Cuaderno de Pedagogía Universitaria

https://doi.org/10.29197/cpu.v21i41.564

El uso de inteligencia artificial y sus desafíos para la evaluación académica: una revisión de la literatura

The use of artificial intelligence and its challenges for academic evaluation: a literature review

Guillermo vanderLinde[a]
Tamara Mera Cury[b]
[a, b] Pontificia Universidad Católica Madre y Maestra, República Dominicana.

Corresponding author: guillermovanderlinde@pucmm.edu.do

Abstract

Natural language processing (NLP) has long been studied within the computer science industry. Recent technological advances have led to the development of complex Artificial Intelligence (AI) models, including Chat Generative Pre-Trained Transformer (ChatGPT). These technologies present concerning implications for academic assessment, as they are capable of performing a wide range of linguistic tasks and generating human-like responses. Considering this issue, the aim of this article is to examine the potential advantages and disadvantages of using ChatGPT and other NLP technologies in academic writing and assessment, based on a review of the literature, while drawing attention to the ethical concerns raised by their use. To achieve this objective, a literature review was conducted using academic articles retrieved through Google Scholar. The search yielded 12 highly cited articles. A qualitative methodology was employed, involving the reading and analysis of sources to identify relevant information aligned with the research objectives. Keywords such as "ChatGPT," "AI-generated content," "academic writing," "natural language processing," and "fraud (ethics) in assessment" guided the search process. The results of this preliminary analysis suggest that ChatGPT and other NLP techniques may increase the efficiency of academic writing and research. However, their use also raises concerns regarding their potential impact on the reliability and validity of academic work. The study emphasizes the need for a deeper exploration of the applications, risks, and limitations of these technologies. It also highlights the importance of ongoing critical discussion and ethical reflection surrounding their implementation.

Keywords: Natural language processing, ChatGPT, Artificial Intelligence, Education, Academic assessment.

ISSN (online): 1814-4152 / Website: **http://cuaderno.pucmm.edu.do**
HOW TO CITE: VanderLinde, G., & Mera, T. (2023). Challenges of Artificial Intelligence for Academic Assessment: A Literature Review. *Cuaderno de Pedagogía Universitaria, 21*(41). https://doi.org/10.29197/cpu.v21i41.544

Esta obra está bajo la licencia de Creative Commons Atribución 4.0 Internacional

Introduction

Over the last decade, the educational landscape has undergone a profound transformation. The field of Artificial Intelligence (AI) has experienced remarkable advances, and Chat Generative Pre-Trained Transformer (ChatGPT – the open AI GPT-3 model) is a striking example of this progress (Aydın & Karaarslan, 2022). The educational landscape has not remained untouched by this process and is currently undergoing a profound transformation driven by the advent of Artificial Intelligence (AI). This transformation is expected to systematically affect educational objectives, methodological processes, learning materials, and, consequently, learning outcomes.

Technology in the education sector has historically and primarily manifested in the form of learning management systems, electronic textbooks, and similar tools designed to guide student learning progress and provide educational resources (Linn et al., 2014; Pellegrino & Quellmalz, 2010). However, such technologies have generally offered limited support for addressing relatively simplistic educational issues and have therefore failed to comprehensively meet students' diverse and personalized learning needs (Linn et al., 2023; Zhai, 2021). In contrast, AI, with its capacity to construct an understanding of human language and images, presents a significant opportunity for development and application in education, potentially revolutionizing the model of modern education (Zhai et al., 2020a).

For example, ChatGPT has the ability to generate well-written essays resembling those produced by students, summarize research papers, answer questions well enough to pass medical examinations, and generate useful computer code (Van Dis EAM, Bollen J, Zuidema W, van Rooij R, & Bockting CL., 2023). It has even produced research abstracts that scientists found difficult to distinguish from those written by humans (Van Dis EAM, Bollen J, Zuidema W, van Rooij R, & Bockting CL., 2023).

