

Chatbots and Citations: An experiment in academic writing with Generative AI

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Abstract

The world of Educational Technology is no stranger to tales and predictions about the Next Big Thing, with Artificial Intelligence (AI) being the current title holder. This paper documents the process and experiences of the authors in undertaking a challenge to “go all in” with AI (in this case, ChatGPT-3.5) to generate academic material pertaining to their professional context, and to reflect upon the endeavour and the possible broader implications arising from this. We found that, on balance, the AI engine generated a credible base content for our chosen topic, and proved particularly useful for some aspects of the writing process. The experiment deepened our understanding of the potentials and pitfalls of using Artificial Intelligence with regard to academic writing, and of the need to stay abreast of this rapidly evolving field.

1. Introduction

The history of Educational Technology (EdTech) is frequented with promises of the Next Big Thing. On some occasions we stop and reflect upon such developments from a retrospective point of view and consider how impactful they really were (Weller, 2020); on others we adopt a forward-looking perspective and ask “what might the future look like” for this field (Brown, Costello, & Donlon, 2021, p. 455). The latest holder of the title of Next Big Thing is Artificial Intelligence (AI) and its use with regard to teaching, learning, assessment, and academic writing (Bozkurt, 2023; O’Dea & O’Dea, 2023). Rudolph, Tan, and Tan (2023), for instance, refer to the “New AI Gold Rush”, while Ghnemmat, Shaout, and Al-Sowi (2022) consider the “Artificial Intelligence Revolution” with regard to Higher Education.

Thus, we decided to bring together a former Next Big Thing with the current one for the purpose of this paper: the concept of Digital Natives as explored through the eyes and use of Artificial Intelligence. Beyond a somewhat serendipitous symmetry, this combination attracted us for several reasons. First, as the domain of higher education is currently in a state of heightened alert and attentiveness regarding the use of AI (Concannon et al., 2023; Rudolph et al., 2023), our own professional context of Initial Teacher Education (ITE) finds itself no less immune to this (Jamal, 2023; Trust, Whalen, & Mouza, 2023). Related to this is that we as teacher educators who work primarily in the area of digital learning find ourselves often confronted with the concept of Digital Natives with regard to the level of academic development (if indeed, any at all) that is warranted regarding pre-service teachers’ use of digital technologies for teaching and learning (Wang & Ko, 2022; Wilson, Hall, & Mulder, 2022) and thus we were particularly interested to see what an AI engine would produce on

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this topic. Thirdly, while some might argue that the “heyday” of the Digital Natives concept has come and gone, it persists to the current day (for instance: Reid, Button, & Brommeyer, 2023; Sa’diyah & Prasetyo, 2023) and thus remains a topic of relevance to us. And finally, as researchers with a growing interest in matters related to AI (Tiernan et al., 2023) and current debates about its usage with regard to academic writing (Bozkurt et al., 2023; Lund et al., 2023), we opted to use this as a space “to develop our own critical AI literacies” and to accept the challenge for this special issue of the *Irish Journal of Technology Enhanced Learning* to “go 'all in' with AI” (Wolf et al., 2023).

Process and Prompts

To do so, we engaged with the free version of ChatGPT (Generative Pre-Trained Transformer) 3.5 for this academic exercise. While the field of Generative AI engines has quickly become a busy one (Rudolph et al., 2023), ChatGPT is among the most well-known (Rasul et al., 2023) and thus we reasoned that the results obtained from its usage would be of particular interest.

All engagement with the AI engine took place in mid-October 2023. We began by submitting an initial request to the AI engine as follows:

Please write an academic paper (2000-2500 words) on the concept of digital natives and how this pertains to teacher education. Please include academic references and a bibliography in APA format.

