

# Building the Plane as We Fly It: Experimenting with GenAI for Scholarly Writing

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## Abstract

Due to the COVID-19 pandemic that forced universities to shift to online learning, the need for proper training and support for faculty to ensure effective online teaching and positive student outcomes has resurfaced and gathered momentum. This paper experimented with a GenAI tool (Perplexity) toward generating content on the effects of a lack of online teacher training on teaching, cognitive, and social presence in online university courses, specifically discussing how each presence is affected according to the Community of Inquiry extant literature. The authors' reflection on the adopted process and GenAI content yielded mixed results and proposed future strategies for improved outcomes of similar research endeavors. Implications for education stakeholders and the field at large were discussed culminating in a shared perception of the value of Critical AI Literacy skill development while thoughtfully leveraging the vast capabilities of GenAI to bring about a profound transformation of teaching, learning, and scholarship.

## 1. Introduction

### 1.1 GenAI in education and research: Proceed with caution

The utilization of Large Language Model-powered AI chatbots (e.g. ChatGPT, Bing, Midjourney, Perplexity, etc.) has generated significant interest within the realms of research, education, and other related fields. It is already acknowledged that Generative AI (GenAI) is posed to have a huge impact on all the aforementioned (Chen et al., 2020), with relevant adjustments to essential learning theory constants such as Bloom's taxonomy (Oregon State University Ecampus, 2023), or the TPACK framework (Mishra, 2023) already taking place. Yet, synergies between education and general technologies require vigilance and preparedness for an AI-dominated future (Bozkurt, 2023). Users are warned that GenAI responses are sometimes based on hallucinations, and/or are certainly not free of bias and stereotypes (OpenAI, 2023a). Staiman (2023) indicates that AI detectors produce too many false positives or negatives and are more likely to identify text written by non-native English speakers as being written by AI. In addition, apart from the fact that automated AI detectors do not work (OpenAI, 2023b), linguists' and reviewers' efforts to identify AI vs. human writing have proved largely unsuccessful (Casal & Kessler, 2023). Nevertheless, research has already confirmed that "Although AI chatbots on average outperform humans, the best humans can still compete with them" (Koivisto & Grassini, 2023, p. 9) in creative divergent thinking tasks. The review of the studies investigating the use of ChatGPT in academic writing and its potential association with plagiarism (Jarrah et al., 2023) concluded that:

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ChatGPT can be a valuable writing tool; however, it is crucial to follow responsible practices to uphold academic integrity and ensure ethical use. Properly citing and attributing ChatGPT's contribution is essential in recognizing its role, preventing plagiarism, and upholding the principles of scholarly writing. By adhering to established citation guidelines, authors can maximize ChatGPT's benefits while maintaining responsible usage (p.1).

It is therefore evident that it is more than critical to keep exploring GenAI tools, identifying the challenges, the research and ethical issues that arise with their uses, and investigating in action their educational potential through applications to teaching, learning, and scholarship (Hwang & Chen, 2023).

## **1.2 Educational and scholarly connections to GenAI**

All three authors who contributed to this article are involved and have a vested interest both in GenAI, and in online teaching and learning in their respective roles as education professionals and scholars.

M.D. Avgerinou (MDA) is an online learning specialist and researcher, with publications on both the Community of Inquiry (CoI) framework (Anderson et al., 2001) and the presence of technology (Learning Management Systems/LMS) in teaching and learning (Malama & Avgerinou, 2023; Rubin, et al., 2010; Rubin, et al., 2013). She has presented at various events on the use of AI in Learning Design and Technology (LDT), while she is teaching and coordinating a Master of Arts program in LDT, in which AI is integrated into both curriculum and assessment. MDA belongs to the AI task force, and to the academic integrity committee of her institution. Finally, in her capacity as the editor-in-chief of a Q1 academic journal, she is currently investigating academic integrity in publishing as affected by GenAI.

A. Karampelas (AK) teaches GenAI as part of a high school AI course, along with a high school Technology course. He is the K-12 AI Coordinator at his school, in charge of the school's GenAI policies and assisting both students and teachers within this context. He has published articles about GenAI in education in different media. His graduate and postgraduate studies involved GenAI elements from the domains of Neural Networks, Supervised and Unsupervised Learning algorithms.

The background knowledge of V. Stefanou (VS) spans from Information Systems, Information Technology, Human-Computer Interaction, and User Experience to Technology Enhanced Learning and blended/online learning, with publications in these fields. VS has been experimenting with the various GenAI tools that recently emerged to support both her own practice as a college professor, and research in the field of UX and online/blended learning. She is also teaching in the MA in LDT, coordinated by MDA.

