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GPT Search for Revolutionizing Research for Early-Career Education Scholars: A Mediation and Multi-Modality Perspective

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Abstract

In the domain of academic research, the ongoing discourse centers around the intersection between the integration of artificial intelligence (AI) and some critical phenomena including early-career researchers' challenges, the co-evolution of AI and research methodologies, continuous innovation, reorientation, and multi-modal advancement of various AI tools. Against this backdrop, Open AI's *GPT Search* has just emerged as a versatility step towards its Chat GPT 4.0. The present perspective paper explores how this novel search engine can make broader paradigm shifts in traditional research approaches in literature search, data analysis, and writing discussions. Grounded in the authors' scholarship, subjective insights (authorial experimental observations), critical appraisal of the extant literature, and experiential engagement, this paper perspectivizes that with its mediation and multi-modality functioning *GPT Search* promises to support conducting literature searches that are uniquely helpful for semantic relevance, large search syntaxes, and aggregated and index-specific results from multi-databases in one single search command. Additionally, *GPT Search* can also transform early-career researchers' labor-intensive manual data analysis into automatic but more efficient qualitative data analysis. Furthermore, this search engine offers a reverse approach to writing discussions for articles and theses. The paper is the preliminary perspective that is supposed to trigger further empirical studies to advance the ongoing discourse around AI-integrated research with special attention to the novel research tool i.e., *GPT Search*.

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INTRODUCTION

Beyond academia, general people perceive research as simply conducting a quick web search to find information or a clinical report from a lab. However, research is not that straightforward in its own right. Rather, it is complex and multifaceted, and essentially, it has to navigate systematicity and scientific norms and principles toward the creation of new knowledge or to improve understanding (Williamson, 2002; Wright, 2015; Aspers & Corte, 2019; Song, 2021; Ghezzi, 2020). Especially, education research is typically challenging because of its epistemological and methodological rigor (Towne & Shavelson, 2002) and because it is entangled with the essence of (social) science warranted by search, analysis, and synthesis.

Because of the methodological and systematic complexities of research, it necessitates novice researchers such as doctoral students or other beginner researchers to learn the *how-tos* to conduct the research efficiently (Lander et al., 2019; Ipanaqué-Zapata et al., 2023; Mbuthia et al., 2024).

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Although formalized, structured research training is provided worldwide by universities to research students (Higgs, 2016; Köhler, 2018; Francesca et al., 2024; Girard et al., 2024), research understanding and skills developed from that training are not often thoroughly acquired. Besides, researchers' learning is not limited to the classroom or within the curriculum, unlike the learning of students. Their research learning is more open-ended (Worsley, 2023) and much of it happens beyond classroom settings. Therefore, early-career researchers have an evolving need to supplement their formal research training with external mediating tools with multimodalities when it comes to doing hands-on research. In response to the mentioned need for efficient research support tools, artificial intelligence (AI) as research assistants has already brought about a big optimism (Guersenzvaig et al., 2024).

A range of AI tools including Grammarly, Mandely, Endnote, and so on have speeded up the research process (Chubb et al., 2022), and offered automaticity in research activities (de la Torre-López et al., 2022). It is worth highlighting that available AI assistants possess specific dimensions that facilitate particular research tasks. Grammarly, for example, provides strong support for editing the language of scientific papers. Against this backdrop, with the mono-service orientation of AI tools (e.g., narrowed service in 'writing research', not 'doing research'), multimodal AI is being advocated for innovations, accuracy, and greater impacts in different domains wherein human actors often need digital support and services (Shaban-Nejad et al., 2023; Warner et al., 2024). However, there has been a lack of multimodal capacities of AI tools with research-oriented applications. In this paper, we perceive that *GPT Search* has emerged with strong potential for multi-modal applications that can mediate research processes and practices and assist beginner researchers in carrying out research to a great extent. Precisely, the perspectivization in this paper is the contemporary capture of AI in the novelty of GPT Search as a utopian approach to dealing with researchers' chronic challenges in doing research.