The engine did indeed accomplish much of this request, but the answer fell far short of the stipulated wordcount of 2000 words (889 words including bibliography). A second request to “*please expand this answer to approximately 2000 words*” met with a polite response (“I apologize for the previous brevity”) and an expanded answer, but still well short (at just over 1200 words) of the requested target. Thus, we opted for a more scaffolded approach, drawing on the concept of “iterative refinement” (Lo, 2023) and the understanding that ChatGPT can build upon earlier answers in the conversation. This resulted instead in a structured set of requests which began with the following:

1. *Please write a short (250-300 words) introduction to an academic paper on the concept of digital natives and how this pertains to teacher education. Please include academic references for key points.*

As hoped, this introduction contained a number of key points (three) that the paper would address, and thus our next three requests were as follows:

2. *Please expand on point 1 from the initial answer in this conversation.*
3. *Please expand on point 2 from the initial answer in this conversation.*
4. *Please expand on point 3 from the initial answer in this conversation.*

Conscious of the fact that we were issuing individual requests with a view to compiling the results into one overall paper, our next requests were aimed at creating greater overall coherence between sections:

5. *Please generate a bridging statement to move between expanded answers for point 1 and point 2.*
6. *Please generate a bridging statement to move between expanded answers for point 2 and point 3.*

To bring our paper to a close, we issued the following two requests:

7. *Please write a short (250-300 words) conclusion for this academic paper.*
8. *Please produce a bibliography, in alphabetical order and using APA referencing, for the academic sources listed in this conversation.*

And finally, we asked for some title suggestions:

9. *Please generate 5 creative titles for this academic paper.*

The next section presents the results of this academic experiment. All content has been generated by ChatGPT-3.5, with the sections copied and pasted into position as per the structure outlined above. A very small amount of content has been removed by the authors to reduce some repetition, although we opted to leave most for illustrative purposes. The title was chosen by the authors from the suggestions made by ChatGPT.

2. AI Generated Short Report

Born into Bytes: Teacher Education in the Age of Digital Natives

The emergence of the digital age has transformed the way we interact, learn, and communicate, giving rise to a generation often referred to as "digital natives." Coined by Marc Prensky in 2001, the term "digital natives" describes individuals born into a world saturated with digital technologies, where the Internet, smartphones, and social media have become integral to daily life. As these digital natives enter educational institutions, it raises significant questions about how teaching practices and teacher education programs must adapt to meet their unique needs. This paper explores the concept of digital natives and its implications for teacher education.

Digital natives, typically classified as those born after 1980, exhibit distinct characteristics and preferences when it comes to learning. They are accustomed to instant access to information, multitasking, and interactive media consumption. Their affinity for technology is often seen as a double-edged sword; while they navigate digital environments with ease, there are concerns about the potential drawbacks, such as shortened attention spans and an overreliance on surface-level information (Prensky, 2001).

The traditional approach to teacher education may not fully equip educators to effectively engage and instruct these digital natives. It is imperative for teacher education programs to recognize the evolving landscape of education and adapt accordingly. The pedagogical methods, instructional technologies, and classroom management strategies used in teacher preparation must reflect the characteristics of digital natives to ensure that educators can effectively connect with and instruct the students of the digital age.

This paper will delve into the following key areas:

1. Understanding the digital native generation, including their characteristics, behaviors, and technological preferences (Bennett, Maton, & Kervin, 2008).
2. Analyzing the challenges and opportunities that digital natives present to the field of education, particularly teacher education (Helsper & Eynon, 2010).
3. Exploring innovative approaches and best practices in teacher education to address the needs of digital natives, including the integration of digital technologies, personalized learning, and 21st-century skills development (Koehler & Mishra, 2009).

As we navigate the complexities of modern education, it is essential to adapt teacher education programs to cater to the digital native generation. By doing so, we can bridge the gap between traditional teaching methods and the evolving needs and expectations of today's learners, ultimately fostering a more effective and engaging educational experience.

Understanding the Digital Native Generation

The term "digital natives" was initially introduced by Marc Prensky in 2001 to describe a generation born and raised in a digitalized world. This cohort is now coming of age and entering educational institutions, bringing with them a distinct set of characteristics, behaviors, and technological preferences that have important implications for both educators and teacher education programs.

