

UNDERSTANDING ACADEMIC LITERACY FACILITATORS' PERCEPTIONS OF CHATGPT THROUGH FRAMING THEORY

S. Brokensha

Department of English and Interdisciplinary Centre for Digital Futures

The Humanities

University of the Free State

Bloemfontein, South Africa

<https://orcid.org/0000-0001-6166-3981>

M. Brooks

Department of English

The Humanities

University of the Free State

Bloemfontein, South Africa

ABSTRACT

Currently, ChatGPT (Generative Pre-training Transformer) causes disruption in sectors that run the gamut from retail and marketing to journalism and healthcare. This chatbot also affects higher education, with scholars either extolling its potential or accentuating its pitfalls. Advantages of early adoption of ChatGPT include fostering students' self-directed learning and developing their research skills, while disadvantages mainly reflect educators' concerns that it may harm the integrity of online examinations and make it difficult, if not impossible, to detect plagiarism. To determine educators' perceptions with respect to the nature and application of ChatGPT in the context of students' academic writing, this study conducted focus-group discussions with academic literacy facilitators from a South African tertiary institution. Working within a qualitative research paradigm and employing thematic analysis as a broad methodological approach, discussions were analysed using framing theory. The latter is a sociological concept based on the notion that a phenomenon exhibits myriad values, given that it is perceived through different frames that, in turn, impact the choices people make about that phenomenon. Understanding how educators perceive the nature of ChatGPT and to what extent they accept it paves the way towards challenging unrealistic expectations about ChatGPT's human-like capabilities and addressing the ethical concerns that educators may have about its deployment in the writing classroom.

Keywords: academic literacy, ChatGPT, framing theory, sociology, technological frames

INTRODUCTION

ChatGPT (Generative Pre-training Transformer) is a conversational chatbot launched by OpenAI in 2022 that yields human-like text using natural language processing. Currently, this chatbot is generating both disquiet and enthusiasm among potential users, depending on whether its application is framed in utopian or dystopian terms. If ChatGPT itself is to be believed, “[it] is fine-tuned to generate conversational responses, making it suitable for tasks like answering questions, holding conversations, and assisting with various text-based activities”. At present, little is known about higher education practitioners’ understandings of this tool in the South African context. To address the lacuna, this exploratory study investigates perceptions of ChatGPT by (potential) early adopters, focusing on academic literacy facilitators’ views in the context of the teaching and learning of L2 (second language) writing at a South Africa university. Employing framing theory and specifically technological frames analysis, the research questions are as follows: “(i) “How do academic facilitators perceive the nature of ChatGPT?” (ii) “How do academic facilitators perceive using ChatGPT now and in the future in their teaching and learning contexts?” (iii) “What are academic facilitators’ perceptions of ChatGPT’s benefits and risks in their teaching and learning contexts?” Though questions (ii) and (iii) overlap, each has a distinctive focus, with (ii) emphasising strategies that could be employed to ameliorate the tool’s risks while enhancing its benefits. Before outlining the methodology employed to answer these questions, we consider the evolution of technology-enhanced writing tools as well as recent studies that interrogate ChatGPT’s affordances and risks in the field of writing. We also elucidate framing theory to demonstrate its suitability as an analytical lens through which to examine educators’ perceptions of the tool.

LITERATURE REVIEW

Technology-enhanced (L2) writing

Strategies that exploit technology-enhanced L2 writing in higher education are by no means new. These strategies include Wiki-based collaborative writing (Chao and Lo 2011; De Wever et al. 2015), WebQuest writing instruction (Ebadi and Rahimi 2018), and corpus-based writing assistants (Chang et al. 2008; Bellino and Bascuñán 2020), to name a few. In recent years, technological advancements have enabled the deployment of AI-based tools in the teaching of writing, with Ginger, Grammarly, and QuillBot being prevalent (cf. Ho 2022). Use of such tools has, however, been met with mixed reviews. Wiki-based writing, for example, may help learners enhance the structure and organisation of their writing as it provides a means for learners to collaboratively generate and edit content by way of a Wiki platform (Oskoz and

Elola 2010). Yet such platforms have been reported to be deficient with respect to improving elements of academic writing such as language and content (Hsu 2019). A WebQuest provides specific building blocks that learners employ in order to complete certain tasks. The WebQuest approach may foster both writing and critical thinking skills, given that it scaffolds the analysis, synthesis, and evaluation of information (Al-Shamisi 2016). However, some of its weaknesses pertain to locating credible Internet sources suited to a given activity and assuming that learners are sufficiently proficient in English to conduct effective searches (cf. Amini, Asgari, and Asgari 2020). A corpus-based approach to writing, such as WriteBetter, shows learners how lexical items function in authentic contexts (Bellino and Bascuñán 2020). Nevertheless, this approach first developed by Johns (1986) accommodates a specific type of learner – an adult who is “well motivated: a sophisticated learner” (Johns 1986, 161), as it were. Turning to AI-driven tools, which are useful for generating instant corrective feedback (cf. Alharbi 2023), limitations include providing inaccurate and surface-level commentary, as is the case when Grammarly is employed (Nova 2018; Javier 2022), and producing ungrammatical structures and spelling errors in the case of Quillbot (Rakhmanina and Serasi 2022).

Currently, educators are grappling with ChatGPT, a new generation chatbot that has sparked heated debate among scholars since its 2022 launch, with early research studies in the fields of student writing and scientific research writing questioning whether it is academia's ally or enemy.

Perceptions of ChatGPT with respect to student writing and academic publishing

A plethora of studies focusing on ChatGPT's affordances and limitations in higher education have been published since 2022. Research that explores educators' and students' perceptions of this tool is appearing too, albeit it on a smaller scale (cf. Shoufan 2023). Firat (2023), for instance, has employed thematic content analysis to investigate students' and scholars' perceptions of the chatbot, concluding that both groups generally exhibit positive sentiment towards it, although aspects related to assessment, ethics, and literacy on the digital dimension need to be addressed. Other studies that employ thematic analysis (e.g., Shoufan 2023), case studies (e.g., Tlili et al. 2023), content analysis (e.g., Limna et al. 2023), or mixed methods research (e.g., Bonsu and Baffour-Koduah 2023) to investigate attitudes towards ChatGPT also report a more positive outlook rather than negative sentiment. Adverse facets of the tool as observed by these researchers relate to its potential to diminish students' motivation to learn, its lack of currency owing to the fact that the information it generates predates 2022 (Bonsu and

