Evolving Skills Development with ChatGPT for Public Administration Students: A Two-Year Case Study in Slovenia

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Abstract: A conversational chatbot named ChatGPT, introduced in November 2022, was one of the first artificial intelligence (AI) tools to become widely accessible and easy to use. Its rapid uptake among higher education students points to its growing role in supporting learning and skill development. In the context of modern public administration, where professionals must operate in uncertain and digitally driven environments, ChatGPT offers meaningful opportunities for educational enhancement. Yet its potential in public administration education remains underexplored, with limited empirical research. This study addresses that gap by analysing how public administration students in Slovenia use ChatGPT and perceive its potential for skill development, focusing on how their views evolved over time. Using descriptive statistics and independent-sample t-tests, the study compares survey data from 289 students in the academic year 2023–2024 and 288 students in 2024–2025. Results show a marked increase in ChatGPT usage, with the most common applications being summarising, brainstorming, research assistance, and academic writing. Over time, the introduction of GPT-4o, with more advanced capabilities, expanded its use to technical functions and shifted students' perceptions from language support toward broader digital competencies. Students increasingly valued ChatGPT for skills such as data analysis, digital communication, and AI literacy, although they continued to view it as less effective for developing interpersonal, decision-making, and critical thinking skills. These insights offer evidence-based guidance for educators and policymakers as they adapt public administration education to the evolving digital landscape.

Keywords: ChatGPT, higher education, public administration, skills development, Slovenia

1 Introduction

The launch of the conversational AI tool ChatGPT in November 2022 represented a pivotal moment in the integration of artificial intelligence (AI) into higher education. Created by OpenAI (San Francisco, CA), ChatGPT quickly attracted widespread student interest due to its advanced natural language processing, facilitating smooth and intuitive communication (Alessandri-Bonetti et al., 2024; Mohmad, 2023). While its main role involves simulating human conversation, ChatGPT's functionality spans a broad array of tasks (Boubker, 2024; Das, 2024). As one of the fastest-growing and most sophisticated AI applications targeted at consumers, ChatGPT has drawn global attention from academic communities, generating both optimism and concern in university contexts (Tlili et al., 2024; Twinomurinzi & Gumbo, 2023). Proponents argue that it can enrich higher education by offering benefits such as instant feedback, personalised assistance, multi-platform accessibility, and more effective use of open educational materials, thereby enhancing skill development. Nonetheless, critics point to issues such as data security, biased algorithms, reduced student motivation, plagiarism, and the risk of disinformation or "AI hallucinations," calling for strong ethical frameworks, originality-driven evaluations, and stringent content validation to maintain academic standards (Aristovnik et al., 2024; Michalon & Camacho-Zuñiga, 2023; Ravšelj et al., 2025a; Williams, 2024).

Previous studies have outlined multiple ways in which ChatGPT can be employed to support tasks such as writing assistance, studying, language learning, brainstorming, research facilitation, and personal organisation (Boubker, 2024). These suggested uses underscore ChatGPT's versatility and value as a tool for students seeking to enrich their academic experiences. As a result, there are growing opportunities to embed its functionalities into routine academic activities. As ChatGPT's capabilities continue to expand, especially with the release of GPT-4o in May 2024, which introduced enhanced multimodal features and provided limited access for free-tier users, this latest version significantly increases its potential for use in educational contexts (Dong et al., 2024). Consequently, ChatGPT is increasingly seen as a promising means of helping students acquire a range of competencies relevant to

the field of public administration (AlAfnan et al., 2023; Aristovnik et al., 2024; Rahman & Watanobe, 2023; Rudolph et al., 2023).

The ongoing modernisation of public administration demands that future professionals acquire a broad spectrum of competencies. Recent developments have shown that individuals entering this field must be equipped to function in contexts marked by significant uncertainty and rapid, continuous change, including the ability to navigate digital environments effectively. As a result, there is an increasing emphasis on cultivating the right skillsets among prospective public administration employees (Krpálek et al., 2021; Hirsch et al., 2023; Tomaževič et al., 2023). Within this framework, ChatGPT is recognised as a useful tool for supporting the development of essential competencies among students in public administration programs (Aristovnik et al., 2024). Given that these students represent the next generation of public administration professionals, it is essential to explore their perspectives on ChatGPT's potential to enhance skill development. However, the current academic discourse on ChatGPT in higher education reveals a gap, particularly in terms of quantitative research assessing its effectiveness for skills development among public administration students.