1. Characteristics:

Digital natives exhibit several key characteristics that distinguish them from previous generations. They are often tech-savvy, possessing an innate comfort with various digital devices and technologies. Growing up in an era of rapid technological advancement, they have a high degree of digital literacy, enabling them to navigate and adapt to new digital tools with ease. Moreover, digital natives tend to be highly connected, with online communication and social media being integral to their social lives. These characteristics influence the way they access and process information, interact with peers, and engage with educational content (Prensky, 2001).

2. Behaviors:

Digital natives often demonstrate behaviors shaped by their technological upbringing. They are more inclined to engage in multitasking, switching between various digital activities seamlessly. This propensity for multitasking can affect their attention spans, as they are accustomed to rapidly shifting their focus between different stimuli. Additionally, they frequently prefer visual and interactive content over traditional text-based materials. These behaviors can pose challenges for educators in terms of maintaining students' focus and delivering effective instruction (Palfrey & Gasser, 2008).

3. Technological Preferences:

Digital natives have strong technological preferences, often gravitating towards platforms and devices that offer instant access to information and enable interactive learning experiences. They are more likely to use mobile devices, tablets, and laptops for educational purposes. Their preference for video, multimedia, and gamified content means that traditional teaching methods may not resonate with them as effectively as more interactive and visually stimulating approaches (Bennett, Maton, & Kervin, 2008).

Understanding these characteristics, behaviors, and technological preferences of digital natives is crucial for educators and teacher education programs. To effectively engage and instruct this generation, teachers must adapt their pedagogical methods, incorporating technology, interactive content, and strategies to maintain attention in an increasingly distracted world. Teacher education programs, therefore, need to equip future educators with

the knowledge and skills to meet the unique needs of digital natives, ensuring that they can deliver relevant and effective instruction in today's digital age.

Having delved into the characteristics, behaviors, and technological preferences of digital natives in the previous discussion, it is clear that these attributes have profound implications for education. Understanding these aspects is a critical first step for educators and teacher education programs to effectively engage and instruct digital natives. Moving forward, we will explore the challenges and opportunities that arise when digital natives enter educational settings, shedding light on how these characteristics can be harnessed or mitigated for the benefit of both students and educators.

Challenges and Opportunities

The presence of digital natives in educational settings offers both challenges and opportunities for educators and teacher education programs. Understanding these aspects is vital to adapting and enhancing the quality of teacher preparation.

a. **Challenge: Shortened Attention Spans** - Digital natives tend to have shorter attention spans due to their exposure to short, quick, and engaging online content. This challenge means that educators may face difficulties in sustaining students' focus during lectures and traditional classroom activities. To address this issue, teacher education programs should emphasize the development of active learning strategies that encourage student participation, frequent interactions, and varied activities, such as group discussions and problem-solving exercises (Helsper & Eynon, 2010).

b. **Challenge: Information Overload** - Digital natives are constantly bombarded with vast amounts of information from multiple sources. Distinguishing between credible and inaccurate sources can be a significant challenge for them. Teacher education programs can play a critical role in enhancing digital literacy skills, teaching students how to critically evaluate online sources, and fostering media literacy to navigate the information-rich digital landscape (Livingstone, 2010).

c. **Opportunity: Digital Fluency** - Digital natives have a high level of digital fluency and adaptability. They often require minimal guidance to use various digital tools for learning. Teacher education programs can leverage this fluency by integrating technology into the curriculum, encouraging the creation of digital learning materials, and promoting innovative teaching methods that harness the potential of digital platforms for personalized and interactive learning (Koehler & Mishra, 2009).

d. **Opportunity: Collaborative Learning** - Digital natives are accustomed to communication and collaboration through online platforms and social media. This offers an opportunity for educators to create collaborative learning environments where students can engage in peer-to-peer knowledge sharing, problem-solving, and project-based work. Teacher education programs should equip future educators with the skills to facilitate and manage these collaborative learning experiences (Palfrey & Gasser, 2008).

e. **Challenge: Digital Distraction** - Digital natives are often susceptible to digital distractions, such as social media or notifications during class. Balancing the integration of technology in education with managing these distractions is a key challenge. Teacher

education programs should provide strategies for mitigating these distractions and promoting digital responsibility and mindfulness in the classroom (Junco & Cotten, 2012).

