A full-time professor dedicated to you: ChatGPT from university students' perspective

Un profesor particular a tiempo completo: ChatGPT desde el punto de vista de los estudiantes universitarios

Dragana PAVLOVIC, PhD. Associate Professor. University of Niš, Serbia (*dragana.pavlovic@filfak.ni.ac.rs*).
Joan SOLER-ADILLON, PhD. Associate Professor. Universitat Oberta de Catalunya (UOC), Spain (*jsoleradillon@uoc.edu*).
Zorica STANISAVLJEVIC-PETROVIC, PhD. Full Professor. University of Niš, Serbia (*zorica.stanisavljevic.petrovic@filfak.ni.ac.rs*).

Abstract:

Over the last decades, the emergence of new technologies has brought changes in all areas of social life, including the education sector. Among those, artificial intelligence (AI), after many years playing a secondary role, has recently positioned itself as one with the most capacity for disruption. The newest AI tools have the potential to meaningfully transform various education areas, particularly at the university level. This paper presents a comparative analysis of the opinions of media students from Spain and Serbia on the use of ChatGPT in the learning process. The aim of the work is to determine the similarities and differences in the opinions of students in relation to the following aspects: intention to use, benefits and challenges and potential for personalised learning. A qualitative research method, with structured written interview, was used on a sample of 40 students of the initial years of media studies from universities in both countries. The results indicate that there are similarities and differences in the opinions of media students about using ChatGPT for learning. The findings provide insight into the opinions of media students as key subjects in the learning process and can be a starting point for further research aimed at understanding the role of AI tools and their application in higher education.

Keywords: artificial intelligence, ChatGPT, university, Spain, Serbia, personalised learning.

Resumen:

En las últimas décadas, la aparición de nuevas tecnologías ha traído cambios en

Date of receipt of the original: 2024-11-23.
Date of approval: 2024-06-08.
Please, cite this article as follows: Pavlovic, D., Soler-Adillon, J., & Stanisavljevic-Petrovic, Z. (2024). A full-time professor dedicated to you: ChatGPT from university students' perspective [Un profesor particular a tiempo completo: ChatGPT desde el punto de vista de los estudiantes universitarios]. *Revista Española de Pedagogía, 82* (289), 563-584. https://doi.org/10.22550/2174-0909.4160

todas las áreas de la vida social, incluido el sector educativo. Entre ellas, la inteligencia artificial (IA), tras haber desempeñado durante años un papel secundario, se ha posicionado recientemente como una de las de mayor capacidad de disrupción. Las últimas herramientas de IA tienen el potencial de transformar de forma significativa varias áreas de la educación, en especial en el nivel universitario. Este artículo presenta un análisis comparativo de las opiniones de estudiantes universitarios en España y Serbia sobre el uso de ChatGPT en el proceso de aprendizaje. El objetivo del trabajo es determinar las similitudes y diferencias entre sus opiniones con relación a intención de uso, ventajas e inconvenientes, y potencial para el aprendizaje personalizado. La investigación se ha basado en el método de investigación cualitativa, con una entrevista estructurada por escrito. La muestra ha estado compuesta por 40 estudiantes de universidades de ambos países, todos ellos matriculados en primero o segundo año de carreras relacionadas con los medios y el multimedia. Los resultados apuntan a similitudes y diferencias en las opiniones respecto al uso de ChatGPT. Así, proporcionan una panorámica de la visión del alumnado como sujetos clave en el proceso de aprendizaje y pueden ser un punto de partida para investigaciones futuras destinadas a comprender el papel que deben desempeñar las herramientas de IA y su aplicación en la educación superior.

Palabras clave: inteligencia artificial, ChatGPT, universidad, España, Serbia, educación personalizada.

1. Introduction

Over recent decades, the rise of new technologies, especially artificial intelligence (AI), has significantly impacted various sectors, including education. AI, defined as machines programmed to simulate human intelligence (Russell & Norvig, 2010), is reshaping educational practices across all levels, notably in higher education (Klutka et al., 2020; Kuleto et al., 2021). In university settings, AI's influence is profound across four key areas: profiling and prediction, assessment and evaluation, adaptive systems, and intelligent teaching systems, proving increasingly effective in academic environments (Kim et al., 2020; Woo & Choi, 2021; García-Peñalvo, 2023; Farrokhnia et al., 2023). This technological shift is particularly relevant for media studies, a field expected to be revolutionized by AI (Pavlik, 2023; Dhiman, 2022).

The current debate on AI in education includes its current impact on pedagogical, teaching, and cognitive processes, with ongoing concerns about ethical issues like transparency and credibility (Bozkurt, 2023; Dwivedi et al., 2023; Kasneci et al., 2023; Holmes et al., 2023). Research emphasizes AI's potential to transform both formal and informal educational settings, moving from AI-directed to AI-supported and AI-empowered frameworks, where

learners progressively lead their educational journeys (Schiff, 2021; Ouyang & Jiao, 2021; Adiguzel et al., 2023).

There's a growing need for studies exploring how students adapt to AI-enhanced learning environments while considering the diversity of influencing factors. Recent studies have started to explore emotional responses of students to AI in education, suggesting future applications might offer even greater innovation (Ezquerra et al., 2023; Ezquerra et al., 2022). This paper adds to the discourse by examining student perspectives from two countries on AI's role in their educational experiences.

2. Theoretical approach

In 2022, the educational landscape was notably affected by the advent of ChatGPT, an AI tool developed by OpenAI, which quickly gained widespread popularity (Haleem et al., 2022). Within two months of its release in November 2022, ChatGPT had attracted 100 million users (Sabzalieva & Valentini, 2023), illustrating its broad impact and potential in various educational domains, including programming, natural sciences, medicine, social sciences (Tian et al., 2023; Wardat et al., 2023; Lee, 2023a; Tiunova & Muñoz, 2023).

ChatGPT, primarily functioning as a language model, supports educational activities by facilitating research, analysis, and various forms of writing (Raman et al., 2023). Its capacity to understand complex sentence structures and generate high-quality responses has made it a very valuable tool in academia. It assists in generating ideas for research, analysis, and various writing tasks, including essays, term papers, and articles (Rasul et al., 2023; Fitria, 2023; Avila-Chauvet & Mejía, 2023). It also provides direct interaction with students, offering rapid answers across a range of subjects (Hariri, 2023; Opara et al., 2023), and is instrumental in tasks such as proofreading and translating (Jiao et al., 2023).

In higher education, ChatGPT's benefits extend to enhancing administrative services and improving university operations. It supports adaptive learning, provides personalized feedback, and assists in developing innovative assessment methods. Its accessibility, being free and available to a broad user base, allows for the creation of flexible virtual educational environments conducive to learning from any location at any time (Rasul et al., 2023; Halaweh, 2023; Yu, 2023). Sok and Heng (2023) emphasize its role in innovating and enhancing pedagogical practices, developing learning assessments, providing virtual personal tutoring, assisting with draft creation, and facilitating idea generation.

The tool is particularly praised for its ability to facilitate personalized learning tailored to the diverse needs of students. This includes creating customized exercises, providing feedback, and developing educational materials that reflect individual student progress (Atlas, 2023; Baidoo-Anu & Ansah, 2023; Woolf et al., 2023; Hong, 2023).

