS

While conducting the research, we were interested in how well the surveyed respondents possessed the skills to utilize artificial intelligence. According to the data, 4.3% of students lack the skills to use artificial intelligence, 11.5% have weak skills, 50.5% have an average level, and 33.6% are well or very well skilled. It is evident that the utilization of artificial intelligence in the educational process is limited, and needs to be implemented effectively. The development of AI competencies may also be crucial for financial efficiency. Its targeted and effective use will contribute to the optimization of resources. This may in the future lead to a reduction in financial costs for both students and higher education institutions and a more rational distribution of resources.

Furthermore, 47.9% of students believe the university does not offer training regarding artificial intelligence, and 35.8% are fully unaware of this opportunity. Additionally, only 16.3% indicate that the university delivers training. We can assume that training is conducted at the university, although it is not equally accessible to everyone, or perhaps not all students are aware of it. However, it is conceivable that student interest in receiving information is low. Accordingly, it is crucial to expand training programs and improve communication so that all students are more informed, motivated to participate in training, and have equal opportunities.

It is notable that when asked, “If the institution offers training or courses, have you participated in them?” 13.2% of students stated that they took part in artificial intelligence training offered by the institution, 40.6% did not participate, and 46.2% did not receive such an opportunity. It is interesting to determine what criteria are used to deliver information to students. Furthermore, what determines the fact that a certain part of the students were aware of the training but did not participate in it?

The results of the study demonstrated that 63.9% of respondents have used artificial intelligence without the lecturer realizing it, while 36.1% deny this fact. How can we explain the situation, why the lecturer may not understand the student's use of artificial intelligence and whether this poses a threat? Hiding the fact of using artificial intelligence on the part of the student is associated with certain risks: there may be a complete copying of the work, where students independent ideas and depth of thinking are nowhere to be seen; therefore, the assessment of students by the lecturers cannot be objective, because students do not develop their own vision anywhere and in reality the work of artificial intelligence is being assessed. Students are unable to understand their capabilities and develop them. Therefore, it is important to create a clear vision not only for students but also for professors. It is crucial to have ethical norms and guidelines in place to ensure that artificial intelligence tools can be used effectively.

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An interesting picture emerged regarding student perceptions. We considered it important to determine whether students believe the use of AI instruments in secret from the lecturer to be ethically fair. It is noteworthy that 26.4% of respondents consider the mentioned action to be ethically fair. Furthermore, 48% do not consider it ethically fair, and 25.6% do not have an answer. Such a perception of students may be somewhat problematic. The fact that a student saved time and received an easy assessment may be effective in achieving a specific goal, namely, earning a high score. However, such an approach raises many questions, for example: how fair are the assessments that will be written to students, do they reflect real knowledge and skills?

Additionally, 49.2% of students note that the teacher prohibits the use of artificial intelligence, while 50.8% deny the fact. We cannot unequivocally say that the lecturer does not have the right to prohibit the student from using artificial intelligence, because it depends on the type of assignment. If the main goal of assessment is to evaluate a student's creative thinking and critical analysis skills, then the use of artificial intelligence on the part of the student will not allow us to fairly assess the mentioned skills. Furthermore, it is important to record such prohibitions in the syllabus so that the student has information in advance. As for activities such as searching for literature, writing in fluent language, planning the structure of the paper, and editing text, they should not be prohibited because they free up time and allow the student to devote more time to other beneficial activities. The right approach for lecturers is not to completely ban the use of artificial intelligence, but to allow its use with certain regulations.

According to the results of the study, 71.8% of students believe that the use of artificial intelligence will become inevitable in the future, only 9.1% share the opposite opinion, and 19.1% do not have a formed position on this issue. These results reflect the students' perception of artificial intelligence as an integral component of the modern educational process.

At the same time, the widespread use of artificial intelligence should not create the impression that the role of the lecturer in higher education is losing importance. On the contrary, the current technological changes require the transformation of the lecturer's function and a review of professional role. With the help of artificial intelligence, students can at any time receive an explanation presented in a language that they understand, not limit themself to the number of questions, and repeatedly turn to the system until they receive the desired answer. Such an opportunity is especially important for those students who avoid asking questions in class due to various psychological or social barriers.

Accordingly, if the lecturers activity is limited to the transmission of information, their added value for the student is significantly reduced, since artificial intelligence can also effectively perform a similar function. That is why, in modern higher education, the lecturer’s ability to create a learning environment that will promote the development of critical and creative thinking, problem analysis, argumentative reasoning and active involvement of students is of particular importance. The lecturer should be not only a transmitter of knowledge, but also a moderator of the discussion, a mentor and a facilitator of the learning process.