In conclusion, the presence of digital natives in educational contexts presents both challenges and opportunities. Teacher education programs need to address these challenges by equipping future educators with the skills and strategies to engage students effectively, manage digital distractions, and foster critical thinking. Simultaneously, they should harness the opportunities presented by digital fluency and collaborative learning, enabling educators to create enriching and interactive learning environments that resonate with the characteristics and preferences of digital natives.

Having thoroughly examined the challenges and opportunities posed by digital natives in education, it's evident that adapting to this unique generation of students is paramount for the effectiveness of educational practices. As we transition to the next segment of this discussion, we'll explore innovative approaches and best practices in teacher education. These approaches are essential to equip educators with the skills and knowledge needed to bridge the gap between traditional teaching methods and the evolving needs of digital natives in today's educational landscape.

Innovative Approaches and Best Practices in Teacher Education

To effectively prepare teachers for the challenges and opportunities presented by the digital native generation, teacher education programs should consider and implement innovative approaches and best practices.

a. Integration of Digital Technologies:

- **Blended Learning Models:** Teacher education programs can adopt blended learning models that combine traditional classroom instruction with online learning resources. This approach allows future educators to experience technology-integrated teaching firsthand and learn how to seamlessly blend digital tools into their lessons (Graham, 2013).
- **Educational Technology Courses:** Offering courses focused on educational technology is crucial. These courses can teach future educators how to leverage digital tools, such as Learning Management Systems (LMS), video conferencing platforms, and educational apps, to enhance student engagement and improve instructional effectiveness (Roblyer & Edwards, 2000).
- **Professional Development:** Continuous professional development for educators on the effective use of technology in the classroom is essential. Teacher education programs should incorporate training that helps teachers stay updated on the latest educational technologies and how to integrate them into their pedagogical practices (Koehler & Mishra, 2009).

b. Personalized Learning:

- **Differentiated Instruction:** Teacher education programs should emphasize the importance of differentiated instruction, which tailors lessons to meet individual

student needs. By understanding the diverse learning preferences and abilities of digital natives, educators can design lessons that cater to each student's strengths and weaknesses (Tomlinson, 2000).

- **Student-Centered Approaches:** Encouraging student-centered teaching practices is vital. These approaches empower students to take control of their learning, fostering independence and self-directed learning, which resonates well with digital natives who are accustomed to having information at their fingertips (Bonwell & Eison, 1991).
- **Project-Based Learning:** Emphasizing project-based learning can engage digital natives in authentic, real-world problem-solving experiences. This approach enables them to apply their digital skills and creativity to meaningful projects, which enhances their 21st-century skills (Barron & Darling-Hammond, 2008).

c. 21st-Century Skills Development:

- **Critical Thinking and Problem-Solving:** Teacher education programs should focus on developing critical thinking skills among future educators. These skills are essential for guiding digital natives through information-rich, complex digital environments (Partnership for 21st Century Skills, 2007).
- **Digital Literacy:** Teachers should be proficient in digital literacy, which includes the ability to critically evaluate online information, understand online safety and ethics, and navigate digital tools effectively. This skill is crucial for guiding digital natives safely and responsibly in the digital world (Ribble, Bailey, & Ross, 2004).
- **Communication and Collaboration Skills:** Promoting effective communication and collaboration skills is important. Digital natives are accustomed to working in virtual teams and social networks, making it essential for educators to foster these skills to prepare students for the 21st-century workforce (Trilling & Fadel, 2009).

Incorporating these innovative approaches into teacher education programs can empower future educators to effectively engage and instruct digital natives. By integrating digital technologies, promoting personalized learning, and emphasizing 21st-century skills, teacher education can bridge the gap between traditional teaching methods and the evolving needs and expectations of today's learners.