ChatGPT is a natural language pre-trained model launched by OpenAI, a U.S.-based company, on November 30, 2022 (Assaraf, 2022). It can understand the semantics and syntax of natural language, generate natural language text, answer questions, and engage in dialogue based on specific conversational contexts. Some scholars have already tested its application in academic writing and professional examinations (Kung et al., 2023; Zhai, 2023). The powerful interaction, reasoning, questioning, and feedback capabilities demonstrated by ChatGPT offer new opportunities for educational transformation.

However, it appears that its emergence may not only improve the effectiveness and quality of student learning, but may also be used by students to cheat in academic assessments.

Additionally, this technology has the potential to generate spam, enable data hijacking, and produce other harmful outcomes, which raises substantial concerns for society (Van Dis EAM, Bollen J, Zuidema W, van Rooij R, & Bockting CL.). Given the potential of Large Language Models (LLMs), such as ChatGPT, to expand across multiple fields, there is an urgent need for the research community to engage in a comprehensive debate regarding the possible applications, threats, and limitations of these tools.

For their part, Anson and Straume (2022) raise concerns about AI-based natural language generation systems, since they can produce human-like text without requiring students to engage in the writing process.

Although ChatGPT was first made publicly available on November 30, 2022, by December 4 an article had already appeared in *The Guardian* titled: “AI bot ChatGPT stuns academics with essay-writing skills and usability” (Hern, 2022). Furthermore, Professor Darren Hudson reported an incident of student plagiarism involving ChatGPT at Furman University only two weeks after its release (Mitchell, 2022). In January 2023, ChatGPT was banned in New York public schools (Yang, 2023). Baltimore and Los Angeles quickly followed.

Compared to previous LLMs, ChatGPT is considerably more powerful, surprisingly easy to use, and offers a free version. Although it has numerous useful applications in academia, the educational community is concerned about its potential to facilitate student dishonesty. It is therefore not difficult to understand why many people anticipate the “death of the essay” as a method of assessment, given the extremely rapid increase in the use of ChatGPT (Stokel-Walker, 2022; Yeadon et al., 2022).

Even before ChatGPT, a relatively recent study found that nearly 22% of students at an Austrian university admitted to plagiarism (Hopp & Speil, 2021). The higher prevalence compared to previous studies was attributed to the persuasive assurance of anonymity provided to respondents.

In a more recent report, the Quality Assurance Agency for Higher Education (QAA) estimated that one in seven graduates (14%) may have paid someone to complete their assignments, slightly below the international average (QAA, 2020). Recent years have witnessed a “boom” in publications on fraud in higher education, partly due to the increase in contract cheating and the use of remote-access assessments instead of in-person examinations (Ahsan et al., 2022).

What had already been emerging as a common solution among students now appears to gain new momentum, since ChatGPT increases the risks associated with academic fraud by making these services accessible to a larger number of students, particularly those who may not perceive AI use as cheating or those who previously avoided essay-writing services because they could not afford them.

Because the possibilities of contract cheating and ChatGPT are comparable, identifying this type of academic dishonesty may prove difficult, according to existing research. In the study conducted by Lines (2016), 26 assignments were compared, none of which were flagged as suspicious by evaluators (who had not been specifically instructed to check for contract cheating), and only three were reported to Turnitin.

Collectively, these studies suggest that evaluators can detect contract cheating to a certain extent. Contrary to the claims of cheating-service websites, evaluators in Dawson (2018) were able to detect contract cheating 62% of the time. The use of Turnitin’s authorship investigation tool improved evaluators’ accuracy in detecting contract cheating in Dawson (2020), increasing it from 48% to 59%. Additionally, a training workshop for evaluators in

Dawson (2018) resulted in an increase in sensitivity from 58% to 82% in detecting contract cheating. However, the increase in accuracy was not statistically significant.

These findings suggest that evaluators are often capable of detecting contract cheating, and that software and training can improve their ability to identify it. Although it is currently quite challenging for humans to determine whether an LLM was responsible for portions of ChatGPT-generated text—partly because the technology remains relatively new for most people—the GPT-2 Output Detector developed by OpenAI appears to perform remarkably well.

