THE USE OF LARGE LANGUAGE MODEL TOOLS SUCH AS CHATGPT IN ACADEMIC WRITING IN ENGLISH MEDIUM EDUCATION POSTGRADUATE PROGRAMS: A GROUNDED THEORY APPROACH

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ABSTRACT

This paper shares the reflections of a small group of graduate students and faculty members in the United Arab Emirates (UAE) on the challenges and affordances of using large language model (LLM) tools to assist with academic writing in an English Medium Education (EME) context. The influence of interpretive grounded theory afforded the authors the opportunity to engage with emerging data from a focus group interview. Ethical issues including academic integrity and maturity formed a major theme of this study, as well as the future-thinking affordances of LLMs in facilitating and democratizing academic writing for all, including those in EME programs. Considering that LLMs are here to stay and will be used by students and faculty alike, the authors consider that the nature of assessment is likely to change and indeed will require higher education institutions to consider the types of assessments in place, with a view to potentially modifying them in light of these technological advances. We recommend the use of deeply personalized, critically reflective writing assignments where students demonstrate how the topic has meaning in their individual context and personal life story, that will ensure academic integrity and maturity while still embracing these new technologies to widen the scope of academic writing.

Keywords: *large language models, ChatGPT, English Medium Education, academic writing, grounded theory, academic integrity*

INTRODUCTION

The use of text-generating large language model (LLM) tools is currently a hot topic in many fields, including the education field. This paper shares the reflections of a small group of graduate students and faculty members in the United Arab Emirates (UAE) on the challenges and affordances of using LLM tools to assist with academic writing. Ironically, it emerged from a discussion about academic literacy during a writing retreat research project with the goal of supporting academic writing and, as such, emerged from the data in real

time to be interpreted from a primarily interpretivist grounded theory perspective (Charmaz & Thornberg, 2020; Sebastian, 2019). The structure of the paper is as follows: (1) a brief introduction to LLMs; (2) a description of the context of English Medium Education (EME) in higher education in the UAE; (3) an outline of the methodology; (4) the findings presented through the voices of participants in relation to the literature available regarding the emerging themes; and (5) some recommendations for practice.

Large Language Models

There are many types of LLM tools on the market. They form a part of the artificial intelligence (AI) movement, but in recent months, applications such as ChatGPT have become a "cultural sensation" (Thorp, 2023). Artificial intelligence has been around for quite some time in many facets and has many components, particularly when it comes to research writing (Adams & Chuah, 2022). Artificial intelligence, after all, "is able to analyze and do tasks as a human does" (Adams & Chuah, p. 170). Artificial intelligence in research writing already provides the opportunity for grammar and spell-checking, textual analysis, advanced summaries, and provision of synonyms, among other tasks. It aims to enhance the work of the writer, without removing the writer from the process (Adams & Chuah, 2022; Crompton & Song, 2021).

Large language models, however, present a new challenge. Large language models can produce large quantities of text upon demand that truly resemble human language (Lund & Wang, 2023; Macneil et al., 2022), which presents a dilemma for students, teachers, and researchers across schools and universities. How do we feel about the use of LLM tools? Is it acceptable to use them? Who should be allowed to use them? How can we tell if these tools are being used? Will we be judged for using them? Will we be judged for not using them? Is it plagiarism or is it just another writing enhancement tool? Is this the future of academic writing? This paper seeks to explore some of these questions we all seem to be asking ourselves.

Institutions and various stakeholders are quickly putting together task forces to design policies regarding the use of powerful LLM tools (e.g. Deakin University, 2023; University of Jyväskylä. (n.d.)), while many editorials, opinion pieces, and articles are emerging in academic literature and newspaper articles based on the use of these tools (e.g., Chatterjee & Dethlefs, 2023; Lambert & ChatGPT, 2022; Lund & Wang, 2023; Milmo, 2023; Rospigliosi, 2023; Thorp, 2023). Clearly, there are many issues to consider when it comes to the use of LLM tools. This paper discusses some of the challenges and affordances of the use of these tools, with reference to the innovations possible, and the ethical considerations of their use, especially within the context of English Medium Education.