Conclusion

The emergence of the "digital native" generation has marked a transformative era in education, requiring a fundamental shift in teaching methodologies and teacher education programs. In this academic paper, we have explored the multifaceted dimensions of digital natives and their implications for teacher education.

Understanding the unique characteristics, behaviours, and technological preferences of digital natives is foundational. This generation's high digital literacy, multitasking capabilities, and preference for visual and interactive content creates a distinct learning environment. To effectively engage and instruct digital natives, educators must bridge the gap between traditional teaching methods and their evolving needs.

The challenges digital natives present in education are significant, with shortened attention spans, information overload, and digital distractions posing hurdles. Yet, these challenges also bring opportunities. Leveraging digital fluency and collaborative tendencies can create dynamic, interactive learning experiences.

To address these challenges and harness opportunities, innovative teacher education practices are imperative. Integrating digital technologies, emphasizing personalized learning, and developing 21st-century skills equip educators to navigate the evolving educational landscape. Differentiated instruction, student-centered approaches, and project-based learning are instrumental in catering to the diverse learning preferences of digital natives.

As we navigate this digital age, it becomes evident that teacher education programs play a pivotal role in preparing educators to meet the evolving needs of digital natives. By understanding their unique traits, addressing the challenges, and harnessing the opportunities, teacher education programs can create engaging, effective educational experiences that bridge the digital-native divide. This paper emphasizes the urgency of reimagining teacher education to ensure it remains relevant and impactful in the digital era, ultimately benefitting both educators and the students they teach.

Bibliography

1. Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Educational Technology*, 39(5), 775-786.
2. Hinsch, C. (2013). "Digital Natives" – Challenges for teachers. *Procedia-Social and Behavioral Sciences*, 93, 1354-1357.
3. Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, 36(3), 503-520.
4. Junco, R., & Cotten, S. R. (2012). No A 4 U: The relationship between multitasking and academic performance. *Computers & Education*, 59(2), 505-514.
5. Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6.
6. Rosen, L. D. (2012). *iDisorder: Understanding our obsession with technology and overcoming its hold on us*. St. Martin's Press.
7. Barron, B., & Darling-Hammond, L. (2008). Teaching for meaningful learning: A review of research on inquiry-based and cooperative learning. *Book for the NRC Committee on How People Learn II*.
8. Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.
9. Livingstone, S. (2010). Digital natives: A myth? In *Education policy* (pp. 200-208). Springer.
10. Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. Basic Books.
11. Roblyer, M. D., & Edwards, J. (2000). *Integrating educational technology into teaching* (2nd ed.). Prentice Hall.

12. Partnership for 21st Century Skills. (2007). *Framework for 21st Century Learning*. P21. [Online] Available at: <http://www.p21.org/our-work/p21-framework> [Accessed on 12th October 2023].
13. Ribble, M., Bailey, G., & Ross, T. W. (2004). Digital citizenship: Addressing appropriate technology behavior. *Learning & Leading with Technology*, 32(1), 6-11.
14. Tomlinson, C. A. (2000). Reconcilable differences: Standards-based teaching and differentiation. *Educational leadership*, 58(1), 6-11.
15. Trilling, B., & Fadel, C. (2009). *21st Century Skills: Learning for Life in Our Times*. Wiley.

3. Critical Reflection

It took approximately ninety minutes to produce the above section. Much of this time was spent experimenting with prompts and arriving at the realisation that we would need to use a scaffolded set of prompts rather than one single one, and then compiling these in advance into a Google Doc. Once we had our prompt strategy clear, the prompts were copied and pasted into ChatGPT in order. Things moved swiftly at that point, with the resultant content being produced in less than ten minutes. The final stage of copy-and-pasting the content into a word processor also happened quickly (helped considerably by prompts 5 and 6 to “generate bridging statements”) with a final few minutes to fix some minor formatting issues and the manual removal of a small amount of duplication.