Unlike ChatGPT-generated essays on the same topics, which consistently obtained scores close to 100%, ten student essays submitted by one of the authors in December 2022 showed scores indicating less than a 1% probability of being fraudulent. Moreover, asking ChatGPT to use references, include varied transitions, and write like an undergraduate student only reduced the score to approximately 97%. This aligns with the research conducted by Gao et al. (2022), who found that AI output detectors were highly effective in identifying fabricated scientific abstracts, while human evaluators performed far worse.

Even when prompts are slightly modified or regenerated, the text produced by ChatGPT often remains extremely similar. Consequently, it would be relatively easy for a human evaluator to detect plagiarism if several students used similar prompts for coursework. The plagiarism detection software most widely used, Turnitin, would reveal extremely high levels of similarity among student submissions generated from the same set of keywords if multiple coursework examples were assessed.

Furthermore, Turnitin stated on December 15, 2022, in its blog that it already possessed certain capabilities for detecting AI-generated writing and announced that it would incorporate the “latest AI writing detection capabilities (…) for instructors in 2023.” Naturally, some tension will persist, and the outcome remains uncertain (Chechitelli, 2023).

University staff should treat this situation as a wake-up call and carefully reconsider examination design and measures intended to ensure that academic dishonesty is detected and minimized in student work, regardless of future technological developments.

As AI technology continues to advance, concerns also arise regarding the outsourcing of writing and assessment activities. Since ChatGPT can rapidly complete writing tasks and open-ended prompts, students may increasingly rely on this software to complete their assignments (Stokel-Walker, 2022).

UNESCO, CAF, and the Chilean Ministry of Science, Technology, Knowledge, and Innovation have collaborated to organize the first Forum on the Ethics of Artificial Intelligence for Latin America and the Caribbean on October 23. The goal is to establish a regional council to implement UNESCO’s Recommendation on the Ethics of Artificial Intelligence. This council will serve as the principal political and technical space promoting an ethical, inclusive, and rights-based approach adapted to regional needs.

Given the current relevance of this topic and the continued lack of solid evidence regarding the implications of its use in higher education, this article aims to examine the potential advantages and disadvantages of using ChatGPT and other NLP technologies in academic writing and assessment, based on a literature review, while drawing attention to the ethical concerns raised by their use.

In other words, the objective is to gather and analyze a body of literature addressing this topic in order to identify common themes and determine the emerging consensus within the academic community.

The following section presents the methodology used to analyze the documentary sources.

Methodological Processes

In order to provide an overview of the use of the ChatGPT system in education and AI-based learning, a qualitative perspective was adopted to examine in detail the categories, dimensions, emerging theoretical aspects, expressions, attitudes, and elements of social cohesion that are difficult to capture through a quantitative approach (Strauss & Corbin, 2002).

Through a documentary review of articles published on Google Scholar, using search terms related to “ChatGPT,” “teacher assessment,” and “academic fraud,” filtered by relevance and frequency of citation throughout 2023, the study sought to identify and interpret the findings and actions implemented in academia regarding the use of ChatGPT and educational assessment.

Using the most highly cited articles related to this topic as data sources, a bibliographic research strategy was applied. The qualitative strategy implemented for the analysis required the reading and critical evaluation of the sources, as well as the search for relevant data to support the objectives of the study. This inquiry yielded no results for articles produced within the Latin American context.

Table 1. *Corpus of articles analyzed regarding the use of AI-based ChatGPT.*

Results

1. Challenges for Academic Assessment Regarding Students’ Use of ChatGPT

Following the documentary analysis, several common or recurring thematic axes emerged from the reviewed sources:

1. concerns regarding plagiarism and ethical issues;
2. the capacity of AI technologies such as ChatGPT to revolutionize and advance higher education;
3. the need for teacher training; and
4. the need to redesign assessment methods.

The common arguments within each axis are described below:

Of the 12 articles reviewed, 11 raised concerns regarding plagiarism, authentication, and academic integrity. For example, Shahriar Hayawi (2023) mentions potential unethical educational uses, copyright issues, plagiarism, and privacy concerns related to the unintended processing of user information, while Fergus et al. (2023) highlight the need for academic integrity platforms such as Turnitin to detect AI-generated text.

