

Higher Education in the Age of AI: Chatgpt's Impact on Students' Academic Activities

Alexandra CONSTANTIN*

Bucharest University of Economic Studies, Bucharest, Romania

*Corresponding author, alexandra.constantin@economie.ase.ro

Silvia-Elena IACOB

Bucharest University of Economic Studies, Bucharest, Romania

silvia.iacob@economie.ase.ro

Abstract. *In the age of Artificial Intelligence, higher education institutions must adapt accordingly by smoothly transforming their curricula and pedagogical approaches in a student-centered perspective that allows young adults to develop the necessary skillset of AI competences that will ensure them employability in the near future. After the 2022 launch of Open AI's notorious ChatGPT, higher education settings have also faced the urgent need to both regulate and integrate gen AI platforms mainly because their students were already taking advantage of its benefits in terms of generating idea or producing high-quality writing papers. Even though several studies have documented GPT's impact on students' skills, there is limited focus on students' perceptions in Romanian higher education. Hence, the main aim of the present study is to investigate students' perception with regards to their perceived influence of generative AI use for academic purposes on their academic performance. The methodological approach taken in this study is a mixed methodology based on a pilot study (n=186), with data being gathered via a questionnaire-based survey and analysed via SPSS. Findings suggest that GPT improves several research skills of students, while 71% of respondents perceiving GPT's impact as significantly improving their productivity, thus this article adding a valuable contribution to the body of knowledge. Future studies could enhance representativeness, mitigate self-reported bias, and improve econometric model predictive power.*

Keywords: Higher Education, AI in education, ChatGPT adoption, AI literacy, students' perceptions, academic performance, pilot study.

Introduction

The rise of the coming wave of Artificial Intelligence (AI) has been long time foreseen by scientists, journalists, moviemakers, novelists, and Sci-Fi enthusiasts but its extensive integration into educational settings has only become a reality after the 2022 launch of Open AI's notorious generative AI system – ChatGPT. Higher education settings have also faced the urgent need to both regulate and integrate gen AI platforms mainly because their students were already taking advantage of its benefits in terms of generating idea or producing high-quality writing papers.

Higher education students were the first adopters of gen AI during the lockdown, while the post-pandemic end of the exclusive online education has forced both educators and academics to acknowledge AI's implications for the education field. Most research in the field of AI in education focuses on various topics, ranging from AI literacy (Knoth et al., 2024) to AI bias (Eloundou et al., 2024) or AI assessment tools (Gao et al., 2024). With regards to the impact of AI in higher education, the bibliometric analysis conducted by Vorontsova et al. (2025) identifies three main research areas: AI tools for decision-making, digital transformation, and AI-driven efficiency through AI-based technologies. Moreover, their findings suggest that AI could decrease

administrative costs, enhance efficiency, and support educational accessibility and quality (Vorontsova et al., 2025).

On one hand, there is an intensive research effort designed to identify and support the numerous AI-driven advantages into educational settings. Because AI holds the power to revolutionize personalized learning, teaching, and innovation (Abulibdeh et al., 2024; Vorontsova et al., 2025), developing AI literacy and prompt engineering skills becomes crucial for effective AI use (Knoth et al., 2024; Kacperski et al., 2025). Moreover, the systematic review of Gao et al. (2024) identified five types of automated text-based assessment systems that present the potential to ameliorate current pedagogical approaches through AI-driven technologies that not only reduce the time teachers spend on evaluating their students, but also the effort of creating individualized assessments according to students' cognitive needs: Automatic Grading System, Automatic Feedback System, Automatic Writing Evaluation System, Automatic Classifier, Multimodal Evaluation System.

On the other hand, many scholars have concentrated their efforts in pursuing the complex mission of identifying all the challenges presented by the integration of AI into education (Eloundou et al., 2024; Shorey et al., 2024; Alfiras et al., 2025; Kacperski et al., 2025). While AI adoption into education becomes more immersive and transforms traditional educational landscape into an AI-aided environment where all stakeholders take advantage of its capabilities, all studies emphasize the urgent need for regulatory guidelines, cross-verification techniques, and ethical AI use in education (Abulibdeh et al., 2024; Eloundou et al., 2024; Gao et al., 2024; Shorey et al., 2024; Alfiras et al., 2025; Kacperski et al., 2025).

Due to the scarcity of research endeavors concerning the impact of ChatGPT on students' academic activities, the main aim of the present study is to investigate students' perception with regards to their perceived influence of generative AI use for academic purposes on their academic performance. To achieve the paper's main objective, the core research question that guided this study can be stated as follows:

RQ1: How do students perceive ChatGPT's influence on their academic performance in a Romanian HEI context?

By providing an answer to this research question through the means of a pilot study, this article will contribute to the field of AI in education and extend previous knowledge. Thus, the value of the present research lies in its findings upon conducting a survey based on a questionnaire that investigated students' opinions regarding the impact of ChatGPT on their academic activities.

The next section of the paper discusses the impact of generative AI on higher education institutions, educators, and students, allowing us the formulation of the following research hypotheses:

H1: When used for active learning, ChatGPT improves students' academic performance.

H2: Students using ChatGPT for active learning outperform their counterparts that perform a passive use.

Next, the following section of the research paper will provide a synthesis of the main contributions to this field of knowledge in terms of citations, and discuss their findings in relation with the impact of ChatGPT of higher education.

Literature Review

Gen AI versus human capabilities

Nowadays, new technologies emerge more often than back in 1965 when Moore formulated its law stipulating that the number of transistors will double each two years at minimal costs. Hence, there

is little surprise that the 2023 version of generative AI, ChatGPT-4, outperforms the previous model, ChatGPT-3.5 (2022) in subject-specific exams, such as dermatology or English exams (Lewandowski et al., 2024).

All these technological advancements pose greater challenges to individuals that are surpassed intellectually by large language models (LLMs) and generative AI models (Alahmadi et al., 2024). The main difference between LLMs and gen AI is that all LLMs are AI, but not all AI systems are LLMs. In fact, LLMs are a subset of AI consisting of a model trained on vast amounts of text data to understand and generate human-like content, such as ChatGPT (GPT-3.5, GPT-4), Google's Gemini (formerly Bard), Meta's LLaMA, and Anthropic's Claude. Consequently, possessing AI literacy becomes mandatory for teachers that promote traditional evaluation systems through written assignments, due to their otherwise inability to detect AI-generated texts in absence of prior experience using ChatGPT (Parker et al., 2024).