Moreover, it fosters a collaborative learning environment, enhancing critical thinking and facilitating knowledge transfer across various contexts (Rodrigues & dos Santos, 2023; Sison et al., 2023; Mollick & Mollick, 2022). Studies indicate that ChatGPT aids in developing learning skills by providing feedback that succinctly and coherently evaluates student performance (Dai et al., 2023; Firat, 2023). Furthermore, ChatGPT is seen as beneficial in the educational process, significantly enhancing academic outcomes through its capacity to process extensive data and learn from user interactions (Alshater, 2023; Dergaa et al., 2023; Romero-Rodríguez et al., 2023).

However, the deployment of ChatGPT also presents challenges, particularly concerning academic integrity, reliability, and potential perpetuation of biases (Rasul et al., 2023). Qadir (2023) notes that generative systems like ChatGPT may perpetuate biases and disseminate incorrect or incomplete information, rooted in the limitations of their data sources. Additionally, the temporally restricted knowledge base of ChatGPT (particularly in its free version, which is limited to data up to September 2021) may be a disadvantage for students working on less known, highly specialized, or very recent topics (Megahed et al., 2023; Rudolph et al., 2023; Sabzalieva & Valentini, 2023).

The issue of information credibility with AI systems like ChatGPT often creates mistrust and doubts regarding the accuracy and reliability of the data they produce, potentially undermining student confidence. Health (2023) reports that the developers of ChatGPT acknowledge its potential for generating inaccurate or biased results, and its occasional reference to non-existent articles or support of prejudices. Rose (2023) critiques ChatGPT for bias, inappropriate responses, and a lack of emotional intelligence. Uludag (2023) highlights its deficiencies in responding to emotional cues, understanding context, generating original ideas and creative solutions. Additionally, from a psychological perspective, complaints about ChatGPT include its lack of empathy and inability to provide adequate support and understanding to users (Kalla & Smith, 2023; Biswas, 2023).

The deployment of ChatGPT raises significant ethical issues and legal risks, including environmental impacts, content moderation challenges, and copyright infringement risks (Baskara, 2023; Iskender, 2023; Sullivan et al., 2023). Additionally, there are legal concerns related to privacy violations and data security (Addington, 2023; Sebastian, 2023), and the potential for academic plagiarism and other breaches of intellectual property, which pose threats to academic integrity (Susnjak, 2022; Kitamura, 2023; Frye, 2022). In this context, many scholars express deep ethical concerns about severe negative outcomes, such as cheating, dishonesty, deception, or manipulation, which could detrimentally impact both educators and students

(Tlili et al., 2023; Cotton et al., 2023; Zhuo et al., 2023).

To address the challenges associated with ChatGPT, it is key to enhance digital literacy and foster a critical perspective among students regarding the capabilities and limitations of AI technologies. Educators play a pivotal role in shaping realistic perceptions of AI tools by integrating them thoughtfully into curricula and pedagogical practices. Additionally, the use of ChatGPT in higher education necessitates the development of innovative assessment methods that emphasize creativity and critical thinking, skills that AI has yet to master (Zhai, 2023).

3. Methodological approach

This paper presents a comparative analysis of the opinions of media students from Spain and Serbia about the potential of ChatGPT in the learning process. In accordance with the set goal, the research tasks are aimed at examining the similarities and differences in the opinions of students from both countries on the use of ChatGPT in the following aspects: (1) intentions and purposes of its use, (2) benefits and challenges and (3) potential for personalised learning. According to the nature of the research problem, we applied a descriptive research design (Eze et al., 2018), with the use of qualitative and comparative research methods. The basic instrument of the research was a written structured interview, with questions related to various aspects of the application of this AI tool in learning. Structured interviews were chosen to ensure consistency in the data collection process across two diverse cultural and educational contexts: Spain and Serbia. Previous research has shown that this method enables a standardised and objective approach to data collection, i.e. reducing the researcher's bias (see Lee, 2003; Silva, 2007; Kallio et al., 2016).

The interview questions enquire about the student's subjective opinion about ChatGPT in the learning process. The overall duration of the interview was around 45 minutes. The survey was conducted during the first half of May 2023. The research sample is deliberate and uniform and consists of a total of 40 media studies first and second year students: 20 from Spain (Universitat de Vic - Universitat Central de Catalunya) and 20 from Serbia (University of Niš). Students from Spain study Multimedia (Applications and Videogames). This program trains professionals specializing in digital creation: concept generation, graphic design, development and programming, production, and post-production. Students from Serbia are from the Communication and Journalism Department, Faculty of Philosophy, and they study a variety of multidisciplinary subjects related to multimedia applications (computer literacy, modern media technologies, new media, etc.). The choice of first- and second-year media studies students as research participants was influenced by the consideration that these students have a fresh perspective, greater openness to new technologies and can provide insight into the long-

term impact of technology on their educational path.

The procedure included the process of checking and coding the completed instruments, whereby the interviews filled in by students from Spain were marked with the initial letter of the country, E, and a serial number from 1-20 (E1 to E20), while those of students from Serbia were marked with the initial letter of the country, S, and serial number from 1-20 (S1-S20). Research data were processed qualitatively in accordance with established research methodologies (Mathers et al., 2002), and presented graphically. For processing, the thematic analysis was used to interpret the responses from the interviews. This involved a detailed coding process where responses were initially read to identify key themes that had emerged consistently across the dataset. These themes were aligned with our research objectives, focusing on the students' intentions, benefits perceived, challenges faced, and the potential for personalized learning using ChatGPT.

The descriptive research design was selected because it is well-suited for studies that aim to describe the characteristics of a specific group or phenomena. On writing the final version of this paper, ChatGPT was briefly used to get suggestions on how to shorten the text in order to fulfill the final publication requirements (OpenAI, 2023).

In the academic literature, Spain and Serbia are frequently compared, particularly in the context of higher education and general educational issues. This comparative analysis spans various studies and includes multiple aspects of education (Kolenc, 2011; Fedorov & Levitskaya, 2015; Despotovic et al., 2019; Dolenec et al., 2020; Brkanlić et al., 2020; Corbí et al., 2021; Podstawski et al., 2022; Borsos et al., 2022).

4. Results

4.1. Intentions and purposes for using ChatGPT for learning

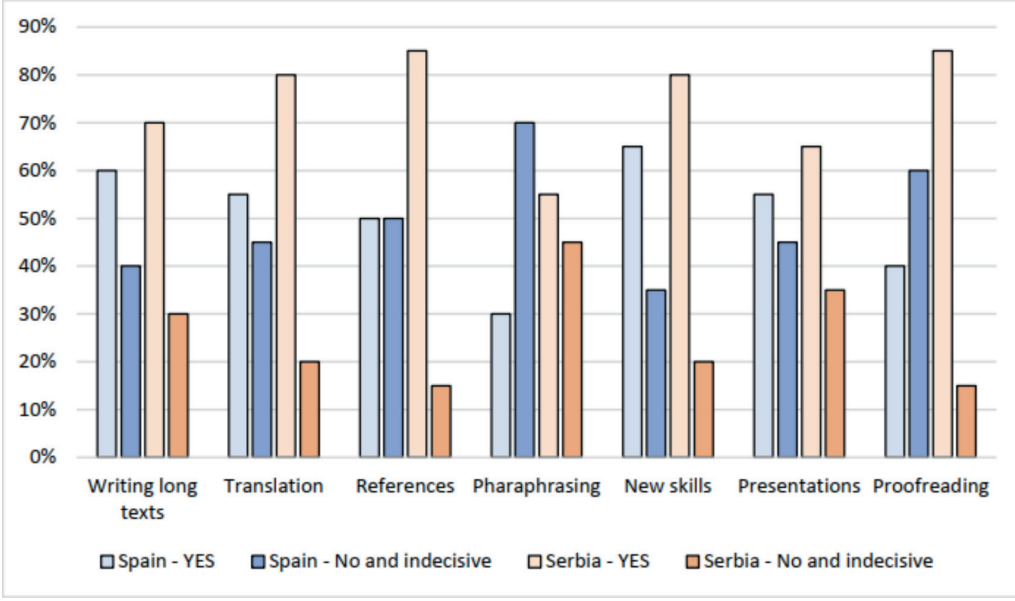
In the initial part of the interview, students were asked about their intentions and usage of ChatGPT in their learning and study processes. The responses indicated that a substantial majority, 80%, of students from both Spain and Serbia have utilized ChatGPT for educational purposes. Among these respondents, only one Spanish student was not previously aware of ChatGPT. Conversely, a smaller segment of Serbian students, 20%, experimented with specific features of the tool but did not employ it extensively in their learning.