Accordingly, this study aims to fill gaps in the current literature by examining the usage patterns and perceptions of public administration students regarding the potential of ChatGPT to support skill development, as well as how these usage patterns and perceptions change over time as students gain greater exposure to and experience with the tool. Gaining insight into students' views on ChatGPT provides a deeper understanding of its practical applicability within public administration education. It also helps identify areas for improvement to better align with student learning styles and needs, which is essential for ensuring its effective integration and use as a tool to enhance skills development. The structure of the study is as follows. The following section outlines the materials and methods used in the study, including details of data collection and analysis. This is followed by a presentation of the main results derived from the collected data. The final section concludes the study by summarizing the key findings and discussing their broader implications.

2 Materials and Methods

The data were collected through the Global ChatGPT Student Survey, initiated by the Faculty of Public Administration at the University of Ljubljana, Slovenia, and conducted in two survey waves. The first survey wave, carried out approximately one year after ChatGPT's introduction (between October 2023 and January 2024), aimed to capture students' early usage patterns and perceptions (Ravšelj et al., 2025b). The second survey wave, initiated two years after its introduction (starting in October 2024 and ongoing as of January 2025), focuses on capturing students' evolving usage patterns and perceptions (Aristovnik et al., 2025). In order to reach a global audience, the survey was offered in seven languages, including English, Italian, Spanish, Turkish, Japanese, Arabic, and Hebrew. The survey specifically targeted higher education students aged 18 or older who had the legal capacity to provide informed and voluntary consent to participate in this anonymous survey (Aristovnik et al., 2024; Ravšelj et al., 2025a). The data were collected using a convenience sampling method, which involved promoting the survey in classrooms and through advertisements on university communication platforms, making it a practical approach for reaching students who were easily accessible and willing to participate (Boubker, 2024; Sarstedt et al., 2018).

The online questionnaire consisted of several sections, both directly and indirectly, related to the context of ChatGPT, including socio-demographic characteristics, 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. Most of these aspects consisted of closed-ended questions, whereby individual survey items were measured on a 5-point Likert rating scale ranging from 1 (e.g., strongly disagree) to 5 (e.g., strongly agree) (Aristovnik et al., 2024; Ravšelj et al., 2025a). The questionnaire remained the same across the first and second survey waves, with a minor adjustment to the question identifying whether participants had used ChatGPT and/or other generative AI chatbots. In the first survey wave, participants were asked whether they had used ChatGPT, while in the second survey wave, the question

was expanded to offer multiple options, including ChatGPT (OpenAI), Microsoft Copilot, Google Gemini (formerly Google Bard), Perplexity AI, Claude AI (Anthropic), and an open-ended 'Other' option.

Although the survey reached students from diverse countries and academic disciplines, this study specifically focuses on higher education students enrolled in public administration programs at the Faculty of Public Administration, University of Ljubljana, Slovenia, due to its particular emphasis on this target group (Aristovnik et al., 2024). Likewise, while the broader survey encompassed multiple dimensions related to the use of ChatGPT, the present analysis concentrates on students' usage patterns and the perceived potential of ChatGPT to support skill development, with a focus on the corresponding individual survey items. In particular, the study explores changes in the initial and evolving perceptions of public administration students regarding ChatGPT's use and its role in fostering skill development.

By the end of the first survey wave (2023–2024), 289 public administration students had participated in the survey, while 288 students participated in the second survey wave (2024–2025) (see Table 1). The structure of the sample across the socio-demographic characteristics of the survey participants remains similar. The majority of participants in both rounds were female (73.2% and 74.6%), full-time students (95.2% and 95.5%), and enrolled in undergraduate programs (83.3% and 80.3%), with slightly more than half engaged in traditional learning (43.1% and 47.0%) and slightly fewer than half in online/blended learning (56.9% and 53.0%). More noticeable differences are observed in ChatGPT usage, which increased from 72.7% in the first round to 92.6% in the second, with most students continuing to use the free version, although a slightly higher number opted for the subscription version in the second round. Given the focus on exploring students' usage patterns and perceptions of ChatGPT's potential for skill development, only participants from the second round who had used ChatGPT were retained in the sample.

Table 1: Socio-demographic characteristics of the survey participants

Socio-demographic characteristics	First wave (2023/2024)		Second wave (2024/2025)	
	Number (#)	Share (%)	Number (#)	Share (%)
Gender				
Male	75	26.8	72	25.4
Female	205	73.2	211	74.6
Student status				
Full-time	275	95.2	273	95.5
Part-time	14	4.8	13	4.5
Level of study				
Undergraduate	240	83.3	229	80.3
Postgraduate	46	16.0	55	19.3
Doctoral	2	0.7	1	0.4
Mode of study				
Traditional learning	124	43.1	134	47.0
Online learning	19	6.6	32	11.2
Blended learning	145	50.3	119	41.8
Used ChatGPT				
Yes	202	72.7	263	92.6
No	76	27.3	21	7.4
Version of ChatGPT				
Free version	193	95.5	234	89.3
Subscription version	1	0.5	16	6.1
Both	8	4.0	12	4.6

Note: Due to missing values, some socio-demographic aspects do not match the number of the final sample.