Context of the Study

The UAE is home to many higher education institutions which offer EME programs (Gallagher & Jones, 2023). English language-proficiency requirements for public university admission at the undergraduate level in Gulf countries are typically low, at the level of 5.0–5.5 IELTS (Green, 2020), while being higher at the postgraduate level (6.0–7.0 IELTS), depending on the program entered in to. It is well discussed in the literature that even if entry requirements are sufficient for students to complete their program of study, it may not be sufficient to realize their full academic potential (Dillon et al., 2021; Gallagher & Dillon, 2023; Trenkic & Warmington, 2019), and therefore English language ability is a strong predictor of academic success within EME contexts (Gallagher & Dillon, 2023; Xie & Curle, 2020). In order to meet their academic writing goals, in terms of fulfilling the requirements of postgraduate programs, postgraduate students need specific supports which scaffold their ability to engage with learning and written assessments in their second language (Gallagher & Dillon, 2023).

METHODOLOGY

The discussion that took place was generated during a focus group interview at the beginning of a writing retreat for graduate students. One of the aims of the writing retreat itself was to explore the factors which support graduate students' academic writing skills within a facilitated writing retreat. The semi-structured nature of the focus group interview had been planned in advance. However, during the retreat, an emerging topic that had not been considered in advance was the area of LLMs as a potential tool to assist with the academic writing process. This led to an extended discussion in this area.

The emerging topic presented an opportunity to discover theory from data that was being "systematically obtained and analyzed in social research" (Glaser & Strauss, 1967). The influence of both grounded theory (GT) and interpretive grounded theory (IGT) afforded the authors the opportunity to engage with emerging data. Two aspects of this study are influenced by a GT/IGT perspective: the absence of a particular research question related specifically to the use of LLMs as the topic emerged from the interview, and the tendency to conduct the literature review after or during data collection (Charmaz & Thornberg, 2020; Sebastian, 2019). Interpretive grounded theory also allows for prior knowledge on the part of the researchers, something which is highly important to acknowledge in this study. While GT maintains that researchers must maintain a neutral stance, IGT encourages the presence of prior knowledge due to the sensitivity to the topic that this prior knowledge brings (Sebastian, 2019). The lens of the researchers must be acknowledged, as well as the potential subjectivity of the participants.

The authors, with varying backgrounds working and/or studying in the UAE have a set of experiences, knowledge, skills, and attitudes which present the opportunity to dialogue with each other and with the topic in purposeful and insightful ways. Therefore, in the analysis of the emerging data, within the context of exploring academic literacy in EME in the UAE, "We are not curious tourists visiting a foreign land" (Jones et al., 2010). This offers both an insider and outsider perspective, which may be helpful in gaining insights, but may lead us as researchers to subconsciously project our own experiences (Deggs & Hernandez, 2018). Therefore, it is of utmost importance to acknowledge the biases that may be inherent to our observations, contributions, and interpretations.

There were three participants in the writing retreat, all of whom were graduate students who had elected to participate. The writing retreat was conducted by the first two authors of this paper. Informed consent was given by all participants, as full approval had been received from the Institutional Review Board at Emirates College for Advanced Education. Findings presented include quotations from all five discussants in this part of the semi-structured focus group interview, listed in the findings anonymously (P1, P2, P3, P4, and P5).

The discussion around the use of LLMs lasted for around thirty minutes, with the interviewers taking note of the main themes emerging during the discussion, and also contributing to the debate. The conversation was transcribed using transcription software and edited for accuracy (Shelton & Flint, 2021). Data were analyzed using the long table method with a highlighter pen and taking notes, rather than using qualitative data analysis software, due to the relatively low number of words to be analyzed (approximately 4,900) (Balmer, 2021). At the same time, a literature review was conducted based on the emerging themes. Overall, the two main themes which emerged from the discussion were the ethical dilemma of using LLMs, with a focus on the importance of academic integrity and maturity, and the affordances of using LLMs from an innovative technology-driven, forward-looking perspective.

ETHICAL DILEMMAS IN THE USE OF LARGE LANGUAGE MODELS

Academic Integrity

Firstly, P4 mentioned her concern with the ethical dimension by asking, "Can I bring those people [who used LLM tools] and see them produce it [the writing] in real time, so you have some way to confirm?" Although, P2 disagreed, responding, "Why do I need to prove to people about how I wrote it? I need to prove to people that I have gained the skills that criticize and analyze this piece of work." P4 stated her concern that "you have no way of checking" because we do not know how randomly it pulls from different sources. P5 also mentioned that "you need to reference," somehow. P4 continued to reinforce her opinion saying, "We need guidelines of checking the skills [of the writer] when you are awarded a degree." P3 suggested that LLM tools should be listed as co-authors. These comments mainly indicate participants' views that the writing needs to be checked, defended, and acknowledged in order to maintain academic integrity, as presented in Thomas et al.'s findings from a similar context (2014).