Students from both countries who did use ChatGPT for educational purposes gave very uniform answers. Among the most repeated answers are those related to quickly finding information, writing essays, preparing exams and homework, making presentations, literature search, plot writing, help defining guidelines for specific topics and for translation purposes. In the answers of students from Spain, the main purpose of using

ChatGPT in learning is the creation of homework (E7); for practical works and summaries (E11) or for checking certain information: "I used Chat GPT during the process of studying to ask [about] certain doubts" (E14). Students from Serbia, similarly, used this tool for exam preparation: "I used it several times during exam preparation, and I used it several times to search literature for seminar papers" (S14), to search for answers to some exam questions or for guidance for writing on a certain topic (S10).

Intention to use ChatGPT in further studies is shown in Figure 1. Students from Spain and Serbia have the most uniform opinion regarding the future use of ChatGPT for organising and creating presentations, with 55% and 65% of positive answers respectively. Students from both countries cited some advantages that the AI tool offers for this particular task, among which the structuring of the presentation, as well as the clarity and precision of the text, stand out. In support of this, they state that "it is a good option if you have problems structuring a presentation. Not a real fan on that aspect, but I can see myself using it in the future" (E15) and also that "yes, it would make presentations easier, because the text generated by ChatGPT is concise and clear" (S10). In contrast, students who declared that they have no intention of using this function explain their attitude as follows: "I don't think so. I need to already understand well the material to be able to know if the examples of ChatGPT are correct" (E3); "I'm not planning for now because I don't think he's giving complete instructions, and I can't rely on him to come up with a whole

FIGURE 1. Students' intentions and purposes for using ChatGPT.



presentation plan for me. I'll better figure out what and how to show it myself; I can possibly look for examples if I don't have inspiration" (S4).

On the questions related to writing long texts (essays, term papers, project proposals, articles and others), 60% of students from Spain and 70% of students from Serbia expressed their intention to use this feature. According to them, ChatGPT can be useful in the production of ideas and motivation for writing; for example, "for some research proj-ects, also some memory projects. Sometimes to look up programming code. Also, I will use it to brainstorm ideas for some projects" (E16). Similarly, students from Serbia state that they plan to use it "as a starting point for making a plan and sequence; I would also use it to collect some information, although I would never completely surrender and reduce everything to ChatGPT" (S1). Likewise, they point out that, thanks to ChatGPT, "that boring beginning of every paper writing is made easier, since it provides guidelines, a theoretical basis and sources of information that I can research on my own. In this sense, he is an excellent motivator because he provides basic information at the start, which can certainly be useful for studying and writing student assignments" (S19).

Students who do not intend to use Chat GPT to write long texts often express doubts about its reliability and relevance of information in their explanations, but they think that it can be good for providing initial ideas. In support of this, some stated that they do not plan to use it because they want to preserve the authenticity of their writing style: "I do like to write my way, but it's really good to give ideas about topic or to structure a really long text" (E15); "I don't plan to use it to write student papers, because I'm proud of my papers! But I will definitely use it to find other works, relevant information that I will later use in writing and studying" (S17). Some see ChatGPT as a distraction: "After a few months of using ChatGPT, I found that it has the advantage of formulating answers in a human way, but it doesn't necessarily make it useful. I think I will refer to it for simple short questions, but in terms of big projects I argue that it is more likely to distract me than to be helpful" (E8).

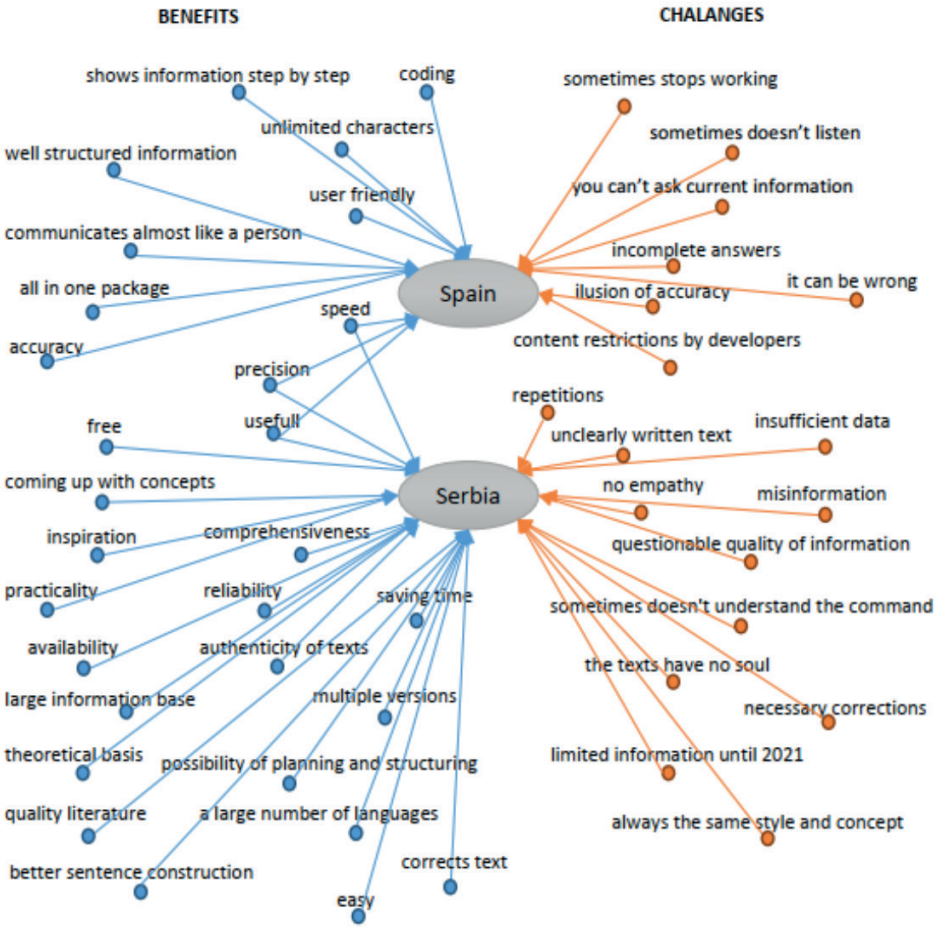
The biggest difference in students' answers about the intention of use can be observed regarding proofreading (checking grammar, spelling and style) of written text. As many as 85% of students from Serbia expressed their intention to use ChatGPT for this in the future, compared to only 40% of students from Spain. The former group sees ChatGPT as an accessible tool that "exactly states what we did wrong, which grammatical norm we violated" (S1) and use it "because I'm often not sure if everything is correct and I want everything to be good and proper" (S10). Also, a student from Serbia states that "sometimes I have a block while writing a text and compose quite simple sentences, and ChatGPT helps me to improve my style in order to explain

my thoughts" (S14). Students from Spain who intend to use this tool for proofreading explain it in the following way: "Why not? A computer can outperform a human in a logic-based context 9 times out of 10. Furthermore, what would be the harm?" (E20). However, those students who do not see the potential for proofreading state: "No, I have online correctors for that" (E19); "No I don't. I usually write in Catalan and there are better tools for that" (E15).