## **1.3 Choice of topic**

All three authors are well-versed in the CoI framework. Additionally, AK has co-authored a book chapter on enhancing the CoI Framework presences in Middle and High School classes of Science, Physics, and Modern Language Arts (Sidiropoulou, et al., 2021). They have also experienced the positive effect of online teacher training on their designing, developing, implementing, and evaluating online courses (Avgerinou, 2021), as well as their ability to do so for emergency online teaching due to COVID-related restrictions (Hodges et al., 2020). Moreover, the selected focus on online teacher training and professional development of

higher education faculty is directly related to MDA and AK's own fields of practice and research, and to the new MA program in LDT at MDA and VS' institution. MDA was also intrigued to explore whether GenAI tools would generate a broad coverage of the topic, with seminal publications in the field, or connect it mostly to the context of the COVID-19 pandemic and its implications for education (Avgerinou, 2021; Avgerinou & Moros, 2020; Karatopouzi & Avgerinou, 2021).

#### **1.4 Choice of GenAI tool**

The tool that was chosen and utilized was Perplexity. A careful inspection of its affordances indicated that it would be able to combine the capabilities of reasoning and search engines under a conversational interface that 'processes' and 'understands' natural language. More generally, it is an Artificial Intelligence tool that employs the GenAI technology. Perplexity has a reputation for better supporting scholarly work, as it is more research-oriented compared to other GenAI tools. Additionally, it is easier to identify the research sources it provides. The tool has (a) a free, standard version that provides additional suggestions (in the form of questions) relevant to the research inquiry, and (b) a paid one, which offers a CoPilot functionality, namely, an interactive search assistant that asks clarifying questions, and a Search Focus feature, with more targeted and relevant results. It was decided by all authors to use the free, standard version of Perplexity to ensure unrestricted access and uniformity across their searches.

#### **1.5 Prompt engineering in action**

Each of the authors independently employed Perplexity as a means to inquire about the impact of university faculty lacking online training on their online instructional practice. Drawing on research related to the CoI framework, and as agreed in the inaugural meeting of the authorship, each author focused on one of the CoI presences, i.e. teaching, cognitive, and social. For the most part, the authors followed the same prompts, in the same order. Whenever the tool needed additional prompting to provide more focused responses, extra steps were taken by some authors while still observing the initial goal of the search.

The prompts used and the sequence followed are listed below:

1. What are the effects of university faculty who have not received online training, on their teaching online? [All authors]
2. In the above passage, I am missing references 4 and 5 [MDA]
3. Thank you. Now, can you weave references 4 and 5 back into your earlier response? [MDA]
4. What are the challenges faced by university faculty who have not received online training? [All authors]
5. What are the challenges faced by university faculty who have not received online training? Use paragraph format. [AK]
6. This is only 580 words. Please expand your response to 1500 including references from the online learning literature, in addition to CoI. [MDA]
7. Further to the above, how does lack of online teacher training affect teaching/cognitive/social presence online? Use paragraph format. [All authors]
8. You are an academic that needs to produce a research-based publication on the effects of/challenges of lack of online teacher training in online university courses specifically discussing how teaching/cognitive/social presence is affected. Your manuscript should be between 2000 and 2500 words, observing APA 7th edition reference style. [All authors]
9. This is only 500 words. Please repeat by expanding each section. [AK]

10. For the teaching presence part, draw evidence from the Community of Inquiry framework. [VS]
11. You now need to merge the two previous replies together, creating a manuscript of approximately 1500-2000 words. [VS]

The Perplexity-generated text is presented below (Section 2) with minor intervention from the authors (copy-editing). In addition, part of the introduction (2.1) appears in the Abstract of the paper.

## **2. AI Generated Short Report**

### **2.1 Introduction**

The COVID-19 pandemic has forced universities to shift to online learning, which has highlighted the need for proper training and support for faculty to ensure effective online teaching and positive student outcomes. Lack of online teacher training can negatively impact teaching, social, and cognitive presence in online learning. Effective teaching presence can improve social and cognitive presence, which in turn can lead to better educational outcomes. This paper will focus on the effects of lack of online teacher training on teaching, cognitive, and social presence in online university courses, specifically discussing how each presence is affected based on the Community of Inquiry literature.

#### **2.1.1 The importance of online teacher training**

Teaching online can be challenging for faculty members who have not received online training. According to an Educause survey, only nine percent of respondents preferred to teach online, and some instructors find it challenging to adjust (Perrotta & Bohan, 2020). However, research has shown that online faculty tend to experience significant benefits (Perrotta & Bohan, 2020).

The impact of online learning on faculty members and students has been significantly observed during the COVID-19 pandemic (Almahasees et al., 2021; Bird et al., 2022; Lobos Peña et al., 2021; Saha et al., 2022). Faculty members' perceptions and attitudes toward online learning emphasized the role of instructors in facilitating communication and earning with students (Almahasees et al., 2021). Instructors acknowledged the content expertise and instructional design as the factors in the success of online learning (Almahasees et al., 2021). Similarly, the call for staff and student training is mandatory for online learning success (Almahasees et al., 2021).