Academic integrity was also mentioned in terms of an overall issue with already existing forms of plagiarism, even without the use of LLM tools. Despite the availability of plagiarism-checking tools, such as iThenticate®, Turnitin®, and PlagScan®, among others (Arabyat et al., 2022), P1

mentioned, "It's almost impossible to prove that someone has plagiarized, even if you suspect it—and it's so delicate." There appeared to be general agreement that cheating in one form or another is a fact of life in academic institutions. For example, P3 noted that one local institution she had heard of had considered moving back to traditional pen and paper exams because of a suspicion that online systems were being hacked, as well as the tacit suspicion that there might be "actual professors or teachers that take money to write essays for students," and eventually it comes down to "teaching them the value of their own education, what it means, and the ethics behind being morally responsible for your own education."

Plagiarism is an issue worldwide, just as it is in UAE universities and in the Middle East in general (Addam, 2023), with some students engaging ghostwriters, employing cut-and-paste techniques, and using online resources inappropriately, often due to a lack of language skills at the appropriate level or a self-perception that they cannot write as well as who they consider to be "native speakers" (Hysaj & Elkhouly, 2020). Nobles & Paganucci (2015) also emphasize how a writer's negative self-perception of their writing can lead to poorer outcomes, and that technological affordances can improve their writing outcomes. The types of assessments given in higher education can also have an effect on incidences of plagiarism within cultural contexts, as highlighted by Thomas et al. (2014), who found that group-based oral assessments as an alternative to written assignments tend to align more with the collectivist cultural norms in the UAE, and therefore lead to more success. The findings of Thomas et al. also speak to the earlier point regarding the need to defend academic work orally (2014).

One of the major challenges facing academics and graduate students is that it is impossible to tell how much of the content (produced using LLM tools) is the contribution of the authors themselves (Aczel & Wagenmakers, 2023), and if it is acceptable in the first place, even if the use of LLM tools has been disclosed. After all, if the content of an article is partly computer-generated, then it does not seem correct to claim such work as one's own. However, it is a reality that these tools can be accessed and used quite easily. So while their usage might be banned officially by some institutions, it is impossible to know for sure if an LLM tool has been used. On the other hand, the challenges to transparency and credibility seem insurmountable. Thorp (2023) notes that in the journal *Science,* which promotes itself as "a leading outlet for scientific news, commentary, and cutting-edge research" with a H-index of 1,229 and some of the most widely cited scientific articles in the world, authors always sign a license affirming that the work they are submitting is original. Thorp's interpretation of this is that any text generated by LLM tools amounts to plagiarism (2023). Elsevier has already issued a statement that LLM tools, such as ChatGPT, may not be listed as co-authors, but if an LLM tool was used then it should be listed in the acknowledgements (Rosenstock et al., 2023). However, Lambert & ChatGPT (2022) list ChatGPT as a second author in "their" editorial, and even include a brief author biography for the LLM tool.

Academic Maturity for Academic Writing

P1 mentioned that she and her family had played with one of the LLM tools to generate a 300-word short essay and found that, "Of course I was able to make the judgment that those things were true, you know, because I know the literature." Similarly, P2 noted, "It's not a copy [and] paste, it's another layer of skin," and requires "metacognition, self-awareness, and self-regulation." As P2 said, "You need to have research skills to read." In this way, participants acknowledged that in order to successfully use LLM tools, you must have background knowledge, skills, and attitudes. And if LLM tools were used to produce texts without significant additional input from the writer and a deep understanding of the assignment, then it would not make the grade, as it were.

P3 stated, "The students that use it have to be academically mature and ready to use it. Like, they know it's their responsibility to go back and forth and read and check and recheck." P5 agreed that if you were to use an LLM tool to generate text, "you'd still need to check it and make sure of your citations." P3 expressed a concern about the education level that should be allowed to use LLM tools by saying, for example, "I worked in a high school with 1,500 boys, and if they had that tool, there's no way they would do anything," and that overall "it could be used very wrongly." P2 maintained that they could "gain those social and cognitive

skills" with proper training. P5 noticed that, as a group, we seemed to be developing a concern about younger learners using these tools, when she summarized, "Maybe we shouldn't be scared of it for academia, but we should be scared of it in lower levels." P1 mentioned that at the doctoral and masters level there is usually an oral defense and, therefore, perhaps LLM tools could have a place, but it would be very difficult to ask all high school students to defend their work.