The above circumstances demonstrate that the traditional, lecture-centered teaching model, which is mainly oriented towards the one-way delivery of information, is gradually losing its effectiveness. Accordingly, an

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important challenge for the higher education system is to substantially update teaching methods, introduce active learning strategies, and promote the professional development of lecturers. In this context, age itself is not a decisive factor; what is much more important is the lecturer's willingness to constantly update their knowledge, master modern technologies, and adapt to the changing educational environment.

Students (61.5%) indicate that they use artificial intelligence in completing a team task. Additionally, 38.5% report a negative answer. It is worth noting that in a university where there are no regulations regarding the use of artificial intelligence, the lecturer does not have a control mechanism, and the assessment of team tasks and the determination of individual contributions, which is already associated with certain challenges, may be a problem.

Some respondents (20.6%) believe that artificial intelligence significantly changes the role of the lecturer in an educational institution, and 38.9% believe that it changes it slightly. In addition, 32.8% believe that it does not change it at all, and 7.7% do not have an answer. It is worth noting that students' answers can be interpreted and perceived in different ways. If the role of the lecturers are limited to transmitting and receiving information, in such a case, artificial intelligence not only changes their role in the educational process, but also no longer represents a need. We also note that when artificial intelligence is an auxiliary tool in the educational process, the lecturers role changes only slightly; they are actively involved in the discussion and analysis part and develop students' critical thinking. And if the lecturers involvement is minimal, their role also loses its function.

One of the challenges related to artificial intelligence is the reliability of information. That is why we were interested in how much students trust the information received from various AI tools. The findings of the study demonstrated that 7.9% of respondents do not trust information obtained via artificial intelligence at all, 82% partially trust it, and 10.1% fully trust it. The results shed light on a significant problem. Unconditional trust in the information provided may lead to a loss of critical thinking to the point that future generations may be unable to make even simple decisions with independent reasoning. Furthermore, there is a probability that the information acquired is unreliable, which causes a number of problems in the learning process. It is important for students to critically approach information received via artificial intelligence tools, verify it, and draw their own conclusions.

Interestingly, 8% of students report frequent use of artificial intelligence for fraudulent purposes (plagiarism, violation of academic norms), 23.6% rarely, and 68.5% never. The use of artificial intelligence tools for the mentioned purpose endangers academic integrity and is unethical. Therefore, it is important to protect honest and fair students with certain regulations. In conditions where the university cannot provide appropriate programs to regulate the problem, the main burden must be borne by the professor. Therefore, it is important to retrain professors and change traditional teaching methods. It is also worth noting that the younger generation may be better versed in using artificial intelligence than a lecturer who follows traditional teaching methods.

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Respondents (18%) believe that most students use artificial intelligence fairly. Furthermore, 44.5% disagree with this opinion. Meanwhile, 37.5% did not answer the question. The above results do not indicate a positive trend. Considering that, in the end, some students may feel unfairly assessed, such a negative attitude affects the motivation of conscientious students. Therefore, it is important for universities to strengthen ethical norms regarding the use of artificial intelligence. If students use artificial intelligence for fraudulent purposes on a large scale, it may become a standard for everyone, which will negatively affect the quality of education.

Some students (33.3%) believe that the use of artificial intelligence should be considered an academic skill, 40.1% have the opposite opinion, and 26.5% do not have an answer to the question. On the one hand, the effective use of artificial intelligence requires critical and strategic thinking, the ability to create correctly formulated prompts, and the ability to evaluate and verify the information received. In this sense, its use relies on competencies that can be considered an integral part of academic skills. On the other hand, the knowledge of using artificial intelligence itself does not automatically mean the possession of an academic skill. Artificial intelligence is, first of all, a technological tool, and its academic value is determined by how the student uses it. If AI is used for critical analysis of information, to deepen knowledge and support independent thinking, its use can be considered a manifestation of academic competence. However, if it is used only mechanically, to automatically obtain answers, then it is a matter of the ability to use a technological tool, not an academic skill.

It is worth noting that the overall assessment of the attitude towards artificial intelligence is very positive for 12.9% of the surveyed respondents, positive for 36.1%, neutral for 44.1%, negative for 5.1%, and very negative for 1.8%. In total, 49% assess it positively and 44.1% are neutral, which indicates that the use of artificial intelligence is gradually gaining ground among students, although it is important to understand what is meant by a positive assessment. Students need to be properly informed about the importance of its use and the negative aspects that may arise if the norms of academic integrity are violated.