Opportunities:	Challenges
Wellbeing support	Technological dependence and concentration of power
Administrative support	Academic integrity challenges
Student intervention	Quality, accuracy, and ethical concerns
Creating collaborative circles	Graduate employment
Research assistant	Dilution or automation of university teacher rolls
Adaptive curriculum development	Privacy and surveillance
Automated grading	Erosion of graduate attributes
Inclusive education	Regulatory and policy challenges
Providing instant feedback	Sustainability
Teaching assistant	Bias

Figure 1. Opportunities and challenges of GenAI integration in higher education

Source: Authors adaptation after Rudolph et al., 2024.

The pandemic has been the catalyst force that facilitated the rapid adoption of GenAI and thus it caused higher education institutions (HEI) to adapt to a new ecosystem of digital technologies through AI-policy implementation and various AI-plagiarism detection tools. Since the integration of AI systems in universities pose both opportunities and challenges, Figure 1 illustrates a comparative analysis of the numerous advantages and risks that should be taken into consideration beforehand.

Teachers and AI: a cautious perspective

Pedagogical evaluation approaches must be redesigned under the peril of students simply copying text generated by ChatGPT. As Parker et al. (2024) argue in their study of ChatGPT's role in higher education, AI-written texts were graded the higher marks in 80% of classes, while half of the assessments generated by AI were undetected by graduate teaching assistants with little or no prior experience with AI models. Similarly, Perkins et al. (2024) acknowledge in their article about detection of GPT-4 generated text in higher education that only 54.5% of AI-written assignments

were reported by professors for academic misconduct, whilst AI detection tools were able to identify 91% of AI-generated submissions.

AI tools, especially ChatGPT, are dominant in higher education discourse, argue Lee et al. (2024) in their work about the impact of generative AI on higher education. They also suggest a more rapid reaction from the part of universities worldwide, in the light of the vast students' adoption of ChatGPT for a rather passive use. Teachers from academia must not only be aware of these new technological advancements but also take full advantage of their potential benefits, such as discovering more of a work-based balance (Watermeyer et al., 2024), utilizing deep learning-based strategies for evaluation (Gao, 2025), and offering instant feedback to a vast number of students (Banihashem et al., 2024).

Moreover, Ofosu-Ampong (2024) argues in his research article about faculty perceptions and acceptability of AI in teaching practices that teachers' cautious perspective could be explained through the lens of the key factors influencing their acceptance of AI for their students, which refer to: pedagogical resources, organizational policies and incentives, perceived difficulty and usability, and socio-cultural context, or even through the lens of the predictors of AI acceptance in education that include years of teaching experience, management support for AI use, and attitudes towards AI.

Finally, pedagogical adaptation studies concerning AI integration focus on AI's power to transform teaching and assessment into a process-focused learning and critical thinking development educational setting (Bower et al., 2024). Yet, ethical challenges and privacy concerns demand for strategic AI implementation (Lee et al., 2024).

Students and AI: an adventurous approach

Studies on AI-assisted learning and scientific writing support tools claim that ChatGPT enhances personalized learning, information access, and creativity mainly because Activity-Based Learning improves academic performance compared to traditional methods (Al Shloul et al., 2024). Additionally, AI literacy, acknowledge Ngo & Hastie (2025), could enhance academic and technological proficiency if effectively integrated into HEI curricula.

In the shadow of GenAI's impact on future workforce competence needs, Chiu (2024) argues that students motivated by AI-powered job prospects should possess additional skills, such as fact-checking, entrepreneurship, and creativity. Trust in AI and prior exposure to AI negatively influence students' AI-generated texts revision behaviors, thus demonstrating the crucial role of AI literacy for effective academic writing (Radtke & Hummel, 2025).

On one hand, scholars agree that overreliance on ChatGPT can limit critical thinking, creativity, and deep understanding because GPT's ability to provide an answer in less than five seconds has caused students to have a preference for prompts consisting in content creation, (Fiialka et al., 2023; Chiu et al., 2024; Mogavi et al., 2024). Moreover, students seem to highly appreciate ChatGPT's ability to shape discourse, offer more than one hundred different linguistic tools, and structure information (Habib et al., 2024; Johnston et al., 2024; Wang & Ren, 2024; Cake, 2025).

On the other hand, HEI students' adventurous approach and fast adoption of ChatGPT seem to only increase digital divide as higher-income students' perception is highly positive, while their lower-income counterparts express severe concerns about labour displacement (Baek et al., 2024). Perceived playfulness, argue Parveen et al. (2024) through the analysis of ChatGPT adoption among students using the Structural Equation Modelling, seems to be the major predictor of behavioural intention, followed by perceived values and performance expectancy. Other scholars having used a similar methodological approach suggest that students' attitudes towards ChatGPT

usage are mainly influenced by the affective and cognitive component, yet gender and age present no significant moderating effects on this relationship (Abdaljaleel et al., 2024; Acosta-Enriquez et al., 2024a; Acosta-Enriquez et al., 2024b; Adžić et al., 2024; Al-Dokhny et al., 2024; Arbulú Ballesteros et al., 2024; Bouteraa et al., 2024; Annamalai et al., 2025).

To sum up, the literature review analysis allowed us to formulate the two research hypotheses suggesting that ChatGPT improves students' academic performance if used for active learning (H1), as well that students using ChatGPT for active learning outperform their counterparts that perform a passive use (H2). Hence, this research article adds value to the field of AI in education and extends previous knowledge in terms of examining students' opinions regarding the impact of ChatGPT on their academic activities through a questionnaire-based survey.

Methodology

The main objective of our study was to investigate students' perception with regards to their perceived influence of generative AI (ChatGPT) use for academic purposes on their academic performance. Thus, a pilot study was employed in order to examine students' perceptions (N=186), consisting of a questionnaire-based survey, in strong connection with our research question:

RQ1: How do students perceive ChatGPT's influence on their academic performance in a Romanian HEI context?

The survey was constructed to address this research question using Likert scale items related to participants' opinions towards the impact of ChatGPT on their academic activities and outcomes. The questionnaire development process involved item selection based on prior scales (Gao et al., 2024). The instrument design consisted in six sections, as follows: 1. Socio-demographic questions (age, gender, level of education); 2. Items related to ChatGPT use for academic purpose/ activities; 3. Limits and errors of ChatGPT; 4. ChatGPT's impact on academic performance and abilities; 5. Ethics and academic integrity; 6. Suggestions for improvement (Table 1).