DISCUSSION

GPT Search: Locating Its Promises and Premises

The emergence of *GPT Search* may be based on multi-iterations and orientations, tailor-making, and revolutionizing Open AI's Chat GPT. Inspired by the overwhelming uses of Chat GPT by students and non-student multitudes, Open AI has, over a short period, made multi-orientations and iterations of their recently developed GPT such as GPT 3.0, GPT 3.5, and GPT 4.0 (Alam et al., 2024; Alam & Asmawi, 2023; Asmawi & Alam, 2024). Thus, in this quick trajectory of the evolution of GPT, Open AI recognized the potential of widespread integration of AI in education and the need for a specialized version of Chat GPT. They tailored-made GPT Edu and launched it as latest as 2024 to bring forth new experiences and responsible usage in higher education. The antecedent versions of Chat GPT and Edu GPT have been overall instrumental for scientific research (Hill-Yardin et al., 2023; Alam & Asmawi, 2024) in drafting articles, coding data (Megawati et al., 2023) and in generating ideas and insights (Obaid et al., 2023). These tools are particularly valuable for early-career researchers in education, as they navigate the dual challenges of mastering research methodologies and addressing complex pedagogical questions. In revolutionizing GPT, Open AI has added a new search engine to their Chat GPT 4.0. The name of this new feature is *GPT Search*. It has a functioning similarity with other search engines, *GPT Search* can perform web searches for information. However, it has significant promises for enhancing educational searches in general and research processes in particular. To best serve the academic purposes of students and researchers, *GPT Search* has taken a collaborative approach by partnering with research databases and owner companies. As a result, *GPT Search* is not characteristically subject to research data feeding. Instead, it sets itself apart by promising comprehensive and reliable research data fetching and retrieval from authentic sources.

GPT Search: Mediation and Multi-Modalities in Research

In Searching Literature

The antecedent to publishing high-quality research is effective and efficient literature searches that researchers conduct as the fundamental task to find a knowledge gap, design research, and conduct it (Siebert, 2019; Jha et al., 2022). However, literature searches are

challenging for novice researchers because it is time-consuming (McGrath et al., 2012), methodological and systematic (Haraldstad & Christophersen, 2015; Vimal, 2022), computerized and organized (Pisters & Hoffman, 1998), optimal (Bramer et al., 2017) and comprehensive (Hazari, 2023). Moreover, research databases (e.g., Google Scholar, PubMed, ResearchGate, Scopus, and Web of Science, etc.) are multiple, and selecting the best search engines is also part of the challenge of literature searches (Dekkers et al., 2022). In the context of online education research, bibliometric analyses have highlighted its growing complexity, emphasizing the urgent need for tools that can streamline access to high-quality literature (Permadi & Tiarto, 2022). Additionally, efforts to enhance scientific literacy capabilities demonstrate the importance of structured and accessible information, which GPT Search effectively addresses through its semantic relevance and comprehensive database integration (Mujakir et al., 2024). For early-career researchers in education, this complexity is further compounded by the need to integrate insights from diverse fields such as psychology, sociology, and pedagogy, making a comprehensive and reliable tool like GPT Search especially advantageous. We perceive that *GPT Search* as a search engine may serve as a comprehensive solution to the above-mentioned challenge of conducting literature searches. Compared to other search engines, *GPT Search*'s distinctive characteristics may be categorized as below.

Semantic Relevance Detection

Traditional search engines primarily operate by matching keywords and understanding their direct correlations within a search query. This approach often leads to search results that include a mix of relevant and irrelevant information, as it relies heavily on the exact presence of specific terms without fully grasping the deeper meaning or intent behind the query. In contrast, GPT Search employs advanced Natural Language Processing (NLP) to go beyond simple keyword matching by understanding the semantic intent behind a search query. This means that GPT Search can interpret the relationships and contextual meanings of words, delivering results that align more closely with the user's actual needs. For example, while traditional search engines might focus solely on the terms within a query like *"effective learning strategies for middle school students,"* GPT Search can discern the deeper context and prioritize results discussing proven strategies tailored for middle school settings. By processing entire phrases and the relationships between terms, GPT Search ensures more meaningful and accurate results.