There are a number of aspects of the “paper” that we responded to positively and consider the AI engine got “right”. To begin with, the overall quality of writing (on a mechanical level) that it produced was of a good standard; the writing was predominantly error-free in terms of spelling, grammar, and punctuation, and even included the Oxford (or serial) comma, which is an often-overlooked requirement for APA style (American Psychological Association, 2020). The spelling was American English but we had not specifically requested any other dialect.

Citation Investigation

One aspect that we were particularly curious about was the academic references that the AI engine proposed, as we were familiar with the concept of “hallucinations” with regard to Generative AI in terms of either outright fabrication of references or employing valid references in the wrong context (Athaluri et al., 2023; Emsley, 2023). Thus, we were pleasantly surprised to find that most of the references proposed by the AI engine are actual sources (we verified them against Google Scholar, which took approximately 20 minutes) and that these were, for the most part, employed in an appropriate context. While they may not necessarily have been the one(s) that we personally would have chosen for each case, we considered that the AI engine did a credible job in this regard. In particular, it included the key source of Prensky’s foundational work on the topic of Digital Natives (2001), the well-recognised “critical review of the evidence” by Bennett, Maton, and Kervin (2008) and the “where is the evidence” critique by Helsper and Eynon (2010), as well as Koehler and Mishra’s widely-employed TPACK framework (2009) with regard to ITE.

We did however note that the references were, generally speaking, somewhat dated, with most in excess of ten years since publication (also on one occasion a book by Robler and Edwards - 2nd edition, 2000 - was cited, while more recent editions of this work exist). A follow-up prompt to ChatGPT (“*can you provide some recent references, please?*”) returned an apologetic response from the engine that “I do not have access to real-time databases or the internet to provide recent references. My knowledge is based on information available up to September 2021”. A final attempt to address this limitation was to ask ChatGPT “*do you have any in the date range 2018-2021, please?*”, and this did indeed result in five newer references (“Certainly, I can provide you with some references within the 2018-2021 date range that are relevant to the issue of digital natives and teacher education”). Why it did not include some of these more recent references to begin with, we are not sure.

Our final observation on the references relates to the bibliography that ChatGPT produced. Structurally, the individual journal article references were appropriately formatted, and even employed italics where relevant, although they did not include DOIs. However, the bibliography was numbered and not in alphabetical order. Nevertheless, these are relatively minor issues that could (and would) be addressed quickly with manual intervention. Of larger concern is that the bibliography did not include some of the in-text citations from the body of the text, such as Graham (2013) and Bonwell and Eison (1991). It is unclear why some references were missed while most were included.

Quality Considerations

With regard to the overall quality of the body of text produced by ChatGPT, we consider this to be a reasonable, but largely uncritical, account of the concept of Digital Natives and the perceived implications of this for ITE, although certainly it is reflective of a number of the arguments that we have encountered in both our professional and research capacities (particularly some of the less robust assertions). In retrospect we did not specifically ask for a critical account of the concept and issues, and a subsequent request for critiques and limitations of the concept did return a more critical overview. We take this, along with our earlier observation about date range for sources, as further learning and evidence of the importance of employing accurate and prescriptive prompts when using a chatbot such as ChatGPT (Bozkurt, 2023) and would place a higher emphasis on this “prompt engineering” (Giray, 2023) if undertaking the task again.

Conclusion

As we come to the end of this academic experiment, we are struck by a number of implications for scholarship and academic writing. Certainly we have found this to be an illuminating process with regard to why AI is the subject of such attention in academia (Bozkurt et al., 2023; Concannon et al., 2023). In particular we were struck by its potential for certain individual components of an academic paper, such as the introduction and conclusion, and the title. While we would not necessarily conclude (based solely on this initial endeavour) that the AI engine would write a ready-to-go, start-to-finish academic paper of high standard without manual intervention, we can certainly see how it could be used to initiate, construct, or augment certain aspects of it, or to generate an initial outline for a paper or a first draft (Gordijn & Have, 2023).