Number of students (24.6%) believe their computer/laptop is powerful and modern enough to use artificial intelligence. It is of average power for 49.7%. The answer "it is weak and cannot run some programs" is indicated by 14.8% of respondents, it is very weak - 2.9%, and 8.1% do not have a computer. It is worth noting that to perform a number of tasks (searching for information, analyzing, compiling slides, etc.), the power of the computer does not matter, and a computer of any working power will perform the assigned work. A powerful computer may be required to prepare certain types of models. Considering that rules and requirements for the use of artificial intelligence in the educational process have not been established, the majority of professors do not use it at all. We think that students will not encounter barriers to mastering the use of artificial intelligence with the computers they have at their disposal. However, the approximately 8% of students who do not have a computer at all face serious obstacles in preparing even elementary material. Without high-power computers, it will be difficult for IT specialists to perform tasks, so specialties affect the requirements for computers. Nowadays, the problem at the university is the lack of stable Internet access, and students may have the same problem at home, which we think is a much more serious concern.

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To the question, "How would you rate the speed and stability of the Internet when using artificial intelligence?" 29.2% of students answered "very fast and stable", 60.5% - "average", 6.5% - "slow", 3.8% - "unfavorable". There is indeed a problem in this regard, and poor-quality Internet hinders the quality of students' work, leads to deviations from plans, and prevents them from using their time budget effectively. In this regard, universities need to create appropriate conditions and an environment for students to complete the tasks assigned to them without interruption.

"How accessible are the licensed programs you need for using artificial intelligence?" Always available is reported by 23.2% of respondents, sometimes - 38.7%, rarely - 23.3%, never - 14.8%. In many universities, students use artificial intelligence tools such as ChatGPT Edu, Copilot for Students, and Google Workspace with Gemini Pro, which help them receive quality education. There is no such offer at our university. For research and preparation of relevant materials, students need ChatGPT/Gemini (Plus or Edu); for analysis and presentations, Excel, Wolfram Alpha Pro, and others.

It is important for students of the Faculty of Economics and Business to have access to Excel/Power BI/Tableau–for real business analysis, SPSS/Stata/EViews–for research statistical analysis; ChatGPT/Copilot/Gemini - for AI-assisted teaching; QuickBooks or a similar accounting system - for financial management. Similar programs are almost never used at the undergraduate level and are difficult to access at the graduate level.

Students (12.1%) report that the university offers sufficient technological resources for the use of artificial intelligence. Moreover, 27.1% answer "partially", while 38% answer negatively, and 22.8% do not have an answer. To improve the quality of education, it is important for the university to provide students with appropriate computer infrastructure and appropriate spaces where they can perform work/assignments. Artificial intelligence teaching platforms OpenAI API/GPT SDK, MLflow, and Weights & Biases operate in high-ranking universities. Students need to be able to manage and visualize data and to have licensed programs, MATLAB AI/ML libraries, SAS/SPSS AI packages, etc. We believe it is crucial to find resources to form a modern teaching system.

Number of students (13.2%) believe university infrastructure fully meets the requirements for using artificial intelligence. While, 36.9% of respondents report that it partially meets the requirements, 23% say it slightly meets the requirements, and 26.9% express dissatisfaction.

Inadequate infrastructure makes it difficult to combine theoretical and practical knowledge. Accordingly, students are often limited to theoretical knowledge only, which prevents them from improving the quality of education and meeting current market requirements. Without the combination of theoretical and practical knowledge, it is impossible for students to compete with graduates of highly rated universities. In today's environment, it is important that a diploma does not remain just a piece of paper and that it also reflects the relevant skills. In the absence of licensed platforms, the risk of academic integrity being compromised increases.

Hypotheses

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Hypothesis 1: Students' AI usage skills (Q11) are positively related to positive attitudes toward AI (Q30).

Spearman correlation analysis was conducted to examine the relationship between students' AI skills (Q11) and attitudes towards AI (Q30). Both variables were coded on a scale of 1 - positive/high evaluation, 5 - negative/low evaluation.

The analysis revealed a statistically significant, although weak, negative correlation between the variables (r_s = -.21, p < .001, N = 1,016) (see Table 1). The result demonstrates that students who are better equipped with AI tools are relatively more critical/negative towards the technology. Accordingly, hypothesis H1 was not confirmed (was rejected).