Complex Query Handling

Researchers have to do rather complex search queries when they conduct literature searches in traditional search engines (e.g., Google Scholar). It includes relying heavily on Boolean operators (i.e., AND, OR, NOR). Often the researchers have to restructure the search syntax to refine the search intents and to get comprehensive and relevant results. *GPT Search*, in contrast, performs on simplistic and straightforward search intents without needing Boolean logic. It operates on a nuanced understanding of conversational language. That is, *GPT Search* understands large language models. Hence, it can bring more relevant and comprehensive results, even if it is given a phrase query or a large syntactical topic to search instead of articulated complex Boolean structures. For example, the authors put in the search syntax "emotion in childhood education" in Google Scholar and it brought up many results with a few that were intended while GPT search brought up the intended results with the exact syntax in the titles and the most recent ones.

Optimizing of *GPT Search*

As highlighted earlier, researchers can leverage the advantages of GPT Search's enhanced semantic capabilities, including its ability to understand nuanced queries, deliver comprehensive results, simplify the search process, and improve the discoverability of relevant literature. By combining GPT Search with traditional keyword-based search methods, researchers can achieve greater precision and depth in their literature searches. For early-career education researchers, this hybrid approach is critical in ensuring that key studies on teaching methodologies, student outcomes, and curriculum design are not overlooked. Such an integrative approach not only enhances the efficiency of the search process but also contributes to the overall credibility and

reliability of the research findings. This hybrid strategy ensures that critical resources are not overlooked while benefiting from GPT Search's advanced semantic insights.

Simultaneous Aggregated Results from Multiple Databases

GPT Search's further outstanding ability is that it can simultaneously aggregate articles, books, and chapters from multiple databases, such as ERIC, Springer, Tylor & Francis, Willey, Sage, and the like. Researchers may take this special advantage of GPT Search and significantly reduce the time and effort they invest when searching each database by other traditional search engines. In the cases of other search engines, they lack this integrated approach that compels researchers to switch between platforms such as ResearchGate, Google Scholar, Springer, ScienceDirect, etc., one after the other to gather comprehensive literature. The process is, to some extent, illustrated in Adu's perspective video as well (Adu, 2024).

Conditional Flexibility and Index-Based Filtering in *GPT Search*

GPT Search has an additional flexibility that allows researchers to tailor more conditional search requests. Traditional search engines such as Google Scholar, and ResearchGate allow researchers to limit search criteria to publishing year, citations, journal articles, books, open access, book chapters, etc. *GPT Search* can also perform these conditional searches but it has a unique capability to perform search literature according to indexing conditions. For example, *GPT Search* can perform searches limiting it to the articles published only in Scopus-indexed journals or only in Web of Science-indexed journals. This feature and focused approach of *GPT Search* facilitates researchers in streamlining the relevance, quality, and credibility of the searched and available literature.

It is widely acknowledged that thematic analysis for early career researchers is rather challenging for reasons including cognitive factors (Riger & Sigurvinsdottir, 2016; Belotto, 2018; Braun & Clarke, 2023; Liu, 2024). In doing this challenging job *GPT Search* can be an impressive assisting tool. GPT-Search's multi-modality is not just limited to literature searches; its capability extends beyond retrieving literature as it has impressive application potential, especially for qualitative data analysis in a thematic way. The process of *GPT Search*-mediated qualitative data analysis involves uploading qualitative data (e.g., interview transcripts) directly into the search engine. Then, researchers ask *GPT Search* to analyze the given data with specific research questions. Then, *GPT Search* quickly looks for patterns in the data that thematically align with the targeted research questions.

Then, in its responses, *GPT Search* organizes the most prominent (dominant pattern-based) theme heads and within each main theme, it further breaks down responses into more specific sub-themes grounded in the cited participants' actual words (e.g., "Participant 1"). Thus, the responses structured into themes and sub-themes help researchers understand the nuanced aspects of each theme. The whole process is done quickly, efficiently, and consistently. This is a significant advantage for qualitative researchers because *GPT Search* saves them from labor-intensive manual coding and interpreting qualitative data. Essentially, *GPT Search*-mediated data analysis may serve to accelerate qualitative research by streamlining data, deriving thematized insights from the data, and offering a nuanced understanding of a phenomenon with transparency and data specifications and citations of participants. Similar evidence is also reflected in Adu's perspective video (Adu, 2024; Hamish, 2024). Despite the above-mentioned utopian potentials of GPT Search in qualitative data analysis, some dystopian risks of biases and inaccuracy as some critical issues may come to be the by-products or spillover effects of this search engine, which necessitates authors' human revision and monitoring.