The questionnaire design included several open-ended questions asking participants to explain how they correct ChatGPT when providing wrong answers, what kind of errors could be solved in GPT's prompts, what new GPT-features would be useful for students, to formulate a recommendation for a responsible GenAI-use to their peers, and to express their opinion towards ethical AI-use in academic written assignments.

Table 1. Instrument design structure in terms of variable selection

Section of the questionnaire	Independent variables	Dependent variables
Demographic information	- Age range - Gender - Level of education - Year of study - Type of institution	- Impact of ChatGPT on academic activities
AI usage for academic activities	• Use of other AI tools • Participation in AI education courses • Version of ChatGPT used • Type of academic activities (essays, research etc.) • Frequency of use • Use of ChatGPT in academic activities	• Frequency and extent of ChatGPT use in academic activities • Impact on time management in academic tasks

Section of the questionnaire	Independent variables	Dependent variables
ChatGPT's errors and limitations	○ Frequency of errors ○ Types of errors ○ Methods of correction	○ Perception of ChatGPT's reliability and error rate
ChatGPT's impact on academic performance and abilities	- Influence of ChatGPT on specific academic skills (research, writing etc.) - Influence of ChatGPT on academic performance	- Improvement or hindrance in academic skills (research, critical thinking etc.) - General academic performance (grades, understanding)
Ethics and academic integrity	● Ethics of using ChatGPT in academic writing ● Recommendations from faculty ● Measures to maintain originality	● Perception of ethical considerations and academic integrity
Suggestions for ChatGPT's improvement	○ Suggestions for responsible use of ChatGPT	○ Perception of responsible AI use in academia

Source: Authors' own research.

The survey was distributed via institutional emails and Whatsapp groups of students from the Faculty of Accounting and Management Information Systems (bachelor) and the Faculty of Theoretical and Applied Economics (master and PhD) within the Bucharest University of Economic Studies. Because no incentives were used to increase students' response rate, while students frequently tend to ignore surveys if they are not requested personally by their peers, the suitability of the snowballing approach was applied for the questionnaire distribution and participants were encouraged to further share it to their peers.

In spite of the failure to ensure statistical relevance due to the sampling method, the nature of our study is exploratory while aiming to identify a potential trend. The data collection period extended from 24th of January to 5th of February 2025, corresponding to GPT-4's main prevalence. A total of 186 survey responses were collected.

The methodological section of our study used a mixed-method approach. For the quantitative analysis, the most relevant outcome variables from the Likert scale responses were impact on academic performance, influence on creativity development in writing texts and on research abilities, and impact on academic integrity. All items used a five-point Likert scale (1=none, 2=minor, 3=moderate, 4=major, 5=profound). Next, the responses for each variable were modelled using a general linear model with possible explanatory variables of *age group* (<20, 20-24, 25-29, 30-34, >34years), *gender* (male or female), *level of study* (bachelor, master, doctorate/PhD), *year of study* (1, 2, 3, 4), *prior AI experience* (yes or no). All analyses were performed using the SPSS package (IBM, Version 20).

A minimum sample size of 185 was further obtained for a population of 1.731 with a z-score of 1.64, a margin of error (e) of 5.7%, and a standard deviation (p) of 0.5%. Thus, a sample size of n=186 should attain results that provide a high level of confidence to validate the findings.

Next, the Cronbach's Alpha was calculated via SPSS to assess the internal consistency of the multi-item scale in our questionnaire and thus it was obtained a value of 0.731 of the Alpha coefficient suggesting a good reliability. However, the sampling method lacks representativeness and results should be interpreted cautiously.

The qualitative analysis follows the quantitative analysis to observe more direct interconnections between the two sets of results. The qualitative data of our research included the fully anonymized open-ended responses concerning students' opinions, further reported using

quotes to conserve fidelity to the underlying data. Additionally, data analysis was performed via SPSS and involved the following statistical analysis operations: descriptives, frequencies, correlations, T-Test, ANOVA, regression analysis, and Decision Tree model.

Nevertheless, several limitations of our study must be acknowledged. The first limitation concerns the reliance of our study on self-reported perceptions of GPT's impact, which might be affected by response bias, such as desirability or recall errors. Secondly, the findings might not be generalizable to a broader student population, due to the sample's homogeneity (89.2% bachelor students).

Results

Furthermore, the frequency analysis indicates a predominance of female respondents (62.9%), as well as a dominance of bachelor students (89.2%), with 42.5% of them in their first year, 33.3% in their second year, and 21.5% in their third (final) year. Additionally, the vast majority of students (90.9%) use other AI tools, while only 21% of the students have participated in AI courses (Table 2).

Table 2. Sociodemographic profile of the sample (n=186)

Item		N	%
Gender	Male	69	37.1
	Female	117	62.9
Age	<20	76	40.9
	20-24	99	53.2
	25-29	9	4.8
	30-34	-	-
	>34	2	1.1
Level of study	Bachelor	166	89.2
	Master	10	5.4
	PhD	10	5.4
Year of study	1	79	42.5
	2	62	33.3
	3	40	21.5
	3 sup.	3	1.6
	4	2	1.1
Have you used other AI tools for academic activities before?	Yes	169	90.9
	No	17	9.1
Have you ever enrolled to an AI course?	Yes	147	79
	No	147	21

Source: Authors' own research.

According to data from Table 3, highest mean values suggest strong agreement with ChatGPT's impact on fast acces to information (4.15), on time management (3.82; 3.81), and on overall academic outcomes (3.67), while lowest mean values indicate a weak perceived impact of ChatGPT's influence on developing analytical skills (2.91) and on content originality (2.99). Moreover, the high variability in responses concerning ChatGPT's impact on time management enhancement (1.254), creative idea generation (1.335), text coherence and structure (1.238), and on academic papers improvement (1.212) shows that students have mixed opinions on these aspects, whereas they seem to have more consistent views on other topics, such as GPT's impact on creativity in academic writing (0.602) and on a profound understanding of courses (0.730).

Next, the near zero skewness of variables ranging from -0.5 to 0.5 suggests a relatively balanced view concerning GPT's impact on academic skills (research, writing, critical thinking).