4.2. Benefits and challenges of ChatGPT in learning

Figure 2 shows the answers of the second part of the interview, intended to determine the opinions of students regarding the benefits and challenges of using ChatGPT in the learning process. With a first look at the numbers, it's clear that the Serbian students articulated more and more positive items (21 benefits and 11 challenges) compared to those given by students in Spain (11 benefits and 7 challenges).

FIGURE 2. Perceived benefits and challenges of ChatGPT use in learning.



The results show that students from both countries have similar attitudes when it comes to the speed, accuracy and usefulness of ChatGPT. Namely, both groups singled out speed and precision, and then usefulness as important benefits in the application of ChatGPT in the learning process. They start from the position that this AI tool has the ability to quickly generate answers and provide accurate information, which is significant in the context of student learning. Positive answers include: "It does exactly what you are asking for and it's so fast" (E18) and points out that its most noticeable benefit is "absolutely incredible speed. I still can't believe that it is possible to get such precise and useful answers in just a few seconds" (S3).

Similarities in the answers are also present as regards to other characteristics of ChatGPT, such as for example the fact that it provides easy and well-structured information: "The information is well structured and usually in bullet points, which is easy to follow" (E8); "It was very useful for me when structuring the text, and it was very easy to find all the answers" (S7).

Differences in the perceived benefits among both groups appear on certain specific aspects. For example, students from Spain highlight that "it communicates almost like a person" (E19) and that "ChatGPT shows information step by step" (E17). Half of the Serbian students pointed out the fact that it is free as a benefit: "The biggest benefit is free. Most of the other tools I used have to be paid for" (S10). They also highlight its use as inspiration for ideas: "If I don't have an idea how to start work, I'll ask ChatGPT for inspiration and I'll start creating faster, and this way I'd suffer a creative block for days. It's good that it's free and available, I hope they don't start charging for it" (S4).

In line with the results of AlAfnan et al. (2023), a large number of students emphasise the benefit of easily obtaining a theoretical basis and the existence of a large database of information: "ChatGPT has benefits, first of all, speed; it enables quick data search which is complete, there is a lot of information available, it also uses a large number of languages and provides information in various languages" (S11); "It provides a theoretical basis in its proposals, which facilitates my further work and provides guidelines and sources for further research» (S19).

The differences among both groups can be explained by the existence of distinct priorities and preferences, which is arguably due to differences in their educational contexts, and in the goals and objectives of study programs. Students from Serbia cite benefits such as better sentence construction and authenticity of texts: "ChatGPT can construct my sentences better, can express my thoughts in a better way and generate an authentic text" (S13), among other answers related to writing style, which indicate that they have somewhat more specific needs related to the language and quality of the responses generated. Students in Serbia, here, are more focused on generating

textual content and stylistic language corrections. In contrast, those in Spain place a higher value on the technical aspects of working with this tool, particularly as regards to coding: "For example, if you search for code, it generates the exact code you are looking for. ChatGPT explains it to you, so you can understand it better" (E16).

As regards to the challenges, it is noticeable that both groups of students identified a smaller number of them compared to the number of identified benefits. They noticed problems related to reliability and operation: "Sometimes stops working" (E18); "Sometimes doesn't listen" (E18); "Sometimes doesn't understand the command" (S1). A significant challenge perceived by both groups relates to its limitations in providing current or up-to-date information. Namely, the students rightly stated that the currently available version of ChatGPT 3.5 has a limited information base, and it cannot provide data beyond what it was trained on: "It doesn't have internet connection, so you can't ask for current information' (E16); "The big drawback of ChatGPT is that it is limited to information until September 2021 (if I'm not mistaken), and there is no information after that date" (S12).

A very significant challenge of ChatGPT in the learning process, especially in the part of writing texts, was also noticed by both groups of students, and it refers to getting wrong or incomplete answers that at first glance seem correct: "The illusion of it having high accuracy of the information provided can be harmful since users may forget that it's a new tool that keeps improving every day. For example, when I asked about the battle of Kosovo that took place in 1389, it wrote to me about the wars of the nineties" (S8). This deficiency is especially pronounced when it comes to searching references for writing texts, where, according to the students, it happened that ChatGPT offered them a complete reference list that included non-existing texts: "Several times it gave me a list of references that didn't exist at all, especially when I was looking for more recent references from the social sciences" (S7). Accordingly, students feel that some texts generated by this tool are insufficiently credible, imprecise and can cause confusion and distraction: "When it comes to social and historical facts, that's when the greatest mistrust occurs" (S1).

As said above when describing ChatGPT's challenges, the students in Spain focus mostly on technical aspects and the time limitation and accuracy of the information. In contrast, students from Serbia, in addition to these technical aspects, cite other challenges that are more specific to their educational context, i.e., tasks related to studying and learning that they can implement with the help of this AI tool. These specific concerns are primarily related to the language and style of the generated content, because apparently students from Serbia receive such assignments to a greater extent, and consequently use

ChatGPT the most for writing different texts.

In this context, students from Serbia mention limited creativity and lack of imagination as one of the perceived challenges and notice that ChatGPT often formulates the generated text in almost the same way: "I think its creativity is limited and maybe not imaginative enough" (S4); "A problem can arise if two people ask to paraphrase the same passage, because they will give a very similar answer and there is no way to check this. The texts are very similar to each other, and the style and concept of writing is always the same" (S16). In addition, they point out that the texts generated by ChatGPT can be unclear or repetitive and also that the lack of an emotional component in the generated text can be noticed: "The texts it writes have no soul. It is only good when he needs to list the facts" (S8); "It is quite dry, lacks empathy in the texts he has put out so far" (S10).