Research has shown that even short online training programs have the potential to affect participants' interpretations of teaching-learning situations, especially when participants are not very experienced in teaching (Vilppu et al., 2019). Therefore, pedagogical training should be offered already at the early stages of teaching careers (Vilppu et al., 2019).

In summary, the effects of university faculty who have not received online training on their teaching online can be challenging. However, research has shown that online faculty tend to experience significant benefits, and short online training programs have the potential to affect participants' interpretations of teaching-learning situations. Therefore, pedagogical training should be offered to faculty members at the early stages of their teaching careers to improve their online teaching skills.

### 2.1.2 The Community of Inquiry Framework (CoI)

The Community of Inquiry (CoI) framework is a widely used model for understanding and improving online learning. The framework consists of three interdependent elements: teaching presence, social presence, and cognitive presence (Zhang et al., 2023).

Teaching presence is a critical component of online education. It refers to the design, facilitation, and direction of online learning activities by the instructor of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes (Laves, 2010). In other words, teaching presence is the degree to which an instructor is actively involved in the online course and interacts with students to facilitate learning.

Social presence refers to the ability of learners to project themselves socially and emotionally in an online environment. Social presence is a critical component of the CoI framework, as it is essential for creating a sense of community and fostering engagement in online learning (Cunningham, 2015). Social presence refers to the degree to which learners feel connected to others in the online learning environment.

Cognitive presence refers to the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse (Zhang et al., 2023). As it applies to the process of collaborative knowledge construction in online learning, it is central to success in higher education settings (Moore & Miller, 2022).

### 2.1.3 The shift to online classes during the COVID-19 pandemic

In 2020, the COVID-19 pandemic forced a new reality where online classes became the norm, the dominant and maybe the only available teaching and learning mode (Li, 2022). The sudden shift to online learning has highlighted the need for educators to adapt their teaching methods and utilize online platforms effectively (Svihus, 2023). Despite the challenges posed by the pandemic, some higher education teachers have successfully adapted to online teaching and have embraced new teaching approaches that promote student participation in online classes (Svihus, 2023).

However, the lack of online teacher training has made it challenging for faculty members to create an effective online learning environment, which can further impact cognitive presence.

Further, the sudden change from on-campus to online learning due to the COVID-19 pandemic has disrupted students' established study routines and social interactions (Kaspar, Burtniak, & R uth, 2023). This has led to challenges in maintaining cognitive presence in online learning. However, some students have reported benefits from online learning, such as increased flexibility and access to course materials (Kaspar, Burtniak, & R uth, 2023).

### 2.1.4 COVID-19 crisis: The role of Community of Inquiry in online learning

With the new pandemic reality that has beset us, teaching and learning activities have been thrust online (Lemay et al. 2021). The COVID-19 pandemic has brought a tremendous impact on the pedagogy and learning experience of students in sub-degree education sector (Lau et al., 2021). The pandemic has highlighted the importance of community of inquiry in

online learning, which refers to the process of collaborative knowledge construction in online learning. (Lau et al., 2021). Effective teaching presence can improve social and cognitive presence, which in turn can lead to better educational outcomes (Lau et al., 2021). While much research has explored student perceptions of online learning during the COVID-19 pandemic, there is a need for more research on the effects of/challenges of lack of online teacher training on cognitive presence in online learning.

## **2.2 Effects of lack of online training on teaching presence**

The absence of adequate online teacher training can have various implications for teaching presence in the online environment.

**Reduced interaction with students:** Faculty members who lack online training may not be familiar with the tools and techniques required to interact with students effectively in an online environment. This can lead to reduced interaction with students, which can negatively impact teaching presence (Richardson et al., 2016).

**Poor course design:** Online courses require a different approach to course design than traditional face-to-face courses. Faculty members who lack online training may not be familiar with the best practices for designing online courses, which can lead to poor course design and a lack of engagement with students (Preisman, 2014). This can negatively impact teaching presence within the CoI framework.

**Inadequate feedback:** Providing feedback is an essential component of teaching presence. Faculty members who lack online training may not be familiar with the tools and techniques required to provide feedback effectively in an online environment. This can lead to inadequate feedback, which can negatively impact teaching presence (Wang & Liu, 2020). This can negatively impact cognitive presence within the CoI framework.

**Reduced social presence:** Social presence is the degree to which students feel connected to their instructor and other students in an online course. Faculty members who lack online training may not be familiar with the tools and techniques required to establish social presence in an online environment. This can lead to reduced social presence, which can negatively impact teaching presence. This can negatively impact cognitive presence within the CoI framework.

In addition, the CoI framework emphasizes the importance of teaching presence in facilitating cognitive presence, which is relevant to the intellectual tasks of knowledge-building.