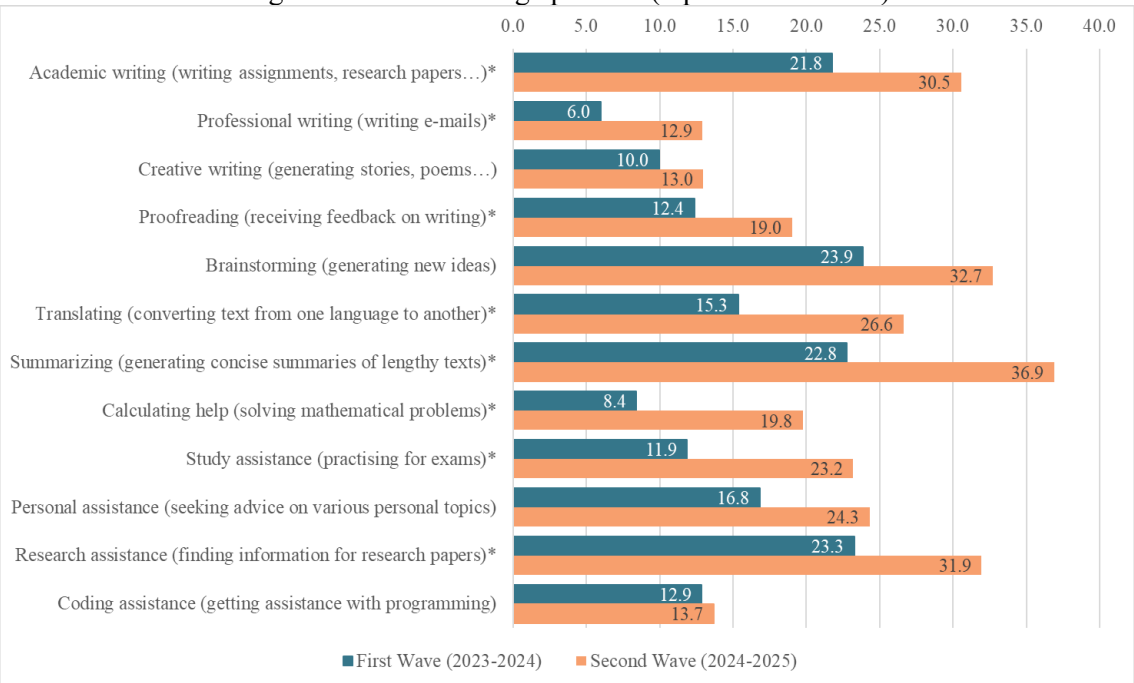
Source: Own calculations based on the Global ChatGPT Student Survey.

The collected data were analysed using two distinct statistical approaches. The first approach involved descriptive statistics, specifically calculating the top two box scores, which represent the percentage of students who selected the highest two responses on a 5-point Likert scale (i.e., "agree" and "strongly agree"). The second approach involved conducting an independent-sample t-test to examine mean differences between the students' initial and progressive perceptions, thereby identifying changes in their views on the potential of ChatGPT for learning and skills development. 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).

3 Results

The results in Figure 1 show a clear upward trend in ChatGPT usage across nearly all surveyed tasks between the 2023–2024 and 2024–2025 academic years, reflecting its increasing integration into students' academic workflows and broader digital habits. This growth suggests greater student familiarity and confidence with the tool, reinforcing its practicality for everyday academic support. Despite this rise, the hierarchy of usage remained stable, with the most common applications being summarising, brainstorming, research assistance, and academic writing. These tasks closely align with students' academic responsibilities and the cognitive demands of higher education (Aristovnik, 2024b). Meanwhile, although professional writing remained the least frequent use case, its usage more than doubled year-over-year, suggesting growing recognition of ChatGPT's potential in formal communication, despite its limitations in tone personalisation. A similar spike in usage for mathematical problem-solving likely corresponds to the broader availability of multimodal and computation-enhanced capabilities in GPT-4o released in May 2024 (Dong et al., 2024). On the other hand, usage for creative writing and coding assistance remained comparatively stagnant and low, which may reflect their limited relevance in non-technical, public administration-focused programs.

