

THE PERCEPTIONS OF SLOVENIAN HIGHER EDUCATION STUDENTS ON CHATGPT: A COMPARISON WITH GLOBAL TRENDS

Aleksander Aristovnik, Lan Umek, and Dejan Ravšelj*
University of Ljubljana
SLOVENIA

Abstract

The launch of ChatGPT in November 2022 profoundly impacted higher education, quickly gaining popularity among students. Therefore, this paper aims to examine the perceptions of Slovenian higher education students on ChatGPT compared to global trends. The results, based on data from 23,218 students, including 452 students studying in Slovenia, collected between October 2023 and February 2024, reveal that students use ChatGPT for brainstorming, summarizing, and research, with Slovenian students favouring it for academic writing. Moreover, ethical concerns include cheating, inaccuracy, and plagiarism, highly emphasized by Slovenian students. Most students support regulation, though Slovenian students are less supportive.

Introduction

The introduction of the conversational chatbot ChatGPT in November 2022 represented a pivotal moment for artificial intelligence applications in higher education. Created by OpenAI (San Francisco, CA), ChatGPT quickly gained popularity among students due to its natural language processing capabilities, enabling seamless user interactions (Alessandri-Bonetti et al., 2024; Mohmad, 2023). While the primary function of ChatGPT is to mimic human conversation, it is highly versatile, offering numerous possibilities for various tasks (Boubker, 2024; Das & Madhusudan, 2024). As one of the most advanced and rapidly growing consumer artificial intelligence applications, ChatGPT has drawn the attention of educational professionals worldwide, eliciting both excitement and skepticism within higher education settings (Tili et al., 2023; Twinomurinzi & Gumbo, 2023).

Some educational professionals advocate for the integration of ChatGPT to enrich the learning experience (Aristovnik et al., 2024; Farrokhnia et al., 2023; Rudolph et al., 2023; Umek et al., 2023). ChatGPT provides numerous benefits that can significantly improve learning in higher education. It offers real-time feedback and guidance, helping students stay focused and address issues as they occur. Additionally, its availability across various platforms, including websites,

smartphone apps, and messaging services, and enables students to use the tool at their convenience, promoting flexible learning. Moreover, ChatGPT delivers personalized support tailored to each student's preferences and goals and can enhance the utilization of open educational resources (Firat, 2023; Michalon & Camacho-Zuñiga, 2023). Consequently, ChatGPT is believed to have substantial implications for learning outcomes, including the development of employability skills (Ravšelj & Žabkar, 2024).

Conversely, some educators are wary of incorporating ChatGPT in higher education due to several ethical concerns. Major issues include data privacy, as unauthorized access demands strict adherence to regulatory standards. Additionally, algorithmic bias stemming from historically biased datasets requires the use of diverse data sources and regular audits to safeguard student experiences. While ChatGPT can aid in personalized learning, it might reduce student engagement and self-efficacy, necessitating a balance between artificial intelligence autonomy and human oversight. Furthermore, ChatGPT could facilitate plagiarism, requiring robust academic honesty policies, plagiarism detection tools, and originality-promoting assessment methods. Finally, the risk of AI "hallucinations" or misinformation underscores the importance of rigorous verification of artificial intelligence-generated content to maintain educational integrity (Williams, 2024).

Despite some research attempts exploring the factors influencing student perceptions of ChatGPT, studies specifically highlighting the impact of socio-demographic characteristics remain limited. Preliminary findings suggest that attitudes toward ChatGPT are significantly shaped by variables such as country of residence, age, type of university, and recent academic performance (Abdaljaleel et al., 2024). Therefore, the paper aims to compare the perceptions of Slovenian higher education students on ChatGPT with those of their international counterparts. The paper primarily focuses on aspects related to ChatGPT usage, including the ethical concerns surrounding its use and its regulation. More specifically, the paper seeks to answer the following research questions:

- RQ1: Which tasks do students most frequently perform with the help of ChatGPT?
- RQ2: How do students perceive the ethical concerns associated with using ChatGPT?
- RQ3: How do students perceive the regulation of ChatGPT usage?