In conclusion, teaching presence is a critical component of online education. The lack of online training for faculty teaching online university courses can have a significant impact on teaching presence. Faculty members who lack online training may struggle with poor course design, inadequate feedback, and reduced social presence, which can negatively impact teaching presence within the CoI framework. It is essential for universities to provide adequate training and support to faculty members to ensure that they can effectively teach online courses and maintain high levels of teaching presence.

## **2.3 Effects of lack of online training on cognitive presence**

The lack of online teacher training can affect cognitive presence online in several ways.

First, when faculty members lack online training, students may misunderstand or misread course and assignment expectations, which can lead to confusion and frustration (Singh, Singh, & Matthees, 2022). This can negatively impact cognitive presence, as students may struggle to engage with the course content and with each other. Second, faculty members who lack online training may struggle to create an effective online learning environment, which can further impact cognitive presence (Moore & Millers, 2022).

Furthermore, instructors who lack training may not be able to facilitate continuous dialog and reflection, which is essential for learners to construct meaning (Singh, Singh, & Matthees, 2022). In addition, instructors who lack training may not be able to design, facilitate, and direct cognitive and social processes to realize personally meaningful and educationally worthwhile learning outcomes (Lau et al., 2021). Last but equally importantly, instructors who lack training may not be able to provide opportunities for learners to critically analyze the learning contents through engaging in a reflective discourse, posing questions in the process of constructing new knowledge (Al Mamun & Lawrie, 2023).

In summary, lack of online teacher training can affect cognitive presence online by limiting instructors' ability to facilitate continuous dialog and reflection, design, facilitate, and direct cognitive and social processes, and provide opportunities for learners to critically analyze the learning contents through engaging in a reflective discourse. It is thus essential for universities to provide online teacher training to faculty members to ensure that they can create an effective online learning environment and promote cognitive presence in their online courses.

#### **2.4 Effects of lack of online training on social presence**

And what about the effects of the absence of online training on social presence? To start with, it is well documented that lack of collaboration, communication, motivation, in-person participation, and social presence in the virtual medium of learning leads to increased frustration (Barrot, Llienares, & Del Rosario, 2022). The absence of classroom environment interaction can be a drawback of online learning, which can negatively impact social presence (Barrot, Llienares, & Del Rosario, 2022).

Further, effective teaching presence can improve social presence, which in turn can lead to better educational outcomes (Gray & DiLoreto, 2016). The instructor's role is "a major factor" in the success of online learning (OECD, 2020). Richardson and Swan (2003) found that the instructor was one of the most essential aspects when investigating students' perception of social presence (OECD, 2020).

The influence of social presence on the learning experience within online higher education appears to be overstated (OECD, 2020). There are also significant inconsistencies in the way online learning environments are visualized as communities of inquiry and how they are organized in practice (OECD, 2020). The social presence construct is somewhat problematic and requires further articulation (OECD, 2020).

Studies have shown that effective online learning environments require clear objectives, well-organized content, variety of opportunities for interpersonal interaction, and effective use of technology (Barrot, Llienares, & Del Rosario, 2022; Gray & DiLoreto, 2016). Learner interaction is also a critical component of online learning, as it can help students feel connected to their classmates and instructors (Barrot, Llienares, & Del Rosario, 2022).

Course delivery in online classes requires pedagogical strategies that will create as many learning and engagement opportunities as possible (Barrot, Llenares, & Del Rosario, 2022; Gray & DiLoreto, 2016). Online learning can be effective in certain places, but it can also cause challenges and restrictions for students (Basar, et al., 2021).

In conclusion, a lack of online teacher training can negatively impact social presence in online university courses. Social presence is a critical component of the CoI framework, as it is essential for creating a sense of community and fostering engagement in online learning. The absence of classroom environment interaction can be a drawback of online learning, which can negatively impact social presence. Effective teaching presence can improve social presence, which in turn can lead to better educational outcomes. The instructor's role is "a major factor" in the success of online learning. However, the influence of social presence on the learning experience within online higher education appears to be overstated, and the social presence construct is somewhat problematic and requires further articulation. Effective online learning environments require clear objectives, well-organized content, variety of opportunities for interpersonal interaction, and effective use of technology. Learner interaction is also a critical component of online learning, as it can help students feel connected to their classmates and instructors.