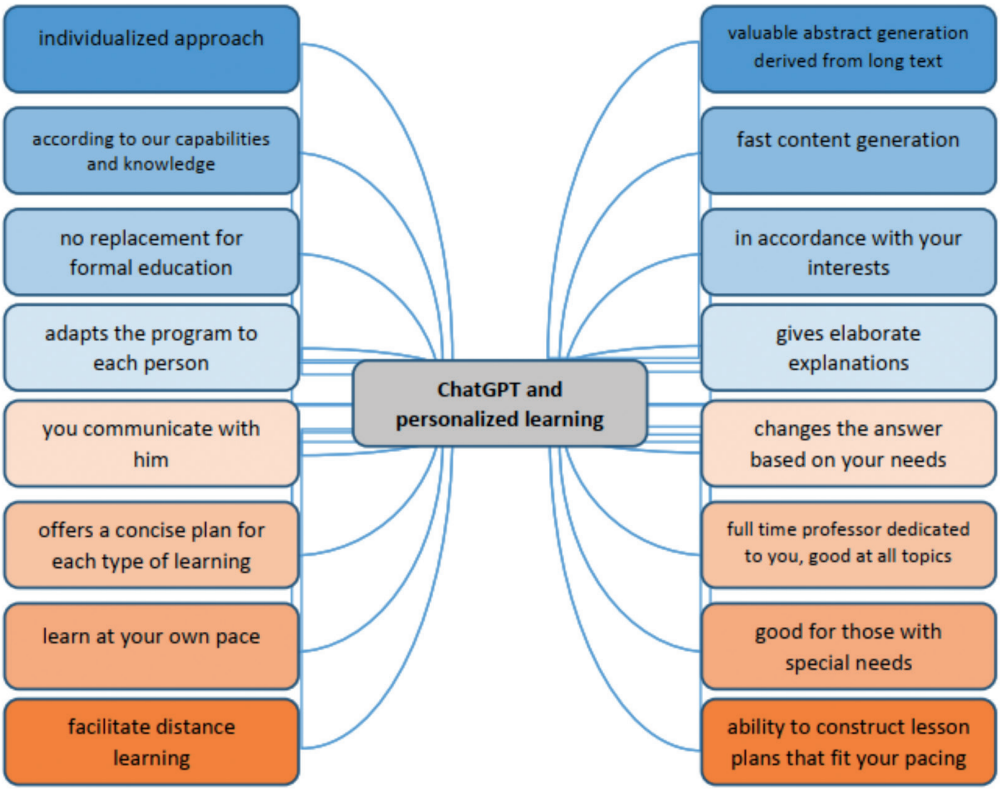
In addition, students from Serbia state that there are challenges related to the limitation of content when answers are requested in languages other than English. "I've been using it for two months now. For data in English, it is fine, but for data in Serbian, it has no credibility' (S15). In relation to this, they point to the thematic limitation of the content, which can cause problems when it comes to certain topics or types of information that it generates: "Inaccurate data for unsolved murder issues, socio-social topics, school violence topics, etc." (S15); "Generally known information in the world is correct, but when it comes to local information that, for instance, regarding Serbia, Niš, the information was incorrect. For example, he did not give the correct answer about FC Radnički, and the club was famous in Europe in history" (S16).

4.3. Potential for personalised learning

Figure 3 shows the results of the survey of the opinions of students from Spain and Serbia regarding the potential of ChatGPT for personalised learning. By reviewing the data, it can be concluded that there are no major differences in students' opinions. Almost all students from both countries recognize the potential of ChatGPT for personalised learning. The only exception is one student from Spain who thinks that this function of ChatGPT is not an option: "I don't think it can be possible" (E4). Other responses can be divided into four categories: individualised approach, learning plan, detailed explanations and suggestions.

As regards to individualised approach, the students recognize the potential of ChatGPT so that students can learn at their own pace: "Students can find topics that interest them and get at least basic knowledge in a certain area for free; they can learn at their own pace and when they want and as much as they want" (S10). Students from Spain also highlight the ability to customise ChatGPT and generate content: "[It] fits your pacing and availability" E(20).

FIGURE 3. Opportunities for personalised learning with ChatGPT.



In addition, they state that ChatGPT matches the answers to cover a specific task: "For example, if you ask it for a code, you can change it based on your needs" (E16) and thus "facilitates distance learning through some exercises, examples, tests" (S13). They also recognize the usefulness of this AI tool for planning learning adapted to individual needs: "The great advantage is that it can, with good instructions, adapt the program to each person as it suits that person, and for any topic" (S7). Furthermore, it "offers a concise plan for each type of learning" (S9) and it is also generally good for any type of planning: "A very good function of this tool, because it is possible to create a plan (learning, diet, training...) which suits only you" (S12).

Students from both countries stated that ChatGPT provides detailed interpretations and answers to students' questions and requests related to the material through a personalised approach, "like having a professor dedicated to your questions full time and being good at all topics" (S15). According to them, this tool favours more effective learning because it "enables students to learn through interaction" (S11), to be more effective in learning because they can use "additional sources and sketches

of the material it creates" (S14), while receiving "elaborate explanations" (E8). Only one of the students stated that he saw "the potential of ChatGPT for the learning of persons with special needs" (E19).

However, along with this rather positive take on the topic, many students from both countries did show caution when it comes to using ChatGPT for personalised learning: "I believe that ChatGPT helps in the search for knowledge, but it is not adequate to completely replace the teacher and formal education or transfer experiences from person to person" (S6). In relation to improving the tool for this specific purpose, the students suggested it should "provide you videos or tutorials. That is an easier way to learn than just reading it" (E18).

5. Discussion and conclusions

The results presented above allow us, in line with our research goal, to paint a picture of the reception and intentions of future use of ChatGTP, and by extension similar AI tools, by university students. It also shows some interesting differences between the two groups that responded to the structured interview.

In summary, Spanish students demonstrated a more cautious approach to adopting ChatGPT for learning, with only 65% expressing intent to use it, unlike Serbian students, where 85% showed willingness. This discrepancy aligns with Boyon's (2022) research, suggesting that individuals from developing countries tend to trust and adopt AI technologies more readily than those from developed nations.

Both groups of students agreed on using ChatGPT for organizing and creating presentations, as well as for writing extensive texts, paralleling Haensch et al.'s (2023) findings that students commonly employ ChatGPT for essays and coding tasks on social networks. Additionally, Biswas (2023a) noted ChatGPT's potential for proofreading tasks like grammar and style checks. However, there were important differences in opinions regarding proofreading between the two groups, with Serbian students displaying greater interest than their Spanish counterparts. This variation may stem from the more prevalent use and integration of Catalan and Spanish language tools in standard text applications, unlike Serbian, as suggested by student E15's response.

There was consensus on ChatGPT's advantages in the learning process, particularly its speed, accuracy, and overall usefulness, aligning with Keles and Aydin's (2021) findings that university students value AI's usefulness, ease of use, and its capacity for innovation. However, the challenges identified varied between groups. Spanish students primarily cited technical issues like time constraints and information accuracy, while Serbian students highlighted problems related to text generation, language, and writing style. Additionally, the latter group noted limitations in creativity and imagination, reflecting concerns corroborated

by Uludag (2023) regarding ChatGPT's creative capacities. These differences in perceived challenges might be attributed to varying academic needs and tasks, or even broader educational program content.

Regardless of the educational context they come from, students from both countries recognized the potential of ChatGPT for personalised learning. This is in fact where the greatest level of similarity between both groups is found, as they all show to perceive that ChatGPT has high potential to provide answers in accordance with individual needs, interests and individual knowledge level. They do believe, however, that it is not able to replace the teacher, a result that was also reached by Ausat et al. (2023).

In general terms, it can be concluded that students from both countries agree that ChatGPT can be a useful tool to support learning, although in their answers there is doubt and caution in relation to its use. As said above, the differences in opinions can arguably be explained by a different socioeconomic context, their different educational contexts, and also by the availability of other useful digital tools, their individual preferences and the level of information about AI technology.