Baffour-Koduah 2023), errors and biases in the tool's training data (Limna et al. 2023), and possible reductions in students' critical thinking (Tlili et al. 2023). Several studies report a mix of positive and negative attitudes related to ChatGPT's nature and affordances (Baidoo-Anu and Ansah 2023; Mogavi et al. 2023). A few studies specifically investigate ChatGPT's advantages and pitfalls with respect to academic writing skills and scientific research writing. In the context of teaching argumentation, some initial concerns focus on ethics and intelligence. Regarding the former, Su, Lin, and Lai (2023, 9) observe that ChatGPT may be useful for scaffolding elements of argumentative writing related to structure and language. Nonetheless, these scholars identify ChatGPT's inability to correctly reference externally sourced materials and its generation of biased texts as significant challenges. As for the latter, and citing work by Thorp (2023), these authors note that the chatbot may reflect flaws in reasoning, given its potential to construct fabricated or inaccurate information based on users' somewhat vague or ambiguous prompts (Su et al. 2023, 10). Such issues are not unique to argumentative writing classrooms and have been explicitly or tangentially considered in relation to second language writers (Warschauer et al. 2023), business English writing (Kim, Shim and Shim 2023), scientific writing for researchers (Currie 2023), and legal writing (Romig 2023). Several studies are dedicated to examining ChatGPT and risks around plagiarism in the contexts of student writing and academic publishing (Anders 2023; Khalil and Er 2023; King and ChatGPT 2023). With the exception of the publication by Romig (2023), the studies listed here focus on ChatGPT's technical affordances. What is missing from current research are the voices of educators. In addition, and to the best of our knowledge, there are currently no studies that have explored academic literacy instructors' perceptions of ChatGPT in the South African context.

Utilising framing theory to understand perceptions of ChatGPT

Examining literacy instructors' perceptions is critical, as these perceptions influence the pedagogical practices they choose to adopt. Since AI goes through constant iterations at rapid speed, it is necessary to keep "checking in" (Gallacher et al. 2018, 70) with these iterations, allowing educators to become more circumspect about what this tool means for pedagogy, human creativity, decision-making, and the like. To understand perceptions of ChatGPT, framing theory works well, given that "[to] frame is to select some aspects of a perceived reality and make them more salient in a communicating text" (Entman 1993, 52). It is this salience that influences conceptualisations, causes, assessments, and treatments of phenomena or events (Entman 1993, 52). Since ChatGPT is novel, academics such as those who operate in the field of literacy have few cues or locations they can draw on to understand its attributes and

consequences, where cues or locations include “the communicator, the text, the receiver, and the culture” (Entman 1993, 52). At this early stage, and in our own institution, academics receive interpretative cues about ChatGPT based on informal experimentation with the tool in their own classes and through training webinars that focus on its affordances and ethical consequences. Academics are thus secondary rather than primary ChatGPT stakeholders, not only in the sense that they are participating in its deployment rather than enjoying any direct involvement in its design, but also in the sense that they are uncertain about its nature and deployment.

Several studies have been published on the framing of AI by news media outlets, with many reflecting Global North contexts (e.g., Garvey and Maskal 2020; Brennen, Howard, and Nielsen 2022) and a few focusing on Global South perspectives (e.g., Brokensha and Conradie 2021). Overall, these studies report positive sentiment towards AI, although Nguyen and Hekman (2022a) note that journalists' voices have become more critical in recent years. These researchers identify dominant frames used across news media outlets, such as automation, AI weapons, and AI healthcare. Although such studies are significant in that the news frames identified may shape how laypeople perceive AI, these frames “are not objectively ‘mirroring’ reality, since they are highly selective narratives in which the perception of relevance and interpretation of meaning vary between discourse participants” (Nguyen and Hekman 2022b, 61). A more useful framework within which to explore educators' perceptions of ChatGPT is Orlikowski and Gash's (1994) typology of technological frames, which reflects the nature of technology, technology strategy, and technology in use. Technological frames are social in nature because they reflect “the understanding that members of a social group come to have of particular technological artifacts, and they include not only knowledge about the particular technology but also local understanding of specific uses in a given setting” (Orlikowski and Gash 1994, 178). What is useful about this conceptualisation is that it allows for an understanding of people's interpretations of the nature and functions of a given technology's which directly influence its use (Basdogan, Birdwell, and Harris 2022). Orlikowski and Gash's (1994) framework aligns with a socio-technical view that interrogates technology in terms of its societal and ethical impacts. Over the last two decades, the framework has been employed in numerous studies to gain insights into expectations around technologies (e.g., Criado and de Zarate-Alcarazo 2022). Given that the framework foregrounds technology within an organisation, it lacks a focus on AI itself. For this reason, we supplement it with a taxonomy proposed by Jones (2015) which frames AI in terms of artifice, competition, and nature. The combined framework is outlined below.

METHODS

Sample and focus-group discussion arrangements

To determine tertiary educators' perceptions of ChatGPT, one of the researchers conducted focus-group discussions with academic literacy facilitators from a South African university's Centre for Teaching and Learning (CTL). Using purposive sampling and following the university's ethical guidelines, 13 facilitators were recruited for this study. Inclusion criteria comprised (a) being experienced rather than novice teachers of academic writing for ESL (English as a second language) students and (b) having scant to no familiarity with ChatGPT. We excluded facilitators with little experience in the teaching of writing as we wished to glean insights into the affordances and pitfalls of this tool from educators with a nuanced understanding of the teaching and learning of academic writing. Further, we selected participants who had either limited or no knowledge of ChatGPT as we wanted to explore their initial impressions thereof as (potential) early adopters with a view to having them re-visit these impressions in a future study when they will have gained more experience in its deployment.

In the pre-discussion phase, participants were asked to read two South African news articles from the *Daily Maverick*. The first article was titled "ChatGPT is an amazing and exciting tool for teachers willing to surf the wave" (Russell 2023), while the second was titled "Real danger of ChatGPT lies in its robbing us of our ability to read and research critically" (Sparks 2023). We were concerned that providing participants with some literature on ChatGPT would influence their responses during the discussions. However, given that the technology is nascent, it was deemed necessary to introduce participants to general themes around the tool to stimulate engagement. This pre-discussion phase substituted engagement questions, which may be defined as icebreakers that allow the given participants to become more familiar with a phenomenon they are uncertain about (cf. Purvis et al. 2020).