## References

- Almahasees, Z., Mohsen, K., & Amin, M. O. (2021, May). Faculty's and students' perceptions of online learning during COVID-19. In *Frontiers in Education*, 6, 638470. Frontiers Media SA.  
<https://www.frontiersin.org/articles/10.3389/feduc.2021.638470/full>
- Al Mamun, M. A., & Lawrie, G. (2023). Cognitive presence in learner–content interaction process: The role of scaffolding in online self-regulated learning environments. *Journal of Computers in Education*, 1-31.  
<https://link.springer.com/article/10.1007/s40692-023-00279-7>
- Barrot, J. S., Llenares, I. I., & Del Rosario, L. S. (2021). Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. *Education and information technologies*, 26(6), 7321-7338.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8162157/>
- Basar, Z. M., Mansor, A. N., Jamaludin, K. A., & Alias, B. S. (2021). The effectiveness and challenges of online learning for secondary school students—A case study. *Asian Journal of University Education*, 17(3), 119-129.  
<https://files.eric.ed.gov/fulltext/EJ1309475.pdf>
- Bird, K. A., Castleman, B. L., & Lohner, G. (2022). Negative impacts from the shift to online learning during the COVID-19 crisis: evidence from a statewide community college system. *Aera Open*, 8, 23328584221081220.  
<https://journals.sagepub.com/doi/full/10.1177/23328584221081220>
- Cunningham, J. M. (2015). Mechanizing people and pedagogy: Establishing social presence in the online classroom. *Online Learning*, 19(3), 34-47.  
<https://files.eric.ed.gov/fulltext/EJ1067482.pdf>
- Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *International Journal of Educational Leadership Preparation*, 11(1), 1.  
<https://files.eric.ed.gov/fulltext/EJ1103654.pdf>
- Kaspar, K., Burtiak, K., & R uth, M. (2023). Online learning during the Covid-19 pandemic: How university students' perceptions, engagement, and performance are related to



- their personal characteristics. *Current Psychology*, 1-20.  
<https://doi.org/10.1007/s12144-023-04403-9>
- Lau, Y. Y., Tang, Y. M., Chau, K. Y., Vyas, L., Sandoval-Hernandez, A., & Wong, S. (2021). COVID-19 crisis: Exploring community of inquiry in online learning for sub-degree students. *Frontiers in Psychology*, 12, 679197.  
<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.679197/full>
- Laves, E. (2010). *The impact of teaching presence in intensive online courses on perceived learning and sense of community: A mixed methods study*. The University of Nebraska-Lincoln. <https://core.ac.uk/download/pdf/188042004.pdf>
- Lemay, D. J., Bazalais, P., & Doleck, T. (2021). Transition to online learning during the COVID-19 pandemic. *Computers in human behavior reports*, 4, 100130.  
<https://doi.org/10.1016/j.chbr.2021.100130>
- Li, D. (2022). The Shift to Online Classes during the COVID-19 Pandemic: Benefits, challenges, and required improvements from the students' perspective. *Electronic Journal of E-Learning*, 20(1), 1-18. <https://files.eric.ed.gov/fulltext/EJ1333732.pdf>
- Lobos Peña, K., Bustos-Navarrete, C., Cobo-Rendón, R., Fernández Branada, C., Bruna Jofré, C., & Maldonado Trapp, A. (2021). Professors' expectations about online education and its relationship with characteristics of university entrance and students' academic performance during the COVID-19 pandemic. *Frontiers in Psychology*, 12, 642391. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8060569>
- Moore, R. L., & Miller, C.N. (2022). Fostering presence in online courses: A systematic review (2008-2020). *Online Learning*, 26(1), pp. 130-149.  
<https://doi.org/10.24059/olj.v26i1.3071>
- OECD (2020). The potential of online learning for adults: Early lessons from the COVID-19 crisis. <https://www.oecd.org/coronavirus/policy-responses/the-potential-of-online-learning-for-adults-early-lessons-from-the-covid-19-crisis-ee040002/>
- OECD (2020). Strengthening online learning when schools are closed: The role of families and teachers in supporting students during the COVID-19 crisis. <https://www.oecd.org/coronavirus/policy-responses/strengthening-online-learning-when-schools-are-closed-the-role-of-families-and-teachers-in-supporting-students-during-the-covid-19-crisis-c4ecba6c/>
- Perrotta, K. A., & Bohan, C. H. (2020). A reflective study of online faculty teaching experiences in higher education. *Journal of Effective Teaching in Higher Education*, 3(1), 50-66. <https://files.eric.ed.gov/fulltext/EJ1253897.pdf>
- Preisman, K. A. (2014). Teaching presence in online education: From the instructor's point of view. *Online Learning*, 18(3), 3. <https://files.eric.ed.gov/fulltext/EJ1043166.pdf>
- Richardson, J. C., Besser, E., Koehler, A., Lim, J., & Strait, M. (2016). Instructors' perceptions of instructor presence in online learning environments. *International Review of Research in Open and Distributed Learning*, 17(4), 82-104.  
<https://files.eric.ed.gov/fulltext/EJ1108404.pdf>
- Saha, S. M., Pranty, S. A., Rana, M. J., Islam, M. J., & Hossain, M. E. (2022). Teaching during a pandemic: Do university teachers prefer online teaching? *Heliyon*, 8(1).  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8741442/>
- Singh, J., Singh, L., & Matthees, B. (2022). Establishing social, cognitive, and teaching presence in online learning—A panacea in COVID-19 pandemic, post vaccine and post pandemic times. *Journal of Educational Technology Systems*, 51(1), 28-45.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9019503/>
- Svihus, C. L. (2023). Online teaching in higher education during the COVID-19 pandemic. *Education and Information Technologies*, 1-19.  
<https://link.springer.com/article/10.1007/s10639-023-11971-7#citeas>