Despite the limitations of our small sample size and the recent emergence of ChatGPT, our research offers valuable initial insights into the use of this AI tool across two countries. These findings aim to contribute to the ongoing global discussion on AI technologies in education, emphasizing the need for increased dialogue and collaboration among educational institutions, researchers, and experts from diverse fields and regions to enhance the effectiveness and meaningful integration of AI in learning environments.

Future work includes expanding our sample into a wider number of respondents and the presence of more countries. It also includes iterating the design of the written structured interview in order to obtain responses that help towards a more in depth understanding of the perceptions and intentions of use of AI tools in general, and of how the differences among different cultural and educational contexts can influence the acceptance of artificial intelligence technologies.

Given the projected significance of AI in education over the next two decades (Zawacki-Richter et al., 2019), research into student perceptions and the broader application of AI tools is key. Such studies do not only enrich our understanding but are very important for integrating AI effectively into higher education curricula (Neumann et al., 2023). While the full impact of tools like ChatGPT on educational practices remains uncertain, it is essential to acknowledge the significant role educators and developers play in responsibly leveraging these technologies to enhance learning outcomes.

Authors' contributions

Dragana Pavlovic: Conceptualisation; Data curation; Formal analysis; Methodology; Writing (original draft); Writing (revision and editing); Visualisation.

Joan Soler-Adillon: Conceptualisation; Data curation; Funding acquisition; Writing (revision and editing); Validation.

Zorica Stanisavljevic-Petrovic: Conceptualisation; Data curation; Formal analysis; Funding acquisition; Methodology; Supervision.

Funding

This study was supported by the Ministry of Science, Technological Development and Innovations of the Republic of Serbia (contract No. 451-03-66/2024-03).

This article is part of the R+D+i project PID2021-128875NA-I00, funded by MCIN/AEI/10.13039/501100011033/"ERDF A way of making Europe".

References

Addington, S. (2023, May 9). ChatGPT: Cyber security threats and countermeasures. *SSRN*. http://dx.doi.org/10.2139/ssrn.4425678

Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. *Contemporary Educational Technology*, *15* (3), ep429. https://doi.org/10.30935/cedtech/13152

AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). ChatGPT as an educational tool: Opportunities, challenges, and recommendations for communication, business writing, and composition courses. *Journal of Artificial Intelligence and Technology*, *3* (2), 60-68. https://doi.org/10.37965/jait.2023.0184

Alshater, M. M. (2023, January 4). Exploring the role of artificial intelligence in enhancing academic performance: A case study of ChatGPT. *SSRN*. http://dx.doi.org/10.2139/ssrn.4312358

Atlas, S. (2023). *ChatGPT for higher education and professional development: A guide to conversational AI*. DigitalCommons@URI, University of Rhode Island. https://digitalcommons.uri.edu/cba_facpubs/548

Ausat, A., Massang, B., Efendi, M., Nofirman, N., & Riady, Y. (2023). Can ChatGPT replace the role of the teacher in the classroom: A fundamental analysis. *Journal on Education*, *5* (4), 16100-16106. https://jonedu.org/index.php/joe/article/view/2745

Avila-Chauvet, L., & Mejía, D. (2023, March 4). Can professors and students detect ChatGPT essays? *SSRN*. http://dx.doi.org/10.2139/ssrn.4373643

Baidoo-Anu, D., & Ansah, O. L. (2023, April 13). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *SSRN*. http://dx.doi.org/10.2139/ssrn.4337484

Baskara, F. R. (2023). The promises and pitfalls of using ChatGPT for self-determined learning in higher education: An argumentative review. *Prosiding Seminar Nasional Fakultas Tarbiyah dan Ilmu Keguruan IAIM Sinjai*, *2*, 95-101. https://doi.org/10.47435/sentikjar.v2i0.1825

Biswas, S. (2023a, March 31). The function of ChatGPT in social media: According to ChatGPT. *SSRN*. http://dx.doi.org/10.2139/ssrn.4405389

Biswas, S. (2023b, June 4). Role of ChatGPT in education. *SSRN*. https://ssrn.com/abstract=4369981

Borsos, É., Banos-González, I., Boric, E., Lyngved, R., & Fekete, A. B. (2022). Trainee teachers' perceptions of outdoor education. *Environmental Education Research*, *28* (10), 1490-1509. https://doi.org/10.1080/13504622.2022.2031901

Boyon, N. (2022). Opinions about AI vary depending on countries' level of economic development. *Ipsos*. https://www.ipsos.com/en/global-opinions-about-ai-january-2022

Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, *18* (1), 198-204. https://doi.org/10.5281/zenodo.7716416

Brkanlić, S., Sánchez-García, J., Esteve, E. B., Brkić, I., Ćirić, M., Tatarski, J., Gardašević, J., & Petrović, M. (2020). Marketing mix instruments as factors of improvement of students' satisfaction in higher education institutions in Republic of Serbia and Spain. *Sustainability, 12* (18), 7802. https://doi.org/10.3390/su12187802

Corbí, M., Tombolato, M., Bueno-Sánchez, L., Hermans, K., Valenti, A., Garcés, J., Straniero, A. M., Brojčin, B. B., Mesquita, C., Bonifácio, E., Martini, B., Rodríguez, S., Milants, M., Glumbić P., & Glumbić, N. (2021). Intellectual disability in higher education: Self-perceived training needs of university teachers. *Specijalna edukacija i rehabilitacija*, *20* (1), 1-15. https://doi.org/10.5937/specedreh20-31002

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, *61* (2), 228-239. https://doi.org/10.1080/14703297.2023.2190148

Dai, W., Lin, J., Jin, F., Li, T., Tsai, Y., Gasevic, D., & Chen, G. (2023, July 5). Can large language models provide feedback to students? A case study on ChatGPT. *EdArXiv*. https://doi.org/10.35542/osf.io/hcgzj

Dergaa, I., Chamari, K., Zmijewski, P., & Saad, H. B. (2023). From human writing to artificial intelligence generated text: Examining the prospects and potential threats of ChatGPT in academic writing. *Biology of Sport*, *40* (2), 615-622. https://doi.org/10.5114/biolsport.2023.125623

Despotovic, D., Cvetanovic, S., Nedic, V., Despotovic, M. (2019). Social aspects of sustainable competitiveness in the selected European countries in the period 2012-2015. *Social Indicators Research*, *141*, 841-860. https://doi.org/10.1007/s11205-018-1840-4

Dhiman, B. (2022, 23 de octubre). Artificial intelligence and voice assistant in media studies: A critical review. *SSRN*. http://dx.doi.org/10.2139/ssrn.4250795

Dolenec, D., Balković, A., Kralj, K., Širinić, D., Romanos, E., & Fernandes, T. (2020). Protest event dataset for Croatia, Portugal, Serbia and Spain: Focus on strike data. *Politička misao: časopis za politologiju*, *57* (4), 155-168. https://doi.org/10.20901/pm.57.4.07

Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaidi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., […] y Wright, R. (2023). Opinion paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, *71*, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642

Eze, S. C., Chinedu-Eze, V., & Bello, A. O. (2018). The utilisation of e-learning facilities in the educational delivery system of Nigeria: a study of M-University. *International Journal of Educational Technology in Higher Education*, *15* (34), 1-20. https://doi.org/10.1186/s41239-018-0116-z

Ezquerra, A., Agen, F., Rodríguez-Arteche, I., Ezquerra-Romano, I. (2022). Integrating artificial intelligence into research on emotions and behaviors in science education. *Eurasia Journal of Mathematics, Science and Technology Education*, *18* (4), em2099. https://doi.org/10.29333/ejmste/11927