We are cognisant of the fact that we used the “free” version of ChatGPT (3.5) and that ChatGPT-4.0 currently exists on a paid-for basis, with the release of GPT-5 now appearing imminent (Medium, 2023), both of which are/will be more powerful than the version we used

in our experiment. In addition, there are many other AI engines (Khan, 2023) being explored for use in higher education (Rudolph et al., 2023), with some researchers opting to combine or compare the functionality of engines to enhance results (Mallio et al., 2023; Roos et al., 2023). All indications are, therefore, that the AI juggernaut shows no signs of slowing any time soon (Schöbel et al., 2023). As teachers, researchers, and scholars, we must continue to watch this space and endeavour to stay abreast of these developments as they unfold (Rasul et al., 2023).

References

- American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). American Psychological Association.
- Athaluri, S. A., Manthena, S. V., Kesapragada, V. S. R. K. M., Yarlagadda, V., Dave, T., & Duddumpudi, R. T. S. (2023). Exploring the boundaries of reality: Investigating the phenomenon of artificial intelligence hallucination in scientific writing through ChatGPT references. *Cureus*, 15(4), e37432. <https://doi.org/10.7759/cureus.37432>
- Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, 18(1), 198–204. <http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/718>
- Bozkurt, A., Xiao, J., Lambert, S., Pazurek, A., Crompton, H., Koseoglu, S., Farrow, R., Bond, M., Nerantzi, C., Honeychurch, S., & Others. (2023). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. *Asian Journal of Distance Education*, 18(1), 53–130. <https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/709>
- Brown, M., Costello, E., & Donlon, E. (2021). Digital education as social practice: Major trends shaping online learning futures. *Rivista Di Digital Politics*, 1(3), 455–484. <https://www.rivisteweb.it/doi/10.53227/103800>
- Concannon, F., Costello, E., Farrell, O., Farrelly, T., & Wolf, L.G. (2023). There's an AI for that: Rhetoric, reality, and reflections on EdTech in the dawn of GenAI. *Irish Journal of Technology Enhanced Learning*, 7(1). <https://doi.org/10.22554/ijtel.v7i1.116>
- Emsley, R. (2023). ChatGPT: These are not hallucinations – they're fabrications and falsifications. *Schizophrenia*, 9(1), 52. <https://doi.org/10.1038/s41537-023-00379-4>
- Ghnemat, R., Shaout, A., & Al-Sowi, A. M. (2022). Higher education transformation for artificial intelligence revolution: Transformation framework. *International Journal of Emerging Technologies in Learning*, 17(19), 224–241. <https://doi.org/10.3991/ijet.v17i19.33309>
- Giray, L. (2023). Prompt engineering with ChatGPT: A guide for academic writers. *Annals of Biomedical Engineering*, 51(12), 2629–2633. <https://doi.org/10.1007/s10439-023-03272-4>
- Gordijn, B., & Have, H. T. (2023). ChatGPT: Evolution or revolution? *Medicine, Health*