- Vilppu, H., Södervik, I., Postareff, L., & Murtonen, M. (2019). The effect of short online pedagogical training on university teachers' interpretations of teaching–learning situations. *Instructional science*, 47, 679-709. <https://doi.org/10.1007/s11251-019-09496-z>
- Wang, Y., & Liu, Q. (2020). Effects of online teaching presence on students' interactions and collaborative knowledge construction. *Journal of computer assisted learning*, 36(3), 370-382. [https://www.researchgate.net/publication/337894544\\_Effects\\_of\\_online\\_teaching\\_presence\\_on\\_students\\_interactions\\_and\\_collaborative\\_knowledge\\_construction](https://www.researchgate.net/publication/337894544_Effects_of_online_teaching_presence_on_students_interactions_and_collaborative_knowledge_construction)
- Zhang, Y., Huang, J., Hussain, S., & Dong, Y. (2023). Investigating the impact of the community of inquiry presence on online learning satisfaction: A Chinese college student perspective. *Psychology Research and Behavior Management*, 1883-1896. <https://doi.org/10.2147/PRBM.S409229>

### 3. Critical Reflection

#### 3.1 Reflecting on the process

As mentioned earlier, each author was responsible for inquiring individually first about the impact of lack of online training on university faculty's online instructional practice, and then about their assigned presence. The three, individual GenAI texts produced in response to the former, were compared for content and accuracy of supporting literature with the view to selecting the best response out of the three. Yet, given that all texts were almost identical, selecting a text was rather straightforward. The three individual texts discussing the CoI presences were also studied for content and accuracy of the supporting literature before they were stitched together.

The use of Perplexity as a research assistant to support the generation of a scholarly manuscript revealed both the strengths and weaknesses of this GenAI tool. For example, the output did not meet the expected word count, producing circa 500 words against a target of 2,000 to 2,500 words, despite several attempts of expansion that resulted in a slight increase in the total word count. This may reflect an inherent inability of the tool to robustly adjust its output within a certain word count range, perhaps being more profound with increased text volume.

There were also inaccuracies and inconsistencies in references ranging from occasionally missing in-text references (e.g., Richardson & Swan, 2003), and excluding prominent references within the field, to providing non-scholarly ones, and typically presenting references as non-adhering to the required APA style. Overall, the level of elaboration and critical analysis was not up to the standards of scholarly work, producing rather superficial statements based on a very limited literature review, with occasionally redundant, slightly unrelated, or out-of-focus information. Conversely, GenAI excelled at delivering both valid content that was relevant to the given queries for the most part, and corresponding resources, as well as at summarizing effectively the main points of the subject matter. Timewise, Perplexity managed to return swift responses in under ten seconds, leading to a total engagement time ranging between one to two hours per author.

Future strategies to enhance the performance of GenAI tools such as Perplexity in scholarly writing could indicatively include a more structured approach of outlining the article's segments and progressively refining each part in a conversational, explorative fashion; the employment of specialized enhancement tools like Perplexity's 'Copilot' and 'Search Focus';

the deployment of new prompting techniques such as the ‘Chain of Density’ approach (Adams et al., 2023); the use of GenAI to brainstorm main research points rather than generating the manuscript itself; and, the parallel employment of more than one such tools for comparative purposes.

The experience of employing GenAI to write a long scholarly piece varied, with some finding it relatively easy to generate a draft manuscript in contrast to conventional methods in terms of response time, while others found it somewhat disruptive and time-consuming due to necessary adjustments and refinements to meet scholarly requirements. About the latter, it was noted that double-checking for content and sources, as well as adhering to the mere process of prompt engineering, can be very disruptive for the general flow of writing, as well as for the cognitive processing and sequencing of the content. Moreover, Perplexity clearly favored COVID-related sources, perhaps because they correlate with the online learning implications and considerations in the huge datasets it has been trained with. Additionally, the authors expanded into different prompts on top of the main, shared ones, which posed challenges in compiling and evaluating the final manuscript.