Ezquerra, A., Agen, F., Toma, R. B., Ezquerra-Romano, I. (2023). Using facial emotion recognition to research emotional phases in an inquiry-based science activity. *Research in Science & Technological Education*, 1-24. https://doi.org/10.1080/02635143.2023.2232995

Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2023). 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

Fedorov, A., & Levitskaya, A. (2015). The framework of Media Education and Media Criticism in the Contemporary World: The opinion of International Experts. (Situación de la educación en medios y la competencia crítica en el mundo actual: opinión de expertos internacionales). *Comunicar*, *23* (45), 107-125. http://dx.doi.org/10.3916/C45-2015-11

Firat, M. (2023). What ChatGPT means for universities: Perceptions of scholars and students. J*ournal of Applied Learning and Teaching*, *6* (1), 1-7. https://doi.org/10.37074/jalt.2023.6.1.22

Fitria, T. N. (2023). Artificial intelligence (AI) technology in OpenAI ChatGPT application: A review of ChatGPT in writing English essay. *ELT Forum: Journal of English Language Teaching*, *12* (1), 44-58. https://doi.org/10.15294/elt.v12i1.64069

Frye, B. L. (2022). Should using an AI text generator to produce academic writing be plagiarism? *Fordham Intellectual Property, Media & Entertainment Law Journal, Forthcoming*, *33* (4), 5. https://ir.lawnet.fordham.edu/iplj/vol33/iss4/5

García-Peñalvo, F. J. (2023). The perception of artificial intelligence in educational contexts after the launch of ChatGPT: Disruption or panic? *Education in the Knowledge Society*, *24*, e31279. https://doi.org/10.14201/eks.31279

Haensch, A. C., Ball, S., Herklotz, M., & Kreuter, F. (2023, March 9). Seeing ChatGPT through students' eyes: An analysis of TikTok data. *arXiv:2303.05349v1*. https://doi.org/10.48550/arXiv.2303.05349

Halaweh, M. (2023). ChatGPT in education: Strategies for responsible implementation. *Contemporary Educational Technology*, *15*(2), ep421. https://doi.org/10.30935/cedtech/13036

Haleem, A., Javaid, M., & Singh, R. P. (2022). An era of ChatGPT as a significant futuristic support tool: A study on features, abilities, and challenges. *BenchCouncil Transactions on Benchmarks, Standards and Evaluations, 2* (4), 100089. https://doi.org/10.1016/j.tbench.2023.100089

Hariri, W. (2023, April 17). Unlocking the potential of ChatGPT: A comprehensive exploration of its applications, advantages, limitations, and future directions in natural language processing. *arXiv:2304.02017v10*. https://doi.org/10.48550/arXiv.2304.02017

Health, T. L. D. (2023). ChatGPT: Friend or foe? *The Lancet: Digital health*, *5* (3), e102. https://doi.org/10.1016/S2589-7500(23)00023-7

Holmes, W., Bialik, M., & Fadel, C. (2023). Artificial intelligence in education. In C. Stückelberger, & P. Duggal (Eds.), *Data ethics: Building trust. How digital technologies can serve humanity [Ética de los datos: construir la confianza. Cómo las tecnologías digitales pueden servir a la humanidad]* (pp. 621-653). Globethics Publications. https://doi.org/10.58863/20.500.12424/4276068

Hong, W. C. H. (2023). The impact of ChatGPT on foreign language teaching and learning: Opportunities in education and research. *Journal of Educational Technology and Innovation*, *5* (1), 37-45. https://jeti.thewsu.org/index.php/cieti/article/view/103/64

Iskender, A. (2023). Holy or unholy? Interview with Open AI's ChatGPT. *European Journal of Tourism Research*, *34*, 3414-3414. https://doi.org/10.54055/ejtr.v34i.3169

Jiao, W., Wang, W., Huang, J., Wang, X., & Tu, Z. (2023, November 2). Is ChatGPT a good translator? A preliminary study. *arXiv:2301.08745v4*. https://doi.org/10.48550/arXiv.2301.08745

Kalla, D., & Smith, N. (2023). Study and analysis of ChatGPT and its impact on different fields of study. *International Journal of Innovative Science and Research Technology*, *8* (3). https://doi.org/10.5281/zenodo.10250455

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of advanced nursing*, *72* (12), 2954-2965. https://doi.org/10.1111/jan.13031

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., Stadler, M., Weller, J., Kuhn, J., & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, *103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Keles, P. U., & Aydin, S. (2021). University students' perceptions about artificial intelligence. *Shanlax International Journal of Education*, *9*, 212-220. https://doi.org/10.34293/education.v9iS1-May.4014

Kim, J., Merrill, K., Xu, K., & Sellnow, D. D. (2020). My teacher is a machine: Understanding students' perceptions of AI teaching assistants in online education. *International Journal of Human-Computer Interaction*, *36* (20), 1902-1911. https://doi.org/10.1080/10447318.2020.1801227

Kitamura, F.C. (2023). ChatGPT is shaping the future of medical writing but still requires human judgment [ChatGPT está dando forma al futuro de la redacción médica, pero aún requiere criterio humano]. *Radiology*, *307* (2), e230171. https://doi.org/10.1148/radiol.230171

Klutka, J., Ackerly, N., & Magda, A. J. (2020). *Artificial intelligence in higher education. Current uses and future applications.* Learning House.

Kuleto, V., Ilić, M., Dumangiu, M., Ranković, M., Martins, O. M. D., Păun, D., & Mihoreanu, L. (2021). Exploring opportunities and challenges of artificial intelligence and machine learning in higher education institutions. *Sustainability*, *13* (18), 10424. https://doi.org/10.3390/su131810424

Lee, H. (2023, March 14). The rise of ChatGPT: Exploring its potential in medical education. *Anatomical Sciences Education*. https://doi.org/10.1002/ase.2270

Lee, Y (2003). The technology acceptance model: Past, present and future. *Communications of the Association for Information Systems (CAIS)*, *12* (50), 752-780. https://doi.org/10.17705/1CAIS.01250

Mathers, N., Fox, N., & Hunn, A. (2002). *Trent Focus for research and development in primary health care: Using interviews in a research project*. Trent Focus Group.

Megahed, F. M., Chen, Y. J., Ferris, J. A., Knoth, S., & Jones-Farmer, L. A. (2023, February 17). How generative AI models such as ChatGPT can be (mis)used in SPC practice, education, and research? An exploratory study. *arXiv:2302.10916v1*. https://doi.org/10.48550/arXiv.2302.10916

Mollick, E. R., & Mollick, L. (2022, December 23). New modes of learning enabled by AI chatbots: Three methods and assignments. *SSRN*. http://dx.doi.org/10.2139/ssrn.4300783

Neumann, M., Rauschenberger, M., & Schön, E. M. (2023). "We need to talk about ChatGPT": The future of AI and higher education. In *2023 IEEE/ACM 5th International Workshop on Software Engineering Education for the Next Generation (SEENG)* (pp. 29-32). IEEE.