Interestingly, just one day after the writing retreat research project ended, an article in *The Guardian* newspaper indicated that the International Baccalaureate (IB) organization had decided to allow students to quote content created in LLMs in their essays. The head of assessment and principles for IB was quoted by Milmo (2023) as saying it is an "extraordinary opportunity." This leads to further questions about how academic maturity can be interpreted and what types of guidelines could be given to students at different stages of their academic journey in terms of using LLM tools. Academic maturity involves engagement with critical thinking skills, which amount to real-life problem-solving skills, although the concept of critical thinking in the academic arena is understood in different fields (Toppin & Chitsonga, 2016). At its core, it involves metacognition and self-regulation, as mentioned by P2.

Another ethical issue was a sense that there might be a loss of learning for students based on using LLM tools. P4 stated her feeling that it is "the solidity of science, kind of like disintegrating." She expressed another concern: "What skills does it mask that can go undetected in the education system […] and then they don't have them because they relied on that support?" P4 continued, "If you start looking at it as a tool for support, like a writing center, even then the goal is that you get to a level where you can function without that support." She maintained that if learners keep needing these supports, "that becomes a flaw in the education system." P3 agrees, saying, "If they use it heavily, they will lose out on the writing skill." P4 considered that "the conception of knowledge will be affected." These concerns are weighty and show a deep concern for maintaining quality in academic writing through engaging with the traditionally accepted aspects of academic literacy, similarly to concerns noted by Rosalsky and Peaslee (2023), which prompted Edward Tian to write a program called GPTZero in order to avoid this potential loss of learning.

P5 echoed these concerns, suggesting, "The whole writing process may be affected, since we strive to teach students a holistic approach to academic literacy, breaking it down to introduce the steps, strategies, and skills required." Indeed, the complexities of academic literacy amongst second language learners are well documented (Hyland, 2007; Lillis & Turner, 2001), referring to the need for layers of iterative processing, the acquisition of genre knowledges (Tardy, 2009), as well as self-reflection, metacognitive knowledge (Negretti & Kuteeva, 2011; Negretti & McGrath, 2018), and access to a community of practice (Tardy et al., 2020; Wenger, 1998). The multifaceted writing process includes knowledge of the research skills needed to narrow down research topics and identify relevant and credible sources, reading strategies, and skills to classify and process the key information required to be able to paraphrase using the lexicogrammar of their field. Furthermore, the use of metacognitive strategies (Mezek et al., 2021; Negretti & Kuteeva, 2011; Negretti & McGrath 2018) as a tool to self-regulate, reflect upon learning strategies, and edit texts is also vital. P5 questioned whether the use of LLM tools would "translate to a gap in the knowledge of the[se] very strategies we seek to develop with students, or maybe it highlights the need to teach in a different way." Other participants conveyed their concern with the ethics of this potential loss of learning.

AFFORDANCES

P2 stated, "It's like another shortcut for providing an outcome," and that "we need not to stop avoiding and being scared of technology, because this is the future." She mentioned that it brings a "different philosophy […] so we need to see the world differently." She explained it as a different way of approaching writing in that "it's not writing starting from constructing—it's already there and you start to break it down." P4 said, "You can't prevent people from using it […], let's say, 5 years down the road. This just becomes the norm." P2 reiterated, "This is something new—change. We are out of our comfort zone," and sees it as "an opportunity to shift our mindset" and that this is part of "coping with technology." P2 continued in

the vein of thinking towards the future, comparing tools we have used in recent years with those we have used in the past, for example: "Technology 100 years ago was one thing, but now the definition is something else." She reminded the group by saying, "Systems in the future will be machines; they are already automated," and, again, that advanced technology is "another trend of the world." This echoes the statements made by IB earlier (Mowri, 2023), in the sense that according to P2, "It's wonderful." A recent Forbes Middle East report refers to a program director in the Middle East who said, "Education must change, especially in the Middle East. We have been saying this for the past 150 years" (Addam, 2023).