### **3.2 Reflecting on the implications**

The integration of GenAI tools like Perplexity -- the capabilities of which are yet unknown despite the anticipated exponential rise of their use (Hwang & Chen, 2023) -- in the realms of knowledge, scholarship, teaching, and learning could have transformative implications. The advent of such tools facilitates easy access to the extensive corpus of knowledge they have been trained with, at a speed that was humanly impossible to be attained until recently, and at no additional cost. In addition, the fact alone that essentially only an electronic device, an Internet connection, and the presence of natural, human language are required for the use of such GenAI tools, may justify the claim that GenAI is democratizing access to knowledge (Kanbach et al., 2023). Tools like Perplexity that are not only characterized by their reasoning, and conversational nature, but are also enhanced with search engine capabilities to handle real-time information and identify useful resources, emerge as powerful personal assistants to scholars, educators, and learners.

For scholars, GenAI can support research investigations allowing initiation of research tasks and fast access to the body of literature. While these tools prove to be exceptionally beneficial, reliance on them should be judicious (Bozkurt, 2023). Their outputs, typically text outlines, require significant human intervention for the validity of content, enrichment, and refinement. Furthermore, editorial teams and manuscript reviewers might find it nearly impossible to identify and/or address unauthorized or inappropriate utilization of GenAI (Staiman, 2023).

Educators can use GenAI as personal assistants, enabling among others the creation of assessments, lecture notes, personalized content, syllabi, and automated feedback (Miao & Holmes, 2023). However, assessment necessitates adjustments that cater to the capabilities of GenAI. Indicatively, this involves the incorporation of AI-assisted components that may foster deeper learning, and the specification and respective communication of the ethical usage of such AI tools.

For learners, GenAI can manifest as personal assistants, among other things, helping to clarify and simplify content and acting as tutors to broaden their understanding of various subjects, at the potential risk of weakening thinking skills as a result of the habitual and unconscious use of AI (Mollick & Mollick, 2023). Nevertheless, since GenAI has been called

a ‘digital parrot’ or ‘a brain without a mind’ (Cao & Dede, 2023), and may behave as ‘an occasionally drunk intern’ (Mishra, 2023), the development of Critical AI Literacy as a conscious measure “to avoid the fallacy of seeking for technological fixes for societal problems” (Strauß, 2021, p. 45) must have preceded all such GenAI applications to student learning.

In a broader disciplinary context, the emergence of GenAI tools such as Perplexity signifies a transformation characterized by the collaboration between humans and intelligent machines and the subsequent augmentation of the abilities of scholars, educators, and learners alike.

This work experimented with utilizing Perplexity as a means to generate content discussing the effects of the absence of online teacher training on teaching, cognitive, and social presence in an online Higher Education context, specifically drawing on the Community of Inquiry literature. The authors’ reflection on the adopted process and GenAI content yielded mixed results and proposed future strategies for improved outcomes of similar research endeavors. Implications for education stakeholders and the field at large were discussed culminating in a shared perception of the value of Critical AI literacy skill development, while thoughtfully leveraging the vast capabilities of GenAI to bring about a profound transformation of teaching, learning, and scholarship.

## References

- Adams, G., Fabbri, A., Ladhak, F., Lehman, E., & Elhadad, N. (2023). From sparse to dense: GPT-4 summarization with chain of density prompting. <https://arxiv.org/pdf/2309.04269.pdf>
- Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, 5(2). <https://doi.org/10.24059/olj.v5i2.1875>
- Avgerinou, M.D. (2021). The i<sup>2</sup>Flex evolution: From learning methodology to school culture embracing the new normal. In Avgerinou, M.D., & P. Pelonis (Eds.), *Handbook of research on K-12 blended and virtual learning through the i<sup>2</sup>Flex classroom model* (pp. 361-395). IGI Global. <https://doi.org/10.4018/978-1-7998-7760-8.ch013>
- Avgerinou, M.D., & Moros, S.E. (2020). The 5-Phase process as a balancing act during times of disruption: Transitioning to virtual teaching at ACS Athens elementary school. In R.E., Ferdig, E., Baumgartner, R., Hartshorne, R., Kaplan-Rakowski, & C. Mouza (Eds.). *Teaching, technology, and teacher education during the COVID-19 pandemic: Stories from the field* (pp. 583-589). Association for the Advancement of Computing in Education (AACE). <https://www.learntechlib.org/p/216903/>
- Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, 18(1). <http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/718>
- Cao, L., & Dede, C. (2023). *Navigating A world of generative AI: Suggestions for educators*. The Next Level Lab at Harvard Graduate School of Education. President and Fellows of Harvard College: Cambridge, MA. [https://bpb-us-e1.wpmucdn.com/websites.harvard.edu/dist/a/108/files/2023/08/Cao\\_Dede\\_final\\_8.4.23.pdf](https://bpb-us-e1.wpmucdn.com/websites.harvard.edu/dist/a/108/files/2023/08/Cao_Dede_final_8.4.23.pdf)
- Casal, J. E., & Kessler, M. (2023). Can linguists distinguish between ChatGPT/AI and human writing?: A study of research ethics and academic publishing. *Research Methods in Applied Linguistics*, 2(3), 100068. <https://doi.org/10.1016/j.rmal.2023.100068>
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access*, 8, 75264-75278. <https://doi.org/10.1109/ACCESS.2020.2988510>
- Hodges, C., Moore, S., Locke, B., Trust, T., & Bond, A. (2020, March 27). The difference between emergency remote teaching and online learning. In *EducauseReview*. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- Hwang, G.-J., & Chen, N.-S. (2023). Editorial position paper: Exploring the potential of generative artificial intelligence in education: applications, challenges, and future research directions. *Educational Technology & Society*, 26(2). [https://doi.org/10.30191/ETS.202304\\_26\(2\).0014](https://doi.org/10.30191/ETS.202304_26(2).0014)
- Jarrah, A. M., Wardat, Y., & Fidalgo, P. (2023). Using ChatGPT in academic writing is (not) a form of plagiarism: What does the literature say? *Online Journal of Communication and Media Technologies*, 13(4), e202346. <https://doi.org/10.30935/ojcm/13572>
- Kanbach, D.K., Heiduk, L., Blueher, G., Schreiter, M., & Lahmann, A. (2023). The GenAI is out of the bottle: Generative artificial intelligence from a business model innovation perspective. *Rev Manag Sci*. <https://doi.org/10.1007/s11846-023-00696-z>
- Karatopouzi, E., & Avgerinou, M.D. (2021). The purple yeti in the digital slopes: An action research on mindfulness in physical education online and hyflex elementary classes. *International Schools Journal (ISJ)*, XLI(2), 26-35.
- Koivisto, M., & Grassini, S. (2023). Best humans still outperform artificial intelligence in a creative divergent thinking task. *Scientific Reports*, 13(1), 13601. <https://doi.org/10.1038/s41598-023-40858-3>