Table 1. Correlations

			11. How good are your skills in using artificial intelligence?	**30. Overall, your level of confidence in artificial intelligence is:**
Spearman's rho	**11. How good are your skills in using artificial intelligence?**	Correlation Coefficient	1,000	-.214**
		Sig. (2-tailed)		0,000
		N	1019	1016
	30. Overall, your level of confidence in artificial intelligence is:	Correlation Coefficient	-.214**	1,000
		Sig. (2-tailed)	0,000	
		N	1016	1016

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' findings

Hypothesis 2: Students with experience using AI (Q11) are more likely to consider AI as an essential tool for future education (Q22).

A one-way ANOVA was conducted to determine the difference between students' skills in using artificial intelligence (AI) (Q11) and their perception of AI as a necessary tool for future education (Q22). The use of one-way ANOVA allows us to assess whether there is a statistically significant difference between the means of the dependent variable in the three named groups. F(2,1014)=6.639, p=0.001. The analysis of variance revealed a statistically significant difference between the groups (F(2,1014)=6.639, p=0.001) (see Table 2). Since the significance level is less than the p<0.05 threshold (p=0.001), the difference is not random and confirms that students' AI skills and experience significantly differentiate their position regarding the future educational role of AI. Accordingly, hypothesis H2 was confirmed: students who have better skills and experience in using AI are more likely to consider it an essential tool for future education.

Table 2. ANOVA

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	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10,911	2	5,456	6,639	0,001
Within Groups	833,191	1014	0,822		
Total	844,102	1016			

Source: Authors' findings

Hypothesis 3: Students who perceive AI as an academic skill (Q29) are more likely to use AI in a way that the lecturer does not understand (Q17).

To test the hypothesis, we used Pearson's chi-square test and cross-tabulation, as both variables (Q29 – Perception of AI as an academic skill and Q17 – Have you ever used AI in a way that the lecturer didn't understand?) are categorical. Cross-tabulation demonstrated that students who consider AI an academic skill use it in the learning process in ways the lecturer didn't understand at a significantly higher proportion (74.3%) than those who do not perceive it as an academic skill (60.2%) (see Figure 1).

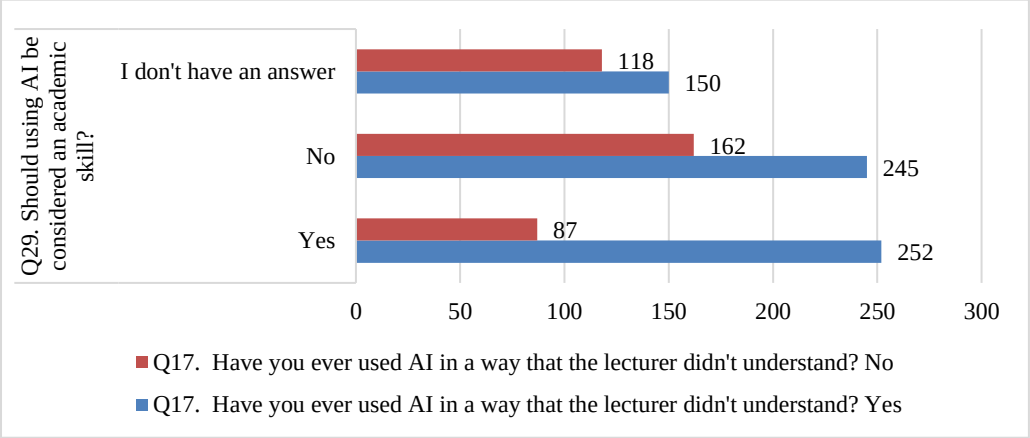

Figure 1. Q29. Should Using AI Be Considered an Academic Skill?/ Q17. Have You Ever Used AI in a Way That the Lecturer Didn't Understand? Cross-tabulation

Source: Authors' findings

According to the results of the chi-square test, Hypothesis H3 was confirmed (see Table 3). The findings indicate that students who perceive artificial intelligence as a legitimate component of learning and research no longer consider the use of AI as academic dishonesty or a prohibited act. For them, it is a modern, necessary work tool. Accordingly, even in contexts where the academic environment or lecturer does not give permission to use AI, these students still actively use it, even if secretly, because they evaluate their own behavior not as a violation of the rule, but as a necessary academic skill. Accordingly, traditional prohibitions can no longer reduce the frequency of AI use.