- Care, and Philosophy*, 26(1), 1–2. <https://doi.org/10.1007/s11019-023-10136-0>
- Jamal, A. (2023). The role of Artificial Intelligence (AI) in teacher education: Opportunities & challenges. *International Journal of Research and Analytical Reviews*, 10(1), 139–146. http://ijrar.org/viewfull.php?&p_id=IJRAR23A2629
- Khan, U. A. (2023). The unstoppable march of artificial intelligence: The dawn of large language models. *eSignals Pro*. <http://urn.fi/URN:NBN:fi-fe2023080994491>
- Lo, L. S. (2023). The art and science of prompt engineering: A new literacy in the information age. *Internet Reference Services Quarterly*, 27(4), 203–210. <https://doi.org/10.1080/10875301.2023.2227621>
- Lund, B. D., Wang, T., Mannuru, N. R., Nie, B., Shimray, S., & Wang, Z. (2023). ChatGPT and a new academic reality: Artificial Intelligence-written research papers and the ethics of the large language models in scholarly publishing. *Journal of the Association for Information Science and Technology*, 74(5), 570–581. <https://doi.org/10.1002/asi.24750>
- Mallio, C. A., Sertorio, A. C., Bernetti, C., & Beomonte Zobel, B. (2023). Large language models for structured reporting in radiology: Performance of GPT-4, ChatGPT-3.5, Perplexity and Bing. *La Radiologia Medica*, 128(7), 808–812. <https://doi.org/10.1007/s11547-023-01651-4>
- Medium. (2023, September 29). *GPT-5 release dates & mind-blowing new features in ChatGPT you can use NOW!* Medium. <https://medium.com/@trendingAI/gpt-5-release-dates-mind-blowing-new-features-in-chatgpt-you-can-use-now-572fdfc2a460>
- O’Dea, X., & O’Dea, M. (2023). Is artificial intelligence really the next big thing in learning and teaching in higher education? A conceptual paper. *Journal of University Teaching & Learning Practice*, 20(5). <https://doi.org/10.53761/1.20.5.05>
- Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, 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 & Teaching*, 6(1), 41–56. <https://doi.org/10.37074/jalt.2023.6.1.29>
- Reid, L., Button, D., & Brommeyer, M. (2023). Challenging the myth of the digital native: A narrative review. *Nursing Reports*, 13(2), 573–600. <https://doi.org/10.3390/nursrep13020052>
- Roos, J., Kasapovic, A., Jansen, T., & Kaczmarczyk, R. (2023). Artificial intelligence in medical education: Comparative analysis of ChatGPT, Bing, and medical students in Germany. *JMIR Medical Education*, 9, e46482. <https://doi.org/10.2196/46482>
- Rudolph, J., Tan, S., & Tan, S. (2023). War of the chatbots: Bard, Bing Chat, ChatGPT, Ernie and beyond. The new AI gold rush and its impact on higher education. *Journal of Applied Learning & Teaching*, 6(1), 364–389. <https://doi.org/10.37074/jalt.2023.6.1.23>

- Sa'diyah, H., & Prasetyo, W. H. (2023). Digital native teacher vs digital immigrant teacher: A systematic literature review and research agenda. *Proceedings of the International Conference on Learning and Advanced Education (ICOLAE 2022)*, 902–916. https://doi.org/10.2991/978-2-38476-086-2_77
- Schöbel, S., Schmitt, A., Benner, D., Saqr, M., Janson, A., & Leimeister, J. M. (2023). Charting the evolution and future of conversational agents: A research agenda along five waves and new frontiers. *Information Systems Frontiers*. <https://doi.org/10.1007/s10796-023-10375-9>
- Tiernan, P., Costello, E., Donlon, E., Parysz, M., & Scriney, M. (2023). Information and media literacy in the age of AI: Options for the future. *Education Sciences*, 13(9), 906. <https://doi.org/10.3390/educsci13090906>
- Trust, T., Whalen, J., & Mouza, C. (2023). ChatGPT: Challenges, opportunities, and implications for teacher education. *Contemporary Issues in Technology and Teacher Education*, 23(1), 1–23. <https://www.learntechlib.org/p/222408>
- Wang, P., & Ko, J. (2022). ICT competency and practicum of preservice teachers as digital natives: A mixed-method study. *Asia Pacific Journal of Education*, 1–16. <https://doi.org/10.1080/02188791.2022.2083581>
- Weller, M. (2020). *25 years of ed tech*. Athabasca University Press. <https://www.aupress.ca/books/120290-25-years-of-ed-tech/>
- Wilson, M. L., Hall, J. A., & Mulder, D. J. (2022). Assessing digital nativeness in pre-service teachers: Analysis of the digital natives assessment scale and implications for practice. *Journal of Research on Technology in Education*, 54(2), 249–266. <https://doi.org/10.1080/15391523.2020.1846146>
- Wolf, L.G., Farrell, O., Concannon, F., & Farrelly, T. (2023, September 18). *Irish Journal of Technology Enhanced Learning (IJTEL) Special Issue Call: The Games People Play: Exploring Technology Enhanced Learning Scholarship & Generative Artificial Intelligence*. Irish Learning Technology Association (ILTA). <https://journal.ilta.ie/index.php/telji/announcement/view/2>