Although Artificial Intelligence tools have the potential to increase student engagement and knowledge retention, concerns also exist regarding their assessment and evaluation (Firat, 2023), as well as doubts related to authentication, plagiarism, and academic integrity (Crawford et al., 2023). Nevertheless, the efficient use of these tools may be promoted through university training programs, while simultaneously encouraging ethics and academic integrity (Hassani & Silva, 2023).

Of the 12 articles reviewed, 11 highlighted the capacity of AI technologies such as ChatGPT to revolutionize and advance higher education, while also emphasizing broad benefits:

a. They have the potential to transform libraries and academia, impacting the ways in which information is collected (Lund & Wang, 2023);

b. They may function as assistants and virtual tutors.

c. They seek to facilitate medical practice, education, and research in this field (Sedeghat, 2023);

d. They may accelerate learning and improve performance, and even have the potential to support academic writing by enhancing natural language processing (Malinka et al., 2023; Dergaa et al., 2023; Shahriar Hayawi);

e. They provide more personalized results for students and could therefore replace search engines (AlAfnan et al., 2023).

Regarding the benefits for educators, Fergus et al. (2023) highlight how teachers can use AI to design assessments that challenge students or to recognize student work through personalized feedback. Additionally, Artificial Intelligence can adapt instruction to the specific needs of each student and transform the roles of educators (Firat, 2023), as well as improve workflows and outcomes (Hassani & Silva, 2023).

Of the 12 reviewed articles, 5 argued that faculty members should receive training so that assessments can be redesigned in ways that prevent students from completing them through Artificial Intelligence. Lo, C. K. (2023) calls for immediate policy updates, instructor training, and education regarding the limitations of these technologies. The study by Dergaa, I. et al. (2023) recommends that academics exercise caution and ensure transparency in the use of AI.

Similarly, Chaudhry, I. S. et al. (2023) urge higher education institutions to review their practices in order to improve learning programs. One recommended practice involves

redesigning assessments beyond knowledge-based questions, which may help educators improve their approach (Fergus et al., 2023). Despite these challenges, AI may provide early feedback, enabling students to demonstrate understanding through complex cases and less traditional forms of assessment (Crawford, 2023).

The negative effects of ChatGPT on students who use this system to complete assignments, particularly those involving creative writing, constitute another aspect of this discussion (Hutson, 2022). As a result, students may avoid following the guidance provided by instructors while completing assignments.

According to creative writing theory, writing skills must be learned and refined through practice. In fact, creative writing—one of the outcomes or byproducts of creativity, which also involves elements of talent—requires continuous guidance and methodological support throughout its development.

Support in creative writing can encourage students to become more original, develop their imagination, expand their fantasies, and enhance their memories. Its principal objectives are beauty, logic, and enjoyment.

To overcome this issue, educators must innovate their assessment processes and focus on internal competencies. General writing skills may no longer be regarded as essential workplace skills, in which case assessment should place greater emphasis on critical thinking and originality.

Consequently, professors should consider innovative assessment activities and formats that evaluate and reinforce these abilities in order to meet the evolving demands of society and educational goals.

Table 2. *Summary of the documentary analysis.*

In summary, the reviewed articles reveal concerns regarding plagiarism and ethical issues (Shahriar Hayawi, 2023; Fergus et al., 2023; Firat, 2023; Crawford et al., 2023; Hassani & Silva, 2023).

Likewise, the studies coincide in recognizing that AI technologies such as ChatGPT have the capacity to transform and advance higher education, while also highlighting broad benefits (Lund & Wang, 2023; Sedeghat, 2023; Malinka et al., 2023; Dergaa et al., 2023; Shahriar, 2023; AlAfnan et al., 2023; Hassani & Silva, 2023).

Nevertheless, the literature also emphasizes the need for teachers to receive training in order to redesign assessments in ways that prevent students from completing them exclusively through the use of Artificial Intelligence (Lo C. K., 2023; Dergaa et al., 2023; Chaudhry et al., 2023; Crawford, 2023; Fergus et al., 2023).