Opara, E., Adalikwu, T., & Aduke, T. C. (2023). ChatGPT for teaching, learning and research: Prospects and challenges. *Global Academic Journal of Humanities and Social Sciences*, 5 (2), 33-40. https://doi.org/10.36348/gajhss.2023.v05i02.001

OpenAI. (2023). *ChatGPT* (March 14th release) [Large Language Model]. https://chat.openai.com/chat

Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence*, *2*, 100020. https://doi.org/10.1016/j.caeai.2021.100020

Pavlik, J. V. (2023). Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. *Journalism & Mass Communication Educator, 78* (1), 84-93. https://doi.org/10.1177/10776958221149577

Podstawski, R., Żurawik, M., Borysławski, K., Omelan, A. A., & Tsos, A. (2022). Working conditions of physical education teachers in European higher education institutions. *Physical Activity Review, 10* (2), 111-126.https://www.physactiv.eu/wp-content/uploads/2022/04/2022_10226.pdf

Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1-9). IEEE. https://doi.org/10.36227/techrxiv.21789434.v1

Raman, R., Mandal, S., Das, P., Kaur, T., Sanjanasri, J. P., & Nedungadi, P. (2023). *University students as early adopters of ChatGPT: Innovation diffusion study* [Unpublished]. https://doi.org/10.21203/rs.3.rs-2734142/v1

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira, F., Ladeira, W. J., Sun, M., Day, I., Rather, R. A., & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning and Teaching*, *6* (1), 1-16. https://doi.org/10.37074/jalt.2023.6.1.29

Rodrigues, M. A., & dos Santos, P. R. (2023, May 1). Enhancing STEM learning with ChatGPT and Bing Chat as objects-to-think-with: A case study. *arXiv:2305.02202v1*. https://doi.org/10.48550/arXiv.2305.02202

Romero-Rodríguez, J., Ramírez-Montoya, M., Buenestado-Fernández, M., & Lara-Lara, F. (2023). Use of ChatGPT at university as a tool for complex thinking: Students' perceived usefulness. *Journal of New Approaches in Educational Research*, *12* (2), 323-339. https://doi.org/10.7821/naer.2023.7.1458

Rose, R. (2023). *ChatGPT in higher education. Artificial intelligence and its pedagogical value*. Pressbooks.

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, *6* (1). https://doi.org/10.37074/jalt.2023.6.1.9

Russell, S., & Norvig, P. (2010). *Artificial intelligence: A modern approach (3rd ed.)*. Prentice Hall

Sabzalieva, E., & Valentini, A. (2023). *ChatGPT and artificial intelligence in higher education: Quick start guide*. IESALC. https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide_EN_FINAL.pdf

Schiff, D. (2021). Out of the laboratory and into the classroom: The future of artificial intelligence in education. *AI & Society, 36*, 331-348. https://doi.org/10.1007/s00146-020-01033-8

Sebastian, G. (2023, February 24). Do ChatGPT and other AI chatbots pose a cybersecurity risk? An exploratory study. *SSRN*. http://dx.doi.org/10.2139/ssrn.4363843

Silva, L. (2007). Post-positivist review of technology acceptance model. *Journal of the Association for Information Systems*, *8* (4), 255-266. https://doi.org/10.17705/1jais.00121

Sison, A. J. G., Daza, M. T., Gozalo-Brizuela, R., & Garrido-Merchán, E. C. (2023, April 6). ChatGPT: More than a weapon of mass deception. Ethical challenges and responses from the human-centered artificial intelligence (HCAI) perspective. *arXiv:2304.11215v1*. https://doi.org/10.48550/arXiv.2304.11215

Sok, S., & Heng, K. (2023, 22 de mayo). ChatGPT for education and research: A review of benefits and risks. *SSRN*. http://dx.doi.org/10.2139/ssrn.4378735

Sullivan, M., Kelly, A., & McLaughlan, P. (2023). ChatGPT in higher education: Considerations for academic integrity and student learning. *Journal of Applied Learning and Teaching, 6* (1), 31-40. https://doi.org/10.37074/jalt.2023.6.1.17

Susnjak, T. (2022). ChatGPT: The end of online exam integrity? *arXiv:2212.09292v1*. https://doi.org/10.48550/arXiv.2212.09292

Tian, H., Lu, W., Li, T.O., Tang, X., Cheung, S.-C., Klein, J., & Bissyandé, T. F. (2023, August 31). Is ChatGPT the ultimate programming assistant - How far is it? *arXiv:2304.11938v2*. https://arxiv.org/abs/2304.11938

Tiunova, A., & Muñoz, F. (2023, June 28). ChatGPT: Using AI in social studies academic research. *SSRN*. http://dx.doi.org/10.2139/ssrn.4451612

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

Uludag, K. (2023, March 22). Testing creativity of ChatGPT in psychology: Interview with ChatGPT. *SSRN*. http://dx.doi.org/10.2139/ssrn.4390872

Wardat, Y., Tashtoush, M. A., AlAli, R., & Jarrah, A. M. (2023). ChatGPT: A revolutionary tool for teaching and learning mathematics. *Eurasia Journal of Mathematics, Science and Technology Education, 19* (7), em2286. https://doi.org/10.29333/ejmste/13272

Woo, J. H., & Choi, H. (2021, October 21). Systematic review for AI-based language learning tools. *arXiv:2111.04455v1*. https://doi.org/10.48550/arXiv.2111.04455

Woolf, B. P., Lane, H. C., Chaudhri, V. K., & Kolodner, J. L. (2013). AI grand challenges for education. *AI magazine, 34* (4), 66-84. https://doi.org/10.1609/aimag.v34i4.2490

Yu, H. (2023). Reflection on whether ChatGPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology*, *14*, 2156. https://doi.org/10.3389/fpsyg.2023.1181712

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education - where are the educators? *International Journal of Educational Technology in Higher Education*, (16), 39. https://doi.org/10.1186/s41239-019-0171-0

Zhai, X. (2023, June 4). ChatGPT user experience: Implications for education. *SSRN*. http://dx.doi.org/10.2139/ssrn.4312418

Zhuo, T. Y., Huang, Y., Chen, C., & Xing, Z. (2023, May 29). Exploring AI ethics of ChatGPT: A diagnostic analysis. *arXiv:2301.12867v4*. https://arxiv.org/abs/2301.12867

Authors' biographies

Dragana Pavlovic. She is an associate professor at the Department of Communication and Journalism at the Faculty of Philosophy, University of Nis, Serbia. She holds two PhDs: one in Technical Sciences (Telecommunications), and another in Social Sciences and Humanities (Communication and Education). She has published two books and more than 60 research papers. Her research primarily focuses on new media and education.

http://orcid.org/0000-0002-5115-8698

Joan Soler-Adillon. He is an associate professor at the Faculty of Computer Science, Multimedia and Telecommunications at the Universitat Oberta de Catalunya (UOC), in Barcelona (Spain), where he is the director of the research group DARTS. He has previously held academic positions at Royal Holloway (University of London)

and at Universitat Pompeu Fabra. His research and practice revolve around digital interactive media and its use in arts, digital creativity, and education.

https://orcid.org/0000-0002-7959-4192

Zorica Stanisavljevic-Petrovic. She is full professor at the Department of Pedagogy, Faculty of Philosophy, at the University of Nis, Serbia. She received her PhD in Pedagogy from the Faculty of Philosophy, Belgrade, Serbia. She has published 5 books and more than 80 papers in national and international journals and proceedings in the area of school theories, institutional upbringing and education, school problems, new media and education.

http://orcid.org/0000-0001-9212-4286