In contrast, left-skewed responses demonstrate a predominantly positive perception of ChatGPT's impact on fast access to information (-1.417) and overall academic performance (-1.243). Yet, the positive skewness of students' age indicates younger students dominate the sample. Additionally, the negative Kurtosis suggests students have widely differing opinions on GPT's impact on factual verification (-1.362) and on grammar check (-1.345), whilst there is a consensus towards its impact on overall academic performance (2.809) and on creativity development (2.712) (Table 3).

Table 3. Descriptive Statistics

Variables N=186	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Students' age	1.67	.670	1.368	.178	4.995	.355
Frequency of GPT use to generate idea	2.26	.996	.656	.178	-.196	.355
Frequency of GPT use for academic writing assignments	2.60	1.092	.429	.178	-.447	.355
Frequency of GPT use in content structure	2.36	.978	.662	.178	.207	.355
Frequency of GPT use for grammar check	3.19	1.424	-.051	.178	-1.345	.355
Frequency of GPT use for factual verification	3.01	1.433	.215	.178	-1.362	.355
GPT's impact on time management for academic activities	3.82	.962	-.374	.178	-.353	.355
GPT's impact on time management enhancement	3.81	1.254	-.907	.178	.233	.355
GPT's impact on academic papers improvement	3.34	1.212	-.547	.178	.237	.355
GPT's impact on creative idea	3.44	1.335	-.590	.178	-.267	.355
GPT's impact on text coherence and structure	3.33	1.238	-.571	.178	.162	.355
GPT's impact on fast access to information	4.15	1.129	-1.417	.178	1.696	.355
Frequency of GPT's errors	3.18	.614	-.127	.178	-.469	.355
Frequency GPT accuracy errors	2.90	.848	.412	.178	.334	.355
Frequency of GPT's contradictory answers	2.76	.985	.251	.178	-.261	.355
Frequency of GPT's correction issues	3.20	.965	.017	.178	-.329	.355
Overall perception towards GPT's accuracy	3.35	.793	-.251	.178	.667	.355
GPT's impact on academic skill of research	3.15	.967	.031	.178	-.165	.355
GPT's impact on academic writing skills	3.01	1.078	.068	.178	-.426	.355
GPT's impact on critical analysis	2.91	1.033	.155	.178	-.125	.355
GPT's impact on information synthesis	3.32	1.052	-.058	.178	-.576	.355
GPT's impact on content originality	2.99	1.073	.170	.178	-.430	.355
GPT's impact on a more profound understanding of courses	3.05	.730	-.918	.178	1.480	.355
GPT's impact on creativity development in academic writing	3.08	.602	-.783	.178	2.712	.355
GPT's impact on overall academic performance	3.67	.802	-1.243	.178	2.809	.355
GPT's impact on academic integrity	3.23	1.025	-.071	.178	-.258	.355

Source: Authors' own research.

Correlation analysis (Pearson's r) follows the frequency analysis and concerns all relevant variables within our research instrument, such as: age, gender, level of study, usage of other AI tools, participation in AI courses, frequency of GPT use for different academic purposes, GPT's accuracy and errors, GPT's impact on academic skills, GPT's impact on text coherence, GPT's

impact on creativity and understanding, GPT's impact on academic integrity, and GPT's overall impact on academic performance.

First, the correlation analysis focuses on nonparametric correlations of demographic variables and suggests that there is almost no linear relationship between age and gender ($r=-0.060$; $p\text{-value}=0.412$), whereas data shows a moderate, statistically significant positive correlation (Spearman's $\rho=0.422$) between students' age and level of study, which indicates that older students tend to be at higher levels of study. Additionally, the Spearman's ρ correlation coefficient (0.072) suggests a very weak positive correlation between the usage of other AI tools and participation in AI courses, yet, this correlation is not statistically significant ($p\text{-value}=0.331$).

Secondly, the correlation analysis examines all the relevant relationships between the continuous variables. On one hand, Pearson's r of -0.198 indicates a weak negative correlation between the frequency of GPT use to generate ideas and the perceived impact on time management enhancement, and suggests a decrease of the perceived impact of GPT on time management as students use it more frequently. **Another weak negative correlation** ($r=-0.195$, $p<0.01$) is further observed between GPT use and academic performance, suggesting that students who frequently use ChatGPT for academic writing may perceive a slight decline in their academic performance, while students who perceive a slight decline in their academic performance may frequently use ChatGPT for academic writing. However, while the correlation is weak, the negative relationship suggests that heavy reliance on ChatGPT might be associated with lower perceived academic performance, possibly due to reduced critical thinking or writing skills. Similarly, the weak negative correlation between GPT use and academic integrity ($r=-0.048$, $p=0.516$) indicates that using GPT more frequently does not strongly impact students' perception of academic integrity, which actually may indicate that students may not necessarily perceive AI use an ethical issue in academic writing. Hence, this could mean that academic policies on AI use should contain clearer guidelines to address ethical concerns. Next, the overall perception of GPT's accuracy is negatively correlated with the frequency of GPT's errors, contradictory answers, accuracy issues, and correction problems, and indicates that as these issues increase, the perception of GPT's accuracy tends to decrease. Moreover, students who find ChatGPT useful for generating creative idea also perceive it as favourable for ameliorating both content originality ($r=0.270$, $p<0.01$) and creativity in academic writing ($r=0.282$, $p<0.01$), although there is a moderate correlation between the two variables.

On the other hand, strong correlations are observed between GPT's impact on research skills such as academic writing skills (Spearman's $\rho=0.622$), critical analysis (Spearman's $\rho=0.694$), and information synthesis (Spearman's $\rho=0.629$), which suggests that GPT improves all these skills. In addition, the strongest correlation is between GPT's impact on text coherence and structure and GPT's impact on academic papers improvement ($r=0.732$, $p<0.01$), which indicates that students who perceive ChatGPT beneficial for improving text coherence and structure also find it significantly advantageous for enhancing their academic papers' quality. Yet, several no significant correlations were observed. For instance, students' gender is not significantly correlated with any of the GPT impact measures, nor is the level of study with GPT's impact on understanding courses or academic papers improvement, and year of study does not significantly affect students' perceptions of overall academic performance or understanding of courses.