Conclusion

Based on the results and discussion, ChatGPT, with its ability to provide responses according to the keywords introduced by the user, can positively influence the world of education and learning. As previously indicated, Artificial Intelligence can function as a personal tutor for students, helping improve their writing production. In addition, its use personalizes teaching and provides search results contextualized to students' needs.

However, it may also serve as a means of avoiding the completion of assignments, thereby negatively affecting the development of creative and academic writing skills. Therefore, it is necessary to formulate strategies that encourage teachers to use supports beyond Internet-based learning.

One strategy that could be implemented is the use of paper-based activities as a means of establishing forms of control and process evaluation when compiling assignments related to creative writing, as suggested by Cassidy (2022).

Also important are the recommendations of UNESCO (2023) regarding Artificial Intelligence in higher education. The organization advises assigning specific roles to AI (personal tutor, dynamic evaluator, etc.) so that the tool functions as support during the production of assignments. This requires teachers to specify within writing instructions how the tool should be used.

In this regard, the following recommendations are proposed:

Learn extensively about what the system can and cannot do, and begin the process of discovering how "bot-proof" assignments truly are. One of the most evident situations is that highly generic essay questions are extremely vulnerable to being completed through GPT.

It is therefore important to reflect on whether assignments merely request lower-level tasks within Bloom's Taxonomy or Tobón's taxonomy (remembering facts and concepts), or whether they require students to analyze, connect, evaluate, design, and present novel ideas.

As Andy Crouch (2023) observed, GPT is quite skilled at producing writing that is fundamentally correct, but it also frequently relies on repetitive and cliché expressions. Part of the issue is that this is precisely the kind of writing often expected from graduates in, for example, introductory Humanities courses.

This suggests the importance of moving toward writing assignments that not only ask students to demonstrate mastery of objective facts and cite specific, recent sources, but also require them to integrate their own detailed personal experiences in relation to the topic.

On the other hand, it is recommended to teach students to write through a sequence of designs and steps, together with an editing process that reflects how real knowledge is constructed. Requiring multiple stages of writing—especially when combined with face-to-face meetings with peers or instructors throughout the development of the final project—will help create a stronger barrier against more routine forms of academic dishonesty.

Ultimately, assessment, and consequently the design of didactic strategies, will undergo a process of adaptation in response to this new technology, which, although it opens the door to new forms of plagiarism, also offers diverse benefits whose exploration remains of considerable interest.

Received: 3/10/2023 | **Approved:** 6/12/2023 | **Published:** 1/16/2024

Funding

This study received no external funding.

Author Contributions:

Guillermo vandeLinde: Conceptualization, project administration, methodology, formal analysis, writing—original draft preparation, and supervision.

Tamara Mera: Literature review, resources, writing—review and editing.

Bibliographical References

Ahsan, K., Akbar, S., & Kam, B. (2022). Contract cheating in higher education: A systematic literature review and future research agenda. *Assessment & Evaluation in Higher Education, 47*(4), 523–539. https://doi.org/10.1080/02602938.2021.1931660

AlAfnan, M. A., Dishari, S., Jovic, M., & Lomidze, K. (2023). ChatGPT as an educational tool: Opportunities, challenges, and recommendations: Communication, business writing, and composition courses. *Journal of Artificial Intelligence and Technology, 3*(2), 60–68. https://ojs.istp-press.com/jait/article/download/184/178

Anson, C. M., & Straume, I. (2022). Amazement and trepidation: Implications of AI-based natural language production for the teaching of writing. *Journal of Academic Writing, 12*(1), 1–9. https://doi.org/10.18552/joaw.v12i1.820

Assaraf, N. (2022). ChatGPT: *Optimizing language models for dialogue.* https://blog.cloudhq.net/openais-chatgpt-optimizing-language-models-for-dialogue/