Using Blackboard Collaborate as a discussion platform, participants were divided into four groups, with the largest groups comprising four to five participants and the smallest two. Two participants is not an ideal size for a focus-group discussion, but we were bound by the participants' teaching schedules and marking loads. Each 50-minute discussion held via Blackboard Collaborate Ultra was audio recorded and meticulously transcribed by one of the researchers. Some participants chose to post chat messages which were either read out loud by the researcher or captured in the form of screenshots, given that Blackboard Collaborate does not record written messages. Although generating transcripts via automatic transcription software such as *NVivo*, *Sonix* or *Whisper* would have eliminated a time-consuming task, human-generated transcripts were deemed to be superior for two reasons. First, there are ethical implications that pertain to data protection when software is used: while some automated

transcription services have the type of encryption that safeguards data from privacy breaches, others operate in the cloud, making any data transcribed easily accessible to others. Second, the quality of automated transcripts might be poor and thus useful only in so far as they help researchers navigate specific sections in the transcripts with a view to coding data (Weir, Becker, and Blair 2023).

The unit of analysis in the transcripts was each participant's answer to either the questions posed or their fellow participants' responses, as long as the answer was related to the discussion questions asked. Each answer was classified according to the coding schemes developed by Orlikowski and Gash (1994) and Jones (2015). As the analysis is qualitative and thus subjective in nature, both researchers coded the data independently of one another before discussing differing interpretations. Any dissonance on the descriptive was resolved through exhaustive analysis at the interpretive level (cf. Vogl, Schmidt, and Zartler 2019).

Discussion questions posed

The main exploratory questions were as follows:

- How familiar are you with ChatGPT or similar AI language models and have you used it/them in your teaching or any other context?
- What do you think are the potential benefits of using ChatGPT in an educational setting?
- What concerns do you have regarding the use of ChatGPT in the classroom?

Additional exploratory questions asked in the context of writing were as follows:

- What is human creativity as opposed to AI creativity?
- Are you familiar with AI hallucination?
- Are you familiar with AI's black box problem?

Last three questions were posed to gain insights into participants' understandings of ChatGPT's architecture. AI hallucinations and the black box conundrum constitute particular obstacles with respect to placing trust in the technology: the former describes the tool's tendency to produce fabricated information, while the latter designates the opaqueness of its inner workings and processes.

All six questions are exploration questions since they are related to the study's three research questions (Masadeh 2012). Throughout each discussion, clarifying questions were

posed in cases where responses required elaboration. These included questions such as “Tell me more” and “Explain that a little bit more; I’m quite keen to hear what you say”. At the end of each session, an exit question (“Is there anything else that you would like to add?”) was asked to establish a final opportunity for participants to generate additional comments (cf. Purvis, Rodger, and Beckingham, 2020).

Analytical framework

Participants’ responses were analysed in terms of the existing typologies referenced in the previous section, making this a deductive content analysis (Zhang and Wildemuth 2009). These typologies, which may overlap, are summarised in Table 1 below.

Table 1. Technological taxonomies

Orlikowski and Gash’s (1994) technological frames	
Nature of technology	Reflects individuals’ understandings of a technology’s current/future capabilities
Technology strategy	Refers to individuals’ views as to why their particular organisation has adopted/will adopt a technology
Technology in use	Describes “people’s understanding of how the technology will be used on a day-to-day basis” (Orlikowski and Gash (1994, 183-184) and what its consequences may be
Jones’ (2015) AI frames	
Artifice	Describes AI as an inexplicable technology that may surpass human intelligence
Competition	Frames AI as a threat to humanity
Nature	Reflects people’s (romantic/anthropomorphic) descriptions of AI’s nature

With respect to Orlikowski and Gash’s (1994) conceptualisation, it is useful to gain insights into how individuals within an organisation frame the nature of technology: users of a given technology may experience difficulties appropriating and employing it correctly in instances where they lack understanding about its architecture. Jones’ (2015) definition of the frame of nature is similar, given that it also describes a technology’s attributes. However, this particular frame encapsulates individuals focusing specifically on AI and “[questioning] whether something created by a human exists inside or outside of the natural world” (Jones 2015, 32). Artifice takes understandings of AI’s nature to another level in that it is framed as magical and inexplicable. Both the technology in use domain and the competition frame reflect an individual’s understanding of the impact of a technology. However, the former includes positive and negative outcomes of a technology, while the latter predominantly underscores AI’s risks. The technology strategy describes individuals’ views as to why their employer will introduce/has introduced a technology. In employing the combined framework outlined in Table 1, the researchers coded and thematically analysed responses that described both ChatGPT and

AI in general, since participants regularly framed the former in terms of the latter due to their limited knowledge of and experience with using the tool.

ANALYSIS

How do academic facilitators perceive the nature of ChatGPT?

Most participants expressed caution about ChatGPT (or AI in general), with a few lauding its capabilities. Typical comments about the former revolved around mistrust and included “If there’s a necessity to use it, then [...] be careful about it” (P2) and “Upon submission on Turnitin, a 100 per cent AI report [on plagiarism] popped up for [...] students. It said no, but I don’t know if I can trust it!” (P10). With respect to praise of ChatGPT, one participant remarked, “I know I might offend some people like P5. I express my love for it. But I love it. I think it just has so much potential” (P6). A few responses transcended describing ChatGPT’s nature simply in terms of its capabilities or traits, evoking the frame of artifice instead. For example, one participant perceived ChatGPT/AI to be sentient to some degree when they observed that in the context of a machine detecting AI-generated text, “AI knows that it is AI. It knows how it does its AI thinking and so can recognise it in something else” (P1). Similarly, another participant claimed, “I don’t actually think – controversial! – that AI would be so different in creativity than human beings” (P7). In relation to human versus AI creativity, no participant anthropomorphised AI creativity and all participants, with the exception of P7, opined that human creativity is dissimilar to that of AI. P7 expressed doubt that a definitive definition for human creativity exists, arguing that “creativity takes different forms”, thus rendering it pointless to compare one agent’s creativity to that of another. The remainder of the participants perceived ChatGPT’s texts to be inauthentic in comparison to human responses. P3, for example, asked, “Is AI actually creating something?” and answered their own question by saying, “It’s responding to a prompt”. This point of view was echoed in claims such as “It creates something from information or content that already exists” (P6) and “It’s just regurgitating what has been said” (P12). Other reasons provided as to why ChatGPT’s creativity is inferior to that of humans included the absence of understanding (e.g., “There’s no understanding in [ChatGPT]” (P4)), the lack of personal experience that humans have (e.g., human creativity encompasses “condensing years of experience [...] funnelling it into a piece of writing” (P10)), and the absence of human-like emotions or empathy (e.g., “AI cannot bleed” (P7)). Several responses demonstrated ambivalent perceptions of ChatGPT’s nature: P9 remarked that one aspect of the tool that “astounded” them was the construction of “such well-written paragraphs”, but a short while later, they observed that they were “written in a very

clinical way". Similarly, although P1 described feeling "flabbergasted" when confronted by the tool's constructions, they also stated that "You just don't feel that human factor" when reading its responses. Other than P5 and P13, participants had not heard about neither AI systems' hallucinations nor about their black boxes.