Figure 1: ChatGPT usage patterns (top two box scores)

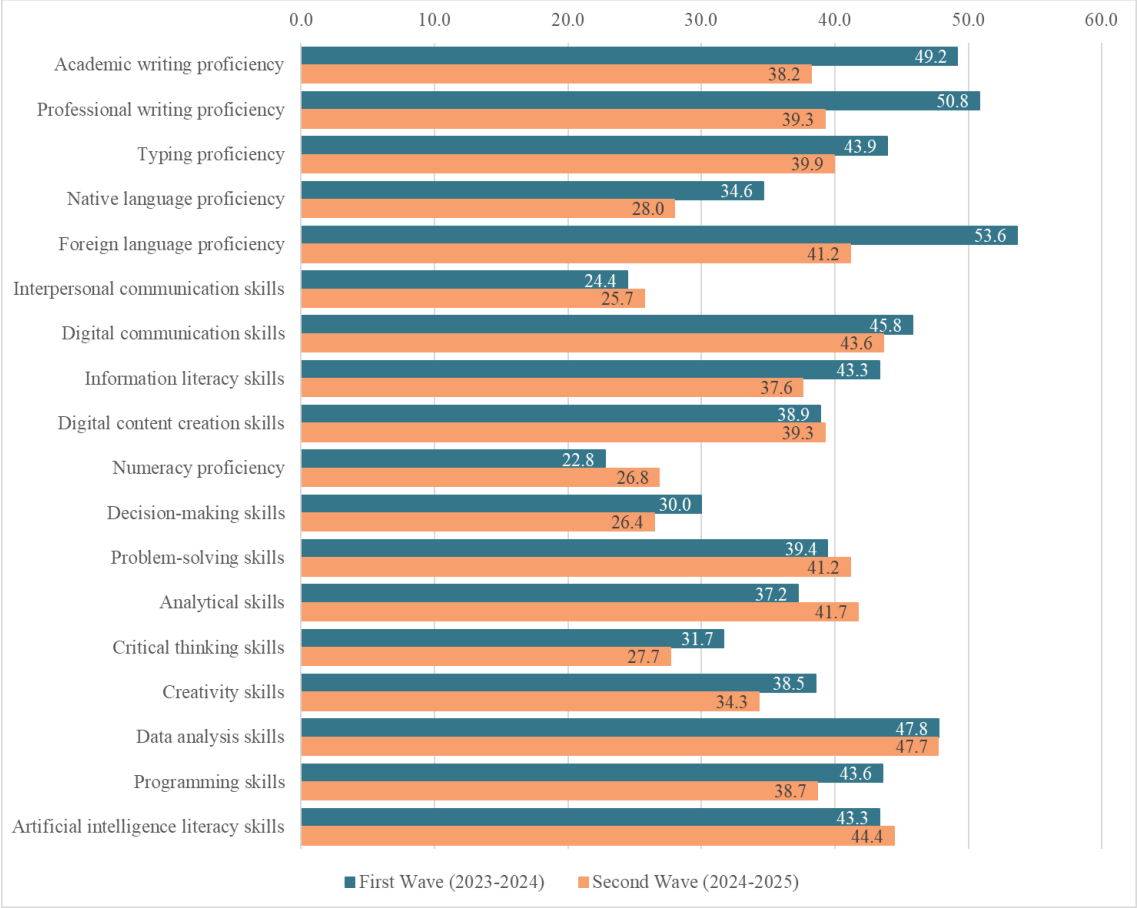


Note: An asterisk (*) indicates a statistically significant result of the t-test ($p \leq 0.1$).
Source: Own calculations based on the Global ChatGPT Student Survey.

Across nearly all statements regarding the potential of ChatGPT for skills development presented in Figure 2, students reported lower levels of agreement during the academic year 2024–2025 compared to the academic year 2023–2024, which captured their initial impressions one year after the tool's introduction. However, these differences in mean scores are not statistically significant, suggesting that

the observed decline may reflect random variation rather than a meaningful change in perceptions. As such, the interpretation emphasises the ranking patterns of agreement, which offer more insightful reflections on how student perspectives evolved.

Figure 2: ChatGPT potential for skills development (top two box scores)



Note: An asterisk (*) indicates a statistically significant result of the t-test ($p \leq 0.1$).
Source: Own calculations based on the Global ChatGPT Student Survey.