Furthermore, we applied the T-Test to investigate whether ChatGPT affects groups of students a different way or not. First, there is no significant difference between male and female students concerning the perceived impact of ChatGPT on overall academic performance ($t(184)=1.066$, $p=0.288$). Next, the mean difference between undergraduates and graduates is 0.523

and statistically significant at the 5% level ($p=0.033$), indicating that bachelor students (mean=3.72) perceive a greater influence of ChatGPT's impact on academic performance than the master students (mean=3.20). However, the perceived impact of GPT differs by 0.423 points between bachelor and PhD students, but this difference is not statistically significant at a confidence level that does not include zero in the interval (-0.595, 1.441), suggesting that the two groups have similar perceptions. Similarly, undergraduate students from the first and second year perceive GPT's impact on academic performance almost identically (Sig.=0.887; $t= -0.051$; $df=139$, Sig. (2-tailed)=0.959). In addition, while third year students could rely heavily on ChatGPT for academic research activities, the output of the T-Test shows no significant difference between them and second year ($t=0.437$, $df=100$, Sig. (2-tailed)=0.663) or first year students.

Taking into account that two grouping variables (level of education and year of study) from the T-Test had more than two groups, the right choice for our analysis is One-Way ANOVA to test differences between the perceived GPT impact on overall academic performance based on students' the level of education. Since the assumption of equal variances is breached ($p=0.005$), we used both a Games-Howell post hoc test and Dunnett's test that revealed that none of the pairwise differences are statistically significant. Thus, inspite of the ANOVA's suggestion of a significant overall difference between groups, the variation is not strong enough to assuredly affirm that one group perceives ChatGPT's impact significantly more than another. Because $p<0.05$ and data is not normally distributed, the Kruskal-Wallis nonparametric test was further applied and also revealed no statistically significant difference between the groups ($p=0.093$), with a very small effect size of $\eta^2 = 0.0066$. Also, the results ($F=1.859$ with a significance value of $p=0.196$, and $F=1.464$ with a significance value of $p=0.260$) from the robust tests of equality of means (Welch and Brown-Forsythe tests) show that there are no statistically significant differences between the three groups in terms of the GPT's impact on their academic grades. This suggests that bachelor, master, and PhD students perceive almost identically ChatGPT's impact on their overall academic performance, so there is no strong evidence that the level of study influences GPT's perception.

Another ANOVA test was applied to identify whether there are differences between students from the first, second, third, and forth year of study regarding their perceived impact of GPT on their overall academic performance. Since the p-value is greater than 0.05 and both robust tests show non-significant results (Welch: $F=0.310$, $p=0.861$; Brown-Forsythe: $F=0.807$; $p=0.564$), we can conclude that there are no significant differences in GPT's impact on academic performance between years of study. Additionally, the value of the eta squared ($\eta^2 = 0.028$) suggests a small effect size, which indicates that the independent variable (year of study) explains only a small proportion of the variance in ChatGPT's impact on students' overall academic performance.

Likewise, the ANOVA test (Levene's test $p=0.750$) and robust tests showed no significant differences in ChatGPT's impact on time management for academic activities across the different years of study, and the Tukey HSD post-hoc test ($p>0.05$) also did not find pairwise differences between groups. Hence, the independent variable (year of study) does not have a significant effect on students' perceived impact of GPT on time management for academic activities. Similarly, the statistical results for GPT's impact on time management for academic activities across different academic levels (bachelor, master, PhD) suggest that this generative AI tool has a similar impact on each group of students, while there are no significant differences between these groups (Sig. Value=0.659).

Surprisingly, the Levene's test for homogeneity of variances of 0.337 with a $p=0.722$ indicated a homogeneous variance of perceived accuracy of GPT across groups of students between different levels of education (bachelor, master, PhD). Moreover, the analysis showed that both

robust tests of equality of means confirm that all three groups fall within the same homogeneous subset, which means that all groups perceive GPT's accuracy in a very similar way. This is particularly concerning because students from higher levels of study (master and PhD) should be equipped with a more developed AI literacy and critical thinking skills than their bachelor counterparts, allowing them to identify ChatGPT's accuracy and errors issues more often and even to correct them appropriately.

Furthermore, the decision tree model we constructed could not find any useful splits, suggesting that our model was not able to identify any meaningful relationship between the independent variables (Frequency of GPT use to generate idea, Frequency of GPT use for academic assignments, frequency of GPT use in content structure, Frequency of GPT use for factual verification, GPT's impact on time management for academic activities, GPT's impact on time management enhancement, GPT's impact on academic papers improvement, GPT's impact on creative idea, GPT's impact on fast access to information, GPT's impact on text coherence and structure, Frequency of GPT's errors, Frequency of GPT's accuracy errors, and Frequency of GPT's correctoin issues) and the dependent variable of GPT's impact on academic performance.

Discussion

The main objective of our study was to investigate students' perception with regards to their perceived influence of generative AI (ChatGPT) use for academic purposes on their academic performance. While previous scholars in this field conducted studies to examine the opportunities and challenges presented by the integration of AI into education (Bower et al., 2024; Eloundou et al., 2024; Shorey et al., 2024; Alfiras et al., 2025; Kacperski et al., 2025), the value of the present research lies in its findings upon conducting a survey based on a questionnaire that investigated students' opinions regarding the impact of ChatGPT on their academic activities. Hence, we employed a pilot study in order to examine students' perceptions (N=186) towards GPT's impact on academic activities and skills. The survey was distributed using a snowballing approach from 24th of January to 5th of February 2025, corresponding to GPT-4's main prevalence, and a total of 186 survey responses were collected from students enrolled to two of the faculties from the Bucharest University of Economic Studies. The methodology of our study used a mixed-method approach, while data analysis was performed via SPSS and involved complex statistical analysis and econometric modelling to further investigate more direct interconnections between the variables. Also, a value of 0.731 of the Alpha coefficient suggests a good reliability of our questionnaire.

A total number of 186 responses was collected, out of whom 63% were female respondents and more than 90% have declared to use other AI tools. In line with previous studies suggesting that overreliance on ChatGPT can limit critical thinking, creativity, and deep understanding (Fiiialka et al., 2023; Chiu et al., 2024; Mogavi et al., 2024), respondents express a quite balanced view concerning GPT's impact on academic skills (research, writing, critical thinking). Yet, students report a predominantly positive perception of ChatGPT's impact on fast access to information and overall academic performance, in consonance with previous research on the impact of AI in higher education (Abulibdeh et al., 2024; Vorontsova et al., 2025).