By addressing these research questions, this paper offers novel, evidence-based insights into the perceptions of higher education students on ChatGPT, comparing Slovenian students with global trends. The results are highly valuable for policymakers and educators as they guide the responsible incorporation of

ChatGPT into higher education settings. Namely, key findings suggest that students mainly use ChatGPT for brainstorming, summarizing, and research assistance, with ethical concerns about cheating and reduced learning being prominent. While there is strong support for regulating ChatGPT, Slovenian students are less supportive of these measures compared to their international counterparts. The rest of the paper is organized as follows: the next section details the methodology of the study, including data collection techniques and analytical procedures. The subsequent section presents the main findings, addressing the research questions. The final section concludes the paper by summarizing the main findings and discussing their broader implications.

Methodology

The data were gathered via the global “ChatGPT Student Survey”, launched by the Faculty of Public Administration at the University of Ljubljana, concentrating on “Students' Perception of ChatGPT”. The online survey was created in English and subsequently translated into six more languages: Italian, Spanish, Turkish, Japanese, Arabic, and Hebrew. It consisted of closed-ended questions addressing various aspects related to the opportunities and challenges ChatGPT presents for students. The survey targeted higher education students who are at least 18 years old and have the legal capacity to provide informed, voluntary consent to participate in this voluntary and anonymous survey (Aristovnik et al., 2024). The data collection took place from October 2023 to February 2024 using a convenience sampling strategy, which involved promoting the survey in classrooms and through advertisements on university communication systems. This practical approach provided easy access to potential students who were readily available and willing to participate in the survey (Boubker, 2024; Sarstedt et al., 2017). Despite the limited generalizability of the convenience sample, this issue is, to some extent, mitigated by ensuring sample diversity and using a large sample size (Jager et al., 2017).

The questionnaire included various sections directly and indirectly related to the context of ChatGPT, covering topics such as knowledge and experiences, capabilities, ethical governance and concerns, satisfaction and attitude, study issues and outcomes, skills development, labour market and skills mismatch, emotions, study and personal information, and general reflections. Individual survey items were measured on a 5-point Likert scale ranging from 1 (e.g., strongly disagree) to 5 (e.g., strongly agree) (Aristovnik et al., 2024). Due to the specific focus of the paper on comparing Slovenian students with their international counterparts from other regions, the paper primarily examines aspects related to ChatGPT usage, including the ethical concerns surrounding its use and its regulation. Regions and countries have specific factors, such as cultural attitudes towards technology,

educational priorities, and regulatory environments, which often influence the usage of digital technologies (Abdaljaleel et al., 2024).

The collected data were analyzed using two distinct statistical approaches. First, descriptive statistics (percentage of students who answered with the highest two responses on the 5-point Likert scale) were computed for the entire sample of students, as well as for students from Slovenia and international students from other regions. This analysis helped identify the most and least prevalent opportunities and challenges associated with ChatGPT in the selected aspects studied. Second, an independent-sample t-test was conducted to explore mean differences between students from Slovenia and their international counterparts from other regions. This parametric statistical technique is considered a very robust method and is the most commonly used for detecting differences in means between two groups (Rasch et al., 2007).

Results

By the end of February 2024, a total of 23,218 students, including 452 students studying in Slovenia, had participated in the survey. As students were not required to complete the entire questionnaire, the number of responses per question may vary due to missing values. Table 1 provides the socio-demographic characteristics of the survey participants. Notably, the majority of students were female (58.8%), studying full-time (85.3%), and enrolled in undergraduate programs (83.4%). Regarding fields of study, most students were in social sciences (41.4%), followed by applied sciences (34.5%), with fewer students in arts and humanities (12.1%) and natural and life sciences (12.0%). Additionally, most students were engaged in either traditional (47.3%) or blended (43.2%) learning formats and used the free version of ChatGPT-3.5 (88.6%).

The overall usage of ChatGPT among students showed a diverse range of applications, with the most common tasks being brainstorming, summarizing, and research assistance, while academic writing and study assistance also saw significant usage, although less frequently (Boubker, 2024). Conversely, ChatGPT was least used by students for professional writing and creative writing. Comparatively, Slovenian students tended to use ChatGPT slightly less for tasks like brainstorming and summarizing but more for academic writing than their international counterparts (Figure 1). However, they reported significantly lower usage for study assistance (mean diff = -0.136, $p = 0.063$), personal assistance (mean diff = -0.181, $p = 0.011$), proofreading (mean diff = -0.251, $p < 0.001$) and professional writing (mean diff = -0.216, $p = 0.001$), with other applications showing only minor differences.