How do academic facilitators perceive using ChatGPT now and in the future in their teaching and learning contexts?

With the exception of Participants, 9, 10, and 12, no participant indicated that they employed the tool in their literacy classrooms. While P3 and P5 were initially adamant that they did not want to employ the tool in any context, the remaining participants communicated using it in settings outside the classroom, either for experimental reasons or out of curiosity. P4, for instance, stated: "I've played around a bit a few times with ChatGPT. I've asked it a few questions and it's given answers". Others indicated that they were using it "to summarise a couple of books" (P6), for "email writing" (P4), to draft a speech for a wedding (P11), and for dream analysis (P13). Participants 9, 10, and 12 claimed that they were using it to detect potential cases of plagiarism in their students' writing (e.g., "I have used it in terms of figuring out if students have used ChatGPT. Specifically, you know, there's a function where you can ask: 'Has this paragraph [...] been generated by a human?'" (P9). P3 signalled that they were hesitant to use the tool in their private capacity because they were in the process of completing their Master's degree and was "scared" in case the tool was detected in their search history, potentially leading to a false accusation of plagiarism. P5 simply stated, "I know it exists and I know I don't like it", although they conceded: "I'm open to ideas". Considering future use, all participants demonstrated that they would be employing ChatGPT to teach writing, although several indicated a degree of unwillingness to do so (based on risks summarised in the next subsection). Those with more positive sentiment articulated that they intend using it in class "to get [students] to think deeper" about topics (P4), to enhance students' research on a topic, to "let [them] analyse and fact-check on (sic) a ChatGPT-generated essay" for flaws (P7), "to teach them [...] to summarise" (P8), and use it "to help improve [students'] skills and capabilities because most [of them] are rather innovating (sic) and keen on being part of new innovations" (P10). Regarding institutional motivation, only Participants 1, 2, and 6 looked to the university for guidance on when and how to use ChatGPT, although they did not indicate why they believed the university would adopt this technology. Typical comments included "I want to take direction from what does the university say? What do my superiors say? What can I do? What can't I do?" (P1) and "I haven't brought it up as yet with the students. If it is not yet known,

then I should rather keep it like that until the university tells me otherwise” (P6). The types of future strategies participants identified as ones they would use in class to mitigate ChatGPT's risks included sensitising students to its “potential pitfalls” so that it is used “ethically” and “responsibly”, (P1), deciding “in what scenarios [ChatGPT] is relevant and [...] how much we involve ChatGPT in how we teach” (P6), and ensuring that the tool is used merely “as a co-pilot or a fellow student or a writing consultant in a certain capacity” to ensure that students' written assignments reflect “their voices” (P13).

What are academic facilitators' perceptions of ChatGPT's benefits and risks in their teaching and learning contexts?

The strategies summarised are indicative of the risks of ChatGPT the participants identified. One concern hinged on the potential for over-reliance on the tool to the extent that students would ultimately “not put in the effort to try to understand how to do the right work” (P6), thus “losing [their] voices” (P13). In this regard, P1 pointed out that ChatGPT might “eliminate [the writing process] and affect skills development” when some of the skills required to achieve literacy include “the ability to read, skimming through paragraphs and so forth, and building up ideas and [...] brainstorming”. Another apprehension included fears around students using ChatGPT to plagiarise and the accompanying concern that AI detection tools may be unreliable. P1 summarised this concern when they said, “The student doesn't have to understand anything because as long as ChatGPT has the data, they can spit out a wonderful answer and it's a misrepresentation of the student because [...] it's not their work.” Additional threats identified included the possibility of security breaches in the sense that a student's work could be stolen from the Internet, the tool's lack of African training data, and the potential for bias on the part of “creators” (P3), although it should be noted that only one participant referred to the latter as a risk factor. One participant was aware of under-representative data when they stated: “I've been told that ChatGPT draws from what is out there, right? So in Africa [...] where there isn't maybe a lot of research on the Internet, it misses out on so much contextual [information] and like culture and people” (P4). Six participants identified benefits that ranged from providing students with examples of well-written paragraphs (P5) to helping students summarise texts (P8). One participant added a caveat to the benefits when they stated: “I think it could possibly be a tool to use if you're not starting out with your studies, if you already have a well-established writing ability” (P2). This concern was echoed by other participants who did not explicitly focus on ChatGPT's benefits. For example, P4 remarked, “If you already have the knowledge you need to do what you need to do and you're just using ChatGPT to assist you, then I think it is a

very good tool. But again, that goes back to what I was saying: if you don't have the skills... Say you're a first year, you don't have the knowledge. You don't have the skills to write a paragraph. Your academic writing is not on par. You can't read correctly. Then all it does is take away the necessity to teach and learn those very important skills".

DISCUSSION

Contrary to the findings of other studies, our analysis indicates that participants expressed mixed sentiments about the nature of generative AI (cf. Baidoo-Anu and Owusu Ansah 2023; Mogavi et al. 2023), with most leaning towards alarmist/negative framings. The tendency to depict the tool's nature in ambivalent terms is understandable, given that most participants were not yet employing it in their classrooms: "new educational technological solutions, in particular those that draw on [...] artificial intelligence [...] are only now being deployed on a large scale. The period of early adoption has been characterized by high ambivalence toward the use of [...] AI-driven technologies" (Johri and Hingle 2023, 223). Contradictory framing may also be attributed to being uninformed about ChatGPT's underlying structure – a deep neural network that (simplistically speaking) "takes in a string of text as input and generates a response as output" (Cretu 2023, para. 5). In our study, most participants could not define AI's black boxes or hallucinations, which is again unsurprising since they expressed the barest of knowledge about ChatGPT's structure. While educators are by no means expected to exhibit sophisticated technological knowledge, it is nevertheless judicious at this sense-making stage that they have some comprehension of how the limits of an uncertain technology's design impact writing. Part of this critical AI literacy includes awareness of AI hallucinations and black boxes, as well as familiarity with the principle of explainability, which revolves around being able to trust ChatGPT's processes and outputs. With respect to classroom practices, we suggest that facilitators explain to students why, for instance, the tool fails to identify citations or references and actively teach them how to evaluate its responses. Such strategies would promote critical thinking and help students understand that "language models [...] have learnt that humans often support claims with a quote, and the software mimics this behaviour but lacks the benefit of human understanding of ethics and attribution" (Dwivedi et al. 2023, 27).