Table 3. Chi-Square Tests: AI as an Academic Skill by Undisclosed AI Use

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.699	2	0,000

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Likelihood Ratio	26,370	2	0,000
Linear-by-Linear Association	23,098	1	0,000
N of Valid Cases	1014		

Source: Authors' findings

Hypothesis 4: Availability of technological resources (computer, Internet, programs) (Q52) influences the frequency of AI use in teamwork (Q24).

To determine the impact of technological resource availability (Q52) on the frequency and practice of using artificial intelligence in teamwork (Q24) (hypothesis H4), Pearson's chi-square test and cross-tabulation analysis were conducted. Statistical analysis revealed a statistically significant relationship between the variables: $p < 0.001$, significantly less than 0.05 (see Table 4).

Table 4. Chi-Square Tests: Technological Resources by AI Use in Teamwork

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	20.787[a]	4	0,000
Likelihood Ratio	20,777	4	0,000
Linear-by-Linear Association	12,707	1	0,000
N of Valid Cases	1009		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.18.

Source: Authors' findings

Cross-tabulation demonstrated that the practical use of AI in group tasks increases in direct proportion to the increase in the power of technological resources. This finding confirms that the availability of technological infrastructure is a critical factor: well-functioning hardware makes it easier for students to integrate AI tools into collaborative learning, while the scarcity of technical resources creates a barrier and limits the practical use of technologies (see Figure 2).

Q40. Have your financial expenses decreased after using AI?

Q42. In your opinion, does AI help you use your time more effectively in the learning process?

Q11. How good are your skills in using artificial intelligence?

Spearman's correlation analysis revealed statistically significant relationships between all three variables ($p < 0.001$).

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Access to Science, Business, Innovation in Digital Economy
2027, 8(1), 88-104, https://doi.org/10.46656/access.2027.8.1(5)
ISSN 2683-1007 (Online)
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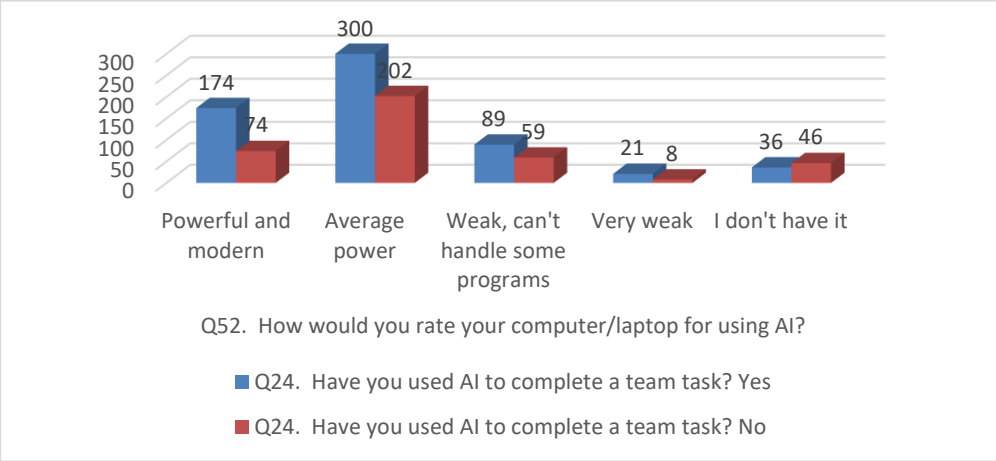

Figure 2. Q52. How Would You Rate Your Computer/Laptop for Using AI?/ Q24. Have You Used AI to Complete a Team Task? Cross-tabulation

Source: Authors' findings

In particular, a weak negative relationship was observed between the level of AI skills (Q11) and the reduction of financial costs (Q40), and a weak negative relationship was also observed between AI skills (Q11) and the effective use of time (Q42). According to the data, the higher the user's AI competence, the lower the financial costs and the higher the time saving in the learning process. In addition, the strongest relationship was directly between time saving (Q42) (Q42 was reverse-coded, with 1 indicating "strongly agree" and 5 indicating "strongly disagree.") and cost reduction (Q40), demonstrating that these two benefits are closely related. It is worth noting that, for the accuracy of the results, the answer "I do not use" was pre-filtered from the analysis, allowing us to draw conclusions directly based on the data of active users. A high level of artificial intelligence competence is associated with the optimization of both time and financial resources, and those users who save time with AI are also the most successful at reducing costs.