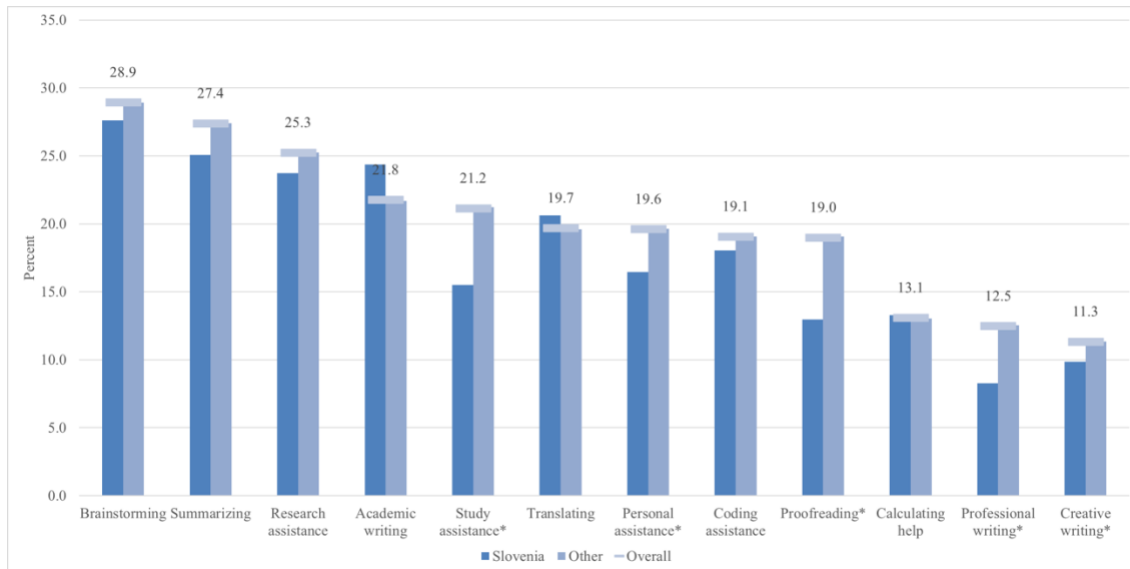
Table 1*Socio-Demographic Characteristics of the Survey Participants*

Socio-demographic characteristics	Number (#)	Share (%)
Gender		
Male	9346	41.2
Female	13365	58.8
Student status		
Full-time	19409	85.3
Part-time	3354	14.7
Level of study		
Undergraduate	18935	83.4
Postgraduate	2867	12.6
Doctoral	912	4.0
Field of study		
Arts and humanities	2740	12.1
Social sciences	9356	41.4
Applied sciences	7809	34.5
Natural and life sciences	2717	12.0
Mode of study		
Traditional learning	10754	47.3
Online learning	2159	9.5
Blended learning	9833	43.2
Version of ChatGPT		
ChatGPT-3.5	14120	88.6
ChatGPT-4.0	525	3.3
ChatGPT-3.5 and 4.0	1284	8.1

Source: Authors' calculations based on ChatGPT Student Survey.

Figure 1

Usage of ChatGPT for Individual Tasks (% of Students Using ChatGPT Often or Always)



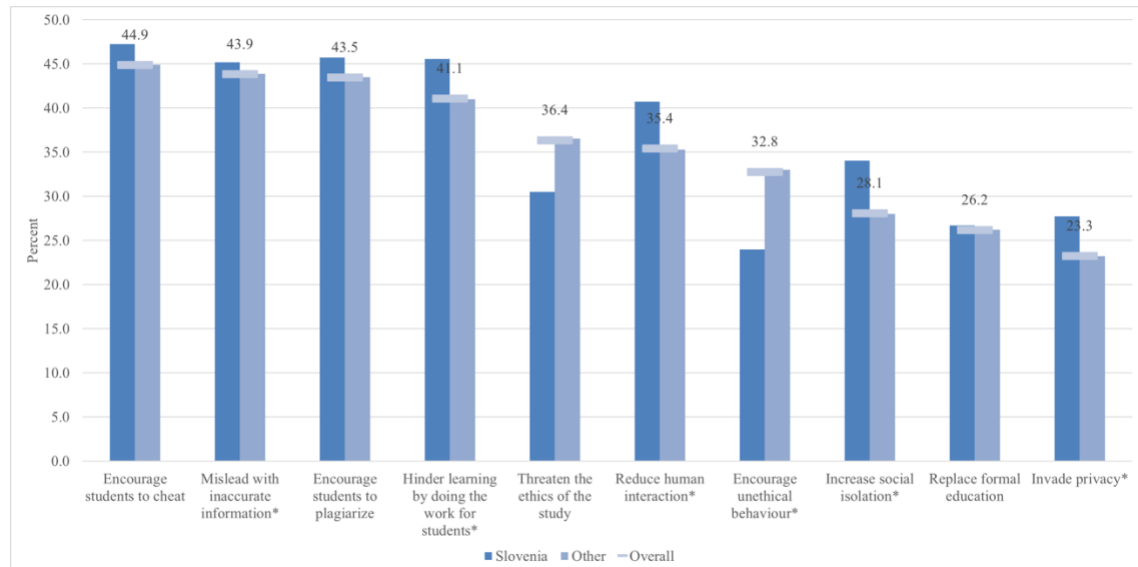
Note: Items are sorted in descending order based on their overall %. An asterik (*) indicates a statistically significant result of the t-test ($p \leq 0.1$).