Additionally, the weak negative correlation observed between GPT use and academic performance indicates that students who frequently use ChatGPT for academic writing might perceive a slight decline in their overall academic performance, while the weak negative correlation between GPT use and academic integrity indicates that using GPT more frequently does not strongly impact students' perception of academic integrity, which actually may indicate that

students may not necessarily perceive AI use an ethical issue in academic writing. Thus, this could mean that academic policies on AI use should contain clearer guidelines to address ethical concerns (Abulibdeh et al., 2024; Eloundou et al., 2024; Gao et al., 2024; Shorey et al., 2024; Alfiras et al., 2025; Kacperski et al., 2025).

Next, the overall perception of GPT's accuracy is negatively correlated with the frequency of GPT's errors, contradictory answers, accuracy issues, and correction problems, and indicates that as these issues increase, the perception of GPT's accuracy tends to decrease. Moreover, students who find ChatGPT useful for generating creative idea also perceive it as favourable for ameliorating both content originality and creativity in academic writing, although there is a moderate correlation between the two variables. Similarly, previous works have also suggested that students seem to highly appreciate ChatGPT's ability to shape discourse and structure information (Habib et al., 2024; Johnston et al., 2024; Wang & Ren, 2024; Cake, 2025).

In contrast, strong correlations observed between GPT's impact on research skills such as academic writing skills, critical analysis, and information synthesis indicate that GPT improves all these skills. In addition, the strongest correlation is between GPT's impact on text coherence and structure and GPT's impact on academic papers improvement, which indicates that students who perceive ChatGPT beneficial for improving text coherence and structure also find it significantly advantageous for enhancing their academic papers' quality.

Furthermore, the T-Tests we applied show that there is no significant difference between male and female students concerning the perceived impact of ChatGPT on overall academic performance, bachelor and master students have similar perceptions towards ChatGPT's impact on their academic performance, and undergraduate students from the first and second year perceive GPT's impact on academic performance almost identically. In agreement with previous studies, gender and age present no significant moderating effects on this relationship (Abdaljaleel et al., 2024; Acosta-Enriquez et al., 2024a; Acosta-Enriquez et al., 2024b; Adžić et al., 2024; Al-Dokhny et al., 2024; Arbulú Ballesteros et al., 2024; Bouteraa et al., 2024; Annamalai et al., 2025). Despite third year students could rely heavily on ChatGPT for academic research activities, the output of the T-Test shows no significant difference between them and second or first year students. Also, the results from the robust tests of equality of means show that there are no statistically significant differences between the three groups (bachelor, master, PhD) in terms of the GPT's impact on their academic grades, indicating that bachelor, master, and PhD students perceive almost identically ChatGPT's impact on their overall academic performance. Next, the ANOVA tests revealed that there are no significant differences in GPT's impact on academic performance between years of study, and the year of study does not have a significant effect on students' perceived impact of GPT on time management for academic activities. Moreover, the robust tests of equality of means confirm that all three groups perceive GPT's accuracy in a very similar way, which is particularly concerning because students from higher levels of study (master and PhD) should be equipped with a more developed AI literacy and critical thinking skills than their bachelor counterparts, allowing them to identify ChatGPT's accuracy and errors issues more often and even to correct them appropriately.

While the value of the present research lies in its findings upon conducting a survey based on a questionnaire that investigated students' opinions regarding the impact of ChatGPT on their academic activities, limitations of our study must also be acknowledged. The first limitation concerns the reliance of our study on self-reported perceptions of GPT's impact, which might be affected by response bias, such as desirability or recall errors. Given the fact that students may overestimate or underestimate GPT's usefulness based on personal experiences or external

influences, future studies should complement self-reported data with objective performance measures, such as academic grades or time-tracking data on GPT usage, to enhance result validity. Secondly, the findings might not be generalizable to a broader student population, which could be mitigated by future research that include students from diverse institutions, academic disciplines, and various levels of digital proficiency, and use random or stratified sampling techniques to ensure a more representative dataset.

Conclusion

This study set out to objectively measure and assess the impact of ChatGPT on students' academic activities, whereas the value of the present research lies in its findings upon conducting a survey based on a questionnaire that investigated students' opinions regarding its impact of their academic endeavors. Additionally, our study's contribution consists in providing a student-centric perspective from an Eastern European higher education institution, as well as offering a practical recommendation, like mandatory AI literacy courses at Bucharest University of Economic Studies to increase its actionable impact.

Returning to the question posed at the beginning of this study, it is now possible to state that GPT improves research skills, such as academic writing skills, critical analysis, and information synthesis. In addition, students who perceive ChatGPT beneficial for improving text coherence and structure also find it significantly advantageous for enhancing their academic papers' quality, whereas students who find ChatGPT useful for generating creative idea also perceive it as favourable for ameliorating both content originality and creativity in academic writing (H1). Similarly, previous works have also suggested that students seem to highly appreciate ChatGPT's ability to shape discourse and structure information, whilst respondents report a predominantly positive perception of ChatGPT's impact on fast access to information and overall academic performance (H2). Moreover, bachelor, master, and PhD students perceive almost identically ChatGPT's impact on their overall academic performance. This is particularly concerning because students from higher levels of study (master and PhD) should be equipped with a more developed AI literacy and critical thinking skills than their bachelor counterparts. Furthermore, this paper has argued that GPT's impact on time management for academic activities could be an important factor to influence academic performance of students.

Notwithstanding, several limitations of our study must be acknowledged. The first limitation concerns the reliance of our study on self-reported perceptions of GPT's impact, which might be affected by response bias, such as desirability or recall errors. Secondly, the findings might not be generalizable to a broader student population due to the sample's homogeneity.

Finally, recommendations for future work could include a broader sample of students from diverse institutions, academic disciplines, and various levels of digital proficiency, and use random or stratified sampling techniques to ensure a more representative dataset. Additionally, future studies should complement self-reported data with objective performance measures, such as academic grades or time-tracking data on GPT usage, to enhance result validity. Lastly, future studies could incorporate additional variables like students' digital literacy level or study habits to enhance the predictive power of the econometric model.

Acknowledgement

This paper was co-financed by The Bucharest University of Economic Studies during the PhD program.