Cassidy, C. (2023, January 10). Australian universities to return to 'pen and paper' exams after students caught using AI to write essays. *The Guardian.* https://www.theguardian.com/australia-news/2023/jan/10/universities-to-return-to-pen-and-paper-exams-after-students-caught-using-ai-to-write-essays

Chaudhry, I. S., Sarwary, S. A. M., El Refae, G. A., & Chabchoub, H. (2023). Time to revisit existing student performance evaluation approaches in higher education in a new era of ChatGPT—A case study. *Cogent Education, 10*(1), 2210461. https://www.tandfonline.com/doi/pdf/10.1080/2331186X.2023.2210461

Chechitelli, A. (2023). Sneak preview of Turnitin's AI writing and ChatGPT detection capability. *Turnitin.* https://www.turnitin.com/blog/sneak-preview-of-turnitins-ai-writing-and-chatgpt-detection-capability

Crawford, J., Cowling, M., & Allen, K. A. (2023). Leadership is needed for ethical ChatGPT: Character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching & Learning Practice, 20*(3), 02. https://ro.uow.edu.au/cgi/viewcontent.cgi?article=3180&context=jutlp

Crouch, A. (2023). Culture making: *Recovering our creative calling.* InterVarsity Press. http://www.christianity9to5.org/wp-content/uploads/2013/04/CultureMakingChapters3-5.pdf

Dawson, P., & Sutherland-Smith, W. (2018). Can markers detect contract cheating? Results from a pilot study. *Assessment & Evaluation in Higher Education, 43*(2), 286–293. https://doi.org/10.1080/02602938.2017.1336746

Dawson, P., Sutherland-Smith, W., & Ricksen, M. (2020). Can software improve marker accuracy at detecting contract cheating? A pilot study of the Turnitin authorship investigate alpha. *Assessment & Evaluation in Higher Education, 45*(4), 473–482. https://doi.org/10.1080/02602938.2019.1662884

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://scholar.google.com.do/scholar?hl=es&as_sdt=0%2C5&q=From+human+writing+to+artificial+intelligence+generated+text

Fergus, S., Botha, M., & Ostovar, M. (2023). Evaluating academic answers generated using ChatGPT. *Journal of Chemical Education, 100*(4), 1672–1675. https://pubs.acs.org/doi/full/10.1021/acs.jchemed.3c00087

Firat, M. (2023). What ChatGPT means for universities: Perceptions of scholars and students. *Journal of Applied Learning and Teaching, 6*(1). https://scholar.google.com.do/scholar?hl=es&as_sdt=0%2C5&q=What+ChatGPT+means+for+universities

Gao, C. A., Howard, F. M., Markov, N. S., Dyer, E. C., Ramesh, S., Luo, Y., & Pearson, A. T. (2022). Comparing scientific abstracts generated by ChatGPT to original abstracts using an artificial intelligence output detector, plagiarism detector, and blinded human reviewers. *bioRxiv.* https://doi.org/10.1101/2022.12.23.521610

Hassani, H., & Silva, E. S. (2023). The role of ChatGPT in data science: How AI-assisted conversational interfaces are revolutionizing the field. *Big Data and Cognitive Computing, 7*(2), 62. https://www.mdpi.com/2504-2289/7/2/62

Hern, A. (2022, December 4). AI bot ChatGPT stuns academics with essay-writing skills and usability. *The Guardian.* https://www.theguardian.com/technology/2022/dec/04/ai-bot-chatgpt-stuns-academics-with-essay-writing-skills-and-usability

Hopp, C., & Speil, A. (2021). How prevalent is plagiarism among college students? Anonymity preserving evidence from Austrian undergraduates. *Accountability in Research, 28*(3), 133–148. https://doi.org/10.1080/08989621.2020.1804880

Hutson, M. (2022). Could AI help you to write your next paper? *Nature, 611*(7934), 192–193. https://doi.org/10.1038/d41586-022-03479-w

Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., Madriaga, M., Aggabao, R., Diaz-Candido, G., & Maningo, J. (2023). Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models. *PLOS Digital Health, 2*(2), e0000198.