- Malama, S.Th., & Avgerinou, M.D. (2023, November 24-26). *The implementation of the Community of Inquiry (CoI) framework during emergency remote teaching (ERT) as a benchmark for effective learning in high school*. International Conference in Open and Distance Learning, Athens, Greece.
- Miao, F., & Holmes, W. (2023). *Guidance for generative AI in education and research*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000386693>
- Mishra, P. (2023, July 26). *ChatGPT is a smart, drunk intern: 3 examples*. <https://punyamishra.com/2023/07/26/chatgpt-is-a-smart-drunk-intern-3-examples/>
- Mishra, P. (2023, August 22). *TPACK in the age of ChatGPT and Generative AI*. <https://punyamishra.com/2023/08/22/tpack-in-the-age-of-chatgpt-and-generative-ai/>
- Mollick, E., & Mollick, L. (2023, September 25). *Student use cases for AI*. <https://hbsp.harvard.edu/inspiring-minds/student-use-cases-for-ai>
- OpenAI (2023a). *New AI classifier for indicating AI-written text*. <https://openai.com/blog/new-ai-classifier-for-indicating-ai-written-text>
- OpenAI (2023b). *What is ChatGPT*. <https://help.openai.com/en/articles/6783457-what-is-chatgpt>
- Oregon State University ECampus (2023). *Advancing meaningful learning in the age of AI: Bloom's Taxonomy revisited*. <https://ecampus.oregonstate.edu/faculty/artificial-intelligence-tools/meaningful-learning/>
- Rubin, B., Fernandes, R., & Avgerinou, M.D., (2013). The effects of technology on the community of inquiry and satisfaction with online courses. *The Internet and Higher Education*, 17, 48-57. <https://doi.org/10.1016/j.iheduc.2012.09.006>
- Rubin, B., Fernandes, R., Avgerinou, M.D., & Moore J. (2010). The effect of learning management systems on student and faculty outcomes. *The Internet and Higher Education*, 13, 82-83. <https://doi.org/10.1016/j.iheduc.2009.10.008>
- Sidiropoulou, M.A., Bakoyiannis, C., & Karampelas, A., (2021). Middle and high school implementations of Moodle-facilitated blended instructional designs. In Avgerinou, M.D., & P. Pelonis (Eds.), *Handbook of research on K-12 blended and virtual learning through the i2Flex classroom model* (pp. 330-360). Hershey. IGI Global. <https://doi.org/10.4018/978-1-7998-7760-8.ch020>
- Staiman, A. (2023, September 14). Publishers, don't use AI detection tools! *The Scholarly Kitchen*. <https://scholarlykitchen.sspnet.org/2023/09/14/publishers-dont-use-ai-detection-tools/>
- Strauß, S. (2021). "Don't let me be misunderstood" - Critical AI literacy for the constructive use of AI technology. *Tatup - Zeitschrift Für Technikfolgenabschätzung In Theorie Und Praxis*, 30, 44-49. <https://doi.org/10.14512/tatup.30.3.44>