References

- Abdaljaleel, M., Barakat, M., Alsanafi, M., Salim, N. A., Abazid, H., Malaeb, D., Mohammed, A. H., Hassan, B. A. R., Wayyes, A. M., Farhan, S. S., El Khatib, S., Rahal, M., Sahban, A., Abdelaziz, D. H., Mansour, N. O., AlZayer, R., Khalil, R., Fekih-Romdhane, F., Hallit, R., Hallit, S., & Sallam, M. (2024). A multinational study on the factors influencing university students' attitudes and usage of ChatGPT. *Sci Rep* 14, 1983 <https://doi.org/10.1038/s41598-024-52549-8>.
- Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of Industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production*, 437, 140527. <https://doi.org/10.1016/j.jclepro.2023.140527>.
- Acosta-Enriquez, B.G., Arbulú Ballesteros, M.A., Huamaní Jordan, O., López Roca, C., & Saavedra Tirado, K. (2024a). Analysis of college students' attitudes toward the use of ChatGPT in their academic activities: effect of intent to use, verification of information and responsible use. *BMC Psychol* 12, 255 <https://doi.org/10.1186/s40359-024-01764-z>.
- Acosta-Enriquez, B. G., Arbulú Pérez Vargas, C. G., Huamaní Jordan, O., Arbulú Ballesteros, M. A., & Paredes Morales, A. E. (2024b). Exploring attitudes toward ChatGPT among college students: An empirical analysis of cognitive, affective, and behavioral components using path analysis. *Computers and Education: Artificial Intelligence*, 7, 100320. <https://doi.org/10.1016/j.caeai.2024.100320>.
- Adžić, S., Tot, T. S., Vukovic, V., Radanov, P., & Avakumović, J. (2024). Understanding student attitudes toward GenAI tools: A comparative study of Serbia and Austria. *International Journal of Cognitive Research in Science, Engineering and Education*, 12(3), 123-145. <https://doi.org/10.23947/2334-8496-2024-12-3-583-611>.
- Al Shloul, T., Mazhar, T., Abbas, Q., Iqbal, M., Ghadi, Y. Y., Shahzad, T., Mallek, F., & Hamam, H. (2024). Role of activity-based learning and ChatGPT on students' performance in education. *Computers and Education: Artificial Intelligence*, 6, 100219. <https://doi.org/10.1016/j.caeai.2024.100219>.
- Al-Dokhny, A., Alismaiel, O., Youssif, S., Nasr, N., Drwish, A., & Samir, A. (2024). Can multimodal large language models enhance performance benefits among higher education students? An investigation based on the task–technology fit theory and the artificial intelligence device use acceptance model. *Sustainability*, 16(23), 10780. <https://doi.org/10.3390/su162310780>.
- Alahmadi, M. D., Alharbi, M., Tayeb, A., & Alshangiti, M. (2024). Evaluating large language models' proficiency in answering Arabic GAT exam questions. *Engineering, Technology and Applied Science Research*, 14(6), 17774-17780. <https://doi.org/10.48084/etasr.8481>.
- Alfiras, M.I.I., Emran, A.Q., Bojiah, J., Al Farsi, M.M., Shobbar, S., Alhawi, O.A. (2025). *ChatGPT in Education Between Advantages, Authority and Ethics: A Rapid Literature Review*. In: AlDhaen, E., Braganza, A., Hamdan, A., Chen, W. (eds) *Business Sustainability with Artificial Intelligence (AI): Challenges and Opportunities*. Studies in Systems, Decision and Control, vol 566. Springer, Cham. https://doi.org/10.1007/978-3-031-71318-7_12.
- Annamalai, N., Bervell, B., Mireku, D. O., & Andoh, R. P. K. (2025). Artificial intelligence in higher education: Modelling students' motivation for continuous use of ChatGPT based on a modified self-determination theory. *Computers and Education: Artificial Intelligence*, 8, 100346. <https://doi.org/10.1016/j.caeai.2024.100346>.

- Arbulú Ballesteros, M. A., Acosta Enríquez, B. G., Ramos Farroñán, E. V., García Juárez, H. D., Cruz Salinas, L. E., Blas Sánchez, J. E., Arbulú Castillo, J. C., Licapa-Redolfo, G. S., & Farfán Chilicaus, G. C. (2024). The sustainable integration of AI in higher education: Analyzing ChatGPT acceptance factors through an extended UTAUT2 framework in Peruvian universities. *Sustainability*, 16(23), 10707. <https://doi.org/10.3390/su162310707>.
- Baek, C., Tate, T., & Warschauer, M. (2024). “ChatGPT seems too good to be true”: College students’ use and perceptions of generative AI. *Computers and Education: Artificial Intelligence*, 7, 100294. <https://doi.org/10.1016/j.caeai.2024.100294>.
- Banihashem, S. K., Taghizadeh Kerman, N., Noroozi, O., Moon, J., & Drachsler, H. (2024). Feedback sources in essay writing: Peer-generated or AI-generated feedback? *International Journal of Educational Technology in Higher Education*, 21, 23. <https://doi.org/10.1186/s41239-024-00455-4>.
- Bouteraa, M., Bin-Nashwan, S. A., Al-Daihani, M., Dirie, K. A., Benlahcene, A., Sadallah, M., Zaki, H. O., Lada, S., Ansar, R., Fook, L. M., & Chekima, B. (2024). Understanding the diffusion of AI-generative (ChatGPT) in higher education: Does students' integrity matter? *Computers in Human Behavior Reports*, 14, 100402. <https://doi.org/10.1016/j.chbr.2024.100402>.
- Bower, M., Torrington, J., Lai, J.W.M. *et al.* (2024). How should we change teaching and assessment in response to increasingly powerful generative Artificial Intelligence? Outcomes of the ChatGPT teacher survey. *Educ Inf Technol* 29, 15403–15439. <https://doi.org/10.1007/s10639-023-12405-0>.
- Cake, S. (2025). Artificial intelligence as a collaborative tool for script development. *Media Practice and Education*. <https://doi.org/10.1080/25741136.2025.2454074>.
- Chiu, T. K. F. (2024). Future research recommendations for transforming higher education with generative AI. *Computers and Education: Artificial Intelligence*, 6, 100197. <https://doi.org/10.1016/j.caeai.2023.100197>.
- Eloundou, T., Beutel, A., Robinson, D. G., Gu-Lemberg, K., Brakman, A.-L., Mishkin, P., Shah, M., Heidecke, J., Weng, L., & Kalai, A. T. (2024, October 15). *First-person fairness in chatbots*. OpenAI. <https://cdn.openai.com/papers/first-person-fairness-in-chatbots.pdf>.
- Fiiialka, S., Kornieva, Z., & Honcharuk, T. (2023). ChatGPT in Ukrainian Education: Problems and Prospects. *International Journal of Emerging Technologies in Learning*, 18(17), 236-250. <https://doi.org/10.3991/ijet.v18i17.42215>.
- Gao, Y. (2025). Deep learning-based strategies for evaluating and enhancing university teaching quality. *Computers and Education: Artificial Intelligence*, 8, 100362. <https://doi.org/10.1016/j.caeai.2025.100362>.
- Gao, R., Merzdorf, H. E., Anwar, S., Hipwell, M. C., & Srinivasa, A. R. (2024). Automatic assessment of text-based responses in post-secondary education: A systematic review. *Computers and Education: Artificial Intelligence*, 6, 100206. <https://doi.org/10.1016/j.caeai.2024.100206>.
- Habib, S., Vogel, T., Anli, X., & Thorne, E. (2024). How does generative artificial intelligence impact student creativity? *Journal of Creativity*, 34(1), Article 100072. <https://doi.org/10.1016/j.yjoc.2023.100072>.
- Johnston, H., Wells, R.F., Shanks, E.M., Boey, T., & Parsons, B. N. (2024). Student perspectives on the use of generative artificial intelligence technologies in higher education. *Int J Educ Integr* 20, 2. <https://doi.org/10.1007/s40979-024-00149-4>.