Participants conveyed inaccurate knowledge about AI detection tools. Significantly, and in the context of checking for plagiarism, a lack of understanding about the nuts and bolts of ChatGPT resulted in some participants indicating that they are currently using the tool to confirm whether or not it has generated particular texts submitted by students. However, ChatGPT is presently unable to detect itself since it merely mimics the human writing process.

Educators may open up a hornet's nest of ethical issues if they rely on the tool to confirm plagiarism, resulting in false accusations levelled against students (Alkhaqani 2023). Our participants were particularly concerned about students exploiting the tool to commit plagiarism, which is a finding reported in other studies as previously noted. With respect to prohibiting students from using ChatGPT, an important scholarly revolves around *how* using this tool constitutes cheating: Anders (2023) argues that it is pointless to define ChatGPT plagiarism (in the conventional sense) as “the use of another person’s or AI’s ideas, words, or concepts” (Anders 2023, 1), since other digital writing assistants already use AI. Since generative AI is here to stay, Anders (2023, 1) suggests that plagiarism should “[include] the use of advanced original text creation [by] AI when it is specifically not allowed by the instructor for a given assignment”. Oravec (2023) supports a shift in focus from adversarial measures to punish plagiarism towards “mindful and reflective approaches that emphasize [how] human-AI collaboration can serve to empower students in their quests to become capable employees and community members” (Oravec 2023, 227). On a practical level, and in the context of the writing classroom, a strategy to empower students could include the addition of meta-cognitive tasks that sensitise students to ChatGPT’s deficiencies, train them to recognise hallucinations, and compel them to corroborate the tool’s sources if identified (Oravec 2023, 228).

With the exception of one participant, all were ignorant that ChatGPT’s training data reflects biases. It is necessary to educate literacy facilitators not only about the potential for unrepresentative datasets to generate biased texts, but also about how political bias may be embedded in ChatGPT. In terms of pedagogy, we suggest that facilitators and students receive training in how to capture bias, although it is difficult to confirm conceptually and practically (Oravec 2023, 225). Senekal and Brokensha (2023) offer a useful multi-dimensional model that includes making use of an AI model developed by The Bipartisan Press to determine bias in texts. The model is a regression model for machine learning and “because it has been trained on a large database of articles (pre-categorised according to bias), it can classify texts according to their direction (“left” or “right”) and degree (“minimal” to “extreme”) of bias” (Chandler 2020, para. 2). The website offers an easy-to-use “Bias Analyzer” into which one simply cuts and pastes a given text to analyse bias. Students could be taught how to use a tool like this in order to analyse bias and confirm or disprove accuracy.

Considering current use of ChatGPT with its associated risks and benefits, a few participants shared that they have begun employing the tool in their private capacity outside of the classroom setting. Again, this is not a surprising finding, given that deployment of the tool at the researchers’ institution is not yet widespread. Furthermore, early adopters tend to initiate

an experimental phase when encountering novel technology before shifting into implementation and then wide-scale application phases in an institutional context (cf. Neumann, Guirguis, and Steiner 2023). What is noteworthy is that although participants indicated that they would be disposed to utilise ChatGPT in the literacy classroom in order to foster deep learning and help students research topics or summarise texts, several also offered the caveat that use of the tool would be beneficial only in instances where students have some level of academic language proficiency in the first place and do not over-rely on it to achieve academic success. Of course, this is one of the more significant challenges with respect to using the tool in the context of literacy classes: students attend such classes because they have not yet mastered academic English. Yet in order to recognise poor writing generated by ChatGPT (such as lack of cogent arguments) or inaccuracies related to citations and references, for example, students need to display adequate levels of proficiency and familiarity with the conventions of academic writing (Warschauer et al. 2023, 8). Students will have to learn how to write *with* ChatGPT, which entails learning new digital skills that are similar to the pedagogical strategies identified by Oravec (2023). Warschauer et al. (2023, 8) characterise the issue as “the ‘with or without’” contradiction. The authors argue that “[p]remature exposure to AI writing tools can inadvertently teach students to extensively and exclusively rely on these tools, robbing [them] of opportunities to develop the foundational writing skills that they will need to best use them in the future” (Warschauer et al. 2023, 9), while AI illiteracy will force them into a (future) world of work they are ill-equipped for. In classrooms where ChatGPT is used, facilitators need to teach students how to critically identify, evaluate, synthesise and create information, since the tool is not capable of contextual understanding and nuanced interpretation.

Pederson (2023) argues that we should consider the threats that generative AI holds for writing culture: “higher education will need to decide if using AI writing will be valued as an aesthetic or professional practice and a means to garner what social theorist Pierre Bourdieu calls ‘cultural capital’ (Bourdieu, 1986)” (Pedersen 2023, 1). In other words, if it becomes the case that we shift into a reality in which AI can also write well, how do we determine our value as humans? (Pedersen 2023, 2). How do we establish authorship? Writing *with* a generative AI tool such as ChatGPT means acknowledging that “AI is [...] contingent upon human perception and interpretation. Much like the co-originary nature of the human and the technical [...] AI is [...] co-constitutive with human intelligence” (Zeilinger 2021, 38). Our participants recognised – and to some degree reluctantly accepted – the inevitable co-constitutive relationship between their students and generative AI, but agreed that human and AI creativity cannot be conflated. Participants’ positioning against anthropomorphism appears to reflect a tacit understanding that ChatGPT’s capabilities cannot be romanticised in the sense that it is perceived as *author*.

Zeilinger (2021, 21) concedes that while it is not the case that AI models cannot become authors, it is nevertheless necessary to enter into a debate in which authorship is re-evaluated in the context of what constitutes creative expression. Several scholars contend that current authorship guidelines dictated by scholarly publishers already reflect criteria indicating why ChatGPT cannot be considered as a co-author. The International Committee of Medical Journal Editors (2023), for example, mandates that manuscripts should include “[s]ubstantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND Drafting the work or reviewing it critically for important intellectual content”. Educators need to convey to under- and post-graduate students the importance of understanding who constitutes an author in the realm of scholarship. In this regard, we suggest that while they need to explicitly teach students how to cite ChatGPT, they should encourage students to use prompts that make it clear that the tool is simply a vehicle for brainstorming and not a writer.