Lines, L. (2016). Ghostwriters guaranteeing grades? The quality of online ghostwriting services available to tertiary students in Australia. *Teaching in Higher Education, 21*(8), 889–914. https://doi.org/10.1080/13562517.2016.1198759

Linn, M. C., Donnelly-Hermosillo, D., & Gerard, L. (2023). Synergies between learning technologies and learning sciences: Promoting equitable secondary school teaching. In *Handbook of Research on Science Education* (pp. 447–498). Routledge.

Linn, M. C., Gerard, L., Ryoo, K., McElhaney, K., Liu, O. L., & Rafferty, A. N. (2014). Computer-guided inquiry to improve science learning. *Science, 344*(6180), 155–156.

Lo, C. K. (2023). What is the impact of ChatGPT on education? A rapid review of the literature. *Education Sciences, 13*(4), 410. https://www.mdpi.com/2227-7102/13/4/410

Lund, B. D., & Wang, T. (2023). Chatting about ChatGPT: How may AI and GPT impact academia and libraries? *Library Hi Tech News, 40*(3), 26–29. https://www.researchgate.net/profile/Brady-Lund/publication/367161545_Chatting_about_ChatGPT_How_may_AI_and_GPT_impact_academia_and_libraries

Malinka, K., Peresíni, M., Firc, A., Hujnak, O., & Janus, F. (2023, June). On the educational impact of ChatGPT: Is artificial intelligence ready to obtain a university degree? In *Proceedings of the 2023 Conference on Innovation and Technology in Computer Science Education V.1* (pp. 47–53). https://dl.acm.org/doi/pdf/10.1145/3587102.3588827

Mitchell, A. (2022, December 26). Professor catches student cheating with ChatGPT: 'I feel abject terror'. *New York Post.* https://nypost.com/2022/12/26/students-using-chatgpt-to-cheat-professor-warns/

Pellegrino, J. W., & Quellmalz, E. S. (2010). Perspectives on the integration of technology and assessment. *Journal of Research on Technology in Education, 43*(2), 119–134.

QAA. (2020). *Contracting to cheat in higher education – How to address contract cheating, the use of third-party services and essay mills.* Quality Assurance Agency.

Sabzalieva, E., & Valentini, A. (2023). *ChatGPT e inteligencia artificial en la educación superior: Guía de inicio rápido.* UNESCO.

Sedaghat, S. (2023). Early applications of ChatGPT in medical practice, education and research. *Clinical Medicine, 23*(3), 278–279. https://www.rcpjournals.org/content/clinmedicine/23/3/278

Shahriar, S., & Hayawi, K. (2023). Let's have a chat! A conversation with ChatGPT: Technology, applications, and limitations. *arXiv preprint arXiv:2302.13817.* https://arxiv.org/pdf/2302.13817.pdf

Stokel-Walker, C. (2022). AI bot ChatGPT writes smart essays — Should professors worry? *Nature,* d41586-022-04397-7. https://doi.org/10.1038/d41586-022-04397-7

van Dis, E. A. M., Bollen, J., Zuidema, W., van Rooij, R., & Bockting, C. L. (2023). ChatGPT: Five priorities for research. *Nature, 614*(7947), 224–226.

Yang, M. (2023, January 6). New York City schools ban AI chatbot that writes essays and answers prompts. *The Guardian.* https://www.theguardian.com/us-news/2023/jan/06/new-york-city-schools-ban-ai-chatbot-chatgpt

Yeadon, W., Inyang, O. O., Mizouri, A., Peach, A., & Testrow, C. (2022). The death of the short-form physics essay in the coming AI revolution. *arXiv preprint arXiv:2212.11661*. https://arxiv.org/abs/2212.11661

Zhai, X. (2021). Advancing automatic guidance in virtual science inquiry: From ease of use to personalization. *Educational Technology Research and Development, 69*(1), 255–258.

Zhai, X., Haudek, K. C., Shi, L., Nehm, R., & Urban-Lurain, M. (2020a). From substitution to redefinition: A framework of machine learning-based science assessment. *Journal of Research in Science Teaching, 57*(9), 1430–1459.