P5 noted, "There is an argument for these tools that it will get more people published that wouldn't usually be able to," in reference to the fact that it can be difficult to be published, especially for people who have excellent content knowledge but not the requisite language skills. Some authors in the medical field see the affordances of LLMs in publishing. For example, Liebrenz et al. (2023) consider that the dissemination of knowledge will be democratized, in that authors who may previously have been unable to publish in the English language will now have that option, and therefore more scholarly output will be made available which may ultimately benefit the medical field.

P5 referred to the University of Jyväskylä's proactive stance in providing advice for people to use LLM tools correctly. P4 mentioned that if people have gotten "into a habit of how to properly use it, then they won't misuse it," and that hearing about institutions issuing guidelines encouraged her, in which she thought, "OK, now we have some sort of actual system letting it be there with us." P5 mentioned that it reminded her of when we discussed earlier in the day how much referencing software saves time for researchers. And P1 exclaimed how the use of tools, such as Google Scholar, has changed the way we search for academic literature. P5 also mentioned how LLM tools will improve vastly in the future, with various new tools being launched all the time. P1 further referred to how we can now save time on interview transcriptions with widely available transcription software, just as would be done for the present study.

In 2003, a study conducted by Goldberg et al. revealed that the act of using a word processor improved the quality of K-12 student writing, compared with pencil and paper, as the longer periods they spent writing meant that they practiced more and also had more opportunities to revise and redraft during the writing process. The use of word processing seems so obvious to us currently that academic writing of any form seems impossible without it; although authors such as Balmer (2021) argue for the use of artistic layering using paint in the analysis of data, which speaks to the affordances of technologies of different kinds, just as technology was defined so differently many years ago, as mentioned by P2.

In the context of the UAE, which prides itself on pursuing innovation and transformation in education (Gallagher, 2019), it is widely recognized that new technologies used wisely could be "a catalyst to help them move forward" (Dickson et al., 2019). The use of new technologies is such a fast-moving area and requires a new way of thinking, as it is acknowledged that students in the UAE are indeed "digital natives" (Dickson et al., 2019). The use of mobile devices, apps, or YouTube videos to enhance learning, for example, were relatively new areas in the recent past, and were resisted by some. However, studies in the region around ten years ago found that they should be embraced to enhance learning (e.g., Hopkyns & Nicoll, 2013; Santos, 2013; Santos & Ali, 2012; Tamim, 2013). Technology has moved so rapidly since those studies were conducted that these have become part of the regular repertoire of technological tools used by students and instructors. What we now know more than ever is that technology can and will continue to develop and be used in a multitude of ways in educational institutions, particularly in the post-Covid era (Hopkyns & Nicoll, 2021).

RECOMMENDATIONS

Ethical issues including academic integrity and maturity formed a major theme of this study, as well as the future-thinking affordances of LLMs in facilitating and democratizing academic writing for all, including those in postgraduate EME programs. Participants' views developed through the discussion, as each one engaged in dialogue with the other, thinking deeply about this issue and thrashing out ideas for and against.

Considering that LLMs are here to stay and will be used by students and faculty alike, the authors

consider that the nature of assessment is likely to change and will indeed require higher education institutions to consider the types of assessments in place, with consideration to potentially modify them in light of these technological advances. It is likely that in some cases traditional tests will see a resurgence in higher education, with a partial return to "set and timed" tasks (i.e., closed condition, an increase in the use of randomized computerized multiple-choice tests, or even pen-and-paper tests—particularly at the undergraduate level). It is also likely that there will be increased use of oral defense of a pre-submitted written paper at the undergraduate and master's level, although this style of oral defense is currently more associated with doctoral studies.