A limitation of this study is that it is an exploratory one, reflecting a small number of participants. This in turn means that the results are not generalisable to a larger context. However, our aim was not to provide generalisable results: at this initial sense-making stage, academics at our institution are beginning to experiment with ChatGPT in their classrooms. Given that there is uncertainty surrounding this technology’s nature and that perceptions about its affordances and risks may differ depending on this technology’s specific contexts of use (cf. Amani et al. 2023), it makes sense to conduct an exploratory study that aims “to indicate rather than conclude” (Crouch and McKenzie 2006, p. 492). In other words, in the context of this particular study, it would be premature to draw any definitive conclusions about literacy facilitators’ perceptions of ChatGPT. We argue that our study generates preliminary insights into perceptions, forming the basis for conclusive research that is quantitative in nature.

CONCLUSIONS

Employing technological frames analysis, this study has determined that some participants in our cohort are at this stage equivocal and uncertain about the nature of ChatGPT as well as about how to go about using it in responsible and ethical ways in the classroom. Being exploratory in nature, the findings cannot be generalised to a larger population of literacy practitioners, but nevertheless suggest a number of ways forward. Among others, institutions of higher learning need to prioritise guidelines that include critical (generative) AI literacy training as well as sensitisation to the challenges involved in detecting and addressing AI plagiarism. Pedagogically speaking, literacy facilitators need to walk a fine line between

initially fostering their students' academic writing skills without generative AI and then training them how to employ it in their writing. Educational institutions will need to ensure that human agency remains central in the face of ongoing developments in generative AI. In this regard, what constitutes creative expression, authorship, and cultural capital in the context of human-AI interaction needs to be carefully (re)-considered.

With respect to the teaching and learning of writing, future research should include assessing the pedagogical strategies recommended in this article. This could take the form of experimental sandboxes that allow facilitators and students to 'test' ChatGPT and other generative AI tools with a view to discovering how these technologies may meet their unique needs. Such sandboxes will also create spaces for the sharing of ideas among students who encompass different ages, genders, (digital) skills levels, and the like.

REFERENCES

- Alharbi, Wael. 2023. "AI in the Foreign Language Classroom: A Pedagogical Overview of Automated Writing Assistance Tools." *Education Research International* 2023: 4253331. <https://doi.org/10.1155/2023/4253331>.
- Alkhaqani, Ahmed Lateef. 2023. "ChatGPT and Academic Integrity in Nursing and Health Sciences Education." *Journal of Medical Research and Reviews* 1, no 1: 5–8. <https://doi.org/10.5455/JMRR.20230624044947>.
- Al-Shamisi, Aisha Saeed. 2016. "The Effect of WebQuests on Grade 11 Reading Comprehension and Student Perceptions of WebQuests." *American International Journal of Contemporary Research* 6, no 1: 132–143.
- Amani, Sara, Lance White, Trini Balart, Lakasha Arora, Dr. Kristi J. Shryock, Dr. Kelly Brumbelow, and Dr. Karan L. Watson. 2023. "Generative AI Perceptions: A Survey to Measure the Perceptions of Faculty, Staff, and Students on Generative AI Tools in Academia." arXiv preprint [arXiv:2304.14415](https://arxiv.org/abs/2304.14415).
- Amini, Mahdi, Masoud Asgari, and Zahra Asgari. 2020. "Advantages and Disadvantages of Using Webquests in Junior High School English Classes in Iran." *Journal of Critical Studies in Language and Literature* 1, no. 1: 35–43. <http://doi.org/10.46809/jcsll.v1i1.4>.
- Anders, Brent, A. 2023. "Is Using ChatGPT Cheating, Plagiarism, Both, Neither, or Forward Thinking?" *Patterns* 4, no. 3: 1–2. <https://doi.org/10.1016/j.patter.2023.100694>.
- Baidoo-Anu, David and Leticia Owusu Ansah. 2023. "Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT in Promoting Teaching and Learning." *SSRN* 2023. <https://doi.org/10.2139/ssrn.4337484>.
- Basdogan, Merve, Tracey Birdwell, and Tripp Harris, T. 2022. "Technological Frames in Classroom: A Case Study for a Faculty Professional Development." *Research in Learning Technology* 30 (3 October): 2678. <https://doi.org/10.25304/rlt.v30.2678>.
- Bellino, Alessio and Daniela Bascuñán. 2020. "Design and Evaluation of WriteBetter: A Corpus-Based Writing Assistant." *IEEE Access* 8 (24 April): 70216–70233. <https://doi.org/10.1109/ACCESS.2020.2982639>.
- Bias Analyzer. *The Bipartisan Press*. <https://www.thebipartisanpress.com/analyze-bias/>.