Source: Authors' calculations based on ChatGPT Student Survey.

Moreover, students expressed several ethical concerns regarding ChatGPT, primarily focusing on its potential to encourage cheating, mislead with inaccurate information, promote plagiarism, and hinder learning by doing the work for students. There were also worries about threatening the ethics of study, reducing human interaction, and encouraging unethical behaviour. This is also in line with previous research that highlighted the challenges of using ChatGPT for unethical purposes, such as plagiarism of intellectual property or cheating (Hasanein & Sobaiih, 2023). Compared with their international counterparts, Slovenian students exhibited higher levels of concern in most of the presented elements, except for threats to the ethics of study and encouraging unethical behaviour (mean diff = -0.179, $p = 0.007$), with the latter being significantly less pronounced among Slovenian students (Figure 2).

Figure 2

Ethical Concerns About ChatGPT (% of Students Who Agree or Strongly Agree With the Selected Ethical Concerns)



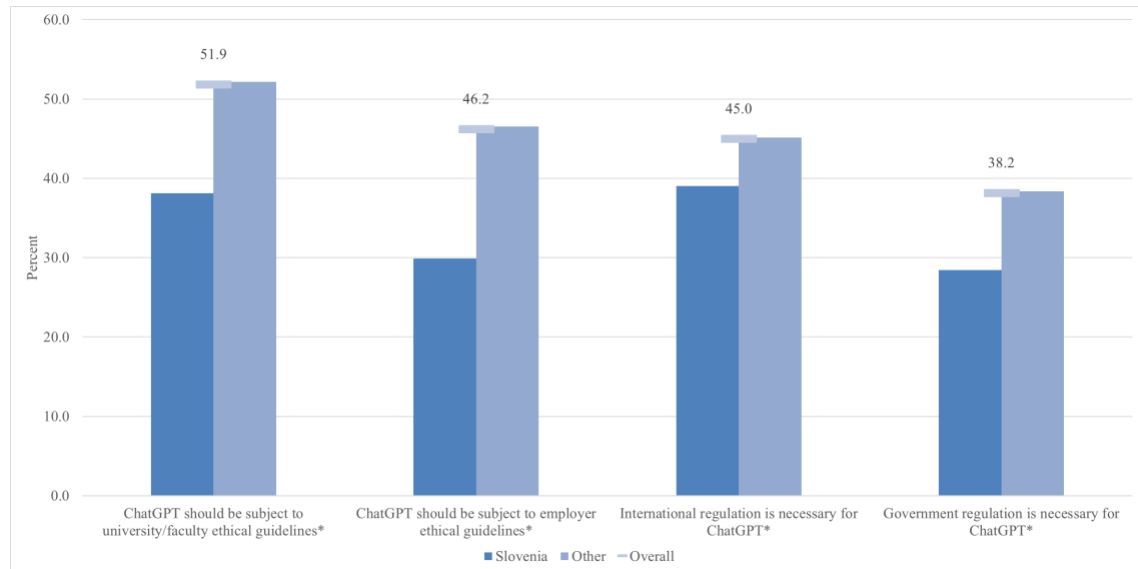
Note: Items are sorted in descending order based on their overall %. An asterik (*) indicates a statistically significant result of the t-test ($p \leq 0.1$).

Source: Authors' calculations based on ChatGPT Student Survey.