The traditional open-ended written assignment at the postgraduate level is likely to place more emphasis on deeply personalized, critically reflective assignments where students demonstrate how the topic has meaning in their individual context and personal life story. Assignments may include more opportunities for authentic tasks performed in person and perhaps videoed for future grading or grade moderation. It may indeed involve the critique/ evaluation/appraisal of two or more pieces of text, whether generated by LLM tools or otherwise. Authentic datasets will become even more valuable in terms of personalization to the context. All of these types of tasks are at the upper end of the taxonomy of educational objectives. It is useful to remind ourselves of the various genres of writing tasks used widely in higher education, at the undergraduate and postgraduate level, and consider their application in the context of deeply personalized interpretations to avoid the possibility of students submitting work that may have been directly generated using LLMs. These include case studies, critiques, design specifications, empathy writing, explanations, literature surveys, problem questions, methodology recounts, and proposals (Gardner & Nesi, 2013; Myers et al., 2021; Nesi & Gardner, 2012). While LLMs are able to produce text that sounds plausible in relation to a given topic, and will be used to do so, the personalization of such texts is crucial. This personalization, which takes a high level of academic maturity in terms of the academic writing skills, will ensure academic rigor, especially if the use of LLMs is noted as a resource (e.g., Rospigliosi, 2023; Lambert & ChatGPT, 2022). Increased emphasis on learning how to integrate LLM tool technology alongside recognized learning strategies, such as self-regulation and tapping into metacognitive knowledge (Negretti & Kuteeva, 2011; Negretti & McGrath, 2018), may mitigate against the loss of learning of academic writing feared by some participants and pave the way to considering the structure of academic writing differently—instead of constructing text from the bottom up, perhaps academic writing will involve more deconstruction and reconstruction of texts produced partly by LLMs. In a similar linguistic context, Baroudi et al. (2023) recently had success with a "feeding forward" intervention by engaging students in the feedback provided by the teacher and therefore enhancing its quality, in relation to authentic assessments based on their field placement assignments. Perhaps the manner in which instructors engage with their students to support academic writing also needs to be explored further.

There is no doubt that academic integrity must be maintained, but in a future-forward way. Instead of being afraid to embrace these new technologies in higher education, let us harness them in a way that enhances academic writing output and democratizes publishing opportunities so more knowledge can be disseminated, always considering how to best foster academic maturity among postgraduate students engaged with these writing tasks. This will require support being put in place to ensure that students and faculty alike share a common understanding of what types of sources need to be acknowledged in academic writing if output includes the use of LLMs. This highlights the need for rigorous and thorough assessment task guidelines and rubrics, which include specific criteria indicating critical thought in relation to academic literature, and personalized authentic narratives having more of a place in relation to those syntheses. Picard, in a recent keynote (2023), highlighted this need for authentic assessments to demonstrate meaningful application of real-life knowledge and skills, and referred to Sridharan and Mustard (2015), who offer very useful tools for teachers to reflect on the authenticity of their assessments, well in advance of the emergence of LLMs such as ChatGPT. Picard also highlighted aspects of LLMs that might help students in their learning (2023). These include the possibility of

revising tests using LLMs by generating questions for discussion and reflection, and the potential of using LLMs to conduct an initial scan of the literature, with the output on a topic providing them with key words and concepts, and practicing critical thinking and reflection skills by reflecting on inputs and outputs and annotating them (Picard, 2023).

CONCLUSION

The issue of plagiarism is part of the reality of higher education, and institutions will continue to take similar measures as before to mitigate against these practices. As LLM tool technology develops further, so will the technology used to detect instances of plagiarism. In fact, perhaps the affordances of this new way of thinking about constructing academic writing will allow students who may previously have considered employing ghostwriters—due to a lack of confidence in their academic writing skills, for example—to consider a different approach that involves using LLMs as a tool. Turnitin® itself recommends focusing on the process *and* the product by assessing drafts and outlines as well as the final product (Turnitin, 2023).

Indeed, we need to share a common understanding regarding acknowledging the work or input of others, whether that is an academic citation or a technological shortcut. Without the intent of being facetious, we have started to consider whether a program suggesting "design ideas" when creating a slide deck, borrowing a template from an online word processor, academic search engines helping us find relevant academic literature faster than ever before, or grammar checkers helping correct our language and spelling mean that we should acknowledge their usage. Or can we consider that our usage of these tools demonstrates our ability to choose how to go about our work in the most efficient way? This requires deep thought and consideration as we enter a new era in considering how we approach academic writing for postgraduate assignments and for publication.

The manner in which this paper about LLMs has been created, from an interpretivist grounded theory perspective, indicates how some of the most cutting-edge technological tools, which have a real-life impact on everyone engaged in academic writing, can inspire the real work of qualitative research. Research requires an open mind, metacognitive skills, critical thought, systematic analysis, an ability to search for and synthesize available literature, and often collaboration. From a methodological perspective, the emergent design of this paper highlights the affordances of qualitative research. The irony of analyzing this particular dataset using the highlighter pen method is not lost on the authors, who would also like to acknowledge the use of word processing software, referencing tools, spell-checking tools, grammar checkers, transcription software via online word processor, and both academic and nonacademic search engines. No LLM tools were used in the creation of this paper.

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The authors report there are no competing interests to declare.

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