During the academic year 2023–2024, students most strongly believed that ChatGPT could support the development of language and writing-related competencies, with the highest scores recorded for foreign language proficiency, professional writing, and academic writing. These results align with ChatGPT's original use cases, which focused on natural language generation and refinement. However, in the academic year 2024–2025, the top-rated skill areas shifted toward technical and digital competencies, including data analysis, AI literacy, and digital communication skills. This transition likely reflects greater exposure to ChatGPT's expanded capabilities following the introduction of GPT-4o in May 2024. With this release, even free-tier users, although limited in the number of prompts, gained access to advanced features such as file uploads, memory-based personalisation, web-enhanced responses, and sophisticated data processing tools (Dong et al., 2024). These improvements likely contributed to broader student recognition of ChatGPT as a tool capable of supporting complex digital and analytical tasks, beyond its initial writing-related functions.

On the other hand, in both the academic year 2023–2024 and the academic year 2024–2025, students expressed the least agreement that ChatGPT could aid in developing interpersonal communication, decision-making, numeracy, native language proficiency, and critical thinking skills. These findings suggest that students continue to view ChatGPT as less effective in enhancing skills that rely on deep socio-emotional understanding, abstract reasoning, or authentic contextual engagement. As previous research indicates, such skills are typically cultivated through direct human interaction, reflective

learning, and nuanced problem-solving, which are areas where generative AI still lacks fundamental capabilities (Bin-Hady et al., 2024).

4 Conclusion

The introduction of ChatGPT in November 2022 marked a significant milestone in higher education, offering students intuitive natural language processing capabilities and a versatile tool for academic tasks. As one of the most advanced AI applications, ChatGPT has been praised for enhancing learning by providing real-time feedback and personalised support. However, it has also raised concerns regarding data privacy, algorithmic bias, and academic integrity. In the context of public administration education, where digital proficiency and adaptability are becoming increasingly important, ChatGPT shows potential as a tool for developing essential competencies. Despite this potential, there is still a lack of quantitative studies that assess its impact on public administration students. This highlights the need for further investigation. The present study addresses this gap by examining public administration students' initial and evolving perceptions of ChatGPT's potential for learning and skills development.

The study reveals a notable increase in ChatGPT usage among public administration students between the academic year 2023–2024 and the academic year 2024–2025. Students most frequently used ChatGPT for tasks such as summarising, brainstorming, research assistance, and academic writing, which remained the primary applications (Aristovnik et al., 2024). The release of GPT-4o in May 2024 introduced enhanced features, including advanced data analysis, memory-based interactions, and file upload functionalities. These upgrades contributed to a rise in its use for technical tasks such as mathematical support and calculation assistance (Dong et al., 2024). As a result, students' perceptions of ChatGPT's educational value began to shift. Initially seen as a tool for improving language and writing skills, it is now increasingly perceived as supporting digital and technical skills, including AI literacy and data analysis. An online discussion organised by the Faculty of Public Administration at the University of Ljubljana in March 2023 also contributed to this change. During this event, students explored how digital tools like ChatGPT could facilitate academic work, encouraging them to consider its broader potential. Nevertheless, the study also finds that students continue to perceive ChatGPT as less useful for developing interpersonal, decision-making, and critical thinking skills, which points to the current limitations of the technology in promoting socio-emotional and deep cognitive engagement (Bin-Hady et al., 2024).

The study's findings carry important implications for higher education in the field of public administration. They highlight the transformative role that AI technologies such as ChatGPT can play in enhancing the learning experience and supporting the development of critical skills for the digital era. ChatGPT is particularly effective in helping students build digital communication abilities, AI literacy, and data analysis competencies, all of which are becoming increasingly important in contemporary professional environments. The shift in students' perceptions from a focus on language-related skills to more advanced technical and digital capabilities underscores ChatGPT's adaptability to changing student needs. This evolution emphasises the importance of integrating AI tools into educational programs in a way that aligns with the demands of dynamic, uncertain, and technology-driven labour markets. The study also offers practical recommendations for educators and policymakers. By recognizing both the strengths and limitations of ChatGPT, they can refine instructional practices, enhance the use of technology in learning, and take steps to better support the development of interpersonal and critical thinking skills. These actions are essential for shaping the future of public administration education.

It is also important to consider the limitations of the study. The research focuses exclusively on students enrolled in public administration programs at the Faculty of Public Administration, University of Ljubljana, Slovenia. As a result, the findings may not be applicable to students in other academic disciplines, institutions, or cultural contexts, since these factors may influence the outcomes. Another limitation is the reliance on self-reported data, which requires students to recall and evaluate their own experiences. This method can introduce recall bias and social desirability bias, which may affect the accuracy of the results (Aristovnik et al., 2024; Ravšelj et al., 2025a). Despite these limitations, the

study provides valuable insights into students' evolving perceptions of ChatGPT's role in learning and skills development. These findings serve as a useful evidence base for educators and policymakers seeking to integrate AI tools effectively into public administration education.

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