Writing a discussion is wherein researchers strongly engage to make the results communicable and persuasive to the readers, critically analyzing the results, evaluating the existing knowledge, and appraising the new knowledge (Nundy et al., 2021; Balakumar et al., 2023; Reeves & Buczkowski, 2023). This is why writing an effective discussion for a research paper or thesis is often a challenge, especially for early-career researchers (Budgell, 2009). *GPT Search*'s multi-modality can be extended to assist researchers in overcoming this writing challenge. That is, a further potential of *GPT Search*-mediated research may be detected in its multimodal functionality in transforming the traditional approach to writing a discussion for a research article or a thesis.

It is normative that researchers first gather previous literature before stepping ahead into the stage of a writing discussion on the findings derived from their collected data. However, with *GPT Search*, this can be done in a reverse fashion. In framing the discussion the other way around, researchers already have thematically organized findings mediated by *GPT Search*. Afterward, they can ask the search engine to locate relevant literature to align with or contrast those themes. This procedural demonstration is found in Adu's perspective video as well (Adu, 2024). This potential paradigm shift in discussion writing for research is significant because it reverses, in the first place, the research workflow, which is likely to reduce researchers' burden of extensive pre-review. For early-career researchers in education, this efficiency allows them to focus more on interpreting findings within the context of teaching and learning environments, fostering deeper insights into practical applications for schools and educators. Secondly, by doing so researchers can interpret the results without distractions caused by the manual cross-referencing with pre-reviewed literature. Thirdly, because of *GPT Search*'s mediation and modality, researchers are advantaged with automated comparison and contrast, which helps early-career researchers identify and articulate the unique contributions of their findings. This paradigm shift may revolutionize educational researchers' procedural difficulty involved in the traditional discussion writing by a digital scaffold of GPT Search's collaborating intelligent framing of discussion subject to human revisions.

LIMITATIONS

The study is a quick perspectivization of GPT Search, a new feature of cutting-edge Gen AI tool, Chat GPT. It is not essentially an empirical study. Constructivist qualitative or positivist quantitative studies are, therefore, recommended.

CONCLUSION

Research is a highly complex, systematic, and scientific process. Therefore, especially early-career researchers have a critical need for AI assistance in doing academic research activities including searching relevant literature, analyzing data, and writing a discussion. In the trajectory of AI evolution, GPT's emergence, its multi-iterations, (re)orientations, and revolutionizing have led to the creation and addition of *GPT Search* (an extended feature of Chat GPT). We perspectivize that this novel search engine has a big promise of mediation and multi-modal support and solutions to beginner researchers' challenges in doing research. Researchers can do straightforward intuitive querying by putting large search syntax into *GPT Search* to get access to index-specific, authentic, and high-quality literature. Further, this search engine can be impactfully applied to transform the labor-intensive data analysis process by assisting early-career researchers in rapidly obtaining meaningful interpretations of qualitative data well-structured into themes and sub-themes aligned with research questions and specifically cited participants. In addition, *GPT Search* can potentially offer a reverse approach to writing research discussions. That is, after getting thematic analyses from *GPT Search*, researchers can subsequently retrieve literature by using the same search engine and get a focused discussion through *GPT Search*-mediated comparisons and contrasts. To sum up, we speculate that *GPT Search* signifies a significant evolution of AI (more specifically GPT) that can revolutionize the field of academic research by offering innovative assistance in literature searches, less labor-intensive and digital qualitative data analysis, and even reimagining the reverse process of writing discussions on research findings. With these multi-modal capabilities, *GPT Search*'s scaffolding roles carry a promising and profound impact on the future of academic research, by aligning its mediation seamlessly with the needs of modern researchers, especially those navigating the challenges involved in their early career stage. Thus, the present perspective paper opens up a broader discourse around the novel research tool *GPT Search* in the domain of AI-mediated research and the effects of its unique multi-modality applications on early-career researchers.

AUTHOR CONTRIBUTIONS

MSA and AHMO contributed equally to the development of this perspective paper, including the conceptualization, literature review, analysis, and writing of the manuscript. Both authors reviewed and approved the final version of the manuscript.

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