- Bonsu, Emmanuel Mensah and Daniel Baffour-Koduah, 2023. "From the Consumers' Side: Determining Students' Perception and Intention to Use ChatGPT in Ghanaian Higher Education." *Journal of Education, Society & Multiculturalism* 4, no. 1: 1–29. <http://doi.org/10.2478/jesm-2023-0001>.
- Brennen, J. Scott., Philip N. Howard, and Rasmus K. Nielsen. 2022. "What to Expect When You're Expecting Robots: Futures, Expectations, and Pseudo-Artificial General Intelligence in UK News." *Journalism* 23, no. 1: 22–38. <https://doi.org/10.1177/14648849209475>.
- Brokensha, Susan I., and Thinus Conradie. 2021. "Killer Robots, Humanoid Companions, and Superintelligent Machines: The Anthropomorphism of AI in South African News Articles." *Ensovoort* 42, no 6: 3.
- Chandler, Simon. 2020. "This Website is Using AI to Combat Political Bias." *Forbes*, March 17, 2020. <https://www.forbes.com/sites/simonchandler/2020/03/17/this-website-is-using-ai-to-combat-political-bias/?sh=63bc030a6f4c>.
- Chang, Yu-Chia, Jason S. Chang, Hao-Jan Chen, and Hsien-Chin. 2008. "An Automatic Collocation Writing Assistant for Taiwanese EFL learners: A Case of Corpus-Based NLP Technology." *Computer Assisted Language Learning* 21, no. 3: 283–299. <https://doi.org/10.1080/09588220802090337>.
- Chao, Yu-Chaun Joni, and Hao-Chang Lo. 2011. "Students' Perceptions of Wiki-Based Collaborative Writing for Learners of English as a Foreign Language." *Interactive Learning Environments* 19, no. 4: 395–411. <https://doi.org/10.1080/10494820903298662>.
- Cretu, Calin. 2023. "How Does ChatGPT Actually Work? An ML Engineer Explains." *Scalable Path*, April 6, 2023. <https://www.scalablepath.com/machine-learning/chatgpt-architecture-explained>.
- Criado, J. Ignacio, and Lucia O. de Zarate-Alcarazo, L.O. 2022. "Technological Frames, CIOs, and Artificial Intelligence in Public Administration: A Socio-Cognitive Exploratory Study in Spanish Local Governments." *Government Information Quarterly* 39, no. 3: 101688. <https://doi.org/10.1016/j.giq.2022.101688>.
- Crouch, Mira, and Heather McKenzie, H. 2006. "The Logic of Small Samples in Interview-based Qualitative Research." *Social Science Information* 45, no. 4: 483–499. <https://doi.org/10.1177/05390184060695>.
- Currie, Geoffrey M. 2023. "Academic Integrity and Artificial Intelligence: Is ChatGPT Hype, Hero or Heresy?" *Seminars in Nuclear Medicine* 53, no. 5: 719–730. <https://doi.org/10.1053/j.semnuclmed.2023.04.008>.
- De Wever, Bram, Raija Hamalainen, Michael Voet, and Mario Gielen. 2015. "A Wiki Task for First-Year University Students: The Effect of Scripting Students' Collaboration." *The Internet and Higher Education* 25 (April): 37–44. <https://doi.org/10.1016/j.iheduc.2014.12.002>.
- Dwivedi, Yogesh, K., Nir Kshetri, Laurie Hughes, Emma Louise Slade, Anand Jeyaraj, Arpan Kumar Kar, Abdullah M. Baaddullah, Alex Koochang, Vishnupriya, Manju Ahuja et al. 2023. "So What if ChatGPT Wrote it? Multidisciplinary Perspectives on Opportunities, Challenges and Implications of Generative Conversational AI for Research, Practice and Policy." *International Journal of Information Management* 71 (August): 1–63. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>.
- Ebadi, Saman, and Masoud Rahimi. 2018. "An Exploration into the Impact of WebQuest-Based Classroom on EFL Learners' Critical Thinking and Academic Writing Skills: A Mixed-Methods Study." *Computer Assisted Language Learning* 31, no. 5-6: 1–35. <https://doi.org/10.1080/09588221.2018.1449757>.
- Entman, Robert M. 1993. "Framing: Toward Clarification of a Fractured Paradigm." *Journal of Communication* 43, no. 4: 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>.
- Firat, Mehmet. 2023. "What ChatGPT Means for Universities: Perceptions of Scholars and Students." *Journal of Applied Learning and Teaching* 6, no. 1: 57–63. <https://doi.org/10.37074/jalt.2023.6.1.22>.

- Gallacher, Andrew, Andrew Thompson, and Mark Howarth. 2018. "My Robot is an Idiot!" – Students' Perceptions of AI in the L2 Classroom". In *Future-proof CALL: Language Learning as Exploration and Encounters – Short Papers from EUROCALL*, ed. Peppi Taalas, Juha Jalkanen, Linda Bradley and Sylvie Thouësny, 70–76. UK: Research-publishing.net.
- Garvey, Conlin, and Chandler Maskal. 2020. "Sentiment Analysis of the News Media on Artificial Intelligence Does Not Support Claims of Negative Bias Against Artificial Intelligence." *Omics: A Journal of Integrative Biology* 24, no 5: 286–299. <https://doi.org/10.1089/omi.2019.0078>.
- Ho, Chui Chui. 2022. "The QuillBot Grammar Checker: Friend or Foe of ESL Student Writers?" *Journal of Creative Practices in Language Learning and Teaching (CPLT)* 10, no. 1: 10–31. <https://cplt.uitm.edu.my/v1/index.php/journal-volume/volume-10-2022/vol-10-no-1-may-2022>.
- Hsu, Hsiu-Chen. 2019. "Wiki-Mediated Collaboration and its Association with L2 Writing Development: An Exploratory Study." *Computer Assisted Language Learning* 32, no. 8: 945–967. <https://doi.org/10.1080/09588221.2018.1542407>.
- International Committee of Medical Journal Editors. 2023. "Defining the Role of Authors and Contributors." <https://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>.
- Javier, Darren Rey. 2021. "App Review: Using Tech Tools for Academic Writing – Grammarly as a Pedagogical Tool." *MEXTESOL Journal* 46, no. 2. https://www.mextesol.net/journal/index.php?page=journal&id_article=46359.
- Jones, Sean A. 2015. "Reading Risk in Online News Article About Artificial Intelligence." M.A. thesis, University of Alberta. <https://doi.org/10.7939/R33775Z8B>.
- Johns, Tim. 1986. "Micro-Concord: A Language Learner's Research Tool." *System* 14, no. 2: 151–162.
- Johri, Aditya, and Ashish Hingle, A. 2023. "Students' Technological Ambivalence Toward Online Proctoring and the Need for Responsible Use of Educational Technologies." *Journal of Engineering Education* 112, no. 1: 221–242. <https://doi.org/10.1002/jee.20504>.
- Khalil, Mohammad, and Erkan Er. 2023. "Will ChatGPT Get You Caught? Rethinking of Plagiarism Detection." arXiv preprint arXiv:2302.04335. <https://doi.org/10.48550/arXiv.2302.04335>.
- Kim, Sunyoung, Joobo Shim, and Jaechang Shim. 2023. "A Study on the Utilization of OpenAI ChatGPT as a Second Language Learning Tool." *Journal of Multimedia Information System* 10, no. 1: 79–88. <https://doi.org/10.33851/JMIS.2023.10.1.79>.
- King, Michael R., and ChatGPT. 2023. "A Conversation on Artificial Intelligence, Chatbots, and Plagiarism in Higher Education." *Cellular and Molecular Bioengineering*, 16, no. 1: 1-2. <https://doi.org/10.1007/s12195-022-00754-8>.
- Limna, Pongsakorn, Tanpat, Kraiwanit, Kris Jangjarat, Prapasiri Klayklung, and Piyawatjana Chocksathaporn. 2023. "The Use of ChatGPT in the Digital Era: Perspectives on Chatbot Implementation." *Journal of Applied Learning and Teaching* 6, no. 1: 1–10. <https://doi.org/10.37074/jalt.2023.6.1.32>.
- Masadeh, Mousa, A. 2012. "Focus Group: Reviews and Practices." *International Journal of Applied Science and Technology* 2, no. 10.
- Mogavi, Reza H., Chao Deng, Justin J. Kim, Pengyuan Zhou, Young D. Kwon, Ahmed Hosny Saleh Metwally, Ahmed Tlili et al. 2023. "Exploring User Perspectives on ChatGPT: Applications, Perceptions, and Implications for Ai-Integrated Education." arXiv preprint arXiv:2305.13114. <https://doi.org/10.48550/arXiv.2305.13114>.
- Neumann, Oliver, Katharina Guirguis, and Reto Steiner. 2023. "Exploring Artificial Intelligence Adoption in Public Organizations: A Comparative Case Study." *Public Management Review* 24, no. 1: 1–28. <https://doi.org/10.1080/14719037.2022.2048685>.
- Nguyen, Dennis, and Erik Hekman. 2022a. "The News Framing of Artificial Intelligence: A Critical Exploration of How Media Discourses Make Sense of Automation." *AI & SOCIETY* 2022 (May): 1–15. <https://doi.org/10.1007/s00146-022-01511-1>.