Finally, there was substantial support among students for regulating ChatGPT, with a majority agreeing that it should be subject to university or faculty ethical guidelines as well as employer ethical guidelines (Figure 3). There was also considerable support for international and government regulation. This aligns with the opinion that the development of ChatGPT technology should be carefully regulated to ensure that its applications do not have adverse societal impacts (Yu, 2023). However, Slovenian students showed significantly less support for these regulatory measures compared to their international peers from other regions. They were less likely to agree with university or faculty ethical guidelines (mean diff = -0.346, $p < 0.001$), employer ethical guidelines (mean diff = -0.336, $p < 0.001$), international regulations (mean diff = -0.115, $p = 0.066$), and government regulations (mean diff = -0.198, $p = 0.003$), indicating a notable regional difference in the perceived need for regulating ChatGPT.

Figure 3

Regulation of ChatGPT Usage (% of Students Who Agree or Strongly Agree with Selected Solutions for Regulation)



Note: Items are sorted in descending order based on their overall %. An asterik (*) indicates a statistically significant result of the t-test ($p \leq 0.1$).

Source: Authors' calculations based on ChatGPT Student Survey.

Conclusion

The launch of ChatGPT in November 2022 had a profound impact on higher education, rapidly becoming popular among students due to its capability to engage in natural language conversations. Accordingly, this paper aims to examine the perceptions of Slovenian higher education students on ChatGPT, comparing them with global trends. The results reveal the following. First, students primarily use ChatGPT for brainstorming, summarizing, and research assistance. Slovenian students use it more for academic writing but less for brainstorming and summarizing compared to their international peers. Professional and creative writing are the least common uses. Second, students have ethical concerns about ChatGPT, including its potential to encourage cheating, provide inaccurate information, promote plagiarism, and hinder learning. Slovenian students are particularly concerned about cheating and reduced learning but are less worried about ethical threats and unethical behaviour compared to international students. Finally, there is substantial support among students for regulating ChatGPT through university, faculty, employer, international, and government guidelines. However, Slovenian students are less supportive of these regulatory measures compared to their international counterparts.

Future research could involve conducting longitudinal studies to track changes in students' perceptions of ChatGPT over time, as well as expanding the research to include the perspectives of educators. One significant limitation of the paper should be highlighted. Most of the questionnaire elements were based on students' self-reports. This method is often intricate, necessitating both recall and introspection, which could introduce recall bias and social desirability bias due to the self-reported nature of the data (Aristovnik et al., 2020; Ravšelj & Žabkar, 2024). Despite this, the paper's findings enhance the current scientific understanding of ChatGPT's potential and provide educators and policymakers with evidence-based recommendations for the future advancement of higher education.

Acknowledgements

The authors acknowledge the exceptional assistance of numerous international partners in translating the questionnaire and/or collecting data within the CovidSocLab project (<https://www.covidsoclab.org/chatgpt-student-survey/>), which served as a working platform for collaboration. Moreover, the authors acknowledge the financial support from the Slovenian Research Agency (research core funding No. P5-0093 and project No. Z5-4569). Finally, in the preparation of this manuscript, the authors utilized ChatGPT, version 4, developed by OpenAI, for limited and supplementary purposes. Specifically, ChatGPT was employed to assist with checking the grammar, enhancing clarity, and polishing the language in certain sections of the manuscript. It must be stressed that the role of the ChatGPT was minor and purely supportive in nature. The core content of the manuscript, including all scientific interpretations, conclusions, and critical revisions, is the exclusive output of the human authors. ChatGPT did not contribute to the intellectual content or scientific insights of the manuscript.

***Other (co)authors:** Partners of the International Consortium, <https://www.covidsoclab.org/chatgpt-student-survey/partners/>.

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. *Scientific Reports*, 14(1), 1983. <https://doi.org/10.1038/s41598-024-52549-8>
- Alessandri-Bonetti, M., Liu, H. Y., Giorgino, R., Nguyen, V. T., & Egro, F. M. (2024). The first months of life of chatgpt and its impact in healthcare: a