- Kacperski, C., Ulloa, R., Bonnay, D., Kulshrestha, J., Selb, P., & Spitz, A. (2025). Characteristics of ChatGPT users from Germany: Implications for the digital divide from web tracking data. *PLoS ONE*, 20(1), e0309047. <https://doi.org/10.1371/journal.pone.0309047>.
- Knoth, N., Tolzin, A., Janson, A., & Leimeister, J. M. (2024). AI literacy and its implications for prompt engineering strategies. *Computers and Education: Artificial Intelligence*, 6, 100225. <https://doi.org/10.1016/j.caeai.2024.100225>.
- Lee, D., Arnold, M., Srivastava, A., Plastow, K., Strelan, P., Ploeckl, F., Lekkas, D., & Palmer, E. (2024). The impact of generative AI on higher education learning and teaching: A study of educators' perspectives. *Computers and Education: Artificial Intelligence*, 6, 100221. <https://doi.org/10.1016/j.caeai.2024.100221>
- Lewandowski, M., Łukowicz, P., Świetlik, D. and Barańska-Rybak, W., (2024). ChatGPT-3.5 and ChatGPT-4 dermatological knowledge level based on the Specialty Certificate Examination in Dermatology. *Clinical and Experimental Dermatology*, 49(6), pp.686–691. Available at: <https://doi.org/10.1093/ced/llad255>.
- Mogavi, R. H., Deng, C., Kim, J. J., Zhou, P., Kwon, Y. D., Metwally, A. H. S., Tlili, A., Bassanelli, S., Bucchiarone, A., Gujar, S., Nacke, L. E., & Hui, P. (2024). ChatGPT in education: A blessing or a curse? A qualitative study exploring early adopters' utilization and perceptions. *Computers in Human Behavior: Artificial Humans*, 2(1), 100027. <https://doi.org/10.1016/j.chbah.2023.100027>.
- Ngo, T. N., & Hastie, D. (2025). Artificial Intelligence for Academic Purposes (AIAP): Integrating AI literacy into an EAP module. *English for Specific Purposes*, 77, 20–38. <https://doi.org/10.1016/j.esp.2024.09.001>.
- Ofosu-Ampong, K. (2024). Beyond the hype: exploring faculty perceptions and acceptability of AI in teaching practices. *Discover Education*, 3(1), 38. <https://doi.org/10.1007/s44217-024-00128-4>.
- OpenAI. (2022). *About*. OpenAI. Retrieved February 1, 2025, from <https://openai.com/about/>
- Parker, L., Carter, C., Karakas, A., Loper, A. J., & Sokkar, A. (2024). Graduate instructors navigating the AI frontier: The role of ChatGPT in higher education. *Computers and Education Open*, 6, 100166. <https://doi.org/10.1016/j.caeo.2024.100166>.
- Parveen, K., Phuc, T. Q. B., Alghamdi, A. A., Hajjej, F., Obidallah, W. J., Alduraywish, Y. A., & Shafiq, M. (2024). Unraveling the dynamics of ChatGPT adoption and utilization through Structural Equation Modeling. *Scientific Reports*, 14(1), 23469. <https://doi.org/10.1038/s41598-024-74406-4>.
- Perkins, M., Roe, J., Postma, D., McGaughan, J., & Hickerson, D. (2024). Detection of GPT-4 Generated Text in Higher Education: Combining Academic Judgement and Software to Identify Generative AI Tool Misuse. *J Acad Ethics* 22, 89–113. <https://doi.org/10.1007/s10805-023-09492-6>.
- Radtke, A., & Rummel, N. (2025). Generative AI in academic writing: Does information on authorship impact learners' revision behavior? *Computers and Education: Artificial Intelligence*, 8, 100350. <https://doi.org/10.1016/j.caeai.2024.100350>.
- Rudolph, J., Ismail, M. F. B. M., & Popenici, S. (2024). Higher education's generative artificial intelligence paradox: The meaning of chatbot mania. *Journal of University Teaching and Learning Practice*, 21(6). <https://doi.org/10.53761/54fs5e77>.
- Shorey, S., Mattar, C., Lanz-Brian Pereira, T., & Choolani, M. (2024). A scoping review of ChatGPT's role in healthcare education and research. *Nurse Education Today*, 135, 106121. <https://doi.org/10.1016/j.nedt.2024.106121>.

- Vorontsova, A., Tarasenko, S., Duranowski, W., Durasiewicz, A., Soss, J., & Bilovol, A. (2025). A bibliometric analysis of the economic effects of using artificial intelligence and ChatGPT tools in higher education institutions. *Problems and Perspectives in Management*, 23(1), 101-114. [https://doi.org/10.21511/ppm.23\(1\).2025.08](https://doi.org/10.21511/ppm.23(1).2025.08).
- Wang, L., & Ren, B. (2024). Enhancing academic writing in a linguistics course with generative AI: An empirical study in a higher education institution in Hong Kong. *Education Sciences*, 14(12), 1329. <https://doi.org/10.3390/educsci14121329>.
- Watermeyer, R., Phipps, L., Lanclos, D. & Knight, C. (2024). Generative AI and the Automating of Academia. *Postdigit Sci Educ* 6, 446–466 <https://doi.org/10.1007/s42438-023-00440-6>.