- Nguyen, Dennis, and Erik Hekman. 2022b. "A 'New Arms Race'? Framing China and the USA in AI News Reporting: A Comparative Analysis of the Washington Post and South China Morning Post." *Global Media and China* 7, no. 1: 58–77. <https://doi.org/10.1177/20594364221078626>.
- Nova, Muhamad. 2018. "Utilizing Grammarly in Evaluating Academic Writing: A Narrative Research on EFL Students' Experience." *Premise: Journal of English Education* 7, no. 1: 80–97. <http://dx.doi.org/10.24127/pj.v7i1.1332>.
- Oravec, Jo Ann. 2023. "Artificial Intelligence Implications for Academic Cheating: Expanding the Dimensions of Responsible Human-AI Collaboration with ChatGPT." *Journal of Interactive Learning Research* 34, no. 2: 213–237. <https://www.learntechlib.org/primary/p/222340/>.
- Orlikowski, Wanda J., and Debra C. Gash. 1994. "Technological Frames: Making Sense of Information Technology in Organizations." *ACM Transactions on Information Systems (TOIS)* 12, no. 2: 174–207. <https://doi.org/10.1145/196734.196745>.
- Oskoz, Ana, and Idoia Elola. 2010. "Meeting at the Wiki: The New Arena for Collaborative Writing in Foreign Language Courses." In *Web 2.0-based E-Learning: Applying Social Informatics for Tertiary Teaching*, edited by Mark J.W. Lee and Catherine McLoughlin, 209–277. Hershey, PA: IGI Global. <https://doi.org/10.4018/978-1-60566-294-7.ch011>.
- Pedersen, Isabel. 2023. "The Rise of Generative AI and Enculturating AI Writing in Postsecondary Education." *Frontiers in Artificial Intelligence* 6 (August): p.1259407. <https://doi.org/10.3389/frai.2023.1259407>.
- Purvis, Alison, Helen M. Rodger, and Sue Beckingham, S., 2020. "Experiences and Perspectives of Social Media in Learning and Teaching in Higher Education." *International Journal of Educational Research Open* 1: 100018.
- Rakhmanina, Lisa, and Reko Serasi. 2022. "Utilizing Quillbot Paraphraser to Minimize Plagiarism in Students' Scientific Writing." *Novateur Publications* 2022 (March): 26–33. <https://novateurpublication.org/index.php/np/article/view/5>.
- Russell, Mike. 2023. "ChatGPT is an Amazing and Exciting Tool for Teachers Willing to Surf the Wave." *The Daily Maverick*, February 13, 2023. <https://www.dailymaverick.co.za/opinionista/2023-02-13-chatgpt-is-an-amazing-and-exciting-tool-for-teachers-willing-to-surf-the-wave/>.
- Romig, Jennifer Murphy. 2023. "The ethics of ChatGPT: A Legal writing and Ethics Professor's Perspective." <https://doi.org/10.2139/ssrn.4373550>. *Emory Legal Studies Research Paper. SSRN* 2023 (February).
- Senekal, Burgert A., and Susan Brokensha. 2023. "Is ChatGPT a Friend or Foe in the War on Misinformation? A South African Perspective." *Communicare: Journal for Communication Studies in Africa* 42, no. 2: 3–16. <https://doi.org/10.36615/jcsa.v42i2.2437>.
- Shoufan, Abdulhadi. 2023. "Exploring Students' Perceptions of ChatGPT: Thematic Analysis and Follow-Up Survey." *IEEE Access* 11: 38805–38818. <https://doi.org/10.1109/ACCESS.2023.3268224>.
- Sparks, Stephen. 2023. "Real Danger of ChatGPT Lies in its Robbing Us of Our Ability to Read and Research Critically." *The Daily Maverick*, April 5, 2023. <https://www.dailymaverick.co.za/opinionista/2023-04-05-real-danger-of-chatgpt-lies-in-its-robbing-us-of-our-ability-to-read-and-research-critically/>.
- Su, Yanfang, Yun Lin, and Chun Lai. 2023. "Collaborating with ChatGPT in Argumentative Writing Classrooms." *Assessing Writing* 57 (July): 1–11. <https://doi.org/10.1016/j.asw.2023.100752>.
- Thorp, H. Holden. 2023. "ChatGPT is Fun, but not an Author." *Science* 379, no. 6630: 313. <https://doi.org/10.1126/science.adg7879>.
- Tlili, Ahmed, Boulus Shehata, Michael Agyemang Adarkwah, Aras Bozkurt, Daniel T. Hickey, Ronghuai Huang, and Brighter Agyemang. 2023. "What if the Devil is My Guardian Angel: ChatGPT as a Case Study of Using Chatbots in Education." *Smart Learning Environments* 10: 15. <https://doi.org/10.1186/s40561-023-00237-x>.

- Vogl, Susanne., Eva-Maria Schmidt, and Ulrike Zartler. "Triangulating Perspectives: Ontology and Epistemology in the Analysis of Qualitative Multiple Perspective Interviews." *International Journal of Social Research Methodology* 22, no. (6): 611–624.
- Warschauer, Mark, Waverly Tseng, Soobin Yim, Thomas Webster, Sharin Jacob, Qian Du, and Tamara Tate. 2023. "The Affordances and Contradictions of AI-Generated Text for Second Language Writers." *SSRN* 2023 (March). <https://doi.org/10.2139/ssrn.4404380>.
- Weir, Charles, Ingolf Becker, and Lynne Blair. 2023. "Incorporating Software Security: Using Developer Workshops to Engage Product Managers." *Empirical Software Engineering* 28, no 2: 21.
- Zeilinger, Martin. 2021. *Tactical Entanglements: AI Art, Creative Agency, and the Limits of Intellectual Property*, Lüneburg, Germany: Meson Press.
- Zhang, Yan, and Barbara M. Wildemuth. 2009. "Qualitative Analysis of Content". *Applications of Social Research Methods to Questions in Information and library Science* 308, no. 319: 1–12.