Students gain the opportunity to save money on non-formal education and private tutoring: they no longer pay for English courses, programming, text editing, or other activities. In fact, AI becomes their free learning assistant. Accordingly, education becomes budget-friendly and accessible.

DISCUSSION

It is noteworthy that, according to the results of the study, the students we surveyed perceive artificial intelligence as an important tool that should be integrated into the educational process. Despite its many positive aspects, artificial intelligence is characterized by a number of challenges, including issues related to ethics, infrastructure, and the development of relevant competence. This indicates that simply teaching how to use artificial intelligence in universities is insufficient; it is also crucial to properly understand its capabilities and limitations. The results of the study are consistent with international studies, according to which the integration of AI into the educational process improves its effectiveness. The study results also highlight the importance of upholding academic integrity. Students hold varying views regarding the ethical aspects of using artificial intelligence, underscoring the need for clear university policies and guidelines. Furthermore, access

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to technological resources and relevant knowledge shapes students' experiences. Consequently, it is advisable to conduct training sessions for students and academic staff and to establish clear rules regarding the use of artificial intelligence. At the same time, the readiness of students and academic staff is necessary for proper implementation. When using AI, high competence of students and academic staff may lead to effective time management and reduction of additional financial costs. A limitation of the study is the fact that it was carried out only among students of the Faculty of Economics and Business of Ivane Javakhishvili Tbilisi State University, which is why the generalization of the results to other universities should be done with caution and requires more in-depth research.

CONCLUSION

The results of the study demonstrate that artificial intelligence is gradually becoming an important component of higher education, and its proper use has a positive impact on both the quality of the educational process and the optimization of time and financial resources. Moreover, while artificial intelligence holds significant potential within higher education, its effective use depends on student competence, the upholding of academic integrity, and access to technological resources. Universities must ensure appropriate training for students and lecturers and establish clear guidelines regarding the use of artificial intelligence. Students who have the skills to use AI are better able to save time and reduce additional educational costs, which is especially important in non-formal education. As a recommendation, the university should develop a clear ethical policy. Furthermore, students and academic staff should be trained, and investments should be made to improve technological infrastructure. Thus, the integration of artificial intelligence into higher education should be viewed not merely as a technological innovation, but as an opportunity to enhance the learning process. Its true value depends on the extent to which students can utilize the technology to foster independent thinking, deepen their knowledge, and maintain academic responsibility. Consequently, the goal of universities should be neither to restrict nor to indiscriminately encourage the use of artificial intelligence, but rather to create an academic environment where its application facilitates knowledge acquisition and the development of student competencies.

As we have noted, it is important to increase the number of respondents participating in the study and to include students from other public and private universities in Georgia.

Conflict of Interest:

The authors declare no conflict of interest.

Author Contributions: Conceptualization, N.K. methodology, N.K.; software, M.G.; validation, N.K. and I.G.; formal analysis, N.K. and D.P.; investigation, N.K., D.P., M.G., and I.G.; resources, N.K., D.P., M.G., and I.G.; data curation, N.K., D.P., M.G., and I.G.; writing—original draft preparation, N.K. and I.G.; writing—review and editing, N.K. and D.P.; visualization, D.P.; supervision, N.K.; project administration, M.G.; All authors have read and agreed to the published version of the manuscript.

Declaration of Generative AI and AI-assisted technologies in the writing process: During the preparation of this work, the author did not use generative AI or AI-assisted tools to create or alter images in the manuscript.

Institutional Review Board Statement: Not applicable

Informed Consent Statement: Not applicable

Data Availability Statement:

The data presented in this study are available on request from the corresponding author.

Funding/Acknowledgement – Ivane Javakhishvili Tbilisi State University - Partial Funding

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2027, 8(1), 88-104, https://doi.org/10.46656/access.2027.8.1(5)
ISSN 2683-1007 (Online)
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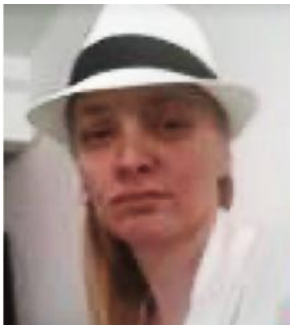

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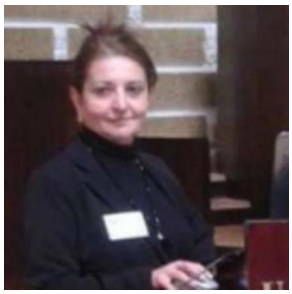

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