- bibliometric analysis of the current literature. *Annals of Biomedical Engineering*, 52, 1107-1110. <https://doi.org/10.1007/s10439-023-03325-8>
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*, 12(20), 8438. <https://doi.org/10.3390/su12208438>
- Aristovnik, A., Umek, L., Brezovar, N., Keržič, D., & Ravšelj, D. (2024). The role of ChatGPT in higher education: Some reflections from public administration students. In S. K. S. Cheung, F. L. Wang, N. Paoprasert, P. Charnsethikul, K. C. Li, & K. Phusavat (Eds.), *Technology in education. Innovative practices for the new normal. ICTE 2023. Communications in Computer and Information Science* (Vol. 1974) (pp. 337-349). Springer, Singapore. https://doi.org/10.1007/978-981-99-8255-4_22
- Boubker, O. (2024). From chatting to self-educating: Can AI tools boost student learning outcomes? *Expert Systems with Applications*, 238(A), 121820. <https://doi.org/10.1016/j.eswa.2023.121820>
- Das, S. R., & Madhusudan, J. V. (2024). Perceptions of higher education students towards ChatGPT usage. *International Journal of Technology in Education*, 7(1), 86-106. <https://doi.org/10.46328/ijte.583>
- Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, 61(3), 460-474. <https://doi.org/10.1080/14703297.2023.2195846>
- Firat, M. (2023). How ChatGPT can transform autodidactic experiences and open education? *OSF Preprints*. <https://osf.io/preprints/osf/9ge8m>
- Hasanein, A. M., & Sobaih, A. E. E. (2023). Drivers and consequences of ChatGPT use in higher education: Key stakeholder perspectives. *European Journal of Investigation in Health, Psychology and Education*, 13(11), 2599-2614. <https://doi.org/10.3390/ejihpe13110181>
- Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). II. More than just convenient: The scientific merits of homogeneous convenience samples. *Monographs of the Society for Research in Child Development*, 82(2), 13-30. <https://doi.org/10.1111/mono.12296>
- Michalon, B., & Camacho-Zuñiga, C. (2023). ChatGPT, a brand-new tool to strengthen timeless competencies. *Frontiers in Education*, 8, 1251163. <https://doi.org/10.3389/feduc.2023.1251163>
- Mohmad, P. (2023, January 19). *How does ChatGPT become popular so quickly and how is it growing*. Analytics Insight. <https://www.analyticsinsight.net/how-does-chatgpt-become-popular-so-quickly-and-how-is-it-growing/>
- Rasch, D., Teuscher, F., & Guiard, V. (2007). How robust are tests for two independent samples? *Journal of Statistical Planning and Inference*, 137(8), 2706-2720. <https://doi.org/10.1016/j.jspi.2006.04.011>

- Ravšelj, D., & Žabkar, J. (2024). The potential of ChatGPT in developing employability skills of public administration students: Empirical evidence from Slovenia. In *IIAS Conference 2024: 26-29 February 2024, Mombasa, Kenya*. International Institute of Administrative Sciences.
- Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning & Teaching*, 6(1), 342-363. <https://doi.org/10.37074/jalt.2023.6.1.9>
- Sarstedt, M., Bengart, P., Shaltoni, A. M., & Lehmann, S. (2017). The use of sampling methods in advertising research: A gap between theory and practice. *International Journal of Advertising*, 37(4), 650-663. <https://doi.org/10.1080/02650487.2017.1348329>
- Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. *Smart Learning Environments*, 10, 15. <https://doi.org/10.1186/s40561-023-00237-x>
- Twinomurinzi, H., & Gumbo, S. (2023). ChatGPT in Scholarly Discourse: Sentiments and an Inflection Point. In A. Gerber & M. Coetzee, M. (Eds.), *South African Institute of Computer Scientists and Information Technologists (SAICSIT 2023): Communications in Computer and Information Science*, vol 1878 (pp. 258-272). Springer, Cham. https://doi.org/10.1007/978-3-031-39652-6_17
- Umek, L., Brezovar, N., Keržič, D., & Ravšelj, D. (2023). The perception of public administration students on ChatGPT. In *EGPA 2023 Conference: 5-8 September 2023, Zagreb, Croatia*. European Group for Public Administration.
- Williams, R. T. (2024). The ethical implications of using generative chatbots in higher education. *Frontiers in Education*, 8, 1331607. <https://doi.org/10.3389/feduc.2023.1331607>
- Yu, H. (2023). Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology*, 14, 1181712. <https://doi.org/10.3389/fpsyg.2023.1181712>

Author Details

Aleksander Aristovnik
Faculty of Public Administration
University of Ljubljana
SLOVENIA
aleksander.aristovnik@fu.uni-lj.si

Lan Umek
Faculty of Public Administration
University of Ljubljana
SLOVENIA
lan.umek@fu.uni-lj.si

Dejan Ravšelj
Faculty of Public Administration
University of Ljubljana
SLOVENIA
dejan.ravselj@fu.uni-lj.si

Editors' note: This is a pre-publication copy of the paper and intentionally does not include page numbers, which will be included in the complete proceedings of ICICTE 2024.